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INSTRUCTIONAL DESIGN AND ASSESSMENT

An Instructional Seminar for Online Case-Based Discussions

Jaclyn M. LeBlanc, PharmD,[a,b] Maria C. Pruchnicki, PharmD,[a] Stephanie V. Rohdieck, MSW,[a] Anand Khurma MA[a] and Joseph F. Dasta, MSc[a]

[a]College of Pharmacy, The Ohio State University
[b]College of Pharmacy, University of Oklahoma*

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Objective. To assess a training seminar developed to prepare pharmacy instructors to facilitate online discussions.

Design. A 2-part seminar was developed to train faculty members and teaching assistants to facilitate online case-based discussions. A preseminar survey instrument was distributed to potential attendees and a postseminar survey instrument was given to those who attended the seminar.

Assessment. Twenty (91%) instructors completed the preseminar survey instrument. Eleven of these instructors attended at least 1 session of the seminar and indicated that the didactic and/or application portions were either ''helpful'' or ''very helpful.'' These faculty members and teaching assistants also completed the postseminar survey instrument and conveyed a significant increase in level of comfort in their ability to facilitate online case-based discussions ($p=0.004$). The 3 most frequently perceived barriers to online teaching remained consistent despite training or teaching experience.

Conclusions. After attending a training seminar and/or facilitating an online case discussion, participants' comfort level in their ability to teach online increased. Further study of the impact of faculty development programs on teaching effectiveness and student satisfaction with online pharmacy education is warranted.

Keywords: distance education, Internet, educational technology, faculty development

INTRODUCTION

Distance education and online-learning, collectively known as ''e-learning,'' are becoming increasingly used in higher education. In 2005, over 64,000 Ohio students were reported to have enrolled in an e-learning course.[1] Nationally, online enrollment increased to 3.2 million students from 2.3 million in 2004, and the majority of higher education institutions offering face-to-face undergraduate and/or graduate courses also offered courses online.[2] Sixty percent of institutions identified e-learning as part of their long-term education strategy, and penetration of online courses in health science professions approximates that of programs in business, computer and information sciences, and education.[2]

Corresponding author: Maria C. Pruchnicki. Address: 500 West 12th Ave. Columbus, OH 43210-1291. Tel: 614-292-1363. Fax: 614-292-1335. E-mail: pruchnicki.1@osu.edu
*Dr. LeBlanc's current affiliation. At the time the project was undertaken, Dr. LeBlanc was a Critical Care Pharmacy Research Fellow and Graduate Teaching Fellow with The Ohio State University.

E-learning can broadly include courses delivered in a variety of formats, including all online (≥80% online, with no face-to-face interactions), blended/hybrid (30%-79% online with some face-to-face activities), and Web-facilitated (1%-29% online, usually to organize or supplement activities in a face-to-face class).[2] Educational technologies include an array of tools, including course management systems, internal Web pages, and methods to deliver content through media and unidirectional conferencing. However, the introduction of Internet-based conferencing software in 1997 heralded a new generation of online education in which participants are part of a social learning community. Identified as one of the key ''near-horizon'' trends in teaching and learning, contemporary desktop conferencing systems allow synchronous (real-time) class interactions without the limitations of physical space and geographic distance.[3]

Since many instructors began their teaching careers before educational technologies were widely available, or have been unable or unwilling to participate in online education regardless of experience, barriers related to competence in the area of online facilitation are likely to exist. Recent review articles have evaluated the status

of e-learning in health sciences (medical, dental, and nursing) education.[4-6] In these, both interactivity and instructional technique/pedagogy were cited as factors influencing students' satisfaction with e-learning. Furthermore, individual faculty members' facility with educational technology, including computer skills and software, are clearly associated with perceptions of learners' satisfaction.[5] A 2004 report describing Canadian physicians' experience with interactive online continuing education (CE) programs compared to face-to-face CE programs found that the "social comfort" of participants and the facilitators' skills to create an active and encouraging classroom were 2 of 3 main themes elicited from the participant perspective (the third being the educational value of program).[7] In nursing, which is arguably the healthcare field most experienced in distance education practices, focus groups and surveys from the educator perspective have identified faculty development and online training as key requirements for effective e-learning.[8,9] Defining (or redefining) the faculty role, acquiring technology skills, and faculty mentoring were included in their top-ranked training needs.

Although similar studies identifying students' and/or instructors' perceptions and needs in pharmacy education have not been published, both a 2003 American Association of Colleges of Pharmacy White Paper entitled "Assuring Excellence in Distance Pharmaceutical Education" and the newest accreditation standards for doctor of pharmacy education, released in February 2006 by the Accreditation Council on Pharmacy Education, highlight the necessity of faculty training in distance learning methods.[10,11] At a minimum, individual faculty members should receive training in educational technologies available at their institution, technical assistance, exposure to so-called "best practices" in e-learning, peer mentoring, and strategies to improve the social and interpersonal dimensions in a distance environment.[11,12] Additional supports could include recognition of faculty members for participation and innovation in online teaching, as well as institutional support for e-learning as an area of research and scholarship.[11]

At The Ohio State University (OSU) College of Pharmacy, we have offered an online Non-Traditional PharmD (NTPD) program since 2000, to provide a means for baccalaureate-level pharmacists (those with a bachelor of science degree in pharmacy) to earn their terminal degree on a part-time basis. Our NTPD program includes 42 credits hours of online didactic course work, including drug information, pharmacokinetics, and a 6 trimester pathophysiology and therapeutics sequence. Technological innovations, particularly the use of Web-conferencing software as a "virtual" classroom, have been used to support faculty-student and student-student interactions. Courses typically meet biweekly in the online classroom to review problem-based learning exercises and case discussions. Although 2 to 3 core faculty members serve as primary coordinators of NTPD courses each year, an ad hoc committee assigned to review the program at its 5 year anniversary identified a need to increase NTPD student interactions with non-NTPD faculty members, practitioners, and "content experts" for various therapeutic areas. Subsequently, many of the guest instructors recruited for online workshops are novices in online teaching, while others may participate only once or twice per year. The purpose of this research was to assess a training seminar developed to prepare pharmacy instructors to facilitate online discussions, including the impact of training on teachers' comfort level with the technology and discussion techniques.

DESIGN

A training seminar was developed to prepare College of Pharmacy instructors, consisting of both faculty members and postgraduate teaching assistants, to facilitate case-based discussions in an online format. These workshops were conducted via Elluminate Live! eLearning Platform (Elluminate, Ft. Lauderdale, Fla, www.elluminate.com) a commercial desktop Web-conferencing software equipped with 2-way audio, chat, shared whiteboards, presentation capabilities, breakout rooms, a built-in graphing calculator, and application sharing. Preseminar and postseminar survey instruments were developed to collect data for assessing the impact of the seminar. The primary outcome measured was change in the comfort level of instructors to facilitate an online case-based discussion. The survey instruments also explored perceived challenges/fears of online facilitation, comfort with the discussion structure and technical aspects of the online classroom, and perceptions after facilitating a case discussion.

The training seminar was developed as a project with the Ohio State Teaching Enhancement Programs (OSTEP) Graduate Teaching Fellows Program, which is administrated through the Department of Faculty and Teaching Assistant Development (FTAD) at OSU. The main objective of the seminar was to enable pharmacy practice residents, postgraduate fellows, and College faculty members to effectively facilitate an online case-based discussion. The training seminar was hosted on campus and designed in 2 parts. Appendix 1 shows an outline of each part of the seminar, which incorporated the overall topic points of technology demonstration and tools, "pearls" for facilitating an online workshop, planning for an online workshop, keeping students engaged, identifying online resources, and benefits/challenges to

teaching in an online environment. These components were identified and designed by 2 pharmacy faculty members and 2 educational consultants with experience in distance education. FTAD consultants serving as mentors and other participants in the OSTEP program also reviewed the content of the seminar and provided suggestions.

A baseline (preseminar) survey instrument was developed to collect data from participants, including information on demographics, prior teaching and distance education experiences, perceptions of previous online teaching experiences, comfort levels with technical and communication aspects of the Elluminate classroom, and fears of teaching online. A follow-up survey (''post-survey'') was created to evaluate satisfaction with the individual seminar components (including suggestions for improvement), perceptions of post-seminar online facilitation experience, comfort levels with technical and communication aspects of the Elluminate classroom software, and comfort level in teaching online. The survey instrument consisted of open answer, multiple choice, and Likert-type questions. Both surveys were evaluated for face validity, then uploaded to Zoomerang (Market Tools, Inc, San Francisco, Calif, www.zoomerang.com), an online survey web site, and pilot-tested by 3 pharmacists and 2 educational consultants. Minor revisions were made to the questions online before the survey instruments were made available to study participants.

After Institutional Review Board approval, invitations to complete the preseminar survey instrument were e-mailed to all instructors within the College of Pharmacy who would potentially be facilitating an online case-based discussion for the NTPD program during the 2005-2006 year. The invitations included a description of the purpose of the survey as well as a web link to Zoomerang where the survey instrument could be completed. Posters were used to advertise the seminar and personal invitations were distributed via the College of Pharmacy e-mail lists. Postseminar survey invitations were e-mailed to faculty members and teaching assistants who had attended at least 1 of the 2 seminar sessions and had subsequently facilitated an online discussion. An invitation was sent 1 to 2 weeks after their online teaching experience, which occurred throughout the academic year (September through June). If participants taught more than one session during the year, the postseminar survey instrument was sent after the session closest in time to the seminar.

Responses from the online survey instrument were downloaded into Microsoft Excel. Data analysis was completed both via Microsoft Excel and SPSS version 14.0 (SPSS Inc, Chicago, Ill). Descriptive statistics were used in the analysis where appropriate. Differences in preseminar and postseminar survey data, including the primary outcome measure in change of comfort level in teaching online, were compared using the paired student *t* test for continuous data. A student's *t* test was used to compare means from groups, and the Wilcoxon signed rank test was used for Likert scale data. All statistical tests were 2-tailed tests, and the *p* value was established at 0.05 *a priori*.

ASSESSMENT

Twenty-two instructors received the preseminar survey instrument, with a 91% (n = 20) response rate. Figure 1 demonstrates the breakdown of the respondents with regard to previous online teaching experience and attendance at the seminar. Those who responded were pharmacy practice residents (n = 6), research fellows (n = 2), regular faculty members (n = 9), or adjunct faculty members (n = 3). Overall, respondents represented a range of teaching experience: no teaching experience (n = 4), <1 year (n = 2), 1-2 years (n = 2), 3-5 years (n = 3), 6-10 years (n = 3), and >10 years (n = 6). Fifteen (75%) had facilitated case discussions in a ''traditional'' or on-campus classroom, while only 8 (40%) had previously facilitated an online case discussion using Web-conferencing technology. Of the 12 respondents who had never facilitated an online case discussion, 50% had little or no prior teaching experience (either no experience, n = 3; or less than 1 year, n = 3), while the others had variable levels of experience (3-5 years, n = 1; 6-10 years, n = 2; or >10 years, n = 3, teaching experience).

The 12 novice online instructors (those who had never facilitated an online discussion) were asked what they anticipated would be different about teaching or facilitating classes online as opposed to traditional teaching. Common responses included missing visual cues and/or not being able to see the students, getting used to the technology, and multitasking within the software

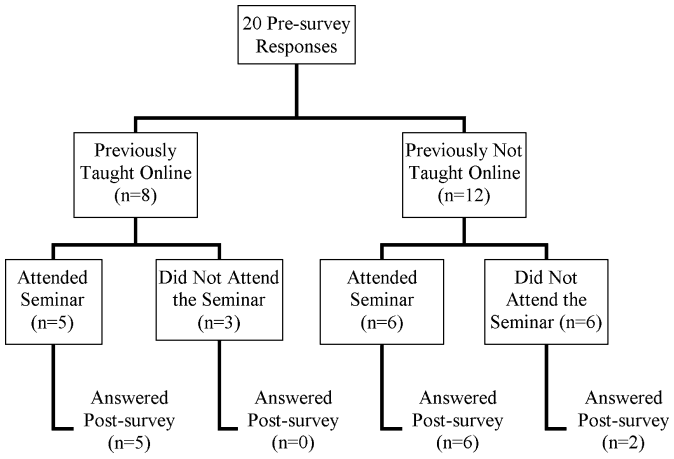

Figure 1. Flow diagram of Pre- and Post-survey Respondents

features of the online classroom. Respondents indicated there were multiple issues they desired to learn from those who had taught in this format previously including how to manage the technology, interact with/engage the students, control disruptive behavior, and prepare and use various formats for the discussion. Figure 2 rates respondents' concerns about teaching in an online environment.

Of those seminar participants who had the opportunity to teach an online class after the seminar took place (n = 10), 6 attended both seminar sessions, 3 attended only the first session, and 1 attended only the second session. One teaching assistant attended only the first session of the seminar, but did not have the opportunity to complete his online teaching session before the end of the academic year. Of the 10 individuals who taught an online case discussion after the seminar, 6 were novices and 4 had taught at least 1 online case discussion.

The 11 respondents indicated that the didactic portion of the seminar was either "helpful" (n = 5) or "very helpful" (n = 6). Similarly, the application portion of the seminar was reported as being either "helpful" (n = 3) or "very helpful" (n = 5); 3 of the postseminar survey respondents did not attend the application portion of the seminar and gave no response to this question. Things that participants liked about the seminar were the numerous examples shared about constructing a facilitation session, sharing of experiences from experienced faculty members, and having hands-on training. Recommendations for improvement included: increasing the time allotted for the seminar overall and spending more time on the application portion. The respondents' perceived values of individual session topics are shown in Figure 3.

Comparison of Preseminar and Postseminar Responses

For the 11 postseminar survey respondents, the overall level of comfort (assessed on a scale of "very uncomfortable," "uncomfortable," "somewhat uncomfortable," "comfortable," to "very comfortable") in their ability to teach in an online case-based discussion increased significantly (p = 0.004, Wilcoxon signed ranks test) (Figure 4). There were no selections of "very uncomfortable" and "uncomfortable" by respondents after they attended the seminar. For the 6 novices, the level of comfort preseminar and prior to teaching was very uncomfortable (n = 4), uncomfortable (n = 1), and somewhat uncomfortable (n = 1). All of the individuals' scores increased after attending the seminar and/or teaching, with 1 reporting improvement to "somewhat uncomfortable" and 5 reporting an improvement to "comfortable." This group had a median (range) change of +3 (1-3), as compared to the 4 individuals who had taught before who had a median change of +1 (0-1) level on the Likert scale.

Comfort levels with both the technical and teaching aspects of the Elluminate classroom all significantly improved postseminar, with the exception of teaching students with a different first language/cultural background (Table 1). Based on preseminar and postseminar survey instruments, the 3 most frequently perceived barriers by the faculty members and teaching assistants remained consistent despite training or teaching experience: lack of feeling "connected" to the students, multitasking with the technology, and students not answering questions. After the online class, 9 (56%) instructors had students

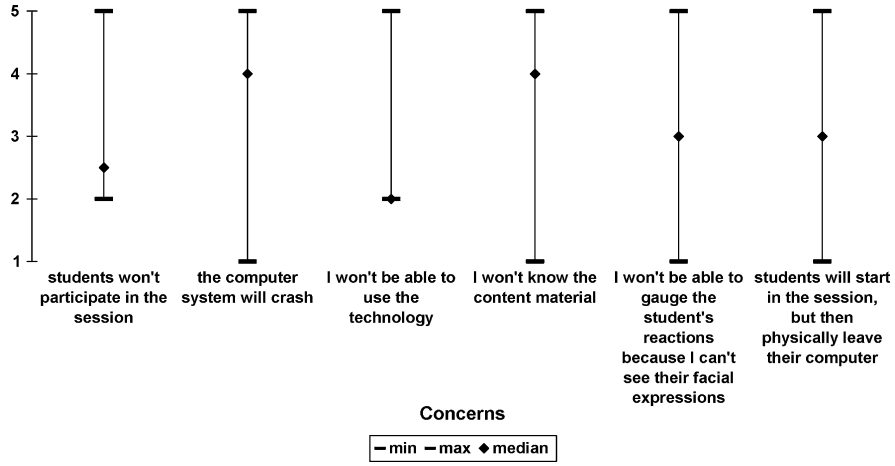

Figure 2. Respondents' rating of concerns about teaching online. Respondents who had not taught in an online case-based format (n = 12) were asked in the pre-survey to rate their concerns about various aspects of the teaching environment. Fears were rated on a scale of 1 = very concerned, 2 = moderately concerned, 3 = mildly concerned, 4 = neutral, 5 = not concerned, and the minimum, maximum and median scores are presented above.

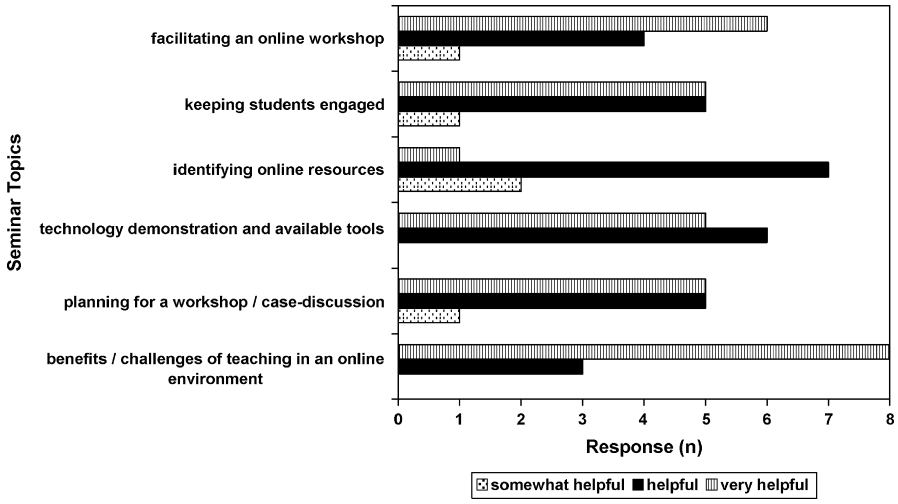

Figure 3. Perceived value of individual seminar components. Respondents who attended the seminar (n = 11) were asked to rate the various components of the seminar sessions; only 10 persons responded to the specific topic of "identifying online resources". Sessions were rated on a scale of 1 = not helpful, 2 = a little bit helpful, 3 = somewhat helpful, 4 = helpful, 5 = very helpful.

contact them for the purposes of contesting grades, clarification of and follow-up on issues brought up during the discussion, and obtaining information on supplemental materials.

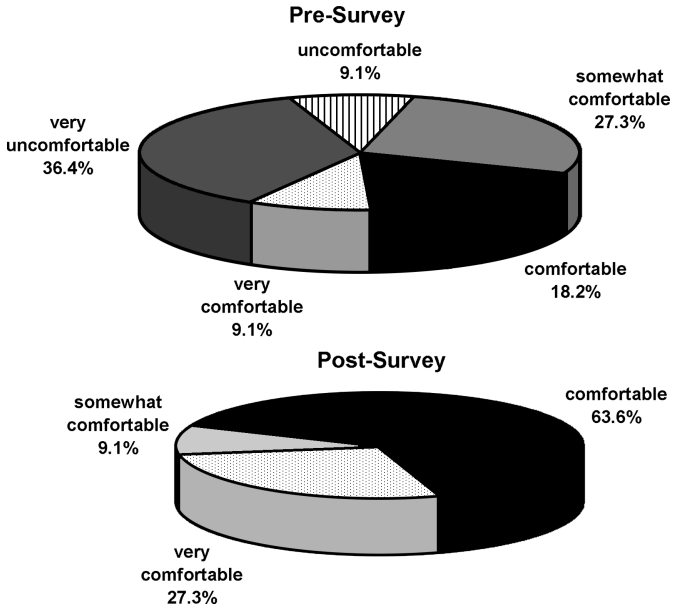

Figure 4. Level of comfort with teaching online pre- and post training (n = 11). Respondents who had attended the seminar were asked to rate their level of comfort with teaching in this type of environment both pre and post training; $p = 0.004$ (Wilcoxon signed rank test). Comfort was rated on a scale of 1 = very uncomfortable, 2 = uncomfortable, 3 = somewhat comfortable, 4 = comfortable, 5 = very comfortable.

Online Teaching Experiences

Overall perceptions of online teaching experiences were explored from the 8 experienced instructors in the preseminar survey and the 6 novices in the postseminar survey. Six of the experienced instructors felt that their prior expectations of the experience were realistic, while 2 did not. Of the latter, 1 described the experience to be more enjoyable than anticipated, while the other was surprised by the "nonthreatening environment" and user-friendly technology. From the postseminar survey, of the 6 respondents who had recently experienced their first online teaching experience postseminar, only 2 felt their expectations were not met. One perceived the teaching to be more interactive than he or she had previously thought, while the other felt the experience was "better than anticipated." Two others expressed that their expectations had been met, but they had somewhat negative comments about their first online teaching experience**,** including feeling it was odd speaking to a computer and it was difficult getting students to participate in the session.

Survey respondents were asked to give impressions of the most recent online case discussion they had actually facilitated, focusing on what went well and what did not. The 8 instructors who had previously taught online most frequently indicated that students participated extensively in the session, they were able to have a good discussion, and the students seemed engaged in the discussion. The novice instructors indicated they had no problems with the technology, they were able to have a good discussion, and they were comfortable with the content material. Interestingly, both the experienced and

Table 1. Pharmacy Instructors' Median Comfort Level* With Aspects of Elluminate Live! Classroom

Aspect	Preseminar Score	Postseminar Score
Technical Aspects		
Polling function‡	2	4
Instant text message function‡	2	4
Power point slides‡	4	5
Microphone‡	3	5
White board‡	2	3
Calling on a student†	2	4
Multitask with the interface‡	2	4
Teaching Aspects		
Encouraging student participation in an online environment‡	3	4
Teaching students with a different first language/cultural background	2	4
Lack of feeling "connected" to the students†	2	3
Teaching students that may have extensive clinical knowledge†	3	4

*Rating Scale: 1 = very uncomfortable, 5 = very comfortable
†$p \leq 0.01$ (Wilcoxon Signed Rank Test)
‡$p \leq 0.05$ (Wilcoxon Signed Rank Test)

novice participants described that their main difficulty was that they were unable to gauge the students' reactions because they could not see facial expressions. Open-ended comments soliciting technology problems or teaching strategies that "did not go well" included having difficulty working within the time allotted, trouble using the computer microphone, and having only a few students participate in the discussion. Preparation time, including review of content, technical training, and development of timeline and questions for discussion, was similar for both novice and experienced instructors, at 4.0 ± 3.0 hours and 5.0 ± 2.4 hours, respectively ($p = 0.51$, independent *t* test). Those who had not facilitated a case-based discussion in the Elluminate classroom prior to the seminar ($n = 6$) spent just 0.3 ± 0.2 hours more than they had anticipated ($p = 0.67$, paired samples *t* test). The respondents felt that the discussion during the case workshop was good ($n = 5$), very good ($n = 7$), or excellent ($n = 2$). Common advice that experienced faculty members and teaching assistants offered for "first timers" to consider before they facilitate an online case discussion included: learn how to use the technology, practice with the technology before the workshop, have a class roster and class pictures available, learn how to engage non-participating students, and use the students as a resource for answering each others' questions.

DISCUSSION

Many educators advocate training for all faculty members to develop their skills as teachers in distance education environments.[13] Thus, a seminar was designed and implemented at our institution to prepare residential instructors to teach in distance education courses. Findings from the assessment were positive, as both novice and experienced instructors had an increased overall level of comfort after the seminar and/or teaching in the online environment at least once. All components of the training seminar were considered at least "somewhat helpful" in preparing participants to teach online.

For the respondents who had not previously taught in an online environment, one of the biggest apprehensions was not being able to use the technology. This issue is frequently identified, as a previous survey of 81 distance learning instructors indicated that 41% had issues with their own competency, and many indicated they had concerns related to technology reliability (80%) and support (58%).[14] This seminar was specifically designed to increase participants' comfort level with using educational technology and improve the outcomes related to using software tools in the Elluminate classroom, and both of these goals were accomplished. For the 6 respondents who attended the seminar and taught their first online case discussion, only 1 indicated he/she a difficult time using the technology.

From the survey by Perreault et al, fostering communication with the students was also found to be a main concern among distance educators.[14] Our instructors were also uneasy about their students not participating in the session and finding methods to foster communication between students. The seminar included instruction on the various aspects of facilitating an online case discussion, and the comfort levels with these topics increased postseminar. Strategies for increasing student

participation in the online classroom were specifically discussed during training, leading to a significant increase in the comfort levels of participants. Another barrier identified in the preseminar survey was not being able to gauge students' reactions because they were unable to see students' facial expressions. This was also cited as an ongoing issue for postseminar survey respondents who had facilitated at least 1 online case discussion. Participants stated they would miss visual cues from students regarding understanding of the material being taught. This barrier has been identified by other researchers, and Bower suggested that the lack of interpersonal contact is difficult as most faculty members are trained as "hand to hand" teachers, observing their students to gauge their understanding.[15] The inability to interact at this level can be difficult for some faculty members and may require them to restructure interpersonal relationships with students when teaching from a distance.[15] Although this remains a limitation with the technology and practices adopted by OSU, there was discussion during the seminar to help prepare instructors and prospectively identify the impact upon the session facilitator. Strategies for encouraging student participation were discussed and more experienced faculty members shared their perceptions and pearls to enhance student interactions. According to the postseminar survey, instructors perceived the overall quality of student discussions during online teaching session as very good, despite the lack of a visual connection. In the future, incorporation of video conferencing technology into Web-conference "classrooms" whereby instructors and students can view each other may help instructors in overcoming this perceived barrier.

When examining those dimensions that faculty members identified as having gone well during their online case discussions, it was interesting that experienced faculty members and teaching assistants cited issues related to communication, whereas novices related issues primarily about technology and content. This may suggest that the experienced teachers were already comfortable with the technology and able to focus on higher-level interactivity skills, including communication. This group also had more teaching experience overall, and thus may have been more comfortable with teaching in general.

Overall, the participants' assessment of the seminar and the individual components was positive. Improvements have been made in subsequent offerings to increase the amount of time spent in the application portion of the seminar and to allow multiple attendees to practice being designated as the facilitator of the discussion. The first participants had commented on technical problems with the wireless laptops that were used for the session, and these issues have since been resolved. Quality benchmarks for excellence in distance education have been developed by the Institute for Higher Education Policy, which include that faculty members be trained in pertinent technologies.[12] Faculty training could be structured in many formats. Other institutions have utilized informal and formal presentations; part-day, full-day, and multiday workshops; and both didactic and application-based presentations.[16-20] Although one-on-one training may be the most effective in educating distance education faculty members, group workshops are another alternative and give attendees an opportunity for sharing ideas.[21] For our seminar, we had multiple-group interactive discussions and a group activity specifically using the Elluminate classroom technology. Our seminar included techniques for encouraging student participation, technology and its impact on the student, availability of support services, practical tips, varying the instructional mix, and a "behind the scenes look at [the] student perspective."[21] Due to time constraints at our institution, we opted for a 2-part seminar for a total of 3 hours contact time.

Comfort levels in the ability to teach online increased significantly after the seminar and teaching an online class. It was interesting that the barriers perceived by respondents about teaching online did not change from the preseminar to postseminar survey period, despite increased comfort in their ability to teach. This suggests that exposure to and practicing with the technology in a "safe" environment prior to teaching are important in preparing faculty members to teach online, despite anticipated or actual limitations associated with educational technology. Although not tested, we also believe an increase in comfort level allows instructors to enjoy the experience more, and may increase their willingness to participate in other distance-teaching opportunities. This theory is supported by recent work by Lee and Busch who demonstrated that instructors' willingness to teach in an online course was correlated to having received training that prepared them to teach in the specialized environment ($r = 0.39$) and being comfortable in their ability ($r = 0.69$).[22]

Although some individuals were already comfortable with Web-conferencing by virtue of prior experience in other venues, the increase in comfort levels for all of the technical aspects associated with the online classroom were significant. Furthermore, comfort increased in all aspects of teaching, with only the "teaching of students with different first language/cultural background" not reaching statistical significance. This may have been the result of having prior experience with culturally diverse students in our entry-level PharmD program. Overall, these results suggest that the aim of the seminar in increasing the comfort of the attendees with these aspects of the online classroom was successful.

Although we attempted to assess the impact of the seminar on individuals' comfort level in teaching online, we did not assess the impact on teaching effectiveness from either the instructor or student point of view. This type of educational assessment is difficult given the multiple confounders inherent in this type of research; however, it should be explored as distance education pathways in pharmacy education continue to expand.

CONCLUSION

This study describes the positive impact that a training seminar and/or online teaching experience has on instructors' comfort level in their ability to teach in a distance education environment. Consisting of both didactic and online experiential foundations, the individual seminar components were viewed positively by attendees. As distance education initiatives and opportunities to participate in this mode expand, institutions must ensure that instructional staff members are adequately trained in newer media and up-to-date technologies, as well as the appropriate teaching strategies to facilitate student interaction and support learning in this unique environment. Further study of the impact of faculty development programs on teaching effectiveness and student satisfaction in online pharmacy education is warranted.

REFERENCES

1. The Ohio Learning Network. Expanding Delivery: e-Learning in Ohio. Annual Report of the Ohio Learning Network. Columbus, OH: Ohio Learning Network; 2006. Available at: www.oln.org/about_oln/pdf/Expanding_Delivery.pdf. Accessed April 30, 2007.
2. The Sloan Consortium (2006). Making the grade: online education in the United States. Available at: http://www.sloan-c.org/publications/survey/index.asp. Accessed March 15, 2007.
3. The 2006 horizon report. In: *The New Media Consortium.* Stanford, Calif: EDUCAUSE Learning Initiative; 2006.
4. Chulmley-Jones H, Dobbie A, Alford C. Web-based learning: sound educational method or hype? A review of the evaluation literature. *Acad Med.* 2002;77:S86-93.
5. Murray T, Belgrave L, Robinson V. Nursing faculty members competence of web-based course development systems directly influences students' satisfaction. *Assoc Black Nurs Faculty J.* 2006;17:100-2.
6. Ruiz J, Mintzer M, Leipzig R. The impact of e-learning in medical education. *Acad Med.* 2006;81:207-12.
7. Sargeant J, Curran V, Jarvis-Selinger S, et al. Interactive on-line continuing medical education: Physicians' perceptions and experiences. *J Contin Educ Health Prof.* 2004;24:227-36.
8. Ali N, Hodson-Carlton K, Ryan M, Flowers J, Rose M, Wayda V. Online education: Needs assessment for faculty development. *J Contin Educ Nurs.* 2005;36:32-8.
9. Ryan M, Carlton K, Ali N. Reflections on the role of faculty in distance learning and changing pedagogies. *Nurs Educ Perspect.* 2004;25:73-80.
10. Accreditation Council for Pharmacy Education. Accreditation Standards and Guidelines for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree. Chicago, Ill: Accreditation Council for Pharmacy Education; 2006. Available at: http://www.acpe-accredit.org/deans/standards.asp. Accessed October 20, 2006.
11. Hunter T, Deziel-Evans L, Marsh W. Assuring excellence in distance pharmaceutical education. *Am J Pharm Educ.* 2003;67:1-25.
12. Institute for Higher Education Policy (2006). Quality on the line: Benchmarks for success in internet-based distance education. Available at: www.ihep.org/Pubs/PDF/Quality.pdf. Accessed: January 11, 2007.
13. Milheim W. Faculty and administrative strategies for the effective implementation of distance education. *Br J Educ Technol.* 2001;32:535-42.
14. Perreault H, Waldman L, Alexander M, Zhao J. Overcoming barriers to successful delivery of distance-learning courses. *J Educ Business.* 2002;77:313-8.
15. Bower B. Distance education: Facing the faculty challenge. Available at: www.westga.edu/%7Edistance/ojdla/summer42/bower42.html. Accessed: January 11, 2007.
16. Auh Y. Developing online instructors requires more than workshops. *Distance Educ Rep.* 2004;8:4-7.
17. Rinear K. "Quick-start" Training puts instructors online fast. *Distance Educ Rep.* 2003;7:1-3.
18. Barber Parker E, Riza L, Tierney S, Barrett A. Interdisciplinary collaboration: An effective approach for developing web-based courses. *Comput Inform Nurs.* 2005;23:308-13.
19. Baldwin C, Niebuhr V, Sullivan B. Meeting the computer technology needs of community faculty: building new models for faculty development. *Ambul Pediatr.* 2004;4:113-6.
20. Kidney G. When the cows come home: A proven path of professional development for faculty pursuing e-learning. *THE Journal.* 2004;31:12-20.
21. Clay M. Development of training and support programs for distance education instructors. Available at: http://www.westga.edu/~distance/clay23.html. Accessed January 11, 2007.
22. Lee J, Busch P. Factors related to instructors' willingness to participate in distance education. *J Educ Res.* 2005;99:109-15.

Appendix 1. Outline of Seminar Series

1st session: (1 hour)

- *Technology Demonstration and Tools*
  - introduction to technology (a 5 minute taped piece of an online workshop)
- *Facilitating an Online Workshop*
  - discussion of who has/hasn't taught in this format
  - goals of teaching in this format
- *Keeping Students Engaged*
  - who these students are and differences in:
    - learning style
    - motivation
    - life
    - clinical experiences
- *Benefits/Challenges*
  - Benefits/Challenges to this format (interactive group discussion)
- *Identifying Online Resources*
  - discussion of resources available online with a prepared handout for reference

2nd session: (2 hours)

- *Technology Demonstration and Tools*
  - overview of the technology (by the Education Technology Manager)
- *Facilitating an Online Workshop/Keeping Students Engaged/Planning For a Workshop*
  - presentation on styles of online case facilitation/discussion
    - case
    - case + mini cases
    - case (minimal time) + extra discussion
    - asynchronous discussions
- *Planning For a Workshop*
  - planning activity
    - planning discussion (focusing on content, logistics, and facilitation of the case-discussions)
      - groups of 2-3, with a break out session for 10 minutes
      - return to main group and discuss
  - grading of assignments (by the Therapeutics Coordinator of NTPD Program)
- *Technology Demonstration and Tools*
  - technology demonstration (using wireless laptops)
    - mock case discussion (using hypertension cases)
    - attendees split into break out groups within the online classroom to discuss the case for 10-15 minutes; everyone brought back to the main classroom to discuss as a large group, with 1 attendee designated as the Facilitator of the discussion
- *Facilitating an Online Workshop*
  - communication online/etiquette (by the Education Technology Manager)