Educational Technology International
2008, Vol. 9, No. 2, 123-142

Collaboration in a Web-Based Learning Environment: Opportunities and Challenges

Seungyeon HAN *
Hanyang Cyber University
Korea

The purpose of this study was to examine how computer conferencing might facilitate collaborative learning for students to engage in meaningful discussion. The participants in this study consisted of the instructor and the students in a graduate level course. Different sources of evidence were used to triangulate the data: in-depth interviews, content analysis of transcripts of discussion, and other archival data including course syllabus, presentation materials, and lecture notes. Participants perceived web-based learning as collaborative process, providing opportunities to share the idea, respect and evaluate different perspectives, and co-construct new insights. Analysis of the data revealed several challenges related collaboration in a web-based learning environment: absence of a sense of community, technical problems, adaptability to different types of learner, and managing the discussion. The data also indicated that a variety of strategies were used to facilitate learning: building a sense of community, technical support, developing instructional methodologies, class size, and design of the content.

Keywords : web-based learning, asynchronous discussion, content analysis

* Dept. of Educational Technology, Hanyang Cyber University
synhan@hycu.ac.kr

Introduction

With the vast spread of the Web, it was not until recently that Web-based learning became increasingly popular. Many university systems and/or institutions are now offering online courses. There are also extensive "virtual universities" in existence or under development around the world. The recent introduction of computer-mediated communication systems has further increased the popularity of web-based learning. Web-based communication systems are specifically aimed at using the web to support students, instructors, and experts in communicating and collaborating with each other in the process of learning, rather than in merely using web pages for posting materials or email for student-instructor messages.

At present, almost any web-based application is labeled as "collaborative." Web-based learning makes possible many-to-many communication with both time and place independence. It is important to give our attention to the time and place independence because they offer distance learning systems opportunities to move from individualist modes of delivery to group oriented interactive modes (Davies, 1995). Internet tools such as chat or bulletin board systems or e-mail, however, do not organize the interactions for learning (Rochelle & Pea, 1999). In fact, these kinds of applications were not primarily designed for pedagogical purposes for building and sharing collaborative knowledge. Hence, without advanced pedagogical preparation, these applications may not contribute to collaborative learning.

According to a growing body of research, Web-based learning, more specifically, computer conferencing offers a host of benefits that can result in increased student learning, maintenance of active student participation, and improved social relationships among classmates (Harasim, 2002; Islas, 2004; Steeples & Jones, 2002). While many authors have discussed the benefits of computer conferencing to students and instructors, several challenges associated with the successful implementation of Web-based learning remain unresolved. Challenges mentioned

in the literature include: lack of readiness (Brandon & Hollingshead, 1999; Kemery, 2000), students' motivation (Song, 2005), conflicts of discourse (Kemery, 2000; Hill, Wiley, Nelson, & Han, 2004; Wegerif, 1998), community building (Hill, Raven, & Han, 2007; Palloff & Pratt, 2004), and assessment of students' learning (Kemery, 2000; Schrum & Benson, 2000). Based on literature and empirical evidence, this paper explores what strategies can resolve current challenges.

Research Plan

Research question

The purpose of this study was to examine how computer conferencing might facilitate collaborative learning for students to engage in meaningful discussion. The study was guided by the following questions: (1) what are perceptions of learning process on the web? (2) what did instructor and students identify as the challenges to collaborative learning on the web? (3) what did instructor and students identify as strategies to resolve current challenges in learning experience?

Data collection

The participants in this study consisted of the instructor and the students enrolled in graduate level course offered by the department of Adult Education at a research university in the southeast of the United States. This population included 22 graduate students who were in masters and doctoral programs from various departments across campus.

The goal of this doctoral level course was to provide an introduction to the field of adult education through an examination of the role of adult education in society. This course was implemented through WebCT, a web-based learning management

system, and face-to-face class meetings. The learning occurred in this environment through bulletin board discussion, reading lecture notes posted on the web, and sharing e-mail.

Different sources of evidence were used to triangulate the data, including interviews, transcripts of the bulletin board, and archival data such as the course syllabus, presentations, and lecture notes. Four in-depth interviews were conducted with the instructor and three students based on their willingness to participate in this study. In conducting interviews, the researcher asked individual participants questions about their individual and collaborative learning experiences in a web-based learning context. The instructor was also asked about his teaching activity, instructional strategies, and experience in communication with students in an online environment.

Transcripts of the discussion board were collected. Transcripts include students' and instructor's postings. All messages were complied as one text file in chronological order of the original message. A total of 243 messages were collected; preliminary data analysis includes one thread including 32 of those messages based on their topic, distance learning. This topic was generated by students and revealed their concerns about their own course and general web-based learning experience.

Data analysis

In analyzing data, to generate categories from the data set, inductive analysis was employed. Three main approaches were used in inductive analysis: meaning condensation, meaning categorization, and meaning interpretation (Kvale, 1996). Meaning condensation involves reduction of large interview texts into briefer formulations. Long statements are compressed into shorter statements where the main meaning of what is said is rephrased in brief forms. Meaning categorization entails coding the interview into categories. Categorization can reduce and structure a large text into a few tables and figures. Meaning interpretation transcends a

structuring of the manifest meanings of a text to deeper and more speculative interpretations of the text.

First, to identify central themes, meaning condensation was conducted. Coding at a very general level is a first step toward organizing the data into meaningful categories (Coffey & Atkinson, 1996). Through coding and categorization, it was possible to recognize and recontextualize data, allowing a fresh view of what is there. As Coffey and Atkinson (1996) stated, "coding inevitably involves the reading and re-reading of data and making selections from the data." Several steps are involved in this empirical phenomenological analysis (Kvale, 1996). First, the interview transcript is read through to obtain a sense of the whole. Second, it was determined that the natural meaning units as expressed by the participant(s). Third, the theme that dominates a natural meaning unit is stated or rephrased as simply as possible.

Secondly, main dimensions (themes) were identified based on codes that were established in the meaning condensation process. As mentioned earlier, this project includes the analysis the transcripts interview and the transcripts of the bulletin board discussion. Seven main dimensions with 32 sub categories were identified in the interview and five main dimensions with 26 sub categories were identified in the transcripts of the bulletin board. These dimensions collapsed together, thus forming five main categories. In this process, several main dimensions from the data were eliminated or collapsed together since they are considered as overlapping or repetitive.

Triangulation and peer examination were employed to establish credibility and transferability of the study (see Krefting, 1991). Triangulation strategies used in this study included the use of multiple participants and multiple data sources. Two peers examined the natural data set (i.e., interview and discussion transcripts) and reviewed the categories and themes for authenticity from the data. Along with the triangulation and peer examination, to certify the consistency with which categories are assigned to the same category by the same researcher on different occasions (i.e.,

reliability, see Krefting, 1991; Silverman, 2001)), a code-recode procedure (i.e., constant comparative analysis, see Glaser & Strauss, 1967) was also employed.

In Table 1, the five dimensions of the perspective on learning via Web are shown in the left-hand column. For the five dimensions, corresponding subcategories with content appropriate to each dimension were made and the subcategories of each dimension are shown in the right-hand column; in all, this came to 20 categories.

Table 1. Meaning categorization

Themes	Sub categories
Perception of web-based learning	• Alternatives • Flexibility • Technical Process
Individual learning process in web-based learning	• Self-directed • Self-motivated • Self-assessment • Think and organize thoughts before communicating with others • Read reference while writing
Collaborative process in web-based learning	• Collective nature of the discussion • Sharing with each other • Respecting each other • Evaluating each other • Co-constructing new insights
The challenges in web-based learning	• Absence of a sense of community • Technical problems • Adaptability to different types of learner • Managing the discussion
Strategies for effective web-based learning	• Building a sense of community • Technical support • Developing instructional methodologies • Class size • Design of the content

As much as possible, coding and categorizing, and meaning interpretation occurred concurrently. Analysis and interpretation are used interchangeably or the two activities often overlap in research process (Wolcott, 1994; Coffey & Atkinson 1996; Kvale, 1996). Thus, in every step in identifying main themes, rephrasing, and collapsing them, meaning interpretation occurred.

Findings

Five themes emerged in analysis of interviews and analysis of the transcripts of the bulletin board: perception of web-based learning, individual learning process in web-based environment, collaborative learning process in a web-based environment, the challenges in a web-based learning environment, and strategies for an effective web-based learning (See Table 1).

Perception of Web-based Learning

The instructor and participants perceived web-based learning as an alternative to face-to-face classroom. The flexibility of time and space was pointed out as a main feature and benefit of web-based learning. From that perspective, flexibility can be an agent for conducting web-based learning. One student posted the following comment on the bulletin board:

> *With online courses we can get up in the middle of the night, wearing whatever we sleep in and eating whatever we want to (even while we type).*

Most students in the class have full time jobs and lived apart from the campus; therefore, students valued convenience and flexibility of the class. In addition, expanded posting with the same topic was possible based on the flexibility of the web-based learning environment.

The instructor perceived web-based learning as a technical process, including preparing, implementing, and managing the course electronically. Diverse teaching activities were identified: taking, converting, uploading, organizing, rearranging, and monitoring the content. He also indicated the larger time commitment it required. Web-based learning required more time to prepare, implement, and manage the course. He stated:

> *It wasn't something straight forward classes, it took some times to do. That took a lot of time to do.*

Consequently, he needed to be more involved in his teaching activity; however, the time commitment caused anxiety as well.

Neither the students nor the instructor believed that web-based learning fundamentally changed the learning process. The instructor mentioned that:

> *I don't think it changed the fundamental learning process, I think the question is how to organize or set up learning in either environment.*

A student also shared similar perspectives:

> *I think there is room in our lives for both forms of instruction. I value both. They each have benefits and limitations. It is up to the instructor and the students to make the best of both and to find creative ways to maximize both forms of teaching and learning.*

As some students pointed out, the more important issue was how to organize or provide the learning in either a face-to-face or web-based way that encouraged critical analysis and consideration of the content.

Individual Learning Process in Web-based Learning

Some students perceived web-based learning as a self-directed learning process.

Through self-assessment, they regulated their own learning and were motivated. They didn't believe web-based learning was the same as self-directed learning. However, students believed that they should be self-directed in a web-based learning environment. The following example shows how the learner used his/her metacognitive skills in a self-regulatory process and how he/she organized the threaded communication.

> *This may not be as suited to this thread as I originally thought, but it is a theme I have to put out there.*

This is also related to students' perception of their individual learning process on the web. In the discussion board, participants differentiated the learning process in the respect that they can ponder, articulate, and organize their thoughts before communicating with others. This is a very distinct feature of web-based learning. As one student posted on the bulletin board:

> *I have a deeper understanding of several different topics via the web without feeling overwhelmed if I was in the classroom environment. I can read, ponder, and share my responses without feeling pressured and I like it.*

The messages remained as text, so that they can read it over and over and respond a few of days later. In addition, students could read the reference to elaborate their thoughts while reading others' postings and writing their own postings.

Collaborative Learning Process in Web-based Learning

The instructor indicated that the nature of conversation via web-based learning environment is collective. The collective nature of this environment contributed to building new insights together through group discussion. The instructor commented that:

> *…the collective nature of conversation, interaction in going back and forth, that is the process of constructing and building new insights.*

Students pointed out that the most critical feature of web-based learning environment was sharing. In this environment, students shared different backgrounds, experiences, perspectives, and goals. One student commented that:

> *I, for one, greatly value our class that I sense from everyone in the class and from which I can learn and share.*

In the group discussion, students asked questions of clarification to facilitate the discussion (e.g. meaning clarification); the following shows how students co-construct their own discussion:

> *My question is purely for clarification: Do you mean to separate campus classes from web instruction or do you mean to say that web instruction is a part of campus instruction that is accessible by a select few?*

Participants respected each other's perspectives and were willing to evaluate other's work. In respecting different perspectives, they developed, constructed, and built new insights together.

As indicated in the literature (Duin & Hansen, 1994; Gallini & Helman, 1995; Weston, 1997), writing and posting their reflection in this context can be understood as both an individual learning process through which a student reads over her own writing and reworks particular sentences or paragraphs for posting messages, as well as potentially collaborative learning process where an audience provides feedback. For example, in their messages posted bulletin board, the students mentioned "you" or "we" frequently. In addition, they used questions as ending mark. It shows that they notice audience in this context, assuming these audiences write back to them. For another example, one student wrote at the end of his messages "Well, I believe that I have gained some serious data about myself

from this reflection." First example shows potential collaborative learning process, and the second one on can be regarded as an individual learning process.

The Challenges in Web-based Learning

Challenges included absence of a sense of community, technical difficulties, managing the discussion and adaptability to different types of learners.

The biggest challenge in a web-based learning environment was identified as creating a sense of community. The instructor believed that a lack of connectiveness could be caused by technical problems and a large number of messages on the discussion board. As a result, there was a lack of richness in the conversation that occurred. This raised the issue of less participation. Some students commented about this:

> *I believed that internet classes and distance learning require a great more creativity to make students, particularly adult students, feel connected.*
>
> *Do we share goals? Are we here for the same reason? Is there a virtual 'break' that we can all take together and engage in casual conversation?*

Technical difficulties associated with participating in the learning process and submitting assignments were perceived as time-consuming. Consequently, those problems caused anxiety in the learning process. Students believed that this challenge can be overcome and that they should get used to using web technology so that they can get benefits from this environment.

In terms of adaptability to different types of learning, participants expressed concern about whether web-based learning can be effective for different learning styles, different pace, and different ability. Students believed that web-based learning should support different learners so that they can be engaged in the learning process. Some students posted their opinions regarding the topic the discussion board:

For example, I'm an auditory learner so I really like to hear my instructor and fellow students.

Instructors must also be prepared to work with students of all ability levels.

The new technology cannot meet all types of learners, but can meet most learners.

A lot of messages were generated on the discussion board in this course. From the communication with students, the instructor believed that some students had difficulty in managing the number of messages or following the flow of conversation. That was also associated with the issue of time commitment and technical difficulties.

Strategies for Effective Web-based Learning

To resolve the current and potential problems, strategies were identified based on the data from the interviews and the discussion board: technical support for instructor and students, using different instructional methodologies, effective design of content and building a sense of community. Through his experience of this course, the instructor came to value the collaboration with the graduate assistant. The instructor perceived that posting leading questions and forming small groups in online class as useful instructional strategies. To build a sense of community, developing communicative devices, students recommended to conduct pre-online course activities, and to encourage interaction among students. Some students believed that small group discussion would be helpful; moreover, they suggested local face-to-face meetings to support their learning.

Discussion and Next Steps

The goal of this study was to identify the current challenges to collaborative

learning on the web and the strategies to resolve the challenges in this learning environment. Students and the instructor expressed their perception of Web-based learning as an alternative to face-to-face learning experience with flexibility and technical process. This new learning environment supports individual learning process as well as collaborative learning. It facilitates students to be more self-directed, self-motivated learners, and gives opportunity of self-assessment while learning. Asynchronous and text-based interaction also makes it possible to think and organize participants' thoughts before communication with others and even to read reference while communicating (i.e. writing & posting, and reading).

As a collaborative learning process, both instructor and students mentioned that computer conferencing presents collective nature of discussion. For example, a thread or a topic starts for meaning clarifying, and then it ends with applying new knowledge or building new insights as results of group discussion (Han, 2002). 'Going back and forth', participants share and compare their knowledge, negotiate the meaning, and apply newly constructed meaning at the end (Gunawardena et al., 1997). For another example, the present study shows that students use question as ending mark and facilitates others to respond and reflect his/her own perspective.

On the other hand, as data shown, a participant notices audiences in this context, assuming theses audiences write back to them. In fact, the nature of computer-mediated communication plays a role as a mediator for this collaborative learning experience. It also associated with the challenges in this environment. In other words, asynchronicity (delayed feedback) may hamper participation of active online learners (Kemery, 2000; Mann & Stewart, 2000; Wegerif, 1998). As data indicated, adaptability to different learners can be a challenge in implementing Web-based learning. Although the flexibility with which an online environment provides in one of the advantages of Web-based courses, some students prefer faster feedback. Consequently, they may have difficulty adjusting to the asynchronicity that this environment offers.

The asynchronicity is also associated with 'conflicts of discourse' (Kemery, 2000;

Mann & Stewart, 2000; Wegerif, 1998). This type of language never existed until computer technology and telecommunication were available. Online discourse is historically unique since it has hybrid features of both spoken and written languages (Mann & Stewart, 2000). In one view, language in an online environment is typed like writing and contains exchanges, which are 'often rapid and informal' like talk. In another view, language in an online environment is 'writing that reads like conversation' or 'writing talking' (Davis & Brewer 1997; Mann & Stewart, 2000).

In the last decade, researchers have made efforts to identify the major differences between ordinary language use and language use in online environments, more specifically, in synchronous mode. Compared to oral conversation, the turn-taking system in chat systems does not consist of the rules and procedures participants commonly use to exchange turns (Sacks, Schegloff, & Jefferson, 1974). Instead, in text chat, turn-order is partially controlled by the software. A participant may not be able to control the exact placement of her message in the text chat box as other participants may complete and send their message first. Thus, this text-based context may result in a different communication environment than is found in oral conversation.

A number of properties of language in online courses are the result of attempts to avoid ambiguity and discontinuity in structures of turn-taking, while ordinary conversation encounters would typically be negotiated by paralinguistic cues such as intonation, pauses, gestures and eye-gaze. Thus for example, it has become entirely conventional for speakers to indicate the intended addressee by putting that person's name at the start of an utterance. From this perspective, this characteristic is referred to 'addressivity' (Werry, 1996; Hutchby, 2001). Besides controlling the turn-taking system in online interaction, use of different emoticons would be helpful to convey paralinguistic cues.

Since this kind of language partially relies on the technology, it is very useful for future research to understand both advanced technology and different use of conventions in chat systems. For example, currently advanced technology helps

users to perceive and control their turn taking in different ways (i.e. instant messaging). It will help to identify prominent properties of language in interaction of online environment. Furthermore, currently this kind of communication and learning process is being used increasingly in online classroom settings. Once people become more familiar with this system, we may be able to develop different strategies to control or manage interactional organizations.

Another considerable challenge is an absence of sense of community. As participants indicated, one explanation for dissatisfaction with Web-based learning experience may relate to a loss of social relationship and a lack of community. As previously indicated, the asynchronicity of online courses may cause the frustration of waiting an unexpected amount of time to receive any reaction or feedback; thus this mode of communication decrease the feeling of social presence of an instructor and other participants. Collaborative learning strategies, which require relatively small classes or groups actively mentored by an instructor, are necessary in order to build a sense of community in online courses (Hiltz, 1998).

Collaborative learning designs are more effective for online learning than pedagogical approaches that emphasize individuals working alone with materials posted online. However, they can only facilitate the desired behavior, not produce it. For the group to adapt a structure of interaction that is collaborative in nature, the instructor must mold, model, and encourage the desired behavior, and the students must be able and willing to practice regularly.

On the other hand, even when collaborative learning is used, the current development of online learning seems to lead to less feeling of community than is typically obtained in face-to-face small group interaction. The question of how to build and sustain online learning communities is thus a prime area where research should be done.

Kemery (2000) suggested social integration is the primary strategy for building community in online courses. The instructor/facilitator should provide structured opportunities for interaction, and pay attention to and be responsive to less-

participating students from the beginning of the course. On-going personal contact such as e-mail or phone call can increase and sustain a participant's social integration.

In the beginning of the course, sharing background and experience between participants would be very helpful to build an initial sense of community in online courses. The more students know about each other, the more likely they are to establish trust, seek and offer support, and find satisfaction from being in a safe learning environment (Murphy & Collins, 1997). For example, developing communicative devices such as naming others in messages or referring to previous postings, and conducting pre-online course activities (i.e. face-to-face pre-course workshop) will help to encourage interaction among students.

Moreover, every class should be designed to include questions for discussion or response among groups of students, rather than simply representing one-way transmission of knowledge. Providing structured opportunities for one-to-one or one-to-many communication would encourage this strategy. Another strategy is to split a large class into small discussion groups. Yet another strategy is use of conference calls or local face-to-face meeting among participants.

For future research and development, the learners and desired learning outcomes should be the ultimate focus of developing successful Web-based learning. Colleges and universities ought to be concerned not just with how fast they can put their courses up on the Web, but with finding out how this technology can be used to build and sustain the meaningful collaborative learning experience. Developing appropriate strategies to resolve the issues and challenges that were raised earlier can contribute to the design and development of meaningful learning experience. Consequently, web-based learning environment promotes interaction amongst learners as the primary mode of learning and also supports socially constructed meaning and knowledge creation (Menchaca & Bekele, 2008; Palloff & Pratt, 2007).

However, it should be considered that Web-based learning is still in its experimental and developmental stage, thereby identifying the need for further

research in the areas of learning outcomes, learner interaction, design and delivery, and strategies in collaborative Web-based learning environment. Furthermore, what barrier can be expected in applying suggested strategies should be identified in future research.

Reference

Brandon, D. P., & Hollingshead, A. B. (1999). Collaborative learning and computer-supported groups. *Communication Education, 48*(2), 109-129.

Coffey, A. & Atkinson, P. (1996). *Making sense of qualitative data: Complementary research strategies*. Thousand Oaks, CA: Sage Publication

Davis, B. H., & Brewer, J. P. (1997). *Electronic discourse*. Albany, NY: SUNY Press.

Davies, D. (1995). Learning network design: Coordinating group interactions in formal learning environments over time and distance. In. C. O'Malley (Ed.), *Computer supported collaborative learning* (pp. 101-123). Berlin: Springer-Verlag.

Glaser, B. G., & Strauss, A. L. (1967). *The discovery of grounded theory*. Chicago, IL: Aldine.

Gunawardena, C. N., Lowe, C. A., & Anderson, T. (1997). Analysis of global online debate the development of an interaction analysis model for examining social construction of knowledge in computer conferencing. *Journal of Educational Computing Research, 17*(4), 397-431.

Han, S. (2002, December). Collaborating to learn on the web: A qualitative inquiry to examine the nature of online discourse. Presented at The Interdisciplinary Qualitative Studies Advanced Seminar Mini-Conference. Athens, Georgia.

Harasim, L. (2002). What makes online learning communities successful?: The role of collaborative learning in social and intellectual development. In C. Vrasidas & Glass, G. V. (Eds.). *Distance education and distributed learning* (pp. 181-200). Greenwich, CO: Information Age.

Hill, J. R., Raven, A., & Han, S. (2007). Connections in Web-based learning environments: A research-based model for community building. In L. Rocci (Ed.), *Online learning communities (pp. 153-168)*. Charlotte, NC: Information Age Publishing.

Islas, J. R. L. (2004). Collaborative learning at Monterrey Tech-Virtual University. In T. Duffy & Kirkley. J. R. (Eds). *Learner-centered theory and practice in distance*

education: Cases from higher education (pp. 297-319). Mahwah, NJ: Lawrence Erlbaum.

Kemery, E. R. (2000). Developing on-line collaboration. In A. Aggarwal. (Ed.), *Web-based learning and teaching technologies: Opportunities and challenges* (pp. 227-245). Hershey, PA: Idea Group Publishing.

Kilian, C. (1994). The passive-aggressive paradox of on-line discourse. *Education Digest*, 60, 33-36.

Krefting, L. (1991). Rigor in qualitative research: The assessment of trustworthiness. *The American Journal of Occupational Therapy, 45*(3), 214-222.

Kvale, S. (1996). *InterViews: An introduction to qualitative research interviewing. Thousand Oaks*, CA: Sage Publications.

Mann, C., & Stewart, F. (2000). Internet communication and qualitative research: A handbook for researching online, Thousand Oaks, CA: Sage.

Menchaca, M.. P., & Bekele, T. A. (2008). Learning and instructor identified success factors in distance education. *Distance Education, 29*(3). 231-252.

Miller, S. M., & Miller, K. L. (2000). Theoretical and practical considerations in the design of web-based instruction. In B. Abbey (Ed.), *Instructional and cognitive impacts of Web-based instruction* (pp. 156-177). Hershey, PA: Idea Group Publishing.

Palloff, R. M., & Pratt, K. (2004). *Collaborating online: Learning together in community*. San Francisco, CA: Jossey-Bass.

Palloff, R. M. & Pratt, K. (2007). Online learning communities in perspective. In L. Rocci (Ed.), *Online learning communities (pp. 3-16).* Charlotte, NC: Information Age Publishing.

Pascarella, E.T. and Terenzi, P.T. (1991). How college affects students: Findings and insights from twenty years of research. San Francisco: Jossey-Bass.

Reeves, T. C., & Reeves, P. M. (1997). The effective dimensions of interactive learning on the WWW. In B. H. Khan (Ed.), *Web-based instruction* (pp. 59-66) Englewood Cliffs, NJ: Educational Technology.

Schrum, L., & Benson, A. (2000). Online professional education: A case study of an MBA program through its transition to an online model. *JALN, 4*(1). Retrieved from http://www.aln.org/journal/Vol4_issue1/schrum.htm

Silverman, D. (2001). *Interpreting qualitative data: methods for analyzing talk, text, and interaction* (2nd ed.). Thousand Oaks, CA: Sage.

Song, L. (2005). *Self-directed learning in online environments: Process, personal attributes, and context*. Unpublished doctoral dissertation, University of Georgia.

Steeples, C., & Jones, C. (Eds.). (2002). *Networked learning: Perspectives and issues*. London: Splinger.

Tobias, S. (1990). They're not dumb, they're different. *Change 22* (4), 11-30.

Wegerif, R (1998). The social dimension of asynchronous learning networks. *JALN 2*(1), Retrieved from http://www.aln.org/alnweb/journal/vol2_issue1/wegerif.htm

Seungyeon HAN

Fulltime Lecturer, Dept. of Educational Technology, Hanyang Cyber University. Interests: Web-based Collaborative Learning, Community Building in Virtual Environments, and Qualitative Inquiry in Technology-mediated Discourse

E-mail: synhan@hycu.ac.kr