

Web-Based Discussion: Construction of Meaning

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Abstract

The paper presents a study that makes use of computer-mediated communication as a way to promote reflective thinking in pre-service teachers. Web based discussion forums were used to enhance traditional face-to-face medium. The discussions were part of the assignments in 2 classes of Foundations of Education. One course was situated in the elementary teacher preparation program and the other within the secondary teacher preparation program. The results indicate that online discussion forums can function as a viable arena to foster enhanced student discourse and may serve to stimulate higher levels of critical reflection than achieved in traditional F2F settings.

Introduction

The importance of reflective practice, though introduced into the education arena in the early part of the twentieth century, rings true today as it always did. In this era of accountability, the need for careful critical thought about pedagogical approaches means that the teacher needs to have not only knowledge of content and pedagogy, but also the ability to make decisions that are based on careful consideration of the problems encountered in the classroom and the contexts that impact those problems. Thus, teacher preparation programs still value John Dewey's (1933) reflective thinking model as a process that is essential to prepare pre-service teachers to be reflective practitioners.

A reflective practitioner will understand that improving one's teaching starts within as a process of reflecting on one's own experiences (Cruikshank, 1987; Canning, 1991; Schon, 1983). Yet reflection as a habit of mind is a thinking process that requires development within specific contexts and maturation (Baxter-Magolda, 1992). Cooper (1999) extends ideas of the reflective process with the concept that the best way to learn about oneself as a teacher, and directly influence the type of teacher one wants to be, is to reflect deeply, self-assess, and

seek feedback from others. The importance of feedback is even more compelling when it is considered in the context of Vygotsky's (1978) understanding of socio-cultural constructivism as a process for social negotiation of meaning. Teacher preparation programs endeavor to stimulate pre-service teacher reflection through varied experiences that include written observation assignments, private journals, and dialogue with mentor teachers, and class discussion. However, limited class time and the typical class trend of students acquiescing to the few most verbal participants (King, 2001) in face-to-face (F2F) discussion invariably restrict reflective interaction by all students. One way to foster reflective student interaction and overcome such limitations in traditional F2F courses is to use distance education discussion technologies. The purpose of this study was to examine the use of online discussion and its effects on the meaning making process of students in a teacher education program.

Theoretical Framework

The study presented here combined our current knowledge of reflective thinking as a meaning making process and web based discussions as a viable method of promoting such thinking through the use of dialogue.

Explanation of Reflective Thinking

Reflective thinking assumes that cognitive activity leads to growth in higher-order thinking like inferences, synthesis, analysis, and evaluation. According to Doolittle (1997), “Vygotsky believed that an individual’s immediate potential for cognitive growth is limited on the lower end by that which he or she can accomplish independently, and on the upper end by that which he or she can accomplish with the help of a more knowledgeable other such as a peer, tutor, or teacher” (p. 85). The cognitive distance between the lower and upper ends is what Vygotsky referred to as the zone of proximal development (ZPD). Vygotsky (1978) defined the ZPD as the difference between a learners’ actual developmental level as demonstrated by independent problem solving and the level of potential development as expanded through expert guidance or in collaboration with peers that are more capable. Within the ZPD, learners mutually benefit from social group processes and create new means for learning and understanding. For pre-service teachers, peer interactions discussing observations of everyday classroom activity expands their opportunity to learn about teaching practices. Standing observation requirements in field-based teacher-preparation programs provide a mechanism for pre-service teachers to synthesize and evaluate learned theories and ideals. Ideally, observations also provide a focal point for discussion and peer feedback.

Reflective thinking has been studied extensively by teacher educators and typologies developed to define the different types of thought into levels of reflectivity (Taggart & Wilson, 1998). Numerous studies that examine the thinking of pre-service teachers have categorized reflective thought into distinct levels in a hierarchical manner thus differentiating between thoughts that are reflective from those that are not deep enough to be considered as such. These typologies define the deepest level of reflective thinking as a process requiring examination of not only problems, but also the premises and assumptions used to frame such problems. This sophisticated level of thinking has been termed, critical reflection (Mezirow, 1998). Studies have shown that pre-service teachers are usually not ready to engage in critical reflection due to a limited knowledge base of the field or maturation (Galvez-Martin, 1997; Livingston & Borko, 1989; Pultorak, 1996). The analysis of web-based dialogues presented in this article includes an examination of the presence or absence of critical reflection.

Reflective thinking through Web based Discussions

The present study makes use of computer-mediated communication as a way to promote reflective thinking in pre-service teachers. Computer-mediated communication (CMC) provides mechanisms for both synchronous and

asynchronous communication (Hawkes, & Romiszowski, 2001). Synchronous refers to computer conferencing activities such as chat where communication is immediate and all interaction takes place within the same time frame. Examples of asynchronous communication are email or Web-based discussion forums where there are delays in communications and interactions take place at different times. Web-based discussion forums common to distance education are of particular interest to this case. Duffy, Dueber, and Hawley (1998) highlight the effectiveness of technology-based asynchronous applications as a means to promote reflective thought. According to Harrington (2002), "Computer conferencing activities can be uniquely structured to provide opportunities for communication that is educative In doing so, they provide opportunities for fostering students' development and illuminate that development as well" (p. 325). Expanding classroom discussion to a web-based setting can extend the social context because it creates a sheltered online space to foster community discourse and encourage feedback. The lack of pressure for immediate response allowed by the asynchronous nature of a web-based sheltered setting creates a place to bring learners into a community where interaction and communication become the priority. This priority to communicate but to have time to formulate one's ideas, instead of immediate response, can tend to stimulate participation and communication at a deeper level. Additional research suggests that asynchronous computer-mediated discussion can encourage the participation of students who seem reluctant to participate in traditional F2F classroom settings (Groeling, 1999). Though increased participation does not necessarily support the development of reflective practice, the researchers feel that broadened participation is a desirable influence in the context of social construction of knowledge.

The researchers' assumption was that reflective thinking would lead to a meaning making process while web based discussions were used to increase interactions which could lead to reflective thinking. Thus the discussions were used as both a vehicle for reflective thinking and meaning making, as well as a medium for the articulation of these processes. The heightened awareness of learner interaction found in distance education research provides deeper insight into planning in any instructional context, and specific direction to the design of this study. Based on Moore's (1989) delineation of the three levels of learner interaction: student-to-content, student-to-instructor, and student-to-student, there are several ways to improve student interaction (Moore & Kearsley, 1996), among them are the following:

- Asynchronous Web-based discussion forums can afford students more time to formulate reflection ideas and assist greater precision in personal expression.

- Shared reflections can be retained in a Web-based discussion forum and offer students a time delay for comparison and evaluation of peer exchanges to expand individual explanations.
- Web-based archive of relevant resources can expand student access to content information.
- The use of online group projects to the Web can expand opportunities for the transfer of information among students.
- Discussion forum transcripts can provide the professor with permanent records to study the effects on individual and group growth in the reflective process.

Methods

The Context

The University of Texas-Pan American (UTPA) is located in the Rio Grande Valley (RGV), at the tropical east tip of Texas. Of the close to 18,000 students at the university, over 3,000 students are enrolled in the College of Education (COE) distinguishing the College as a major producer of bilingual education teachers in the United States. Hispanics of Mexican origin or descent comprise the majority population and local teaching environments reflect sensitivity to dual language usage and dual cultural expression.

Existing Infrastructure

The Johns Hopkins University Center for Technology in Education (JHU-CTE) Electronic Learning Community (ELC) system was adopted by the College of Education at The University of Texas Pan American as part of a PT3 Grant. The use of the ELC has become an integral component of teacher preparation courses. The ELC incorporates functions to support its use in building and maintaining communities of learners. Four of these are that are integral to this study are:

1. *Asynchronous Discussion:* The threaded discussion forums provide a central place and mechanism for members to communicate and exchange materials over time and at will. This function facilitates the creation of the sheltered spaces for members to share ideas and create new understanding new knowledge about the topic discussed.

2. *Resource library*: The fully searchable library allows for managing, exchanging, sharing, archiving, and accessing materials. Access to certain folders, files, or links can be open or restricted to individuals or groups at the contributing member's discretion.
3. *Search*: Key word search allows members to connect immediately to desired content.
4. *Directory*: Member profiles and pictures are collected into a fully searchable directory that may be configured for group or mass e-mail communication. This feature enables members to easily find the email address of a fellow member with whom they may wish to communicate privately.

Additional ELC features include: *Homepage, Announcements, Community bulletin board, Calendar, Synchronous Discussion (chat, instant messaging), Subcommunity Themes, New Content Log, Listing of members online, Group formation within larger groups, Member-controlled permissions to resources, Cross-referencing of content, Content subscription, and Optional Email notification.*

The ELC provides a password-protected environment that promotes ongoing collaborative exchange by providing convenient channels for asynchronous communication. The goal of this study was to examine the effects of online discussion on the meaning making process. Thus, the decision was made to use the ELC as the vehicle to establish an online sheltered environment to expand student dialogue to the web.

The Study

Based on research findings, web based discussion forums were used to enhance traditional face-to-face courses using the ELC. Web-based discussion assignments were included in two Foundations of Education course sections. One course is situated in the elementary teacher preparation program and one course is within the secondary teacher preparation program. A standard foundation of education textbook was used for each course.

The combination of elementary and secondary majors in the discussion forum allowed for the promotion of diversity in the perspectives present in the dialogue. The diversity in the dialogue helped to promote thinking as students had to explain their positions in a persuasive manner. Other aspects of the group that helped to promote divergence included the level of experiential knowledge of the classroom. The elementary education class included a high percentage of instructional paraprofessionals with extensive knowledge of the issues present in the classroom.

Data Collection

Participation data was tracked over a one-semester period in 2 course sections of the Foundations of Education, one section in elementary teacher preparation and one section in secondary teacher preparation. The primary data sources were the ELC participation records, and Web discussion forum transcripts. All use of ELC occurred outside of scheduled class sessions. This paper focuses on an analysis of the first web discussion.

Participants

All participants were junior or senior level students in elementary and secondary education teacher certification courses. Many of the students were not yet accustomed to accessing posted course materials on the ELC. In terms of gender, the elementary education class group was comprised of 95% female and 5% male students; the secondary education class group was comprised of 60% female and 40 % male students; 95 % of the students were Hispanic. The participants continued to meet for traditional classroom sessions but also participated in required Web-augmented discussion board activities. The topic of the discussion initiated by the instructors, asked students to decide between acquisition of knowledge, problem solving or critical thinking as the most important aspect of the learning process. Students were asked to reply to the instructor's question by presenting their opinion and supporting it. A major difference in the way the discussion was presented to the two different classes relate to the assessment of the activity. In the course for elementary education majors, the syllabus clearly articulated the procedures for the web-based discussions. Each discussion required that students respond 4 times, replying first to the instructor, then to three other members of the discussion group. It was clear that assessment of this activity was based on number of responses and clarity but not on the actual opinions expressed. Conversely, the procedures in the course for high school majors encouraged interaction among members but students were required to respond at least once. This difference was not clearly evident until after data was collected.

Analysis of Data

The discussion generated a total of 159 hits. The analysis of the data reveals that 32% of the students chose critical thinking as the most important aspect of learning, while only 12% supported problem solving and 8% supported acquisition of knowledge. The remaining 38% considered that learning is the result of a combination of factors each interacting with the others. (See table 1)

Table 1: Dimensions of Learning

Dimensions of Learning	Number of students N=50	EC-4 17 %	HS 32 %
Acquisition of knowledge	4	2	6
Critical thinking	21	12	30
Problem solving	6	8	4
Combination	19	16	22

In each response students identified their favored dimension of learning and elaborated on the response such as the following excerpt from the dialogue:

“I personally believe that the most important dimension of learning is critical thinking. Critical thinking better prepares students for any type of situation that might arise. I believe that being a critical thinker is important because it allows you to become a high level thinker. Teaching our students to be critical learners enhances them to also become problem solvers as well as acquire knowledge.”

Although critical thinking was identified as the favored dimension of learning, the significance in this study lies in the actual process of dialogue rather than the answers given by students. This is especially important to examine because many students may have chosen critical thinking as the most important aspect because they believed this to be the favored answer by the professors because the constructivist philosophy runs through the core of every course in the teacher education program. Therefore, the analysis attempted to examine the level of thought evidenced in each response by making use of the definition of critical reflection used by Mezirow (1998). Patterns that emerged from the data shows that students used the dialogue as a way to make meaning in four different ways:

1. by clarifying their position when they felt it was not fully understood
2. by using the response of another to support their own position
3. by arguing their position through an opposing point of view
4. by reconsidering their position after careful analysis and changing their minds

The data also shows that the online medium was an effective way for students to negotiate meaning as evidenced by the dialogue where students debated intensely over the topic. Table 2 illustrates the frequencies for each type of process.

Table 2: Analysis of Interaction

Reflective process	Number of students	Elem	HS
Clarifies position	2	1	1
Support from other	24	15	9
Disagreement in response	14	10	4
Mind change	4	4	0

Through the dialogue students were able to think carefully and communicate their ideas and understandings of the topics of discussion. The online medium offered the opportunity to clarify a position when it was not fully understood by others as evidenced in the following passage:

“You give the example of a child. Well, a child is able to use his own ideas because of the experiences that he has had. Think about a fourth grader trying to learn to apply a formula in a math class. Even if the teacher tries very hard to help him acquire the knowledge, this student will not be able to do so until he uses his own thinking. Once this child incorporates his thinking abilities, then he will be able to acquire knowledge. Critical thinking is, therefore, crucial in the acquisition of knowledge.”

Another way to clarify their position was to find a specific detail in someone else’s response then expand on it to support their own point of view such as was done in the following passage:

“I completely agree with you when you say critical thinking is crucial in the acquisition of knowledge, because critical thinking helps the student process the information learned. Also, problem solving skills helps the student solve how the fourth grader will solve the problem after the information is given.”

Students were also asked to respond to someone they disagreed with. This type of response required that participants express their ideas by stating opposition, which often leads to a deeper level of analysis of details. This has particular merit in this cultural setting (95% Latino of Mexican ethnicity) where interpersonal dialogue is expected to remain “pleasant”. Thus, most dialogue is devoid of differing or opposing views. Presenting an opposing argument was not a popular mode of interaction since less than half of the responses used disagreement. Yet, when a

student opposed another's statement, there was evidence of a deeper level of reflective thinking because through disagreement the student was able to evaluate statements and their implied assumptions and premises leading to critical reflection as defined by Mezirow (1998) Here is an example of this type of dialogue:

“When you say that critical thinking lets a child use his own ideas, just where do you think that those ideas are coming from? Those ideas come from the prior knowledge one acquires in the beginning of one's education, therefore you absolutely need the acquisition of knowledge first and foremost in order to use this knowledge to do any problem solving and or critical thinking. So, I strongly disagree with your response”

There was also some evidence of change of opinion after the initial position was contested by others and the student had to reflect upon their initial premises and assumptions. This occurred in four participants (see table 2). Here is an example of statements made by a student revealing the depth of thought involved in her process:

“Ok, my original answer was problem solving... But after opening this question for discussion with my significant other... I understood why Critical thinking would be an important area of knowledge. Critical thinking is the foundation to problem solving, in which it makes you look for details and come to a solution. When you look for details you acquire the knowledge and are able to solve your original problem.”

A change of opinion required that the participant examine the premises and assumptions embedded in a particular point of view. Reflection on premises and assumptions is considered to be a sophisticated level of reflective thinking and is an example of critical reflection; rarely evident in pre-service teachers. This does not mean that the deepest level of reflective thinking only occurs when there is a change of opinion. Nevertheless, to explain the change of perspective, students had to articulate the analytical process that led to change making their thinking process visible.

Conclusions

The results of this study indicate that online discussion forums can function as a viable arena to foster enhanced student discourse and may serve to stimulate deep levels of critical reflection. It appears that the discussion forums functioned as a sheltered environment where students were more comfortable questioning their own assumptions as well as those of classmates. The fact that data demonstrated changed or broadened opinions

supports the concept of using web-based forums to support social negotiation of meaning and scaffolding of understanding. These findings are of significance for teacher educators who aim to foster reflectivity in pre-service teachers and who seek ways to develop course activities from a social constructive perspective.

One somewhat obvious aspect of asynchronous communication in contrast to “real-time” verbal exchange is that participants have more time to process information and formulate ideas before expressing them. Additional time would seem to allow for more in-depth self-assessment. This is traditionally done through journaling and reflection papers. Though valuable, these techniques lack the potential for the more expansive feedback that web discussion forums can afford. A primary benefit of using the ELC was that it offered easy-to-use functionalities and convenient ways for individuals within a community of common interest to gather and exchange information and resources, solve problems and exchange knowledge. The capability extended to members to initiate, as well as participate in discussions and chats, to share, as well as contribute to resources, encourages members to contribute and participate across traditional professional hierarchies and stimulates engagement. The use of web-based discussion forums to foster reflective practice within the sheltered environment of online learning communities warrants additional study.

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