

Collaborative Online Problem Solving with Preserves General Education Teachers and Special Education Teachers

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Abstract:

This study examined the online collaboration and problem solving processes of preservice general education and special education teachers from two teacher education programs in different states as they designed instruction to provide access to the general curriculum for all students, including those with disabilities. The use of online collaborative problem solving across the miles was found to be a vehicle for preservice teachers to prepare to meet the needs of all learners in inclusive environments, for special education majors to have opportunities to practice their collaboration skills, and for general education majors to revise their lesson plans to include accommodations and modifications for students with special needs and to include a coteaching model of instruction.

Article:

Education professionals working in both general education and special education settings are responsible for ensuring that all students have access to curricula and they are held accountable for the success of all their students. To ensure that all students with diverse needs are successful in accessing the general education curriculum, teacher educators must look more closely at how they prepare preservice general and special educators to work together in a collaborative and collegial manner. Access to the curriculum means that all students must be able to interact with the curriculum in order to learn (Orkwis & McLane, 1998). For this to happen, prospective teachers must learn ways to provide all students with meaningful access to the curriculum and be able to deliver the curriculum so that no student has to overcome physical, affective or cognitive barriers, or feel isolated or stigmatized.

Outcomes for all students, such as those set forth by the No Child Left Behind legislation (U.S. Department of Education, 2002), may be enhanced when professional educators work collaboratively to integrate their specialized knowledge and expertise into their teaching practices. Although the importance of collaboration between general and special education teachers has been extensively documented in the literature (Allen-Malley & Bishop, 2000; Friend & Cook, 2003; Hourcade & Bauwens, 2001; Hobbs & Westling, 1998; Snell & Janney, 2000; Wood, 1998), teacher educators may be interested in the use of online collaborative activities to design instruction that meets the needs of diverse learners who must have access to the general curriculum.

Information communication technologies, including course management systems such as Blackboard 5, provide a tool for the development of collaborative skills for preservice teachers across disciplines and geographic locations as they prepare to meet the educational needs of diverse learners. The use of these kinds of tools may increase opportunities for special education and general education teachers to learn how to plan and implement instruction that will provide access to the general curriculum for all students. However, issues that surround the use of computer-mediated communication with preservice teachers focusing on online collaboration skills must be considered, including (a) characteristics of the collaborative group, including participation, interactions, and interdependence; (b) the nature of the collaborative situation; (c) factors that may promote or inhibit

collaboration, and (d) encouraging and teaching collaboration with accountability (Hathorn & Ingram, 2002). In addition, researchers must examine how online collaborative activities foster the development of learning communities among their students and how the process facilitates interactions between students (Copenhaver, Tobin, & Lamme, 1996; Espinoza & McKinzie, 1999).

The purpose of this research project was to understand how collaborative problem solving between preservice elementary and special education teachers was supported by the use of an online learning management system (Blackboard 5). Specific questions addressed in this study are (a) what are the perceptions of general education and special education preservice teachers about using technology (Blackboard 5) to facilitate problem solving and (b) what are the strengths and weaknesses of using synchronous discussions for collaborative problem solving among general education and special education preservice teachers?

REVIEW OF RELEVANT LITERATURE

With the rapid adoption of Internet technologies, collaborative learning and problem solving using the Internet have become a viable instructional strategy for teacher education. Online learning has been generally divided into three types: synchronous, asynchronous, and self-paced learning (Black, 1998), with synchronous and asynchronous learning modes used most often for online collaborative learning experiences (Hathorn & Ingram, 2002). However, different types of collaboration have different applications. Synchronous mode is more like a conversation and is better for quick interactions than asynchronous mode, and when used effectively, asynchronous mode may support deeper, more reflective communications (Warschauer, as cited in Hathorn & Ingram, 2002).

Factors Affecting Online Collaboration

Studies of online collaborative learning have been reported in the teacher education literature about various types of projects including interactions among graduate students (French, 1999; Espinoza & McKinzie, 1999), a cross-country project among preservice teachers (Reinhart, Slowinski, & Anderson, 2001), an interdisciplinary curriculum-design project (Copenhaver, Tobin, & Lamme 1996), and a project involving both on-campus students and distance learning students (Mouza, Kaplan, & Espinet, 2000). Within their respective focus, most of these studies indicate that online education has the potential to transcend the traditional nature of face-to-face teaching by including a larger community of information resources, content material, and people. Instructors in these studies are able to shift more control to the students and become facilitators of learning as they help students construct understanding within a more authentic context (Mouza, Kaplan, & Espinet). The process of becoming a curricular collaborator online also helps participants build learning communities, which fosters professional development, allows students to successfully overcome challenges they once considered insurmountable, and facilitates reflective instruction (Copenhaver, Tobin, & Lamme).

However, researchers also found that while 80% participated actively in different types of online collaboration, there are still 20% who do not contribute or participate (French, 1999). Simply putting people together in groups, either on- or offline, does not ensure that the individuals will collaborate for problem solving and learning (Hathorn & Ingram, 2002; Reinhart et al., 2001). Nevertheless, these studies show us that online collaboration may be optimized by paying attention to such factors as task, technology, group composition, group size, moderated communication, grade/job requirement, individual accountability, and individual differences (Hathorn & Ingram). Finally, online collaboration also needs to be facilitated by collaboration training (Reinhart et al., 2001), which was one of the purposes embedded in this study.

Developing Collaborative Problem Solving Skills Online

As general and special education preservice teachers prepare to work together to meet the needs of diverse learners using innovative practices such as online collaboration, the development of problem-solving skills also appears to be key to successful inclusive practice (Giangreco, Edelman, & Dennis, 1991; Hobbs & Westling, 1998; Phillips & McCollough, 1990). Hobbs and Westling suggested that support of inclusive placements for students with disabilities is enhanced by the use of collaborative problem solving among general and special education teachers. In a related study, Hobbs (1997) discovered that when professionals worked together to

solve problems, they were able to identify more causes, more objectives, and more interventions than when they worked alone. In addition to these findings, it was also reported that cooperatively written plans tended to produce a larger number of actions associated with effective inclusive education than those that were written alone (Hobbs).

The problem-solving process used by general and special education professionals typically involves several components that lead to an effective resolution. Identification of the problem, generation of possible solutions, evaluating or determining the effectiveness of solutions, and planning to implement the solution of the problem are all important in the problem solving process (Gordon, 1977). As general and special education teachers search for ways to effectively collaborate with one another, including the use of online technology to support these efforts, it is essential that they select a problem solving model that will help them in determining how to plan for all students to be successful in accessing the general curriculum (Dettmer, Dyck, & Thurston, 1999).

METHODS

Participants

Participants in this study were undergraduate elementary education and special education majors from two different institutions of higher education. Ten elementary education majors, pursuing their initial teaching license either through an undergraduate program or through a postbaccalaureate program were preservice teachers at a northeastern college. All these preservice general education teachers were female. Half were traditional college-age students and half were older students entering teaching as a second career or finishing their first degree later in life. Preservice teachers in the elementary education program were enrolled in a course titled Elementary Curriculum: Science, Social Studies, and Special Needs. Two faculty members taught this course; one person teaches the science and social studies components and one of the authors teaches the special needs component. The course meets for six hours per week on campus, with two of the hours devoted to the special needs component, and the students have a 72-hour field-based requirement. To meet this field-based requirement, students generally spend either one full day or two half days in a classroom.

Five special education majors from a new undergraduate teacher education program at a regional university in the southeast participated in this study. All of these students were traditional college-age females. They were enrolled in a course titled Interdisciplinary Field Experiences. This course meets for three hours on campus each week, and 10 hours of field experience are required each week. Although not the instructor for this course, one of the authors worked with the preservice teachers on this project as part of the course participation requirements.

Procedures

At the beginning and end of the semester, both groups of preservice teachers were presented with The Inclusion Classroom problem-based learning problem (<http://www.uncg.edu/~bblevin/ecpbl/ecpblproblem.html>). In this problem, the principal offers the prospective teacher a new job opportunity. The school is moving toward a full-inclusion model of education and the principal is offering a teaching position in an inclusion classroom. As part of the problem, a roster of the children who will be in this inclusion classroom the next year, along with brief information about each student, is provided. All participants are asked to identify their initial response to the principal's offer, list what they need to know and learn to make an informed decision, and discuss their initial reactions to the principal's job offer. At the end of the semester, the students are asked to revisit the problem and prepare a final response to the principal's offer that included their reasons for their decision, any questions or concerns they still have, and a list of class activities that helped them make their decision.

During the semester preservice general education and special education teachers worked together online on two different collaborative projects. Random assignment was used to create triads. Each triad included two elementary education majors and one special education major. A Blackboard 5 site was created for this project so participants could communicate online. At the site, group members could access the following functions: (a) group discussion board (for asynchronous, threaded discussions), (b) group virtual classroom (for synchronous

discussions), (c) file exchange, and (d) send e-mail. Group members could only access their own group site, although the researchers had access to all groups' sites. In addition, the researchers had their own group area.

Collaborative Activity #1: Online prereferral intervention planning. Each group's first task was to meet together online and to use the POCS process (Dettmer et al., 1999) to develop an intervention plan to address a specific student's needs in the classroom (see Table 1 for the problem scenario). The POCS problem-solving model addresses (a) P-the Problem; (b) O-Options and alternative solutions for the problem; (c) C-Consequences and possible outcomes for the options to the solution; and (d) S-the Selection of the Solution to the problem. The preservice special education teachers were familiar with the process from course work the previous year. The preservice general education teachers were instructed in the POCS process the week before the online meeting. They practiced the process once in class in small groups, using a template to record their work for each step in the process (West, Idol, & Cannon, 1989).

Table 1 Online Prereferral Intervention Scenario

Bobby Weeks, a rambunctious and lively 2nd grader, was once again up from his seat, excited about the lesson on community service providers that was being presented by his teacher. When his teacher began the presentation on policemen, Bobby leaped from his chair and shouted, "I want to be a policeman," and immediately knocked a very quiet and shy Kristin Smith out of her seat. Bobby jumped to help her up, exclaiming that he would be the policeman and save her! Kristin was in tears, Bobby was bouncing on the balls of his feet, and once again a well-planned lesson was going down the tubes, apparently caused by Bobby's impulsive and disruptive behavior. He often begins his class work in the same impulsive way--starting assignments before instructions were given, then repeatedly calling out for help because he wasn't sure what he was supposed to do once he got started. It was time to make some changes, but what to do? You have decided to contact the student assistance team to get some help.

The two instructors scheduled a common meeting time for both groups. The preservice special education teachers met in a computer lab on their campus. The preservice elementary education teachers met together in a classroom on their campus using wireless laptops. Both groups of students were instructed that they had 50 minutes to discuss the chosen intervention.

Collaborative Activity #2: Coteaching lesson planning. The groups' second task was to revise a lesson plan previously written by one of the preservice general education teachers so that (a) it was delivered using a coteaching model, and (b) it addressed the special needs of individual children in the general education classroom.

Prior to the activity, elementary education majors received instruction about several coteaching models. They examined both broad categories of models (Friend & Cook, 2003) and specific examples within the broad categories (Bauwens & Hourcade, 1997). The coteaching models included (a) one teach/one support through alternative instruction and (b) both teachers delivering instruction through parallel teaching and station teaching (Friend & Cook). The special education majors were already familiar with coteaching models from coursework the previous year.

Within each triad, the preservice special education teacher worked individually with each of the two preservice general education teachers. Pairs were responsible for setting up their own online meeting times; class time was not used for this activity. The preservice general education teachers were asked to select a lesson plan they had written for a methods class and post it in the group's file exchange area. The preservice special education teachers were asked to read through the plan prior to their online meeting. After their online planning session, the preservice general education teacher was responsible for preparing the revised plan and posting it in the group's file exchange site. From there, the special education teachers could review the revisions and contact their partner, as needed. Finally, all participants were also asked to respond to several questions about the online planning process. These questions and a due date were included in the assignment description.

Data Sources

Multiple sources of data were collected to answer the research questions in this study. These included (a) transcripts of the online meetings for each of the collaborative activities, which were automatically saved in Blackboard; (b) participants' initial and final written responses to the Inclusion Classroom Problem from the preservice general education teachers; (c) initial reactions to the first online Prereferral Intervention Planning Activity from the preservice general education teachers; (d) initial reactions to the second online Lesson Planning Activity, which only the elementary education students submitted with their revised lesson plans; and (e) responses to an online survey about this project completed by only half of the participants about three weeks after the semester was over.

Data Analysis Procedures

Guided by a crosswalk created to show the data sources that were collected to answer each research question, the authors read and reread the appropriate data, seeking answers to each research question. Two authors paired up to do a content analysis of data targeted to answer each research question so that they could confirm or disconfirm their partner's inductive interpretation of these data and compare their own inductive interpretation (Mertens, 1998). Triangulation was achieved by having multiple sources of data available for each research question. Lists of themes and patterns were noted in memos that were exchanged and subsequently discussed between researchers working with the same data sources. A third author audited and confirmed each pair's preliminary findings by comparing them to the patterns in the data used to answer each research question. Preliminary findings were exchanged using Blackboard 5 and also discussed and refined in face-to-face meetings of the authors. Extensive peer debriefing sessions were conducted among the researchers and the preservice special education teachers were asked to do a member check (Mertens). Generalizations were determined through analysis, discussion, and further analysis. The findings from our data analysis, which are presented next, represent a synthesis of the data in response to the research questions.

FINDINGS

Uses of the Online Tools

The first online discussion held during class time used only the synchronous feature of Blackboard. However, while the preservice teachers in this study had the ability to communicate within their groups both asynchronously (via e-mail and the threaded discussion feature of Blackboard called the Discussion Board) or synchronously (using the chat feature of Blackboard called the Virtual Classroom), every pair used e-mail to set up times for discussion and then used only the synchronous feature for their actual discussions.

The preservice special education and general education teachers were well able to generate multiple options in their prereferral intervention planning activity as they worked together online to develop an intervention plan for Bobby. The same ability to generate multiple options was true when the pairs worked together to choose a coteaching model and revise a lesson plan.

The tone and conduct of both synchronous discussions among the preservice regular and special education participants in this study was respectful and collaborative. An example of the collaborative nature of these online, synchronous discussions was that every group shifted from using "I" to using "we" about one-third of the way into their discussions.

Not surprisingly, time was a major factor during this project. Participants mentioned the time it took to arrange for their discussions and also commented on time delays during both synchronous discussions, which were a frustration for the participants. However, time delays during the second synchronous discussions did not appear to be as much of a problem for four of the five groups.

Perceptions about Using Technology for Collaboration

The perceptions of the preservice general education teachers in this study about using technology (Blackboard 5) to revise their lesson plans were generally positive based on their written reflections to this online activity, responses to a final survey about the project, and comments gleaned from transcripts of their online discussions.

All the elementary education majors felt successful with the task of choosing a coteaching model and revising a lesson plan to include modifications for students with special needs. They enjoyed being able to work with a special education major who served in a consultant role and helped them generate ideas for modifications and accommodations to their lesson plan. Although all the participants were frustrated by the time it took to arrange for their synchronous chat sessions, which they did through e-mail, the general education students praised this online experience, as can be seen in these representative comments from their written reactions to this online experience:

I feel the opportunity to get feedback (from a preservice special education teacher) was helpful and allowed me to take a more critical look at the coteaching project ... If one of the goals for the activity is to find a way to use a technology component, then I think one achieves this goal. The activity allows students to have a good learning experience from both the technology aspect as well as the coteaching component. (SP, general education, response to lesson planning)

I felt we were successful in making a coherent lesson plan that allows both the classroom teacher and the special education teacher to evaluate the students' understanding of the subject. I wouldn't have had the feedback without being able to work online. (GG, general education, response to lesson planning)

Perceived Strengths and Weaknesses of Online Collaborative Problem Solving

In our effort to determine the strengths and weaknesses of the using synchronous discussions for collaborative problem solving among preservice general education and special education teachers, we analyzed transcripts from the online discussion from five triads, written reflections from the general education preservice teachers, and responses to a final survey. During their initial online discussion, one general education participant was given a brief scenario about a child, Bobby, which described his behavior in the classroom. The preservice teacher then presented information about Bobby and sought assistance from the team. The problem-solving process to be used by the participants in this project is known as POCS (Dettmer et al., 1999). Content analysis of the online discussions of the "Bobby" scenario yielded the following:

All five groups of three (two preservice general education and one special education) teachers identified the problem (P) through a process of describing Bobby's behavior based on the information given in the scenario. Both the general education and the special education teachers exchanged questions and answers and quickly came to the consensus that the problem they needed to address was Bobby's behavior, rather than his motivation or a disability, for example. Typical comments from the preservice special education teachers included asking for clarification or elaboration about Bobby's behavior and suggesting that they explore additional possibilities. One preservice special education teacher suggested to her general education partners that "Before getting him tested maybe there are some classroom interventions" and "First let's think about which behavior is causing the most concern." (SD) while another stated "I feel other interventions should be tried first" (JH) after asking several clarifying questions about Bobby's actions.

Generating options (O) took up about half the time for each triad's discussion and yielded many viable possibilities for modifications for Bobby. In fact, the quality and quantity of the options generated was notable, as represented by the synthesis of categories of potential problem solutions shown in Table 2.

Table 2 *Synthesis of Intervention Strategies Based on Scenario about Bobby*

Suggestions made by preservice elementary education teachers:	Suggestions made by preservice special education teachers:
Preferential seating	Preferential seating
Management of surface behaviors	Management of surface behavior

Parental involvement	Parental involvement
Self-monitoring strategies	Self-monitoring strategies
Grouping strategies	Grouping strategies
Special education referral	Observations of student behavior
	Extensive data collection
	Review of existing information on student

In three out of five of the discussions the preservice general education teachers generated most of the options for Bobby, and the preservice special education teachers in these discussions mainly asked clarifying questions. We interpreted this to mean that while the general education teachers had many good ideas for interventions, the special education preservice teachers were taking on the roles of a collaborator, rather than being a consultant. However, in the other synchronous discussions, during which pairs collaborated to revise a general education teacher's lesson plan, the role played by the preservice special education teacher was more like that of a consultant, as the special education students offered more ideas/options for modifying the lessons for Bobby than the preservice general education teachers in their group.

Interestingly, the first two options raised by the preservice general education teachers in every discussion revolved around (a) referring Bobby for assessment for AD/HD and (b) contacting his parents for further information before they shifted to options that they could carry out themselves in the classroom. On the other hand, in every discussion the preservice special education teachers offered ideas for interventions in the form of examples they had seen work in classrooms. And, several times in every discussion the preservice special education teachers elaborated on or clarified an option suggested by explaining reasons why this would be a good idea. For example, in response to the idea of using a reward system, the preservice special education teacher responded: "too much rewarding to [sic] often might get boring" or "sometimes ignoring can cause a behavior to increase at first." Our interpretation of these responses is that there is a difference in the depth of understanding of the preservice general education and special education teachers' suggestions for options for Bobby, even though the general categories are the same. We concluded that the preservice general education teachers had many of ideas but only a declarative understanding of them; whereas the preservice special education teachers had a more elaborated understanding of the reason why a particular option may or may not be workable. However, it was the preservice general education teachers who suggested that the ultimate goal of creating a behavior management plan for Bobby was to help him learn to self regulate.

During the problem solving discussion, evaluating the consequences (C) for all possible options were given short shrift by every group. Additionally, only the preservice general education teachers raised any concerns about some of the options. They were especially concerned about the fairness of rewarding Bobby for behaviors expected of other students and not giving rewards to all students. Overall, there seemed to be a tendency in all five triads to rush from generating options to choosing a solution (S). Interestingly, in all discussion groups at least one preservice general education teacher reminded their peers that they should try one solution at a time with Bobby, while at the same time acknowledging that it may take several of their ideas to improve Bobby's behavior. At the conclusion of their online collaboration, the general feelings of the preservice general education teachers were similar to this representative comments: "It is really helpful to work with a special education teacher and I hope I have this resource available when I get into the profession" (BA, General education, response to lesson planning) and "The rest of the experience was very valuable because it allowed for experiencing the relationship between a classroom teacher and a special needs teacher. It also internalized the process of planning a coteaching model" (HJ, General education, response to lesson planning).

Two pairs of the eight pairs were not able to arrange a mutually agreeable time for a synchronous discussion,

but those who did engage found value in it despite their initial apprehension about working collaboratively with someone they didn't know, overcoming frustrations with finding a time to chat, and enduring time delays due to slow network connections during their discussions. Several general education preservice teachers said that while they preferred to talk face-to-face or over the telephone rather than online, they appreciated all the ideas that the special education preservice teachers had to offer about their lesson plans. In fact, in her final reaction to the PBL unit at the end of the semester, one of the general education preservice teachers wrote:

Working with [a special education preservice teacher], I came to realize that a lot of the teaching methods that I have already learned and been implementing thus far are methods that can be used to help students with special needs. That helps me to know I can meet many different students' needs (HK, General education, response to lesson planning).

The preservice special education teachers also found the online, synchronous discussions to be frustrating because of time factors, including finding a mutual time to chat and delays due to slow connections to the network. However, these prospective special education teachers appreciated the opportunity to share their knowledge and experience what their roles in inclusive settings might be like. In their final reflections about this project two of the preservice special education teachers stated:

I got to see how hard it is to come up with a time to meet ... the assignments made you think--like a "real" life situation. (KH, Special education, final reflection)

I felt that my team used positive interdependence, small group interpersonal skills, and accountability. The one used the most often would probably be accountability. We all always wanted to make sure we were doing our part to figure out a solution ... I really felt that I was getting to give advice based on my own knowledge. I think that was helpful because it allowed me to take the knowledge I have gained and actually apply it ... Overall I think it was a good way to do PBL. (AH, Special education, final reflection)

SUMMARY AND DISCUSSION

Teams of preservice general education and special education teachers used the synchronous chat feature of Blackboard 5 on two occasions: First, to develop an intervention plan to address a specific child's needs in the classroom using the POCS process; and second, for revising a lesson plan to include a coteaching model and modifications for at least two students with special needs in order to provide them access to the general curriculum. Data from two synchronous discussions held among small groups of preservice general education and special education teachers and written reflections were analyzed to answer our research questions about the perceptions of these two groups of preservice teachers about using online discussions as a vehicle for problem solving and about the strengths and weaknesses of this kind of technology for engaging in collaborative problem solving online. In general, the tone of these synchronous, problem-solving discussions was respectful and collaborative. Both the preservice special education and general education teachers generated multiple options for Bobby during their collaborative problem solving activity. The time delays inherent in synchronous discussion did not appear to be a problem for four of the five triads, although one preservice teacher's poor spelling, as a result of her learning disability, made communication in one group somewhat difficult.

In this study, the use of online collaboration and problem solving for preservice general and special education teachers appeared to be a beneficial process for both groups as they generated ideas for instruction to meet the needs of diverse learners in general education classrooms. The application of those ideas, both in the online prereferral intervention planning scenario and in the development of the cotaught lesson plans, suggested that the preservice general education and special education teachers produced instructional strategies that would contribute to diverse learners' access to the general curriculum. The technological aspects of the online synchronous discussion provided the opportunities for quick interactions and immediate feedback between the two groups of preservice teachers as they discussed their options for the student in the prereferral intervention scenario and the cotaught lesson (Reinhart et al., 2001). Overall, the primary concern the preservice teachers

had in participating in the project was time, particularly in determining when each group could meet online to discuss the development of the cotaught lesson.

As part of the online collaborative problem solving process, the preservice general education teachers offered numerous strategies and interventions, not only for the prereferral intervention scenario, but also in the development of the cotaught lesson plan. The preservice special education teachers provided reasons and rationale for using specific strategies suggested by the general education preservice teachers. For example, one of the special education preservice teachers, KH, explained reasons why it was important to assess the learning environment when deciding where a student should sit, whether it is in close proximity to the teacher or with a specific group of students.

The preservice special education teachers also asked many questions of the general education teachers to include them in the decision-making. We interpreted this to show movement toward a more collaborative role for the special education teachers rather than an expert consultative model, suggesting an understanding of the changing roles of general and special education teachers in inclusive education.

One of the major benefits of the online, collaborative problem-solving experience perceived by the preservice general education teachers was their access to special education teachers in order to discuss student situations and the development of cotaught lesson plans. This led to an increased opportunity for the generation of numerous instructional strategies and interventions (Hobbs, 1997). Without the online access, these general education teachers would not have had the experience of sharing ideas and the opportunity to discuss ideas generated from their discussion with a more experienced special educator. From this observation, we see particular importance for the use of online discussion in problem solving for teachers who are isolated from other professionals as a result of geographic location, or perhaps because they are only one of a few professionals working in a school setting with limited opportunities for collaborative face-to-face interactions with colleagues.

Both groups of preservice teachers were able to learn and practice skills of collaboration during their online discussions, leading to an increased understanding of one another's roles as teachers. This also suggests that both groups of preservice teachers recognized their own expanding roles. With continued accountability for the learning of all students, general education teachers will need more access to strategies to individualize instruction within the general curriculum and special educators must have more knowledge of the goals and objectives of the general curriculum for which the students they serve are responsible. In this study, preservice teachers' opportunities to participate in the online project, to interact with one another, and to develop some interdependence as they used the problem-solving model to make decisions promoted the importance of the collaborative experience for enhancing professional growth (Hathorn & Ingram, 2002).

The online collaborative activity was also enhanced by attention to task. Both the prereferral intervention problem-solving activity and the design of the cotaught lesson were clearly described for the participants. In addition, individual accountability--the fact that preservice teachers were responsible for setting up their own times for the discussion of the cotaught lesson--contributed to the factors that supported the use of the online collaborative activity (Hathorn & Ingram, 2002).

LIMITATIONS OF THIS STUDY AND FUTURE RESEARCH

The online collaborative problem-solving activity between the preservice general education and special education teachers in this study has led us to want to continue to research aspects of this process and to try to improve on some of the limitations of this small study. These students only met twice online in synchronous discussion; once at a prearranged time and then at a time they were to choose. Based on several of the preservice teachers' comments from both groups and our own observations, we believe that additional online meetings would contribute to a better understanding of how online discussions can be used to develop collaborative practice between two distant groups. Additional study of the online collaboration process would

also allow us to manipulate the instructional activities and study how these influence interventions with diverse learners in inclusive environments.

A promising area for future inquiry is the use of online discussion and collaborative activities for inservice teachers in isolated geographic areas or teachers who have limited opportunities for interaction with colleagues. Internet-based discussion forums for problem solving for teachers are common, but little research has been conducted to study the nature of these online interactions.

As teacher educators continue to seek out the most effective practices for preparing both general and special educators for the challenges of increasingly diverse classrooms, the continued use of technology supported by online collaborative activities offers promise and opportunity. Studying these kinds online collaborations will enhance our own skills as teacher educators as we prepare all teachers for the needs of students in inclusive learning environments.

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