Asynchronous Continuing Education for Iowa's Green Industry Professionals

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Summary. **A collaborative two-part project between Iowa State University Horticulture Extension and the Iowa Nursery and Landscape Association (INLA) resulted in an online, asynchronous training program to prepare green industry professionals for the Iowa Certified Nursery Professional (ICNP) exam, and to provide advanced training through webinars. Since 2008, members have accessed a set of 20 training modules that cover plant identification and content on the written portion of the certification exam. In the 6 years since the modules have been used, the pass rate for the written portion of the exam has increased from 57% (2005–07, 18 participants) to 85% (2008–13, 49 participants). A survey administered to participants between 2008 and 2013 gathered information on participant demographics, interest in learning in an online format, usefulness and applicability of information in preparing for the exam, module usability, and how the modules impacted their learning. Participants felt that the modules were an effective way to deliver content (4.45 out of 5) and reported they were comfortable using a web-based format to learn (4.89 out of 5). Advanced training was delivered to members through three webinar series: five webinars in 2011 and four webinars each in 2012 and 2013. Although attendance to the live webinar sessions was limited, the archived versions have been accessed a number of times.**

In the United States, both the nursery (Hall et al., 2005) and landscape industries [Professional Landcare Network (PLANET), 2013a] continue to grow. Statistics from the July 2012 IBIS World market report showed that the green industry had annual revenues of $61 billion, employed 899,958 people, and represented 416,991 businesses (PLANET, 2013a). Garden and landscaping services is a major component of the green industry. In 2009 alone, 72.3% of the total market revenue for the year was attributed to garden/lawn landscaping services (PLANET, 2013a). A Global Industry Analysts report from 2010 forecast that the landscaping services market in the United States was expected to recover from the economic downturn and is poised to reach $80.06 billion by 2015 (PLANET, 2013a). This type of recent and projected growth supports the need for a large and increasing workforce.

A well-educated nursery and landscape workforce is essential to support the growing green industry. Numerous professional development opportunities are available to industry members and these include programs provided by both professional associations and educational institutions. A number of collaborations also exist between U.S. state Cooperative Extension Services and professional green industry associations to provide educational programming to industry members (Justen et al., 2009; Kratsch et al., 2008; Scoggins et al., 2004; VanDerZanden et al., 2006). In an effort to codify this educational training some state nursery and landscape associations provide a professional certification program. In addition, there is a national certification program available through PLANET (2013b). Most often certification is voluntary, but in some cases, it is required by governing boards that issue licensure (North Carolina Nursery and Landscape Association, 2013). The variety of skills required, job types, and company sizes within the nursery and landscape professions makes for a diverse industry. This diversity combined with a lack of regulatory licensing can lead to an assortment of quality control issues in the industry. Education, even if it is not tied to licensure, can be a key part of overcoming this problem (PLANET, 2013b).

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Iowa Nursery and Landscape Association membership surveys in 2005, 2008, and 2010 showed there was a need for continuing education opportunities for their membership. Further, members wanted programming that was flexible and that could accommodate their schedule. To meet this documented need, two online training programs were developed. The first was a set of 20 online training modules to prepare INLA members for ICNP exam. The second was a series of advanced training webinars that cover emerging issues in the green industry.

Iowa Certified Nursery Professional Program

The purpose of the ICNP program is 3-fold: to improve the skill and knowledge of green industry employees; to have this improvement and professional qualification recognized in the eyes of the public, as well as within the landscape and nursery industry; and to provide a means of self-improvement for the employee and increased worth to the company or business (INLA, 2013). This certification is voluntary and not required by the state of Iowa to operate as a nursery or landscape enterprise. The ICNP program includes a core certification training and the option to specialize in either garden center or landscape areas. The core training covers plant nomenclature, plant growth and development, soils and fertilizers, plant disease and insect identification and diagnosis, turfgrass management, and professionalism in the green industry. Training for the specialization areas focus on topics specific to garden center management (i.e., plant care in the garden center, customer service) or landscape design and installation.

The certification exam has two components. The plant identification portion uses a combination of live specimens and slide images and covers a mix of 50 woody and herbaceous plants. The written exam consists of 50 true/false and 65 multiple-choice questions and covers basic horticulture information and an area of specialization.

Before Mar. 2008, members prepared for the ICNP exam using a printed training manual. This manual was adapted, with permission, from

the Ohio Certified Nursery Technician manual published by the Ohio Nursery and Landscape Association (2013).

Materials and methods

IOWA CERTIFIED NURSERY PROFESSIONAL PROGRAM. Between June 2006 and Dec. 2007, a series of 20 online training modules were developed for the INLA to prepare members for the ICNP exam. Eight modules cover plant identification and the remaining 12 modules cover the general topics addressed in the certification exam (Table 1). The eight plant identification modules include the plant name and multiple images highlighting the plant's identifying characteristics (Fig. 1). The 12 content-focused modules were developed using Adobe Presenter (Adobe Systems, San Jose, CA). Each module includes learning objectives; a presentation with audio overlay that is searchable by topic and that can be used to generate printable notes; drag-and-drop self-test exercises; and an automated online quiz that provides immediate feedback to help learners test their understanding of the content. Figures 2–4 show screen-captured images from Module 1: Plant identification and characteristics highlighting some of these features. All of the modules are posted inside the Iowa State University Blackboard Learn™ (Blackboard, Washington, DC) learning management software and are password-protected. Once members register for the ICNP exam they receive login information to access the modules.

In consultation with Iowa State University's Institutional Review Board, a 20-question survey instrument was developed and approved. Survey questions gathered information on participant demographics, interest in learning in an online format, usefulness and applicability of information in preparing for the ICNP exam, module usability, how the modules impacted participant learning, and suggestions for additional online training module topics. The survey consisted of closed-ended and open-ended questions and questions formatted into a Likert scale (Likert, 1932). The survey was administered to the 49 participants who completed the ICNP exam between Mar. 2008 and Feb. 2013, which constituted six separate testing dates. Participants completed the paper-based survey immediately after completing the written exam. Descriptive statistics (i.e., mean values) on the survey data were computed using Excel (Microsoft, Redmond, WA).

INLA EMERGING ISSUES WEBINAR SERIES. Data from the 2010 INLA member survey showed members were interested in professional development that was beyond the training modules created to support the ICNP exam. They were interested in advanced training that addressed current and emerging issues in the green industry. Based on this feedback, webinar series were developed in

Table 1. Topics for the online training modules that support the Iowa Nursery and Landscape Association-sponsored Iowa Certified Nursery Professional exam.

Topic	Slides in each module (no.)
Plant identification modules	
Deciduous trees	109
Shrubs	107
Herbaceous perennials	72
Annuals	28
Evergreen trees	25
Perennial grasses	16
Groundcovers	16
Vines	15
Core certification modules	
1. Plant identification and characteristics	50
2. How plants work: Growth and development	10
3. Rooting environment and fertilization	25
4. Installation and establishment of landscape plants	36
5. Turfgrass establishment and management	42
6. Management of turfgrass diseases and insects	18
7. Introduction to plant diseases and insects	26
8. Diagnosing plant problems	13
9. Managing plant diseases and insects	26
10. New employee training and professionalism	15
Specialization area modules	
11. Garden center management	36
12. Landscape design	20

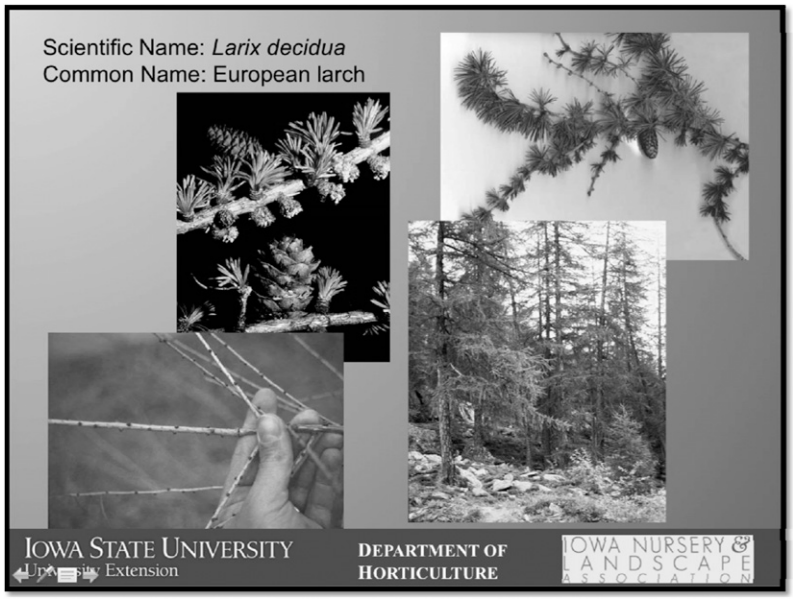

Fig. 1. Screen capture of a slide from the evergreen tree plant identification module in the online training supporting the Iowa Nursery and Landscape Association Iowa Certified Nursery Professional exam.

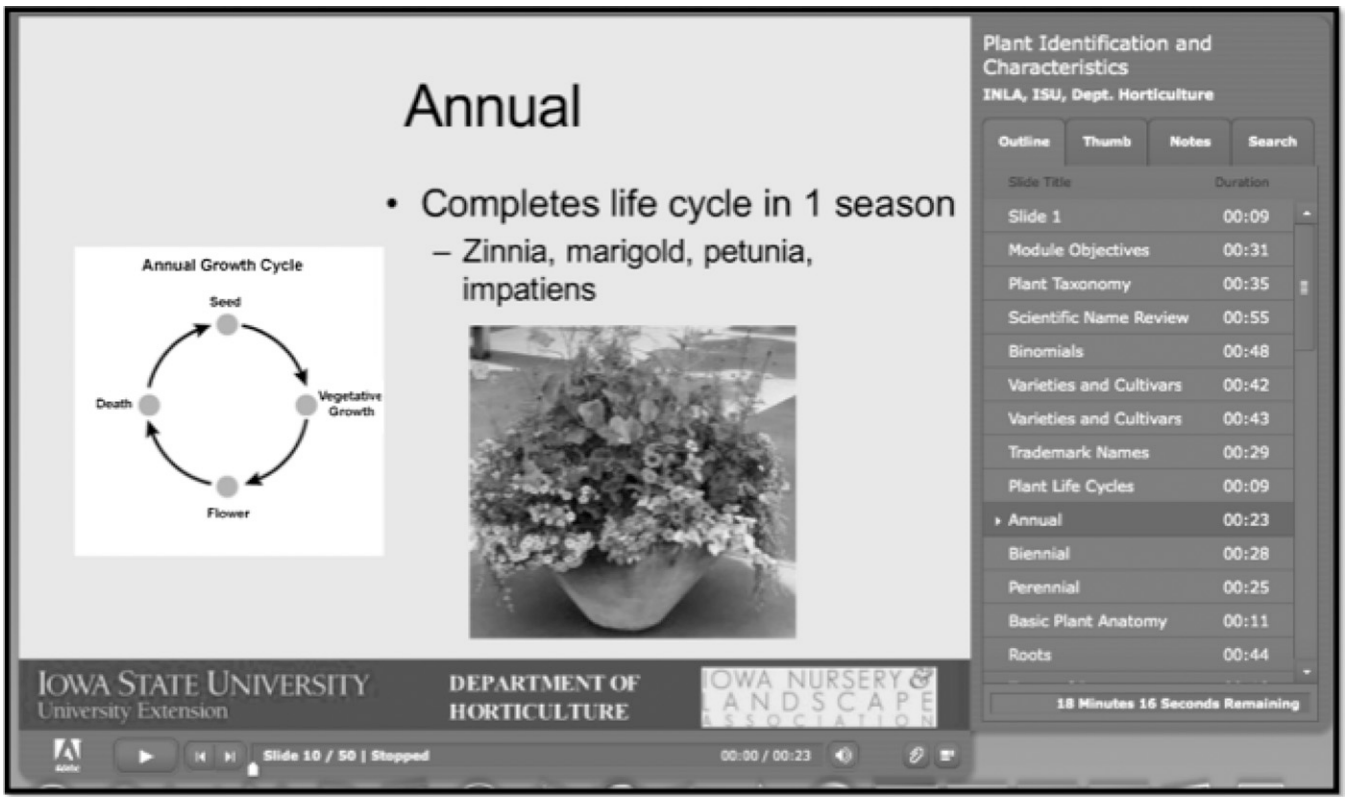

Fig. 2. Screen capture of a slide in Module 1: Plant identification and characteristics of the online training supporting the Iowa Nursery and Landscape Association Iowa Certified Nursery Professional exam. The image shows the user interface in Adobe Connect and how the presentation is searchable by topics listed on the right side.

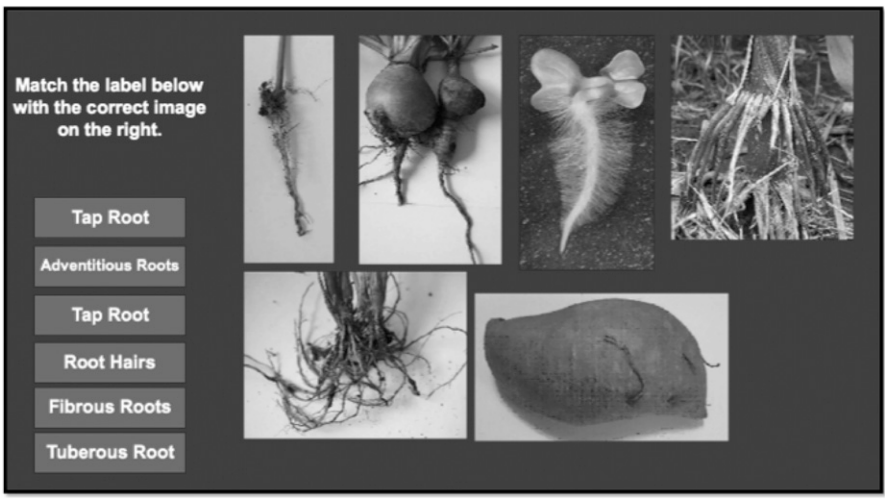

Fig. 3. Screen capture of a slide in Module 1: Plant identification and characteristics of the online training supporting the Iowa Nursery and Landscape Association Iowa Certified Nursery Professional exam. The image shows the drag-and-drop self-test exercise for root types.

winter 2011, 2012, and 2013. The goal was to provide educational opportunities for green industry professionals to supplement existing skills and knowledge with current research-based information.

In July 2010, a planning committee of the INLA Board of Directors and an Iowa State University Extension horticulture specialist established a priority list of topics and speakers for the 2011 webinar series, as well as when to offer the webinars, and how the webinars would be publicized. This same process was followed in the subsequent 2 years to plan the 2012 and 2013 series (Table 2). Each year the webinar series were promoted to green industry professionals attending the annual winter Iowa State University Horticulture Extension conference and trade show (≈700 attendees annually), through the monthly INLA electronic newsletter, direct e-mail reminders the day before the webinar, and through a posting on the INLA website. All of the electronic communications included detailed information on how to access the webinars for the live broadcast, as well as how to access archived versions.

Each year the webinar series occurred on consecutive Wednesdays at 3:00 PM between late January and early March. Each webinar was 1 h long and included time for questions. The webinars were delivered using Adobe Connect (Adobe Systems) and speakers facilitated the live chat feature during the webinar. The live webinar was captured and posted on a password-protected link on the INLA website within 1 week after it aired. Members of the INLA received login information in the electronic

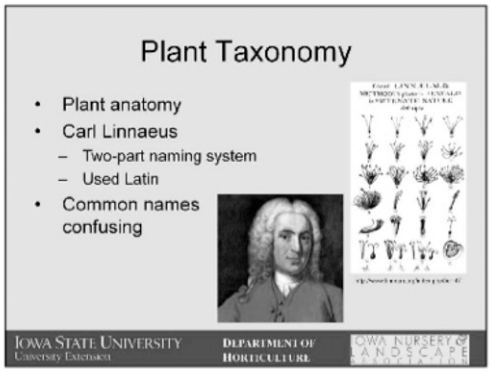

Fig. 4. Screen capture of a slide in Module 1: Plant identification and characteristics of the online training supporting the Iowa Nursery and Landscape Association Iowa Certified Nursery Professional exam. The image shows the printable notes feature.

Table 2. The 2011–13 Iowa Nursery and Landscape Association emerging issues webinar series topics, live broadcast webinar dates, and number of archived webinar downloads ≈2 years, 1 year, and 6 months after the live broadcast.

Live webinar date	Webinar topic	Live broadcast attendees (no.)	Archived webinar downloads as of 1 July 2013 (no.)
16 Feb. 2011	Sustainable sites initiative	8	109
2 Mar. 2011	Stormwater: Best management practices	9	85
9 Mar. 2011	Rain gardens	10	281
23 Mar. 2011	Updating your marketing approach	5	2
1 Feb. 2012	Sustainable landscape management	7	44
8 Feb. 2012	Landscape planting best practices	4	12
15 Feb. 2012	Post planting care and establishment	9	18
29 Feb. 2012	Hardscape trends and design ideas	8	50
7 Mar. 2012	Permeable pavers	7	72
13 Feb. 2013	Sustainable sites update and green roof primer	1	2
20 Feb. 2013	Plant trends—present and future	3	9
6 Mar. 2013	Managing your most important resource—people	4	3
13 Mar. 2013	Small stature trees for the midwest	6	2

newsletter that was published shortly after the webinar series concluded each winter. Members can also contact the INLA office and request login information.

Supplementary online learning modules were created in the Iowa State University Blackboard Learn™ system to accompany each webinar. Each supplementary module includes an embedded link to the archived webinar, a list of additional resources, and an online quiz with immediate feedback.

In consultation with Iowa State University's Institutional Review Board, a three-question survey instrument was developed and approved. The survey asked: if participants gained new knowledge by participating in the webinar; if they would implement one or more new practices or concepts learned in the webinar; and if they expected to increase profitability as a result of participation in the webinar. The 18 unique webinar participants in 2012, and 8 unique webinar participants in 2013, received an e-mail and link to the survey immediately after the final webinar in the series. The survey was created in Qualtrics software (Qualtrics, Provo, UT) and data were exported to Excel for analysis and descriptive statistics computation.

Results and discussion

Iowa Nursery and Landscape Association member response to the online training modules for the ICNP exam and the emerging issues webinars has been positive. Members have appreciated the flexibility afforded by the online offerings and the unique features for getting immediate feedback to check their learning (self-tests and quizzes). These examples of participant satisfaction are similar to what has been reported about other online extension training programs (Futris et al., 2004; Parker, 2009; Rich et al., 2011)

IOWA CERTIFIED NURSERY PROFESSIONAL PROGRAM. The online modules constituted the first electronic, asynchronous training program for the INLA. Initially, there was hesitation from the board leadership whether the membership would embrace the new training format. However, comments from the first group of participants (in 2008) who used the modules to prepare for the exam were promising. There is not a common demographic profile of the INLA members who take the ICNP exam each year, and there is additional variation from year to year. Because of this and the small sample size each year, the results reported here from the training module survey have been pooled across all 5 years to show a comprehensive summary of

participant evaluation of the training modules (Table 3). Over the study period, participants listed their interest in completing the online training modules as 4.1 (1 = not interested; 5 = very interested).

Comments from exam participants suggested the increased number of members taking the exam between 2008 and 2013 could be attributed to the online modules. Between 2004 and 2007, when the printed manual was used for exam preparation, four to five members took the exam each year. Since the training modules have been in place, 9 or 10 members take the exam annually. Further, the percentage of participants who passed the written portion of the exam increased from 57% (2004–07) to 85% (2008–13).

The basic analytics associated with the Blackboard Learn™ learning management system allows for tracking webpage visits and duration of time on a page. Each year (2008–13) the typical usage pattern showed a significant increase in activity accessing the modules in the 2 months before the ICNP exam date. There were 2520 total page views for the entire set of modules between 1 Dec. 2007 and 20 Feb. 2013. During this timeframe, three modules consistently received the most activity: Module 1: Plant identification and characteristics (14.4% of the total page views); Module 3: Rooting environment and fertilization (8.7%); and Module 2: How plants work: Growth and development (6.4%). During this same timeframe, activity on the remaining 17 modules ranged from 5.4% to 2.6% of the total page views. Not all of this activity can be attributed to members preparing for the ICNP exam because all INLA members have access to the modules. Some companies are using the modules to meet their own educational needs, such as individual professional development and new employee training.

INLA EMERGING ISSUES WEBINAR SERIES. Table 2 shows number of attendees for the live broadcast of the webinars and the number of downloads from the archived versions ≈6 months, 1 year, and 2 years later. Because the live attendance was low in 2012, the membership was consulted in preparation for the 2013 series to determine if there was a better day or time. Wednesday afternoon was determined to be the most desirable time.

Results to the three-question survey on knowledge gained, implementation of a new practice or concept, and expected increase to company profitability are shown in Table 4. There were no significant differences between responses to these three questions in 2012 and 2013. Because of this and the small sample size, the data were pooled to provide an overall evaluation of the combined 2012 and 2013 webinar series. Survey response rates for 2012 and 2013 were 55.5% and 79%, respectively. Participant responses suggest the webinars did provide an advanced learning opportunity and that they will be able to apply what they learned from the webinars to improve their profitability. These results, providing a successful learning opportunity and the ability to apply what was learned to their business enterprise, are similar what Rich et al. (2011) reported in their work with the agritourism industry in North Carolina.

Conclusions

A well-educated workforce is important as the green industry continues to grow, and as more homeowners look to industry professionals for high-quality landscape information (PLANET, 2013b; Severson, 2005). Providing current, research-based information to industry professionals that results in adoption of new practices has been done successfully in a number of industries (Barrett et al., 2012; Imler et al., 2012; VanDerZanden et al., 2006). In recent years, extension professionals have also incorporated new technologies as part of their approach to educational program delivery. Examples include webinars, extended online programs, and conferences, and many of these programs have been successful in accomplishing program objectives and reaching new audiences (Allred

Table 3. Evaluation of online training modules used to prepare for the Iowa Certified Nursery Professional exam by Iowa Nursery and Landscape Association members who took the certification exam between Feb. 2008 and Feb. 2013 (N = 49).

Questions related to the modules	Mean rating (1–5 scale)[z]
Readability of module content	3.82
Overall rating of these online training modules	3.79
Navigation within the training modules	3.78
Audio clips associated with the PowerPoint[y]	3.60
The organization of the training material	3.58
The amount of information presented in the modules	3.57
The relevance and usefulness of content covered in the modules	3.29
Questions related to participant learning	**(1–5 scale)[x]**
I felt comfortable using the Web-based format of these modules.	4.57
These online training modules are an effective way to deliver information.	4.27
The modules stimulated me to think more deeply about the subject.	3.94
The interactive format of these modules aided my learning.	3.81

[z]1 = poor, 2 = fair, 3 = good, 4 = very good, 5 = excellent.
[y]Microsoft Corp., Redmond, WA.
[x]1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.

Table 4. Evaluation of the combined 2012 and 2013 Iowa Nursery and Landscape Association emerging issues webinar series (n = 17).

As a result of this webinar …	Mean rating (1–4 scale)[z]
I have gained new knowledge about the topic covered.	3.37
I am likely to implement one or more new practices/concepts I learned.	3.08
I believe I can increase profitability for my employer/company.	2.97

[z]1 = strongly disagree, 2 = disagree, 3 = agree, 4 = strongly agree.

and Smallidge, 2010; Furtis et al., 2004).

The asynchronous training programs for of Iowa's green industry reported here have also been successful as evidenced by the increase passing rate for the ICNP exam after the online modules were deployed, and webinar participant implementation of new practices or concepts. Engaging INLA early in the planning process through membership surveys and consultation with the board of directors allowed Iowa State University Horticulture Extension to tailor programming to address the membership's educational needs. Comments from participants using the ICNP training modules and attending the live webinars were positive and included numerous suggestions for future offerings. The INLA Board of Directors are currently exploring partnerships with other state nursery and landscape associations and allied green industry professional organizations to develop licensing agreements to share content from the training modules and webinars.

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