IMPROVING TEACHER QUALITY THROUGH AN ON-LINE PROFESSIONAL DEVELOPMENT COURSE: A RESEARCH STUDY

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ABSTRACT

This study investigated how in-service teachers of foreign languages constructed knowledge and how this knowledge transformed their teaching, their beliefs, and their sense of themselves as professionals in an on-line professional development course based on a constructivist approach. This article provides an overview of research on distance education, constructivism, and teacher education with findings from a multiple case study of an on-line graduate course on Instructional Planning offered through GOLDEN (German On-line Distance Education Network; http://manila.unl.edu/amoeller/golden), a collaborative professional development project of the AATG (American Association of Teachers of German; http://aatg.org/member_services/lists/aatg-l.html), the Goethe Institut of Washington DC (http://www.goethe.de/ins/us/was/enindex.htm), and the University of Nebraska-Lincoln.

A non-traditional, constructivist approach to learning was implemented in which students and instructors became co-constructors of new information and knowledge. The study investigated in-service teachers' instructional practices, beliefs, and reflections in an on-line course. The data were collected through extensive, multiple sources of information, including interviews, online observations, teachers' narratives, course documents and artifacts, and e-mail communication between the participants and the instructors. This study provides in-depth investigation of four individual cases. The findings offer important insights for further online professional development and for distance education courses in general.

INTRODUCTION

The German On-Line Distance Education Network (GOLDEN) offers on demand professional development to German educators P-16. Initially funded by the European Recovery Plan (http://www.loc.gov/exhibits/marshall/), six courses designed to improve teacher quality/competence to increase student learning were developed by content experts in the United States and Canada. The course template was designed at the University of Nebraska-Lincoln in collaboration with the Goethe-Institut and the American Association of Teachers of German. The course pedagogy is constructivist, building on the background knowledge of the teacher participants and focused on classroom application of research-based instructional strategies. This study investigated how in-service teachers of foreign language constructed knowledge in an on-line

professional development course and how this knowledge transformed their teaching, beliefs and sense of themselves as professional educators.

REVIEW OF THE LITERATURE

The widespread availability and versatility of the Internet offers an exceptional opportunity to provide education anywhere and anytime. The Internet and other interactive communication technologies in distance education have become increasingly widespread, providing an alternative to traditional classroom learning (Eastmond, 1995). With advances in distance education, educators have a wide variety of tools to choose from to support teaching and learning. Coupling these technological changes with changes in pedagogy, from teacher-centered to learner-centered classrooms, provides a dynamic and complex environment for teachers and learners alike. Constructivist perspectives of teaching and learning are coming to the forefront (Garrison, 1997), and new understanding of adult learning is leading to changes in the way distance education is delivered. The traditional view that knowledge can be transmitted from the teacher to the learner is being displaced by a critical and collaborative approach to constructing meaning and confirming understanding (Garrison, 1997). As Prawat (1992) states, "In all constructivist teaching-learning scenarios, the traditional telling-listening relationship between teacher and student is replaced by one more complex and interactive" (p. 357).

The constructivist approach focuses on constructing meaning and validating understanding. That is, individuals make sense of new experiences by integrating them with prior knowledge and then sharing this new meaning with others. Garrison (1997) suggests that "learners must think critically and creatively but also work collaboratively" (p. 8).

Meaningful and worthwhile learning is best achieved in collaborative settings where students' misconceptions are revealed through discourse. Individual responsibility and control along with authentic communication is the essence of a constructivist approach to learning (Garrison, 1997). A collaborative constructivist approach to education centers on issues of responsibility and control. In addition to content expertise, organization and learning support, teacher expectations and goals must be communicated and negotiated so that students can assume ownership of the educational experience (Candy, 1991). One of the most important responsibilities of the teacher is to have expertise in the subject matter (Sternberg & Horvath, 1995). Teachers must be able to select the key concepts as well as provide initial coherence or order to assist students in constructing knowledge. During the learning process, the primary responsibility of the teacher is to understand students' thought processes and diagnose misunderstandings. Finally, assessment methods must be appropriate to the desired educational outcomes (Ramsden, 1992).

Collaborative constructivist approaches to learning at a distance are in contrast to the mass-produced self-instructional self-paced course materials popular after the Second World War. These two contrasting approaches reflect the ideals of collaboration and independence (Garrison, 1993a; 1995) and are implicit in instructors' approach to distance education, particularly in the selection of technology. The self-instructional

correspondence courses/self-paced materials resulted in learner independence and isolation in order to make education as cost-efficient and accessible as possible. This isolation, however, has consequences with regard to the quality of learning outcomes. Garrison (1993b, p.11) has argued that "the overriding impact on the quality of an educational experience is the provision of sustained discourse." Self-instructional course materials failed to address the issue of quality from the perspective of sustained discourse. The technology of the computer era has attempted to address issues of quality through sustained two-way communication.

To design and deliver distance higher education within the collaborative constructivist framework requires a rethinking of the entire way in which higher education works: its structures, its organization, and its practices. It is, in essence, equivalent to creating a completely new learning environment. Current interest in the World Wide Web as the latest technological tool that can be used in teaching and learning at universities is growing exponentially. According to Fetherston (2001), the use of the World Wide Web coincides with a variety of different methods used to deliver courses to onsite and offsite students.

However, much of the literature on distance education and computer use focuses on how to develop, implement, and fund programs (Sherry, 1996), rather than on student learning (Fetherston, 2001). Other researchers have focused on preconceptions of technology's role and ways to promote student learning (Hoffman & Richtie, 1997). Harasim (1987) and Kaye (1992) identified the unique aspects of computer conferencing that have the potential to reshape learning at a distance. Due to the inherent qualities of the technology as well as a general shift to a collaborative constructivist view of learning in education, computer conferencing represents a qualitative shift in the delivery of education at a distance.

The advent of the World Wide Web together with constructivist views places increased demands on students, instructors, and the ways in which they process knowledge (Fetherston, 2001). Constructivism suggests that individuals create their own understanding of the world that impacts how they act in relation to this world (Young & Marks-Maran, 1998). Kelly (1955), a well-known proponent of constructivism, argued that new knowledge is linked to old knowledge through cognitive constructs, and that it is through these constructs that people make meaning of the world.

A key issue in the application of computer conferencing for educational purposes is an understanding of the relationship between written communication and cognitive development. Applebee (1984) states, "It is widely accepted that good writing and careful thinking go hand in hand" (p. 577). Similarly, White (1993) argues that "writing as an advanced skill becomes both the means and the expression of critical thinking and problem solving" (p. 106).

The reflective and explicit nature of the written word is a disciplined and rigorous form of thinking and communicating. These characteristics suggest that the writing process is particularly appropriate for higher education. Moreover, since computer conferencing is

based upon written communication, it too may well be a potentially powerful technological ally in facilitating higher order thinking and learning (Garrison, 1997). The asynchronous and precise nature of this means of communication is consistent with higher order thinking and cognitive development. Since messages are composed and exchanged at one's own rate of speed and without time pressure as well as stored for future retrieval as needed, learners do not have the burden of remembering the points made by other speakers while waiting for their turn to communicate. This allows time for and promotes reflection, permitting the participants to make connections among ideas and constructing coherent knowledge structures.

It is argued that the characteristics of computer conferencing represent a new generation of technology for learning at a distance. Educators must have clearly in mind the types of learning outcomes that collaborative approaches to teaching and learning can facilitate. Collaborative learning is a significant shift from conventional approaches to teaching and learning, particularly in the context of distance education. Collaborative learning has its roots in social constructivism that has as its primary theoretical foundation the work of Lev Vygotsky (1978). Social constructivism accepts the notion that individuals construct their own knowledge, but argues that the process of knowledge construction inevitably takes place in a sociocultural context (Reagan, 1999), by establishing a social environment where critical discourse is valued and where students and teachers are encouraged "to develop theories and ideas of their own which challenge and test the limits of traditional sources of knowledge" (Brody, 1995, p. 138).

Collaboration is suited for higher order learning and a deep, meaningful approach to the teaching and learning process. While the technological characteristics of computer conferencing are congruent with collaborative and constructivist approaches to learning, this does not happen by simply making the technology available or using it as an adjunct to didactic approaches to learning.

Creating a collaborative and supportive learning environment within a computer conference is dependent upon three main moderating functions: contextualizing, monitoring, and meta-communication (Feenberg, 1989). Contextualizing provides the general organization or communication model (i.e., collaboration) as well as focusing the discussion. It is made necessary by the lack of tacit signals inherent in face-to-face communication. Monitoring the conference focuses on recognizing and prompting individual contributions. Meta-communication addresses issues of agenda, relevance, and overload as well as weaving comments that make connections, identify themes, and summarize the discussion.

METHODOLOGY

Research Questions

According to Garrison (1997), many methodological questions regarding the use of computer conferencing in facilitating higher order thinking skills still remain unanswered. The literature suggests that connections between constructivism and student

learning are underdeveloped (Winitzky & Kauchak, 1997). To fully understand these connections we need to hear voices from students who are involved in constructivist on-line courses. Since qualitative research is particularly appropriate in addressing meanings and perspectives of the participants, the naturalistic methods seem to be a valid tool to capture the wide array of interrelated data that will emerge during the data collection.

The following research questions were asked:

1. How can an on-line professional development course improve instructional practices of in-service teachers?
2. How can an on-line course affect the in-service teachers' belief system?
3. How does an on-line course affect teacher reflectivity?

Participants

This research study involved four female students, who registered for the GOLDEN Instructional Planning course through a large Midwestern university. All the participants were Caucasians and demographically spread throughout the United States: Pacific Northwest, West Coast, Midwest--Great Plains, and Eastern Midwest. Their teaching experience ranged from 7 to 34 years of service in secondary and post-secondary institutions.

The Setting

This multiple case study focused on teachers in the context of an on-line, constructivist teacher development course in the fall of 2000. The course was developed and taught by content specialists at two Research-I land grant institutions for the GOLDEN project. It was designed to develop and enhance students' knowledge and skills in the area of planning foreign language instruction. The purpose of the course was to raise questions and encourage students' reflexivity about how they teach German.

Data Collection

Qualitative research methods are particularly suited for exploring the meanings individuals assign to their experiences. A multiple case study was the most suitable for this study due to several reasons:

1. The case was bounded by time and place, since it was an on-line course offered during one semester via the World Wide Web.

2. The case employed a wide variety of data sources such as interviews, observations, documents, and audio-visual materials.

3. The researcher, as a participant observer, was able to spend a considerable amount of time with the participants.

Extensive, multiple data sources ensured the saturation of the categories and verification of coded data, and as a result, contributed to the success of this study. The data sources included open-ended phone interviews, on-line observations, e-mails from and to instructors, participants' narratives and other documents from the course, and audio-visual materials, including videos of their teaching.

Besides the interviews, observations after each conversation with the participants were recorded as well. The observations were examined for biases and assumptions, and subsequently analyzed. In addition, observation notes, e-mails, and documents from the course were examined and analyzed to provide a "rich, thick description." The documentary evidence, such as participants' responses to instructors' questions and their participation in the on-line course, were analyzed as well.

Participants were studied one at a time, moving from single to multiple case analyses. Since qualitative data collection, data analysis, and narrative reporting drive each other, data collection and data analysis occurred simultaneously. The matter of reduction and interpretation was an important process of data analysis in this study (Marshall & Rossman, 1989). "Time-series analysis" was used (Yin, 1989) in which changes in a pattern were traced over time.

FINDINGS

Answers to the research questions are presented below.

Research Question 1: How can an on-line professional development course improve instructional practices of in-service teachers?

The data collected in this study confirmed that there was significant variation among the participants with regard to how they designed lesson plans, implemented them, and elaborated on what went well and why. While some participants entered the course with a solid knowledge of pedagogy, others had only a basic conceptual framework regarding foreign language teaching. During the course, the four in-service teachers were challenged to apply the theory of foreign language learning and teaching to their practices in order to improve their instruction and promote student learning. The data sources such as interviews, on-line observations, participants' narratives, their videotapes, and e-mails to and from the instructors were triangulated to reveal categories in which the participants showed improvement over the course of the semester. These included their use of the textbook, the application of the frameworks/standards, vocabulary and grammar teaching, task structuring and sequencing, lesson planning and implementation, student grouping, and assessment. The degree of improvement varied from participant to participant. The participants' growth in the above-mentioned categories is illustrated in Table 1.

Table 1. Improvements in Participant Instructional Practices

Name	Textbook	Standards	Vocabulary teaching	Grammar teaching	Grouping

Ann	No change: textbook-driven curriculum	Limited use: will integrate more in the future.	Used more TPR (Total Physical Response) and TPRS (Teaching for Proficiency through Reading and Storytelling).	No change: continued to use a traditional approach; used English.	Succeeded in making students stay on task.
Monica	Used textbook as a guideline.	Became more confident which made her a better teacher.	Became better at using TPR (Total Physical Response), drawings, and realia.	Used guided discovery approach more.	Became more precise in stating her expectations.
Alice	Became less textbook dependent.	Consistent use; will use more in the future.	Used more authentic materials, TPRS (Physical Response Storytelling).	Taught grammar in a more meaningful way as a tool; not as the focus of instruction.	Learned more about her students' learning styles.
Liesl	Became less textbook dependent, more learner-centered.	Used standards minimally.	Became more active in using pictures, mime, realia.	Used guided discovery approach more.	Used pair-work activities more.

Table 1. (cont'd)

Name	Sequencing	Lesson planning	Lesson implementation	Assessment
Ann	Planned more thoroughly, but needs to do more.	No significant improvement, but thought more about standards.	Learned more about her students based on the videotape.	More testing of language use and creating with language.
Monica	Became more grounded in second language acquisition theory and its application.	Always planned thoroughly; learned a new lesson format.	Learned a lot from the multiple intelligences lesson.	Changed several items, scrutinized tests more.
Alice	Became more aware of sequencing of activities and more structured.	Will write more detailed lesson plans in the future.	Utilized more learner-centered activities.	Made more purposeful decisions about student assessment.
Liesl	Became more structured, breaking information into smaller chunks.	Improved slightly; needs to use more learner-centered activities.	Used more learner-centered activities and physically active exercises; learned more about her students.	Modified her lessons to include basic assessments.

Research Question 2: How can an on-line course affect the in-service teachers' belief system?

Analysis of the data confirmed that all four participants held certain beliefs about successful teaching and foreign language learning. However, the study showed that in some cases there were discrepancies between the teachers' beliefs and their instructional practices. The extent of such discrepancies varied from teacher to teacher.

This on-line course stressed the importance of the in-service teachers reflecting on their own teaching practices in order to make explicit their implicit belief systems, and to help them clarify what was personally meaningful and significant to them in their professional roles. In addition, in analyzing their reflective comments in narratives and interviews, one could infer their beliefs from the ways in which they behaved in the classroom, based on the videotapes. As a starting point for evaluating teacher beliefs, the instructors asked the participants to write a learner autobiography in which they had to describe how they themselves learned a foreign language and what impeded and facilitated its learning.

In order to address the second question of the study, Williams and Burden's (1997) categories of teachers' beliefs about learners, teaching and learning, and about themselves were used. These categories are illustrated in Table 2.

Table 2. Changes in Participant Beliefs

Name	Beliefs about learners	Beliefs about teaching and learning	Teachers' beliefs about themselves
Ann	From "receptive vessels" to "partners."	Teacher-centered; but also non-traditional approaches such as TPR (Total Physical Response) and TPRS (Teaching for Proficiency through Reading and Storytelling).	Overconfidence impeded conceptual change, claimed to be a good teacher.
Monica	"Individual explorers"	Learner-centered.	Broadened her knowledge, open to conceptual change, self-confident.
Alice	"Discoverers," "democratic explorers."	Hands-on, learner-centered.	Role model for students.
Liesl	"Partners."	Used a more learner-centered approach, improved instruction.	Became co-constructor of knowledge.

Research question 3: How does an on-line course affect teacher reflectivity?

In order to answer this question, the contexts and modes of reflective teaching based on the work of Dewey (1933) and Van Manen (1977) were explored. Dewey (1933) defined reflective thought as "behavior which involved active, persistent, and careful consideration of any belief or practice in light of the grounds that support it and the further consequences to which it leads" (p. 9). Reflection thus implies that the course participants believed in something through the lens of some evidence or proof. According to Dewey, there are certain attitudes such as "open-mindedness, whole-heartedness, and responsibility" that need to be present in order to promote inquiry and reflectivity. Dewey's essential attitudes for reflective action were used to explore the contexts of reflection of four in-service teachers. Table 3 illustrates the participants' attitudes towards reflection.

Table 3. Participant Attitudes Towards Reflection

Name	Open-mindedness	Whole-heartedness	Responsibility
Ann	Expanded her views, became more open to	Listened attentively to input.	Felt responsible for student learning.

	instructors' comments.		
Monica	Open to instructors' feedback and reflected on it regularly.	Embraced innovative strategies of successful teaching.	Followed new strategies and techniques, learned new ideas and shared with her colleagues.
Alice	Open to constructive feedback.	Committed to improving her teaching and increasing student learning.	Felt responsible to her students and the teaching profession.
Liesl	Open to constructive feedback from instructors and students.	Devoted to her students.	Responsible to her students and teaching profession.

One way of demonstrating the characteristics of reflective thinking is through modes of delivery. Van Manen's (1977) three modes or levels of reflective thinking, such as technical, contextual, and dialectical, were used in summarizing the findings. Table 4 illustrates the modes of reflection as they apply to the participants.

Table 4. Participants' Modes of Reflection

Name	Technical	Contextual	Dialectical
Ann	Basic lesson plans	More descriptive, concerned with the affective domain.	Concerned with behavioral issues.
Monica	Elaborate lesson plans	Very analytical, reflective, consciously applied theory to practice.	Was aware of student differences and provided equal opportunities .
Alice	Elaborate lesson plans	Concise in narratives, but compared practices with research.	Concerned with political and ethical issues.
Liesl	Basic lesson plans	Disjointed, less articulate, but established congruency between theory and practice.	Concerned with student affective domain.

DISCUSSION

This study was only one exploration of in-service teachers' instructional practices, beliefs, and reflectivity in the on-line constructivist course. It was not intended to represent all on-line professional development courses, however, through insights gained from the four in-service teachers, some lessons could be learned that could be applied to other on-line courses similar to the one described here.

The instructors of this on-line course encouraged participants to raise their own questions, generate their own hypotheses as possibilities, and test them in their teaching environment. The participants' classrooms served as a laboratory in which they implemented foreign language acquisition theory to their teaching, and conducted action research involving their students. According to the participants, application of the learned material in their classrooms was the main advantage of the course. As Ann stated, "That's really the best part of this course that you learn the theory one day and the next day, the next week, and the next month you apply it in your classroom right away" (Koubek, 2002, p. 313). Monica concurred with it by saying, "I think that's probably the most important because by application I think I learn better" (Koubek, 2002, p. 314).

It was evident that the teachers succeeded in translating theory into practice. Some of them experienced a change in their beliefs as a result of these new experiences. Alice explained how her beliefs about the instructors changed as a result of the on-line course: "Before it was always like 'give me the information, you're supposed to be the teacher and I'm supposed to learn something.' And now I realize that you really learn more when you do the work along the way" (Koubek, 2002, p. 301).

The instructors also encouraged the participants to explore and generate many affirming and contradictory hypotheses. Contradictions were explored and discussed in detail in the conference section, on-line teacher's lounge, or via e-mail. Participants were encouraged to reflect on their practices throughout the course. Journal writing, reflective narratives, and discussions of connections across experiences and strategies facilitated reflective abstraction. Participants varied in their ability to reflect and analyze their own teaching. Although they were challenged by having to reflect on their own practices, they all agreed that it was beneficial in making them more aware of their teaching and student learning. As Liesl explained:

> Throughout this course I have been challenged on many levels and feel that as a result of these challenges, I will be a better instructor. The total impact of this course has been considerable on both my professional and personal development. I have honed skills that will help me provide better instruction for my students and I have learned about myself as a learner and as an instructor (Koubek, 2002, p. 320).

The on-line course encouraged the participants to revisit their beliefs and practices by making connections between research and theory on the one hand, and their own teaching practices on the other. Several noted that prior to taking this course they relied mostly on intuition but that as a result of having taken the course, they now had names for theories that substantiated and validated what they did in the classroom and why. As Monica commented:

> Since the beginning of these on-line courses I have had a shift in my attitude. It is important to me now to know that what I do is substantiated by research. It is much easier to be an example to others when I can refer to the source (Koubek, 2002, p. 323).

Mayer-Smith and Mitchell (1997) noted that knowledge-building processes such as learning are mediated and significantly influenced by the sociocultural setting within which learning takes place. Participants mentioned that their learning resulted from interactions with their peers as well as with the instructor. The on-line nature of the course provided a unique opportunity for teachers to exchange ideas and to discuss various issues and concerns about language teaching. They also mentioned that working with other teachers of German helped them stay connected to their colleagues. Liesl pointed out:

> The advantage is to allow me in the area where there are not many German instructors [*sic*] […] to interact on some level with people who are doing the same kind of teaching […] And some of the problems and some of the things that come up in the examples the people use within the course are things that I can look at and apply it to my teaching directly because they are dealing with the same kind of problems (Koubek, 2002, p. 317).

As participants struggled to make meaning of an on-line environment, they progressed in their own learning. They had to internalize new information differently based on their needs. Through the challenges of revisiting and reorganizing earlier concepts, the participants grew professionally by examining their own strengths and weaknesses. Ann stated, "The learning and growth I mentioned is not only documented in my written responses, but more so in my approach to planning. I am more conscious of what I do, when I do it, and why I do it" (Koubek, 2002, p. 321).

RESULTS/CONCLUSIONS

The course attempted to create opportunities for learning that promoted and challenged participants to examine and reconsider their own practices and beliefs. By using their own classrooms as learning laboratories to explore how to optimize student learning, teachers experienced first-hand what worked, examined why it did or didn't, and shared their results with peers in an on-line discussion.

Course participants emphasized the advantages of being in a course with other German teachers. Often they are the only German teacher in their school or district, and described themselves as isolated, lacking a sense of professional community. They noted that the on-line discourse promoted peer interaction and provided a venue for sharing ideas, lesson plans and resources. The archived answers allowed participants and instructor alike to review discussions, activities and provide more reflective and substantive responses. All participants agreed that the on-line discourse allowed the instructor to take on the role of facilitator who nudged, questioned, suggested, and provided much needed feedback.

A summary of findings that emerged from the study:

- The deep level of learning that occurred in the on-line course caused participants to revisit their beliefs and practices.
- Participants began using appropriate theoretical/pedagogical language to describe their instructional practices. They noted that they acquired names for their beliefs and practices that allowed them to tie research to practice.
- All participants grew professionally, albeit in varied degrees, in their understanding of their work and their students.
- The on-line course was described as meaningful, demanding, substantive, time consuming, useful and impacting.
- The on-line course was highly valued as a useful venue for professional development

This study may facilitate a reevaluation of this and future on-line courses designed for in-service teachers and other types of adult learners. It may also offer on-line instructors and students a conceptual framework for facilitating learning and teaching at a distance. It could provide administrators with a more effective venue for professional opportunities for in-service teachers. It may also assist teacher educators in understanding how teachers change and how reflectivity can occur when using an on-line delivery.

SUGGESTIONS FOR FURTHER RESEARCH

This study has implications for further research. Some of the questions that need to be studied include, but are not limited to, the following:

1. How is the learning of the students enrolled in the classes of these teacher participants affected by teacher participation in such on-line courses? Is student learning increased as a result of teacher participation in an on-line professional development course that is tied to classroom application?

2. What is the degree to which in-service teachers retain the knowledge acquired in a course of this type after varying periods of time?

3. How do the results of an on-line constructivist course compare with those of a face-to-face course?

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