Jl. of Interactive Learning Research (2005) **16***(4)*, 369-393

Computer Conferencing and the Development of Habits of Mind Associated with Effective Teacher Education

PAMELA LEPAGE
San Francisco State University, USA
plepage@sfsu.edu

PAULETTE ROBINSON
University of Maryland, College Park, USA
pr58@umail.umd.edu

Today teacher educators emphasize the need for preservice teachers to develop certain habits of mind (like reflection) in order to be effective teachers. These educators are constantly searching for pedagogical strategies that can help teachers quickly learn, understand, and take to heart important dispositions. This article describes a three-year research project that explored the computer conferencing experiences of practicing teachers who were involved in a two year, nontraditional master's program. In this study it was found that web-based conferencing can provide a valuable pedagogical tool that reinforces content and encourages the development of important dispositions, but it can also perpetuate the very habits of mind that teacher educators want to change. This article illuminates the difficulties of implementing progressive strategies as researchers seek to understand how conferencing can provide added instructional benefit to programs that promote transformative teacher education.

Many research studies focus on whether technology can be used in teacher education programs to develop skills in specific content areas (Harrington & Hathaway, 1994; Hollenbeck, 1998; Kiesler, 1991). Only a few studies, however, focus on how technology can be used to support the development of habits of mind conducive for effective teaching (see for example, Harrington & Hathaway, 1994). Today teacher educators emphasize the importance of moral decision-making and care, and they emphasize profes-

sional interactions with parents and collaboration with colleagues. This article describes a three-year research project that explored the computer conferencing experiences of practicing teachers who were involved in a two-year, nontraditional master's program that emphasized the development of dispositions. In this study, researchers were interested in understanding the meaning teachers made from the conference experience and ultimately what they took away from it as part of their professional development.

There were many variables that affected the students' attitudes about conferencing including their level of technology expertise, their feelings about written disclosures, and their relationship with the faculty and with each other. Ultimately, it was found that conferencing could be used to reinforce content and to develop habits of mind that positively influence teaching. But, it was also found that conferencing could reinforce habits of mind that can have a negative effect on teaching. Even among a well-intentioned faculty in an innovative program with a moral base it is possible to develop activities that can perpetuate (rather than disrupt) unexamined and unproductive assumptions in teachers. It was also found that although some students talked about the importance of habits of mind, they did not always demonstrate that in their actions associated with the conference site itself. For example, in this study some students said they had a better understanding of why it was important to collaborate and share dialog with colleagues. Often they felt it was more important to have a dialog with the professors in the conferencing site, rather than other teachers.

In the past, research on computer conferencing has focused on comparing online dialog with face-to-face interaction (Murphy, Drabier, & Epps, 1998), its impact on higher order thinking (Fabro & Garrison, 1998), or learners' perceptions of online learning (Broady-Ortmann, 2002; Leonard & Guha, 2001; Kim, Williams & Dattilo, 2002; Bronack, Kilbane, Herbert, & McNergney, 1999). Only a small number of research studies have focused on learning outcomes (see for example, Sharpe & Bailey, 1999). This article focuses on both learning outcomes and student perceptions, emphasizing habits of mind, like reflection and other dispositions. This article demonstrates how conferencing can provide instructional benefit to programs that are interested in transformational learning. Our goal is to go beyond how learning technology itself can be transformative (e.g., King, 2003). According to Cranton and King (2003) transformative learning can give us a new perspective on our goals, what we do in our practice, and how we think about our work. In this article, we evaluate how conferencing can be used as a pedagogical tool that can encourage habits of mind.

When other professional programs have used conferencing to encourage professional habits of mind, often they were interested in how conferencing affects a teacher's ability to reflect (DiMauro & Gal, 1994). For example, DiMauro and Gal published a case study that explored how a group of

teacher leaders used network exchange to reflect upon their involvement with peer leadership and teacher-teacher support. DiMauro and Gal identified three dominant modes of discourse: informative, responsive and reflective. The goal of their research was simple, they use online conferencing as a way to stimulate reflective dialog and therefore enhance reflective practice. In this project, we not only talk about reflection, we also discuss other habits of mind such as, 1) attitudes about "what knowledge we value," or "what knowledge is important," 2) the ability to question standard practice in order to move beyond traditional practice, 3) the ability to collaborate and to value a community of learners approach, 4) the development of autonomy and the ability to take moral action, even when faced with consequences, 5) the ability to engage in democratic dialog and the development of a public voice, 6) the development of positive attitudes towards learning.

Rarely do researchers look at how conferencing can affect (for example) a student's ability to take moral action. This is unfortunate since in teaching, as in other professions, it is important to develop and refine an ability for moral decision-making. Many would argue that moral decision-making in teaching is similar to learning how to support an argument with evidence in law school. Moral decision-making is at the heart of the profession. To define transformative learning, Cranton and King (2003) used an epistemological framework developed by Habermas (1971) who identified three types of knowledge, instrumental or technical, communicative, and emancipatory. Cranton and King claimed that teaching is primarily communicative rather than instrumental. That is, it is about understanding ourselves, others, and the norms of the organization, community and society. They suggested that professional development activities that focus on *how to* rather than the broader issue of *practice* fall short in meeting the needs of educators. They also suggested that knowledge about teaching is emancipatory. In there words, it is about critical questioning and reflecting on what we do, how it works, and why we believe it is important.

Context

Before discussing the results of the study, it is necessary to describe the teacher education program that sets the context for this study. The study was conducted in an interdisciplinary "school-based" master's program for teachers (Sockett, Demulder, LePage, & Wood, 2001) at George Mason University. Since 1992, this program has enrolled over 1000 practicing teachers in the Northern Virginia area.

This professional development program, built on a moral epistemology of practice, was one of the first to embrace such widely acclaimed reforms as teacher friendly scheduling, cohort-based organization, interdisciplinarity and school-based research and advising. Teachers enter the program in teams from individual schools; and faculty members visit the schools approximate-

ly once a month. At any given time the program faculty is working with between 40-60 schools in the area. These teams start and finish the program together so they avoid isolation and learn to collaborate. The program is interdisciplinary because the students come from elementary, middle and high schools, special and alternative education, and school library and resource environments. The faculty also teaches in interdisciplinary teams made up of psychologists, anthropologists, philosophers and educational specialists including former K-12 teachers (to name a few). Each faculty team follows a particular group of students throughout their stay in the program. The teacher-friendly schedule is designed to respect the scheduling demands of classroom teaching. The program holds two-week summer sessions and four full-day Saturday sessions during each school year. Furthermore, at the time of this study, the program had negotiated with school districts for teachers to receive four release days to attend classes during each school year.

The curriculum is highly integrated and considered rigorous by teachers and school district personnel. The program has a philosophical base and teachers are expected to confront moral and epistemological issues that affect their interpretations and judgments regarding children. Teachers write autobiographies, narratives and reflections on experience, and then use multiple theoretical frameworks for interpreting them. As a means to promote critical reading, teachers are initiated into the program with pre-course requirements for reading imaginative literature, and thereafter engage with theory from several different disciplines. The teachers earn half their credits for research done in their classrooms. During the first year they produce an individual teacher-researcher study. In the second year, they complete a team project that is often associated with school change efforts. Technology is integrated into the curriculum and for the group involved in this study (as with other groups in the past) laptop computers were provided for email, electronic conferencing and other Internet use.

The program provides a unique experience for the teachers enrolled in the program. A large percentage of the graduates are satisfied, and even excited, about their experiences (LePage, Boudreau, Maier, Robinson, & Cox, 2001; Gerow, 2002; Sevcik, 2002; Schmidt, Sharp, and Stephens, 2002; Barnard and Courter-Folly, 2002; Goss and Stapor, 2002). Some find collaboration (teamwork) to be transformative. Some change their practice as a result of research in their classrooms. Some are drawn to the philosophical emphasis and the intellectual community. Some enjoy writing narratives and reflecting on their experiences. The end result is that students usually have something about the program that positively affects them. Most students describe their experiences as transformative.

In this program, conferencing is used as a pedagogical tool in all of the courses, but the faculty are always interested in learning more about how they can use it effectively. Conferencing therefore has posed many questions associated with some of the faculty's philosophies about teacher education. For example, teachers in this program are not necessarily positioned in role of the learner and the instructors are not necessarily positioned in the role of the knower. Since the program has a constructivist base, it is expected that all participants can teach and learn and that students and faculty will work together to construct knowledge and solve problems. It is suggested that the first step in professionalizing teaching is to treat practicing teachers as respected and knowledgeable professionals. So, given this philosophy, should faculty lead the discussions? Or should teachers have the freedom to develop their own conference space? Should faculty make conferencing an academic requirement? Or should they simply provide space for teachers to connect with others? Should they focus on how conferencing can support instruction? Or should faculty help teachers develop conferencing at their schools? In this study, researchers set out to investigate the students' experiences with conferencing throughout the two years. The study involved 90 students in three cohorts who attend the program together.

METHODS

Student Profile

The 90 graduate students participating in this study were practicing K-12 teachers. Most, if not all, had at least three years of teaching experience, with a large percentage between five and fifteen years of experience. The student population tended to be older, mainly students in their 30's and 40's. They were all returning students who were interested in earning a master's degree. There were 80 women and 10 men. The program admitted elementary, secondary and special education students. The university is inexpensive and therefore accessible to most students, but this program only admits students who are teaching in local schools. The program does not have rigid entrance requirements. The philosophy of the program is that if teachers are working out in the schools with children, they need professional development, whether or not they have stellar academic records. The goal is to make sure that children have well-trained teachers.

Data Collection Methods and Procedures

Data were collected in four ways, through mid-program reflections, end-of-program surveys, mid-program and end-of-program interviews and through conferences postings. When appropriate, the information from one data source was used to support and extend information provided from another.

Student Mid-program Reflections. In the mid-program reflections, students were asked to reflect on their first year of conferencing, write their thoughts on the experience and give feedback on how the faculty could improve the

conferencing process for the upcoming year. During the mid-year evaluations, 68 participants provided written reflections.

End-of-Program Student Surveys. Teachers were asked (at the end of their program) to fill out a short answer survey so the researchers could gather data from a larger number of respondents. Sixty survey responses were received. In the survey, teachers were asked to compare their experiences between the first and second year of conferencing, and they were asked to provide feedback on specific aspects of their experience. In the surveys, the students were asked:

1) Please comment on your experience with conferencing during the second year.
2) Please compare your conferencing experiences during the first and second years.
3) Please describe what you liked best about your conference experience.
4) Please provide suggestions for how the faculty can better use conferencing in the future.

Student and Alumni Interviews. Seven students were interviewed after their first year in the program. Seven alumni were also interviewed. These seven students and alumni were chosen at random for an in-depth case analysis from a list of volunteers. The volunteers included men and women who had both positive and negative feelings about conferencing and about the program. This provided in-depth data that helped the researchers move beyond the information provided in the surveys and the reflections. The interviews were open-ended; the interviewer guided the inquiry, but the participants were allowed to discuss in detail what they considered important about their experiences. Only one person was interviewed during both sessions. The interviews were transcribed verbatim.

Web-Conference Data. The students in this research project conversed in an online conference space for two years. Each conference was kept and then printed for purposes of analysis. Special attention was given to specific conferences that involved class content, as opposed to social discourse. In the first year, the researchers focused on analyzing a conference that was set up for a culture and language course. In the second year, they concentrated especially on a threaded discussion in an epistemology class.

Data Analysis

For this project, researchers used both qualitative and quantitative techniques for data analysis. For our qualitative analysis, Henri's (1991) theoretical model for analyzing conference data was used as a guide, particularly in

the areas of cognition and community. Henri organized conference participation in five categories: participative, social, interactive, cognitive, and metacognitive. The challenge of qualitative analysis is to make sense of massive amounts of data, identify significant patterns, and construct a framework for communicating the essence of what the data reveal (Patton, 1990). Student documents and interviews were analyzed with an inductive cross-case analysis. Inductive analysis means that the patterns, themes, and categories emerged out of the data rather than being imposed on them prior to data collection and analysis. A cross-case analysis means that the information was grouped together according to answers from different people, themes, perspectives or issues. Then, a content analysis was conducted which included the process of identifying, coding, and categorizing the primary patterns in the data. In the final step, the data was interpreted. Interpretation, by definition, goes beyond description. Interpretation means attaching significance to what was found, offering explanations, drawing conclusions, making inferences, building linkages, attaching meanings, imposing order and dealing with rival explanations. To demonstrate how we looked for changes in habits of mind, this is how one student describes some changes in her attitude from when she first arrived at the program and at the end:

> If you were to draw a caricature of me when I first arrived…two summers ago I would have a huge mouth and my eyes would be narrow slits. I would be wearing a propeller beanie and have my pockets stuffed with rubber bands and spit wads. My demeanor would exude arrogance and sarcasm. Today the picture would be different. I would have oversized ears and my eyes would be opened wide. I would be wearing a graduate's cap and my pockets would hold a magnifying glass, a tape recorder, a notebook and a pen. My demeanor would exude confidence, yet humility. So, after two years…I would have to admit that I am a better teacher and a better person, however, I still have a long way to go.

In this quote the faculty was not only impressed with this student's critical self reflection, but also that she admits that she still has a lot to learn. Beyond simply looking at what students said about themselves, we also looked at their responses to other students. Did they show care in their responses to other students? Did they seem to value their colleagues' advice? We examined all the data for each student, from conference postings to answers on survey questions. In this way, we could determine whether students in different contexts were putting into practice the changes that they described (as in the quote above). For example, with the student above, throughout the program she complained that she had trouble getting along with other teachers at her school. She thought they were "not very good" and constantly criticized them. She worked in an alternative school where many of the children had broken the law, some crimes as serious as armed robbery. We asked her why she was able to forgive children who had broken the law,

but yet had very little patience for fellow teachers who were trying to do the best they could in a difficult situation. Years later we found out that this student was nominated by colleagues at her school and then won a teacher of the year award from the district. Obviously, she had put her "words into action and made real change."

From the data, patterns emerged, not only when the conference postings and interviews were analyzed, but also by examining the way that teachers approached and responded to the conference site itself, often derived from interviews. In this study we examined whether the students were putting progressive attitudes about learning into practice as they approached the conference activity itself.

Context of the Conferencing Assignments

Computer conferencing was required during the entire two years the teachers were enrolled in the program. Conferencing in this situation refers to a website where people can post asynchronous messages about various discussion topics. At that time, the program admitted three cohorts with approximately 50-120 students in each cohort. In each of these 3 groups were divided into 3-5 mini-cohorts. Each of the larger groups (and subgroups) had conferencing spaces. Among various cohorts, the program always had from between 10 to 30 separate discussions running at one time. So conferencing was used extensively in the program.

Participation in conferences was required, but for the group under study some of the conferencing assignments were very ambiguous, especially the first year. In the first year, the conference design provided the students with the freedom to create their own site and the option to discuss anything they considered important. People could write in three spaces: 1) in an open public forum that focused on intellectual questions; 2) in their cohorts where they were to have fun, talk and get to know each other; and 3) in another public space that allowed them to ask questions or comment on the program. In some of these spaces, the faculty started the conversations by introducing topics and questions. But usually the faculty wanted the students to feel free to start and develop their own community online.

The faculty teaching team (five people) working with this particular group of teachers was divided on the purpose of conferencing. The faculty member identified as leading the effort was primarily interested in finding ways for teachers to develop community outside the program. Since teachers were recruited in teams from various schools, part of the program's mission was to transform the schools as the teachers went through a transformation of their own. This particular faculty member believed the teachers needed to connect intellectually with colleagues who could help them develop professionally. Other faculty members were more interested in extending their classroom conversations.

Ultimately, during the first year, the program included very little design. Although the faculty set up a simple framework, they hoped the teachers would take off on their own and get something moving themselves. By the time the faculty started using conferencing as a pedagogical tool, they had read several articles on computer conferencing. Most of the articles suggested professors should lead the way in a new conferencing situation, provide a structured framework for conferencing, and be actively involved in all discussions (e.g., Klemm, 1998; Trenton, 1998). But the first year, this advice struck the faculty as being part of the old paradigm where the faculty members are cast as the knowers and the students are cast as the learners. The faculty wanted to involve the teachers in the development of their own space. They wanted a student-centered experience that provided an empowering learning environment. One of their goals was to have students talk with each other and learn the value of professional collaboration. Past experience in the program had shown that when faculty got too involved in the discussions, they often became the focus of the discussion. The students talked to professors and not with each other. Articles on conferencing appeared to be like technical manuals about "how to" develop traditional hierarchical teacher/student relationships in a new learning environment – a conference forum.

The strategies employed the first year proved a bit idealistic, so the second year some of the faculty provided more structure. One faculty member required a conferencing assignment related to an epistemology class that included conversations about authority, evidence, and assessment. In that class, each student had to post five messages containing at least 250 words. The conference was designed specifically to reinforce class content.

The students had mixed reactions to the two different conference structures. Some liked the freedom and the informality of the first year conferences; they wanted to feel connected and to socialize:

- 1st year was fun, varied conversations going on, no restrictions as to what topic you could visit. 2nd year confining, not enough time or energy to visit the 4 areas.
- I felt the social aspects (1st year) enabled our graduating class to learn about each other and bond. 2nd year lost all of that, everyone was too worried about the assignments.

Others wanted intellectual stimulation and preferred the epistemology conferences.

- The second year conferencing was directed and purposeful, while the first year was simply a novelty.
- I liked the structure Professor X gave [to] conferencing. I felt the first year was a wasteland for meaningless thoughts – no meat!

So, the faculty and the students both had different ideas about what they wanted to accomplish through conferencing. Invariably, when faculty asked for input from students to improve the conference space, they received several different answers in response to every question posed. Some students wanted more faculty involvement. Others wanted less faculty involvement. Some wanted the conversations to be friendlier. Others wanted them to be more intellectual. Some wanted more structure. Others wanted less structure. Rather than clarification, the responses added to the ambiguity.

RESULTS

Teachers' Learning

When this research project was in its infancy, the questions focused on whether computer conferencing provided an effective pedagogical strategy? While the faculty associated teacher research and other pedagogical strategies with the development of dispositions, they did not view conferencing as a pedagogical strategy that could impact dispositions, except in the sense that having open discussions about cultural issues might positively affect teachers attitudes about race, class, and gender (e.g., DeMulder and Rigsby, 2002), which is not unique to computer conferencing, but an outcome of effective dialog in any setting. This study was originally focused on the effect of conferencing on learning specific content, which has been posed by other researchers (e.g., Harrington & Hathaway, 1994; Hollenbeck, 1998; Kiesler, 1991). In this study we talk about both learning content and dispositions.

When the researchers were focused on outcomes associated with specific content, they looked for examples and research on the topic. In most sites, the conversations were guided. The students were told what was expected. They were praised for posting messages, staying on track, and being reflective in their responses. The students often posted what the professors wanted to see, as when they wrote papers or talked in class. The conferences resembled classrooms where the professors were the authorities who provide summaries, context, and theoretical associations. More or less, these conferences were online seminars. Many of these programs had success and therefore provided a model for the conference structure design for the epistemology class during the second year of the program. Here is an example of the faculty member's response to a posting in this particular conference:

> Wow, this is a terrific start. Well done indeed. One easy way to find books by Toulmin is to go for the Xlibris section in the libraries consortium. I haven't given you Toulmin to read, but the ideas come from his book *Human Understanding*. No doubt they are replicated elsewhere in his writing. I'd like to see more continued digging into the questions. Our own backgrounds are interesting and important, but it is trying to define the questions that is the real difficulty. Linda and Diane are both (differently) wrestling with teaching children to be rational: what does that mean? I am not sure it is a process. How do you get children a) to change their beliefs in the light of evidence or b) to form beliefs based on evidence or c) to believe what is true directly in the face of common sense (e.g., the tectonic plates theory). Bring in examples of teaching specifics so we can get a handle on the questions. Don't get too bogged down in rationality; but for those interested, I think the best book is still *Rationality* by Jonathan Bennett. Bennett discusses Von Frisch's bees. Frisch figured out that bees tell each where the pollen is by dances they do outside the hive when they return. Looking at this activity, Bennett asks what would we have to add to the bees to make their behavior rational? But I will look up some other sources.

In this response, the faculty member is providing positive feedback for acceptable responses, searching for references, explaining theories, posing questions and asking the students to probe deeper. The professor is providing a structured experience.

The epistemology class conference was the only conference where students specifically mentioned learning. From the four survey questions (out of 60 surveys returned), the researchers counted approximately 31 responses from students that indicated that they believed that conferencing helped them learn. Although the faculty had conferencing required in all of the classes in the program, 17 of the 31 comments about learning were specifically connected with the epistemology class during the second year. It seemed likely (from the content of the other comments) that some of the other 14 comments also related to this conference, but since the comments were not connected directly to that class, researchers did not make that assumption. The comments below are associated specifically with the epistemology class.

- Epistemology was difficult for me to understand and I found that reading and writing in the conferences helped to clarify this difficult area of study.
- The conference for epistemology was good, I learned more about thinking and knowledge through other participants.
- The feedback of others forced me to examine my own views in epistemology. Learning happened when someone fed off of your entry and made you clarify, re-think or see differently.

It is clear that the epistemology conference motivated some teachers to reflect on the content of the course. These quotes clearly describe conferencing as a supplement, an activity that helped them to understand the material presented in class. By analyzing the conference data, many of the postings seemed very thoughtful. Here is an example of a typical student posting:

- I was recently reading an article (provided by my team – thank you!) entitled, "Postmodern Doubt and Philosophy of Education" by Nicholas

> Burbules published in *Philosophy of Education*, 1995. Though this article is more about what postmodernism has to offer for education, there was one particular point that I would like to relate to Professor X's question. The author states that educators need "...to believe that doubt and uncertainty make us better educators – in part because they reemphasize our dependence on each other, including our students, and in part because they insulate us somewhat from false claims for the value of what we have to offer." The author goes on to state that "it means focusing less on outcome standards and more on creating opportunities for discovery, discussion, and development in our teaching." This should be our true classroom practice! It's scary – it forces continuous change and learning. Our students must know we don't have all the answers – we grow with them. How many teachers really have that attitude? How many teachers are comfortable with openness to continuous change – or how many want to pull out the materials and teach the same material from last year? In our rapidly changing society, students need to be prepared to discover, learn and accept new and different knowledge. How do we teach what Toulmin suggests – that rationality is dependent on how our beliefs change? You could give examples of rationality, but how exactly do you teach it? Teach through experiences? I need to think on this some more...

For this project, Henri's (1991) theoretical model for analyzing conference data was used as a guide for our analysis particularly in the areas of cognition and community. Henri organized conference participation in five categories: participative, social, interactive, cognitive and metacognitive. This teacher's posting clearly shows that there is a friendly tone, ("provided by my team – thank you!"). She also demonstrates cognitive and metacognitive abilities by choosing important and insightful quotes that were highly relevant to the discussion. And, although she uses some fluffy rhetoric, she also demonstrates some understanding of the text by translating the author's words into her own language. She is struggling intellectually with Toulmin's ideas when she says, "How do we teach what Toulmin suggests – that rationality is dependent on how our beliefs change?" In fact, in all of her last few sentences she is using inquiry to motivate her colleagues to think about how this information might be translated from theory into practice. She is even cautiously presenting some of her own ideas (e.g., "give examples of rationality" and "teach through experiences"). She does not, however, feel confident enough to explain and clarify her ideas.

After examining the quotes through Henri's (1991) model, it appears as though community was established in this conference. Here are examples of two segments of longer postings from that same conference. These quotes clearly demonstrate a friendly tone and a connection from one student to another:

- Hi Linda, thank you for the head start on this question. I've been in a very rational mode toying with it because in my mind I've convinced myself that it's the one question that lends itself to 1000 words of great Jetta wisdom.
- Hi everyone! I'm with you Jetta – this does seem to be a question that lends itself to 1000 words! I have agreed with most of what has been written so far. How do you get children to change their beliefs in the light of evidence?

The fact that many students also stated on the surveys that conferencing was a great way to get to know other people in the program also supported this conclusion. In the surveys, researchers counted 53 comments that indicated that students liked getting to know other students through conferencing.

Surprisingly, however, in the 68 reflections collected after the first year, 28 students were critical in a way that suggested that an online community was not established for some students. In the second year, the results were similar (somewhere between 1/3 and 1/2 of the students were unhappy). This raised questions as to why the survey data, as well as the conference data, did not produce consistent results when compared to student end of year reflections. By comparing the conference postings from a few individuals with their survey responses and their reflections, it appeared that some students' apparent engagement in the community might have been staged. Some may have been pretending to be part of the community, but did not feel connected. With regard to our original question about the connection between conferencing and content, however, it was concluded that threaded conversations supported and reinforced the learning of class content.

What Types of Knowledge Were Valued?

Although many teachers claimed that the conferences helped them to understand the content of the epistemology class, and it helped them to gain confidence, the epistemology class was the only class (mainly) where students specifically mentioned learning. Was this the only class where learning occurred as a result of conferencing? After analyzing conference postings, it was concluded that learning did occur in other classes. It is possible that the reason that teachers specifically mentioned the epistemology class in conjunction to learning was because in this class conferencing was used in a more traditional sense to stimulate conversations about specific definitions, authors, and theories. In other classes, students were asked to share stories about their classroom practice, to describe their own experiences in schools, and to discuss literature. It is possible that the students mentioned learning associated with epistemology because of their attitudes about what constituted knowledge, what knowledge was important and what they considered intellectual.

- The pop culture discussions were fun. It was interesting to think about culture in all the different ways it exists. The epistemology work was more important though.
- In the first year I felt we used it more as a support mechanism with our peers. It was great to have this. In the second year we were shifted to a more academic use – one of concept discussion I guess.

In these two examples, the first student is saying that culture is fun, suggesting that content in epistemology might not be fun, and she/he is saying that epistemology is important, as if culture is not as much so. In the second example, the teacher is defining academic use. The faculty may have transmitted some of these values, but they may also represent some entrenched attitudes about knowledge. According to Diane Wood (2001) a former faculty member in the program:

> Teachers have been socialized to respect the authority of the text, to privilege abstract over practical knowledge, and to defer to outside experts, all of which are reinforced in their workplaces. Although many in the beginning welcome the idea that knowledge built from practice has value, over time, as they note differences in opinions among colleagues, they become disturbed by the prospect that a variety of conclusions can be drawn from similar experiences. Moreover, as they develop habits of reflection, most identify inconsistencies in their own thinking. We, however, suspect that, in many cases, these attitudes result from the socialization of teachers into school cultures, where authoritative certainty tends to prevail (p. 37).

A question still remains. Did students talk about learning in the epistemology conference because they believed they learned only during this structured epistemology assignment? Or, did it simply fit their scheme of what learning was supposed to look like? A few times, the teachers did connect learning with the sharing of ideas:

- I liked hearing what was going on in everyone's classroom and life. I think I learned a lot by listening to others daily experiences in the classroom and their response or reactions to students.
- I found it helpful to share with other teachers in this program. Not only can you share about what is going on in the masters, you can share education-related information (e.g., "event frames").

Most of the time, however, it seemed the students' definition of learning was greatly influenced by traditional notions of knowledge acquisition. This created an interesting contradiction because an important goal of the epistemology class was for teachers to question traditional notions of knowledge that privilege certain groups and people.

Focusing on Dispositions

When questions surfaced about the authenticity of the online community and what knowledge was being valued, researchers turned their attention to exploring how conferencing enhanced or inhibited the development of dispositions. Whether or not community was established in the conference site was important to program faculty. Past research tells us that community can develop online (McDonald & Campbell Gibson, 1998). According to Gutmann (1999), the professional responsibility of teachers is to "cultivate the capacity for deliberative democracy" (p. 76). Wood (2001) argued:

> ...such a capacity requires people to think for themselves, to be critically reflective, and to act on their own consciences. Necessary for full participation in a democracy, these habits of mind are also essential for developing a sense of autonomy. Teachers who have developed as autonomous professionals are more likely to help children develop a sense of autonomy (p. 42).

Positive Changes. Some teachers did experiences some positive psychosocial changes as a result of conferencing. For example, some felt they overcame a fear of public debate, even though the process of finding a public voice was difficult. Some faced an enormous amount of fear in stating their opinions publicly:

- Because my thoughts were hanging out there it would take me forever to compose a posting.
- Conferencing to me was very unnatural. I felt easily intimidated because I knew whatever I put up on the conference was to be analyzed and may be ranked against others. That made it very uncomfortable to participate.
- I was scared to death! Everyone in the whole world, including the professors, would see me as a total moron – but I did it and I am thankful for the experience. This is something I would have never done on my own so when I was forced to do it, I did.

By examining those three quotes carefully (above), we can see that the teachers' fears actually have taken a tangible form. The teachers describe their fears as manifested in things that can be seen as things that can hang out and as things that are unnatural. In each of these quotes the element of time is associated, not with struggling with the material, but instead struggling with their fears (e.g., "forced to do it again" and "it would take me forever"). Many students claimed to be overwhelmed with reading and posting messages. The students' experiences of conferencing are described in more detail in Robinson's full research report (1999).

Once they were able to overcome their fear, however, many felt conferencing help them build confidence:

- Once I jumped in on the conferencing, I felt confident about what I was learning and how I began to articulate that knowledge as well as my opinion.
- I had much more courage the second year. The first year I did not feel as if my ideas were good enough.
- At times I have hesitated to use it when what I wanted to say might be considered offensive or dumb. It's worse than speaking orally because it's in black and write. Nevertheless, it's been a good experience.

Reinforcing Entrenched Attitudes. So, posting messages in the conference site was helping students to overcome fear, reinforcing content, and helping to create community. Those are important goals. In this program, faculty strives to reconcile the aims of education often simplistically described as self, society, and knowledge (LePage & Sockett, 2002). But the faculty didn't anticipate that the students would be so fearful and that moving beyond fear would take so much energy, which was considered a first step.. The faculty was more interested in having the teachers engaged in intellectually stimulating conversations that moved the teachers forward in their thinking.

According to experts, the dialogic approach to education emphasized in this program could produce powerful learning experiences that were enhanced by computer conferencing (Harrington & Quinn-Leering, 1996). The complexity of what makes a good discussion has been intensely studied in the context of some of the cohort sessions in this program (Sevcik, 2001). But, what makes a good conversation in a conferencing space? Although the faculty team had similar perspectives in this regard, they did not agree consistently on what constituted a great conversation, a vigorous intellectual exchange or a truly reflective posting. But, there were standards. In other words, the teachers were not told to simply say anything. They were asked to keep the work professional, appropriate, intellectual and reflective. It is possible that even by setting these expectations, this motivated teachers to start doing exactly what the faculty was trying to avoid, figuring out to what the faculty wanted, rather than concentrating on the conversation. As one student said:

- The conferencing process (format) was too non-personal for me. I felt that people were writing just what Professor X wanted to hear and they didn't really believe in what they were writing – just for a grade…therefore, it wasn't that real to me.

Many teachers admitted they posted their intellectual paragraph for evaluation purposes and never felt truly involved in a conversation:

- I found that I concentrated on posting my four (250) word writings rather than responding to what others had to say.
- I tried to comment on other postings but never felt I was in a dialogue – more a monologue.

- It seemed that most people were writing to Professor X, and not to each other. People did not interact with each other – they did not dialogue with each other, they simply tried to show Professor X that they were reflective.

Many also felt frustrated when nobody responded to their postings:

- I also disliked the fact that once I posted, it virtually went unnoticed.
- I liked it when someone picked something I wrote to comment on. With that in mind, I'd comb other entries for something to comment back on.
- I liked it when people responded to my postings (professors included).

Having people respond directly to their posts was especially important, not only because it made it more interesting, but because it relieved their fears. When they couldn't motivate others to respond to their posting, they experienced this as a comment on the quality of their posting, even though they admitted themselves that they often posted for the grade with little regard for the conversation. This affected them emotionally, whether or not they knew the quality of the conversation was often affected by many factors including the limitations associated with the linear nature of threaded conversations.

Although there were some differences in experiences and outcomes, a pattern was emerging. The goal to encourage habits of mind for effective teaching in this program was clear and worthy, but these ideals were not always being played out in the conference space itself. At least some of the students admitted they were writing what they thought the faculty wanted to hear for grades, and others talked about the importance of valuing different types of knowledge, but held onto a traditional view of knowledge themselves. It seemed as though the faculty was trying to implement progressive ideas in what developed into a traditional space, reinforcing some of the very habits they wanted to change.

Exploring Other Dispositions: Ambiguity and Autonomy

What appeared to be a disconnection between what the students were saying and what they were doing presented itself in other dispositional areas as well. Specifically, in the IET program, it was considered important for teachers to be able to deal with ambiguity and to develop an autonomous outlook on learning.

Dealing with Ambiguity. Expecting teachers to struggling with ambiguity is not unreasonable, it is considered an important aspect of intellectual development, not only by the faculty in this study, but also by other experts in the field (Kincheloe, 1991, Goodlad, 1988; Lortie, 1975). It is true that teachers change practice as they embrace the reality that in their profession, there are no answers. They become more successful as they begin to understand the complexities of their work. It is important for teachers to understand and embrace the ambiguous nature of what they do, but with conferencing frus-

trations ran high. In this situation ambiguity was a natural consequence of the fact that faculty were learning and experimenting with a new pedagogical innovation, and also the need to struggle with new technology (Pearson, 1999). Because of the range of computer access, and Internet Service Providers (ISP), they had no choice but to problem solve the technology on their own. One student commented that conferencing was:

- Very distressing. Little guidance in how to get started and minimal expectations on format which led to ambiguous, off-task, wasted time on off-topic dialogue.

This comment suggests that this student did not believe that she was responsible for being off-task and wasting time on off-topic dialog. Instead, it was an inevitable consequence of the faculty's instructional strategies. There was no indication that the student believed she had control over her learning and could recommend (or even initiate) change herself.

Becoming Autonomous Learners. Hollenbeck (1998) argues that conferencing can create a more democratic conversation among students and faculty. In her research, Kiesler (1991) found that "the proportion of talk and influence of higher status people was reduced when group members communicated by electronic mail" (p. 155). In the present study, it was clear that although the hierarchy was not as pronounced as it is in some programs, the teachers' valued the faculty's comments over their peers, and grades were considered very important. Their focus on grades was demonstrated (in conference postings) when they expressed a need to have absolute clarity on assignments. Faculty in this program did not strive to reduce ambiguity on assignments. They did not want learning to be reduced to simply accurately guessing what the professors wanted. In this program, teachers were encouraged to interpret assignments in a way that helped them learn what they needed to know to be effective teachers, even if that meant earning lower grades (grades were never very low). They were encouraged to value learning for learning sake, which was considered something they needed to teach children. They were encouraged to dispense with any exaggerated focus on grades or the need to gain approval from authority figures, In other words, it was hoped that teachers would become more interested in their own moral development, and on finding ways to improve their children's learning, than on traditional, competitive academic success.

So, how did the students respond to this progressive vision? At the end of the program, faculty asked the teachers to provide suggestions about what the faculty should do to "improve upon" the structure of the conference. Although many teachers valued the freedom provided by the faculty in the first year, resented the rigid guidelines in the second year, and admitted they posted what the faculty wanted to hear to earn better grades, ultimately their

suggestions clearly demonstrated attitudes deeply embedded in the old paradigm of control, traditional hierarchical roles, and bureaucratic structures:

- I think conferencing should be required for each class.
- Start off by forcing student to do it so they can get over initial fears.
- Put tight controls on this and let students know before they use this.
- Give more practice and attitude instruction and monitor by commenting about what was written.
- Provide guidance for the topics so that they fit the course needs better. Without faculty guidance, teachers chat about inane things.
- Have clear directions about staying on topic and not just writing to pose a question.
- [Put] stress or grade on dialoguing. Unfortunately we do what we know will be graded.

Some of the words in these responses *include, control, force,* and *require*. One person suggested that the faculty provide attitude instruction. One person suggested that teachers would engage only in activities that are graded. Another person suggested that without faculty guidance, teachers chat about inane things. Many wanted more responses and feedback from faculty, even though many teachers said the number of postings were overwhelming. This suggested they valued the faculty's responses over their peers' responses. The researchers recorded about 50 responses (out of 60 surveys collected with 4 questions) that pertained to feedback from students about how the faculty might restructure the conference site. From these 50 responses, they only received about five responses that provide suggestions on how the faculty might provide some freedom and also accomplish their goals. None of the students seemed aware of the program's expectations for them to struggle with ambiguity and to take responsibility for the development of the site and for their own learning at least in this context.

DISCUSSION

In this study it was found that the web-based conferencing both encouraged the learning of content and the development of habits of mind necessary for good teaching, and it also reinforced some bad habits. As an example of positive change, the teachers gained confidence by the second year in their ability to formulate ideas and to share those ideas publicly:

- The 2nd year I did it [conferenced] because I had to and I found out that I had as much to say as anyone else. Thank you Professor X!

They also gained self-knowledge and skills:

- I really like the idea of conferencing, and, to the extent that my col-

leagues use it, it has provided a wealth of thought provoking ideas and notions to consider.

- As I wrote my last paper, I did find that issues we discussed in the pop culture conference to be very helpful and gave me ideas for moving in different directions as I thought about my research.

But, it also reinforced teachers' entrenched attitudes about knowledge, learning and assessment. When they were asked about how to structure the conference more appropriately many students responded:

- Require with a participation grade.

When discussing issues about what knowledge is valued in our society:

- The epistemology work was more important.

When asked about their participation:

- It seemed that most people were writing to Professor X, and not to each other. People did not interact with each other – they did not share dialogue with each other, they simply tried to show Professor X that they were reflective.

Although conferencing was useful to the teachers for reinforcing content, building confidence and connecting with colleagues, the conference also perpetuated some bad habits. These patterns were not discovered when the conference postings were analyzed, but rather through interviews by examining the way that teachers approached and responded to the conference site itself. In many ways, the dispositional knowledge they were learning in the program was not always being put into practice in this particular learning environment. For example, teachers in the program were expected to learn to deal with the ambiguity, but they had difficulty dealing with ambiguity associated with technology and assignments. In the epistemology conference, they learned about issues of authority, the complexity of assessment, and the importance of valuing different ways of knowing, yet in their responses about conferencing, they articulated a traditional (commonplace) view of knowledge, authority and assessment.

Searching for Explanations. Although some might conclude that these teachers never really adopted the values and practices promoted in the program, other program evaluation methods indicated that most students developed professionally and learned to value some of the habits emphasized in the program. In fact, most of those teachers expressed a clear desire to change their classroom practices based on program ideals (Gerow, 2002; Sevcik, 2002; Schmidt, Sharp, and Stephens, 2002; Barnard and Courter-Folly, 2002; Goss and Stapor, 2002), suggesting that teachers' development, especially their ability to translate theory into practice, is significantly tied to context. So, why did teachers respond to the conference site in this way?

Grossman, Smagorinsky, and Valencia (1999) argue that activity theory provides a useful tool for studying teachers' professional development because it emphasizes the social and cultural factors that mediate development in particular contexts. From this theoretical perspective, the goal is not to discover a single cause, but rather to ask, under what circumstances do particular types of change take place?

It is suggested that in this context the problems with conferencing may have been affected by the fact that although the faculty's goals were embedded in nontraditional ideals, the faculty still held some traditional attitudes that influenced outcomes. For example, although the faculty wanted to create a new space for teaching that eliminated the barriers associated with hierarchy, ultimately they were asking questions that reinforced hierarchy. For example, by asking questions such as, "Should the faculty participate in the conference site?" or, "How do we get students more involved in the conference?" the faculty was asking questions embedded in a traditional model. These questions assume a clear distinction between *us* and *them*. They situate both groups in traditional roles. The faculty mostly is given the privilege of struggling with the most interesting intellectual questions, (e.g., How can we design a good learning environment that will motivate students?). The faculty was not asking how they could work together with teachers to build an online community; they took the responsibility away from the learners and put it in the hands of the knowers. Then, after setting the standards for reflective postings and situating both groups in traditional roles, they set the teachers free to be professionals who would independently develop their own conference space and engage in intellectual conversation. It is suggested that these contradictions created confusion.

In the second year, the consequences of moving away from student-centered pedagogy were clear. The students learned in a more traditional sense, but not as much as the faculty had hoped. Content was reinforced, but some unwelcome entrenched traditions were also reinforced. To be fair to instructors, however, students often come to class expecting teachers to know and to provide the class with well-organized, structured assignments that do not create the cognitive dissonance that often accompanies innovation. Education students need to fully understand the goals teacher education programs have to encourage habits of mind.

Implications for Practice. This is not the only research study that has raised questions about using computer conferencing to foster habits of mind (e.g., questioning assumptions). For example, Harrington and Hathaway (1994) did an excellent job looking at the development of reflective thinking among teachers in a conferencing space. They described students' responses as either mature or less mature. This raises the question, did the instructors in Harrington and Hathaway's study sit down with the students at the begin-

ning of the course and discuss their expectations for a mature response? Did they give students the opportunity to talk about how they might define a mature response?

When students tell faculty they need more structure, faculty often respond by changing their assignments to provide more structure and guidance, (which is a category often listed in teaching evaluations) without considering what they are really trying to accomplish. The student responses in this article contain important feedback, but responding to those responses by simply providing rigid guidelines is not the way to make change unless all the professor cares about is whether students can follow directions. This conference experience needs to be redesigned, but in accordance with this program's base of moral professionalism (Sockett, 1996), not in a way that perpetuates historically ineffective methods in teacher education. Therefore it is important for teacher educators to openly discuss their expectations about dispositional knowledge and to work with teachers to design an appropriate learning environment that addresses those needs. Teachers should have the opportunity to question the instructors' assumptions and expectations. Brown (1994), suggests that teachers need to feel ownership of the site. DiMauro and Gal concluded that teachers needed to have specific sociotechnical conditions, including protected workspace for reflection; retrieved text-based collaborative research; access and response to messages; structured dialog linking action with reflection forming reflective practice inquiry; and participatory motivation.

Second, teachers, and other professionals, must have a basic understanding of the different types of knowledge they will be exposed to in their professional development programs and how these different types of knowledge will enhance their ability to be more effective in their jobs. They need to understand how activities like conferencing will support their intellectual development. Many professionals who enroll in various professional development programs have preconceived ideas about what they are supposed to learn. These preconceived notions need to be challenged because most are narrowly focused on learning basic skills that directly relate to their jobs. Many instructors think that professional habits of mind, such as moral judgment are more important than basic skills; so the professors and students are working at cross-purposes. The problem with instructors trying to accomplish one set of goals and the students being focused on another set of goals (rarely discussed openly) has been referred to by Sockett (2000) as epistemological secrets. Professors and students must discuss these issues openly.

The third step is to develop instructional activities that promote habits of mind through active engagement. These activities need to be structured in a way that professionals not only discuss and reflect, but also have the chance to engage in moral action associated with their learning. Kohlberg (1999) believed that children should not only be taught morality through case studies, but that they should be placed is situations where they had to engage in moral action and then reflect on their actions. Kohlberg (1999) called this approach, "the moral communities of practice approach." Professionals can also learn through moral action. For example, in collaborative groups, professionals have the opportunity to work through the same types of moral dilemmas they often experience in the workplace. If these students realize that they are not only working in groups to learn some specific content, but also to learn how to be diplomatic, how to problem solve, and how to lead, the activity is no longer focused solely on content, but also on habits of mind. Computer conferencing is an activity that can allow students to engage in moral action if it is structured appropriately. In this article, it is suggested that conferencing can be structured to enhance habits of mind when the instructors, 1) are open about stated and unstated objectives and allows the students to be involved in the development of their own learning , 2) create a balance between traditional structure and progressive autonomy, and 3) addresses the contradictions that often emerge when educators work toward progressive reform.

Finally, it is important for teacher educators to reflect on the ways they may personally participate in, or perpetuate in their own teaching, the very habits of mind they are trying to change. Confusing contradictions regarding progressive strategies will confound even the most well-intentioned efforts. The reality is that knowledge is messy; and struggling with complexity provides the best opportunity for intellectual development, both for the teachers and the students, whether in teacher education, other professional programs, or in elementary and secondary classrooms.

Maxine Greene (1988; 1995) once wrote:

> Even relieved of authoritarian controls, teachers are perfectly capable, like the rest of us, of relying on unconscious routines, habits, and assumptions. Although most people value the idea of freedom, it requires concerted efforts to develop the 'wide-awakeness' to envision the alternatives that freedom requires: When people cannot name alternatives, imagine a better state of things, share with others a project of change, they are likely to remain anchored or submerged, even as they proudly assert their autonomy (p. 9).

Research tells us that many teachers are passionate about making a social contribution early in their careers and then lose that sense of purpose when faced with bureaucratic controls that create rigid school norms (Cohn & Kottkamp, 1993; Goodlad, 1984; Lortie, 1975; Sarason, 1996). Yet, changing this cycle is complex. The cycle will perpetuate itself, even among the most well-intentioned, unless we work to understand the complexity of what we do in teacher education as we strive to "change the paradigm of change" (Sockett, 2002).

References

Broady-Ortman, C. (2002). Teachers' perceptions of a professional development distance learning course: A qualitative case study. *Journal of Research on Technology in Education 35*(1). 107-116.

Bronack, S. C., Kilbane, C. R., Herbert, J. M., & McNergney, R. F. (1999). In-service and pre-service teachers' perceptions of a web-based, case-based, learning environment. *Journal of Information Technology for Teacher Education 8*(3).

Brown, A. (1994). Processes to support the use of information technology to enhance learning. computer. *Computer and Education 22*(1-2), 145-53.

Cohn, M. M., & Kottkamp, R. B. (1993). *Teachers: The missing voice in education.* Albany, NY: State University of New York Press.

Cranton, P., & King, K. P. (2003). Transformative learning as a professional development goal. *New Directions for Adult and Continuing Education* (98), Summer.

DiMauro, V., & Gal, Shahaf. (1994). Use of telecommunications for reflective discourse of science teachers and leaders. *Journal of Science Education and Technology 3*(2), 123-35.

Fabro, K G., & Garrison, D. R. (1998). Computer conferencing and higher-order learning. *Indian Journal of Open Learning, 7*(1), 41-53.

Gerow, S. (2001). Teachers in school-based teams: Contesting isolation in schools. In H. Sockett, E. DeMulder, P. LePage, D. Wood (Eds.) *Transforming teacher education: Lessons in professional development.* Westport, CT: Bergin and Garvey.

Goodlad, J. I. (1984). *A place called school: Prospects for the future.* New York: McGraw-Hill Book Company.

Goodlad, J. I. (1988). School-university partnerships for educational renewal: Rationale and concept. In K. A. Sirotnik & H. I. Goodlad (Eds.), *School-university partnerships in action,* (pp. 3-31). New York: Teachers College Press.

Greene, M. (1988). *The dialectic of freedom.* New York: Teachers College Press.

Greene, M. (1995). *Releasing the imagination: Essays on education, the arts, and social change.* San Francisco: Jossey-Bass.

Grossman, P. L., Smagorinsky, P., & Valencia, S. (1999). Appropriate tools for teaching English: A theoretical framework for research on learning to teach. *American Journal of Education, 108*, 1-29.

Gutmann, A. (1999). *Democratic education.* Princeton, NJ: Princeton University Press.

Habermas, J, (1971). *kinds of human interests and knowledge.* Boston: Beacon Press.

Harrington H. L., & Quinn-Leering, K. (1996). Computer conferencing and moral discourse. *Journal of Technology and Teacher Education, 4*(1), 49-68.

Harrington, H. L., & Hathaway, R. S. (1994). Computer conferencing, critical reflection, and teacher development. *Teaching and Teacher Education. 10*(5), 543-554.

Henri, F. (1991). Computer conferencing and content analysis. In A. R. Kaye (Ed). *Collaborative learning through computer conferencing.* (pp. 117-146). New York: Springer-Verlag.

Hollenbeck, J. (1998). Democracy and computer conferencing. *Theory into Practice, 37*(1),38-45.

Kiesler, S. (1991). Talking, teaching, and learning in network groups: Lessons from research. In A. R. Kaye (Ed.), *Collaborative learning through computer conferencing* (pp. 147-165). New York: Springer-Verlag.

Kincheloe, J. L. (1991). *Teachers as researchers: Qualitative inquiry as a path to empowerment.* London: Falmer Press.

Kim, B., Williams, R., & Dattilo, J. (2002). Students' perception of interactive learning modules. *Journal of Research on Technology in Education 36*(1).

King, K. P. (2003). Learning the new technologies: Strategies for success. *New Directions for Adult and Continuing Education* (98), Summer.

Klemm, W. R. (1998). Eight ways to get students more engaged in online conferences. *T.H.E. Journal 26*(1), 62-64.

Kohlberg, L. (1999). The cognitive-developmental approach to moral education. In Allan C. Ornstein and Linda S. Behar-Horenstein (Eds). *Contemporary Issues in Curriculum.* Allyn and Bacon: Needham Heights, MA.

LePage, P., Boudreau, S., Maier, S., Robinson, J., & Cox, H. (2001). Exploring the complexities of the relationship between K-12 teachers and college faculty in a nontraditional professional development program. *Teaching and Teacher Education, 17* (2001), 195-211.

LePage, P., & Sockett, H. (2002). *Educational controversies: Toward a discourse of reconciliation.* New York: Routledge.

Leonard, J., & Smith, G. (2001). Education at the crossroads: Online teaching and students' perspectives on distance learning. *Journal of Research on Technology in Education.*

Lortie, D. (1975). *Schoolteacher: A sociological study.* Chicago: University of ChicagoPress.

McDonald, J., & Campbell Gibson, C. (1998). Interpersonal dynamics and group development in computer conferencing. *American Journal of Distance Education, 12*(1), 7-25.

Murphy, K. L., Drabier, R. & Epps, M. (1998). Interaction and collaboration via computer conferencing. Proceedings of Selected Research and Development Presentations at the *National Convention of the Association for Educational Communications and Technology (AECT).*

Patton, M.Q. (1990). Qualitative analyses and interpretation. In M.Q. Patton. *Qualitative evaluation and research methods* (pp. 371-425). Newbury Park, CA Sage.

Pearson, J. (1999). Electronic networking in initial teacher education: Is a virtual faculty of education possible? *Computers & Education, 32*(3), 221-38.

Robinson, P. (2000). *Within the matrix: A hermeneutic phenomenological investigation of student experiences in web-based computer conferencing.* Unpublished doctoral dissertation. University of Maryland.

Sarason, S. B. (1996). *Revisiting the culture of the school and the problem of change.* New York: Teachers College Press.

Sevcik, A. (2001). Talking to learn: A pedagogy both obvious and obscure. In H. Sockett, E. DeMulder, P. LePage, D. Wood (Eds.) *Transforming teacher education: Lessons in professional development.* Westport, CT: Bergin and Garvey.

Sharpe, R., & Bailey, P. (1999). Evaluation and design of technologies to meet learning outcomes. *Journal of Computer Assisted Learning, 15*(3), 179-88.

Sockett, H. (2001). Transforming teacher education. In H. Sockett, E. DeMulder, P. LePage, D. Wood (Eds.). *Transforming teacher education: Lessons in professional development.* Westport, CT: Bergin and Garvey.

Sockett, H. (2000). Creating a Culture for the Scholarship of Teaching, *Inventio, 2*(1). Spring.

Wood, D. (2001). *Teacher as citizen: Professional development and democratic responsibility.* In H. Sockett, E. DeMulder, P. LePage, D. Wood (Eds.). Westport, CT: Bergin and Garvey.