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An Evaluation of Web Conferencing in Online Teacher Preparation

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Abstract: *More and more colleges and universities are utilizing web-based instruction to meet the educational needs of teachers seeking certification in special education, and effective course design strategies for using this technology are needed. In this article we present results form a survey of 54 teachers who evaluated 6 design considerations for using web conferencing in an on-line introductory methods course in the area of emotional/behavioral disorders. The design considerations were class and team size, learning activities, instructor's role, feedback from classmates and instructors, building a sense of community, and technical support. We found that web conferencing was perceived as a very effective delivery format for offering coursework and other professional development experiences to mid-career changers and teachers on limited licenses.*

School districts often hire mid-career changers and teachers on limited or emergency licenses to help alleviate the critical shortage of certified teachers in special education. In Indiana, for example, there are over 500 teachers in the area of emotional/ behavioral disorders who have been hired to teach on emergency licenses (Indiana DOE, 2003). Many of these positions in Indiana and in most other states are in rural communities where access to certification coursework can be very difficult to obtain. But even in urban and suburban areas, commuting times to college campuses, work schedules and other factors can make enrolling in university coursework very challenging for those holding full time teaching positions (Johnson, 2004; McLeskey, Tyler, & Flippin, 2004; Spponer, Spooner, Algozzine, & Jordan, 1998). Many universities have begun using online learning to give limited licensed teachers easier access to certification coursework and web-based conferencing is at the heart of many of these experiences.

Web conferencing is the exchange of written messages among a group of participants in a computer mediated environment. This instructional format has been shown to be effective not only in delivering course content but also in creating an ongoing communication network among students and instructors and in providing other types of instructional and professional support. For example, web conferencing can serve as a collaborative tool to allow teachers from widely disbursed communities to share common interests and concerns and engage in joint problem solving on real life classroom situations (Bonk, Ehman, Hixon, & Yamagata-Lynch, 2002). When used in university coursework and other professional development activities, it can be comparable to having face-to-face discussions in a conventional class setting or staff meeting. Web conferencing, the course instructor can arrange learners into any size group and have them work together on assigned tasks, projects, brainstorming activities and application exercises.

There are some important advantages

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that web conferencing can have over holding in-class discussions. The asynchronous format of web conferences allows students more time to prepare a response to a set of directions or questions. For example, Wade, Niederhauser, Cannon, & Long (2001) stated that in a conventional class, instructor questions are often not fully answered because learners do not have sufficient time to frame a thoughtful response. As a result, their answers are often spontaneous, shallow and incomplete. By comparison, in a web conference learners have time to read over an assigned activity, think through an appropriate answer, prepare a response, and review and edit it before posting it to the discussion network (Harasim, 1990). Web discussions can proceed for days or longer, learners also have the opportunity to review the responses of their classmates, ask for clarification of ideas, consider differing viewpoints, and reformulate their own responses if they wish. Instructors can more easily oversee the interactions of several groups of learners and provide clarification, re-direction and other forms of feedback as needed, while instructors in conventional courses often have to divide their time among several groups and delay feedback until the end of an activity. Thus, it is not surprising that learners often see web conferencing as contributing to their understanding of concepts and interactions with classmates and to their ability to reflect more deeply on issues and ideas (Bodzin & Park, 2000).

Web conferencing is an online instructional tool that is becoming widely used in many teacher preparation programs in special education (Beattie, Spooner, Jordan, Algozzine, & Spooner, 2002). It can provide the primary delivery format in an online course, be used in distance education along with videoconferencing and other technologies and serve as a supplement to conventional on-campus instruction.

Method

The purpose of this study was to evaluate web conferencing in an online course for limited licensed, inservice teachers and use the results to highlight key components in course design that contribute to the effective use of the technology. We used survey methodology to assess important considerations for using web conferencing as a primary course delivery format. The survey was administered to all the teachers enrolled in an online course as a voluntary evaluation procedure. The teachers responded anonymously to the survey questions and were informed that their responses would not affect their course grade. The survey responses were gathered electronically and the results calculated by a research assistant who was not an instructor for the course.

Course Content

The title of the online course was Survey of Behavior Disorders. It was an introductory methods course that covered such topics as the characteristics and attributes of emotional/behavioral disorders; approaches for identifying students with these conditions; formal testing and assessment methods; and approaches for preparing a functional behavior plan to guide the intervention process. It was a graduate level course and required for an Indiana license in the area of emotional handicaps. We offered it in an 8-week period while public schools were still in session.

Emotional/behavior disorders is not a high incidence certification area in Indiana so when the Survey course was offered in a conventional on-campus format at the main campus of Indiana University, it was often cancelled because of low enrollment (i.e., having less that 15 students). Moreover, it has not been offered at several regional campuses because they neither have the faculty nor the enrollments to support it. With an online delivery format, we were able to offer the course jointly at four campuses of the university and, as a result, could make the course available to limited license teachers from a large geographic region and obtain a higher enrollment for the course.

Participants

Fifty-seven inservice teachers enrolled in Survey of Behavior Disorders and they were from urban, suburban, and rural communities throughout southern and central Indiana. Fifty-four of them (95%) provided information about their background and pro-

fessional experience. The ages of these teachers fell into 4 grouping: 2 were from 18–25 years of age; 25 from 26–35 years; 25 between 36–45; and 2 between 46–55. All were admitted to a graduate program in special education and taking the course to fulfill certification requirements. Fifty-one were currently teaching in a special education program on a limited license and the others were general education teachers seeking a license or master's degree in special education. One was working in a preschool, 30 at elementary schools, 6 at middle schools, and 17 at high schools. Three were teaching students with emotional disabilities in community agencies, such as correctional facilities, and the rest were in public schools. In order to participate in the course, teachers needed to have internet access from their homes, school work stations, or public access terminals, such as a public library.

Survey

The same 54 teachers (95%) also completed the online survey administered at the end of the course. This survey presented a series of statements that teachers were asked to respond to in different ways depending on the content of the question. Most questions asked them whether they strongly agreed, agreed, disagreed, or strongly disagreed with a statement such as, "I learned a lot from the course" and "The level of interaction among teachers in the course was high." Other questions had them respond to a three-part indicator such as "more than, about equal to, or less than," as in an item asking how well they got to know classmates in the online course compared with a conventional on-campus course. Still other questions asked them to respond with a quantitative measure, such as asking how many postings for the course they made each week. Teachers could choose not to respond to any of the items if they were unsure of the answer or judged a question not applicable to their circumstances. Except for one or two items by two teachers all the participants who completed the survey answered all the questions.

Web-Conferencing Program

AltaVista's Sitescape Forum was used for web conferencing and other course related activities and information, such as posting the syllabus and making announcements. Sitescape Forum has three environments for having online discussions. The first is the Front Page where every student logs on and enters a total group environment with asynchronous chat rooms, resource lists and helps/hints on using Sitescape. From here students access their separate large group or team environments. A second area is called Forums which is a large group environment where course activities and assignments are presented and where asynchronous class discussions are held. The third area is called Teams and this is a small group environment where groups of 3–5 students work on designated tasks, do problem-solving, plan activities, and hold synchronous chats. Instructors have access to all three environments and can monitor student use, post course activities, answer questions, give suggestions and comments, and provide feedback to individuals, teams or the entire group.

We used Sitescape Forum because Indiana University provided technical support for it and because we had used it before in conjunction with videoconferencing in several other distance education courses. Even through the Survey course was the first online course the teachers had, nearly 75% of them already had experience with Sitescape Forum. At the end of the course, 98% of the participants, including both experienced and novice users, agreed or strongly agreed that the software was easy to use. There are other web-based communication software programs with conferencing capabilities, such as Knowledge Form and Blackboard, that can be used in an online course as well.

Results

The results we obtained from the survey administered to teachers at the end of the Survey course are represented in Table 1. Six web conferencing design considerations were studied: group and team size; learning activities; instructor's role; feedback from classmates and instructors; building a sense of community; and technical support.

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Table 1. Survey Results Evaluating Web Conference and Online Learning

Questions	Strongly Agree	Agree	Disagree	Strongly Disagree
I. Group and Team Size				
The level of student-student interaction in my large group discussion was high	31%	65%	4%	0%
The level of student-student interaction in team activities was high	43%	54%	4%	0%
I learned a sufficient amount about course content by interacting with classmates	43%	54%	4%	0%
	More	About the Same	Less	
I had more/about the same/less communication with classmates than in a conventional course	56%	40%	4%	
I got to know classmates more/about the same/less than in a conventional course	52%	20%	28%	
II. Learning Activities	Strongly Agree	Agree	Disagree	Strongly Disagree
The Starter/Wrapper format (questions/answers/discussion summary) was effective for learning course content	31%	65%	4%	0%
There was a high level of dialogue in my large group forum	65%	31%	4%	0%
There was a high level of dialogue in my Team forum	44%	52%	2%	2%
The activities helped me meet course objectives	52%	44%	4%	0%
I learned concepts I can apply to my teaching situation	30%	66%	4%	0%
III. Instructor's Role	Strongly Agree	Agree	Disagree	Strongly Disagree
My instructor actively participated in my discussion forums	31%	69%	0%	0%
My instructor did a good job facilitating group discussions	63%	37%	0%	0%
	More	About the Same	Less	
I had more/about the same/less communication with my instructor than in a conventional course	38%	45%	17%	
IV. Feedback from Classmates and Instructor	Strongly Agree	Agree	Disagree	Strongly Disagree
I received enough feedback from my instructor	40%	56%	4%	0%
I received enough feedback from classmates	40%	56%	4%	0%
My instructor responded quickly to my inquiries	65%	31%	4%	0%
My instructor motivated me to interact with classmates	59%	37%	4%	0%
V. Building Community	Strongly Agree	Agree	Disagree	Strongly Disagree
I felt I was part of a learning community in the course	52%	44%	4%	0%
Although I couldn't see classmates, I felt they were really there	37%	59%	4%	0%
The interaction online had a friendly atmosphere	63%	37%	0%	0%
	More	About the Same	Less	
Overall, the connectedness I felt with classmates was more/about the same/less than in a conventional course	47%	50%	3%	
VI. Technical Support	Strongly Agree	Agree	Disagree	Strongly Disagree
Sitescape Forum was easy to use	9%	89%	2%	0%
The design of Sitescape Forum facilitated my interactions with classmates	43%	55%	2%	0%
I like interaction interacting via Sitescape Forum	43%	55%	2%	0%

Group and Team Size

One of the first considerations in having online discussions is deciding on the size of the group that will be participating in the course activities. The authors' previous experience with web conferencing indicated that learners were most interactive and productive when the class size was around 15 learners (Knapczyk, in press). This size seemed to provide enough diversity in learner background and experience to establish a solid base for large group interaction. At the same time, the group was not so large that it hampered personal expression or produced an overabundance of postings to process. Accordingly, with 57 students enrolled in the course, we divided them into 4 sections of 14–15 teachers with each section having its own instructor and Sitescape work space. All the sections were taught simultaneously and used the same syllabus, assignments, projects, online activities, feedback approach, and grading rubrics. The four instructors met each week to coordinate course activities and review student progress.

Teachers responses to the survey suggested that this group size allowed for a high level of interaction among participants (see Table 1). Ninety-six percent of the students agreed or strongly agreed that the size of their group facilitated a high degree of student-student interaction during online discussions and an equal percent indicated they were able to learn a sufficient amount of course content by interacting in their class Forum.

We also assigned students in each section to Sitescape teams. A team structure allows learners to hold more in-depth discussions on designated topics, do problem-solving tasks, review case examples, work collaboratively on projects, brainstorm applications of procedures, and carry on other types of more focused dialogues. Our prior experience indicated that teams worked best when they had three to five members so we assigned students in each section to Sitescape groups of this size. This number allowed students to make the multiple postings in activities that involved planning, organizing, analyzing, and critiquing of information without being overwhelmed by the number of classmate responses. Ninety-six percent of the participants agreed or strongly agreed that teacher-teacher interaction in the Team environment was very high. Additionally, more than 90% indicated that they had the same amount or more communication with classmates than in a conventional face-to-face course, and over half stated that they had gotten to know their classmates better.

These results have important implications for using web conferencing with inservice teachers who might be scattered across a wide geographic area. Some online programs use an independent study approach in which teachers work mainly one-on-one with an instructor and have little opportunity to share learning experiences and activities with classmates. By contrast, web conferencing enables teachers to engage in coursework in a group arrangement comparable to a conventional on-campus course. The software allows an instructor to bridge distances across individual teachers so they can share professional experiences; work together on assignments and projects; engage in collaborative planning and problem solving; provide social and emotional support; and participate in other professional development activities.

Learning Activities

As in any teaching format in special education, web-based learning activities must be designed to cover the content students need to acquire and to give them opportunities to practice applying that content to real life on-the-job situations. Content refers to the theoretical concepts, research findings, paradigms, models and other information covered in texts and course readings that provide the foundation for learning about techniques, methods and approaches. In a web environment, instructors facilitate the learning of content by having learners engage in large and small group discussions. Instructors can design a wide variety of online activities to cover course content depending on the goals and outcomes learners need to attain.

We believed that with inservice teachers working on limited licenses it was important to encourage them to take ownership for learning activities and engage in a high level of collaboration with classmates. In order to

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achieve this aim, we typically used two types of activities to cover course content: weekly large group discussions (Mondays through Fridays) and weekly small team reflections (Saturdays and Sundays). For example, in the large group Forums, instructors had one student serve as a Starter for the week. By Monday morning this student posted a summary of the assigned readings and three questions designed to stimulate the class discussion for the week. At the start of a course, instructors gave Starters a model to follow so their postings would meet our expectations for such things as the amount of detail to use in summarizing readings and the types of questions to ask. The other students were Participants in the discussion and were expected to make at least one posting in answer to each of the Starter's questions and at least one additional posting commenting or elaborating on their classmates' postings. Friday afternoon, another student served as the Wrapper who summarized the week's discussion. The Wrapper's task was to provide an overview of the group's interaction and learning by describing major points of discussion, highlighting key concepts learned, pinpointing areas of disagreement or controversy, and identifying important applications of concepts and methods that Participants had given. We also used other types of activities to cover course content such as having students post explanations of theoretical frameworks, hold online debates on controversial issues, serve as "experts" on specific topics, and present descriptions and critiques of professional resources.

Teachers worked in the Team environment on weekends. Their assignment was first to post a reflective summary of what they learned during the week's large group discussion and then to comment on their teammates' reflections. This activity was designed to help students review what they learned from the large group format and to have them explain what they found particularly meaningful and useful in the readings and other course material.

Since this was a Survey course on behavior disorders, activities focused primarily on course content, but instructors also designed practice exercises to give students opportunities to try out and rehearse the con-cepts they learned before actually using them in real life teaching situations. The aim of these learning activities was to broaden the students' understanding of the course content by having them explain how they would apply theories, principles, guidelines and other abstract ideas in classroom situations. When using web conferencing for practice exercises, students usually worked in the Team environment. For example, instructors might post a case study and have teams work together on collaborative problem solving or instructional planning tasks. Or instructors might have students post examples of concepts and methods from their own classrooms, suggest teaching applications, describe sample lessons and present case reviews. Their team members would then read and reply to these postings with suggestions or critiques. For example, instructors posted a case study and asked team members do the following: (1) define a problem in behavioral terms, (2) describe a method for measuring that problem behavior and (3) outline a strategy for systematically recording the behavior in specific classroom situations. Other learning activities involved having students suggest assessment devices to use under defined conditions, analyze and interpret assessment results, and plan intervention goals based on information in an evaluation report.

Another way in which we used web conferencing was having learners apply course concepts to their own teaching situations. The goal with these learning activities was for students to demonstrate their ability to integrate and adapt best practices in real life circumstances. To accomplish this goal, instructors assigned two multi-step projects that built toward on-the-job application. One was to develop a model of consultation to use in their school for working through problems displayed by students with emotional/behavior disorders, and the other was to conduct a comprehensive functional assessment of one of their students and to use the results to set intervention objectives. At the start of a course, instructors provided directions for each project that included a general description of the outcome, the components of the finished product, the steps and tasks to complete and a grading rubric.

They also provided a model of the product and selected components, such as examples of an assessment report. Teachers worked in the Team environment on project tasks. They had on-line chats to discuss particular activities, planned and posted drafts of reports, suggested resources and guides for others to use, shared ideas and results, and critiqued one another's work and offered alternatives.

Teachers evaluated these types of activities very positively (see Table 1, Learning Activities). Ninety-six percent of the students agreed or strongly agreed that the Starter-Wrapper format stimulated a productive weekly discussion and helped highlight the learning that took place. This same percent also indicated that (a) web conferencing produced an effective learning dialogue in both the Forum and Team environments, (b) the activities enabled them to meet course objectives, (c) the discussions facilitated their understanding of concepts and methods, and (d) the overall approach helped them apply the course material to their current teaching positions with students who displayed emotional/behavioral disorders.

Instructor's Role

In web conferencing the instructor's primary role was to facilitate and moderate learning not to be the primary source of information (Honebein, 1996). Accordingly, instead of using teacher-center approaches, the instructors started the Survey course by encouraging cooperative learning among the students, suggesting conversational techniques, modeling posting and interaction formats, and using other approaches to encourage student ownership in the learning activities. After a week or two, instructors stepped back from discussions and let the large groups and teams take charge of the interactions in response to assignment directions and classmates' postings. Instructors typically asked probing questions to invite responses and critical thinking and to further promote a learner-centered approach. For example, an instructor response might be:

"Milly (a teacher in our course) said she was concerned about students who act overly aggressive on the playground. Who can offer her some ideas?"

"Earlier this week, Frank asked about different types of school-wide disciplinary policies. What practices are used in your school?"

Thus, instructors tried to moderate the flow of discussions and encourage further interaction when it was needed. They found that teachers quickly took over responsibility for discussing ideas and asked and answered question of one another rather than the instructor. However, instructors still closely monitored interaction throughout a course to clarify misunderstandings and direct discussions in productive ways.

Teachers were very supportive of a learner-centered approach in an online environment (see Table 1, Instructor's Role). All 54 of them agreed or strongly agreed that their instructor actively participated in class discussions and that the instructor did a very good job of facilitating group interaction. Moreover, 45% responded that they had as much communication with their instructor as in a conventional course and nearly 40% stated they had more interaction. This last finding, that nearly 85% of the teachers felt they had at least as much interaction with their instructor as in a conventional course, is somewhat surprising because instructors deliberately tried to minimize their role to encourage a more learner-centered, collaborative approach. For example, it was not usual for an instructor to make only one or two postings in a class discussion toward the end of the course when teachers were showing a lot of independence in an activity and meeting its objectives. Web conferencing in an online course may help overcome some of the isolation that inservice teachers tend to feel in some distance education delivery formats.

Feedback from Classmates and the Instructor

Another consideration in any course is ensuring that learners receive timely feedback and grades for their work so they can gauge their progress in meeting the instructor's expectations. In an online course, tests, projects and other product-oriented assignments can

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usually be graded in the same ways as in a conventional course. But with web discussions it is important that teachers get used to giving and receiving peer feedback because the instructor is much less present in the class sessions. During the Survey course, instructors used online communication techniques that tended to promote a peer feedback approach. For example, rather then directing attention to individual problems in posting, they made group-oriented comments highlighting such areas as the desirable length of postings, response etiquette, number and type of questions to ask, using conversational language and arranging responses into discussion threads. They also pointed out exemplary peer models of posting techniques to help overcome problems. In these ways, teachers received ongoing feedback in discussions as they interacted with one another and as the instructor provided guidance, redirection and examples. Instructors also graded student discussion postings by giving each of them a weekly score using a rubric for evaluating such elements as the quality and thoughtfulness of comments, timeliness of responses and number of postings made. Along with a weekly score, instructors gave individualized comments and suggestions that reinforced good work habits or remediated poor ones. Each of these feedback approaches aimed to encourage self- and peer-evaluation and collaboration.

The course survey indicated that 96% of the students said they agreed or strongly agreed that they received enough feedback from their instructor, their classmates, and their teammates to do well in the course. An equal percent felt that the feedback was timely and that it motivated them to interact in the discussions. One of the most important sources of feedback among inservice teachers on limited licenses is other teachers in similar circumstances. Sometimes they were in a better position than a university instructor because they could offer more realistic suggestions and ideas, provide everyday examples of best practices, and give more genuine social and emotional support. Our finding suggested that teachers perceive web conferencing as providing at least a sufficient amount of feedback to advance their professional development.

Building a Sense of Community

Learners will take more responsibility and ownership for their own and each others' learning when they have a sense of community with classmates (Knapczyk, Chapman, Rodes & Chung, 2001). That is, they must feel comfortable with one another in asking and answering questions, giving personal examples, offering suggestions, expressing opinions and interacting in other ways (McDonald & Gibson, 1998; McGinnis, 1996; and Northrup, 2001). In web discussions, learners especially need to reveal personal and professional information to give them visibility and identity, and to provide a foundation for interaction. Accordingly, in the Survey course the instructors designed "ice-breaker" activities to introduce the course and encourage teachers to feel part of an online community. In the first class meeting they asked teachers to formulate three questions that would help them get to know their online classmates, and their assignment for the week was to post their answers to these questions in the discussion Forum. In the Team environment, they elaborated on their responses by outlining their professional background and indicated what they hoped to get out of the course and from their online teammates. After these initial postings, teachers readily shared a wealth of personal examples and anecdotes that seemed to advance their online relationships. For example, instructors noted that teachers quickly started referring to each other by first names, greeted one another, offered compliments on postings and showed empathy. Later in a course when groups and teams established more cohesion and trust, these more "social" interactions generalized to course related activities. They began to give pointed suggestions on assignments, noted contradictions, expressed opposing views, showed disagreement and used other approaches that advanced one another's understanding of the material. Instructors also played an important role in community building by modeling interactive behavior such as by initiating the first posting in ice-breaker activities, using personalized greetings, and responding informally and conversationally to postings.

Teachers reported these approaches for

community building were beneficial (see Table 1, Building Community). Ninety-six percent of them said they agreed or strongly agreed that they felt like part of a learning community in the course, and all of them indicated the online interactions had a friendly atmosphere. Almost half of them reported feeling a greater level of "connectedness" with classmates during web discussions than during a conventional course, while only three said they felt less connected to their classmates.

Some online programs have learners work mostly in isolation without many peer instructional and social supports. While these approaches may be effective under certain conditions, they seem to run counter to the professional development needs of inservice special education teachers who oftentimes already work in isolation. The findings from this study seem to indicate that web conferencing can be a useful tool for building a valuable professional and emotional support network among practicing teachers.

Technical Support

When using web conferencing, instructors must take steps to ensure that students quickly become comfortable with using the software and with having online discussions with their classmates and instructor. One of the first directions we gave teachers who were novice users of technology was to pair up with someone in class who was already familiar with using Sitescape Forum. This approach gave these teachers an easy to access resource throughout the course. The instructors also provided step-by-step job aides for operating Sitescape Forum and they included additional information with assignment to build further expertise. Moreover, the icebreaker activities in the first class were specifically designed to give students opportunities to try out the web conferencing functions without feeling the pressure of completing content-related assignments. Finally, instructors offered technical support by email. This combination of methods seemed to make teachers comfortable with the online conferencing techniques. The survey results indicate that 98% of them either agreed or strongly agreed that Sitescape Forum was easy to use, that they liked using it, and that it facilitated their interactions with classmates.

Conclusions

Instructors must use an appropriate pedagogical framework and course design strategy to take full advantage of web conferencing. In this study, we investigated several of these factors by administering a survey to 57 limited licensed teachers enrolled in an online certification course that used web conferencing as its primary delivery format. One factor in web conferencing we examined was the size of the group and the teams engaging in web conferencing. The results indicated that a class size of about 15 and a team size of about 3–4 seemed about the right numbers to promote effective interactions and participation in course activities. Another design consideration was the types of learning activities instructors used and in our course teachers responded very positively to having activities that focused on three areas: developing an understanding of course concepts, practicing the concepts in case study situations, and applying the concepts to their own teaching situations. They were also very supportive of their instructors acting as facilitators of learning and their engaging primarily in learner-centered activities, such as peer initiated discussions, cooperative learning, small group problem solving, and peer modeling. The results also suggested that teachers felt their classmates provided feedback that was content-related and timely and that motivated them to interact with one another.

Building a sense of community among participants in web conferencing was another course design factor we investigated and the survey results indicated that students felt very comfortable with interacting with one another. The initial "ice breaker" activities were an important way to build visibility and cohesion among teachers and after a couple of weeks, they found their own methods for encouraging and enhancing a sense of connectedness to the online community. The last design consideration we examined was technical support or ensuring that teachers developed sufficient expertise to use the web conferencing software. Our results revealed

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that teachers felt Sitescape Forum was an easy program to use and that they could quickly learn the basic posting skills from one another with minimal additional support from instructors.

One major limitation of our study was the teachers' lack of experience with other types of web conferencing approaches and design frameworks. The Survey course was the first web-based class the students had taken and any other experience they had with web conferencing was restricted to courses in our certification program. Thus, the teachers were unable to compare design strategies used in our course with other web-oriented approaches. For example, even though they rated having discussion groups of about 15 and teams of about 4 very highly, they were not able to say whether these sizes were more or less effective than other size groups or teams. Similarly, although students rated the instructor-as-facilitator role very highly, they could not compare it to a more teacher-centered approach to holding web conferencing. Thus, future research needs to investigate web conferencing under different design strategies in order to provide instructors with additional guidelines for using this approach in teacher preparation. For example, it would have been useful to have another group of teachers who took the course in a conventional format and compare survey responses between them. However, our findings do suggest that web conferencing can be a very effective tool for offering coursework and other professional development experiences to mid-career changers and teachers on limited licenses.

Research shows that web conferencing can be an effective tool for a variety of professional development activities, but there is little evidence of it serving as a primary course delivery format in special education teacher preparation. Therefore, it would have been very helpful to do a more in-depth comparison of the teachers' views on web conferencing with their views on conventional on-campus teaching methods. In order to investigate this issue empirically, we would have had to randomly assign one group of teachers to the online course and another group to a conventionally taught on-campus section of the same course. In our circum-

stances, as it is with many teacher education programs that serve personnel teaching with emergency licenses, creating these conditions was neither feasible nor appropriate for addressing a primary consideration in deciding whether to use web conferencing for course delivery (i.e., to make teacher education coursework accessible to teachers across a large geographic region). For example, we already knew that enrolling in the Survey course was very difficult for many teachers because the course typically had low enrollments or was cancelled when it was offered in a campus-based format even through the state was issuing a large number of emergency licenses in emotional/behavior disorders. It is not unusual for other teacher education programs to encounter the same type of problem. Additional supporting evidence was comments by several teachers who stated that they would have had to look for other jobs if the course had not been offered online because they could not realistically commute to the university to take it. Even though it would have been useful to compare our online approach with a campus-based course, we instead directed the study toward what we felt was the more pressing issue in teacher education of identifying factors that contribute to effective use of web conferencing.

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