

# Patterns of Communication in an Asynchronous Learning Environment

Andrea Powers  
Dorothy Fuller  
Black Hills State University

## Abstract

*The objective of this study was to trace the rhythm of communication in an asynchronous learning environment, and its impact on collaborative learning. This study traced the interactions of students in a one semester graduate level class for educators seeking an MSCI degree. The research examined types and levels of involvement for the students at various time intervals during the semester. The study also examined levels of satisfaction with those interactions and the web based asynchronous learning environment. A fundamental assumption of this study was that distance environments which use the asynchronous communication function as the primary record of learner progression follow a traceable pattern similar to the traditional educational environment, with some compensations for lack of physical proximity of the students to the instructor.*

## Introduction

Educational institutions have successfully made the transition from viewing technology as a target in itself to a tool to be integrated for a myriad of educational goals. Instructional delivery has evolved from a simple text download to a multiplatform delivery system which utilizes any combination of email, logged chat, whiteboard, conferencing, video, and telecommunication to name a few. Still, it is unclear exactly how computer and telecommunication technology alter the nature of learning. There are hundreds of reports indicating we possess a clearer understanding of the usefulness of learning in a technology-rich environment, but few of those studies address how those learning communities develop.

One of the most prevalent features of web based instructional delivery systems is the asynchronous learning environment. Asynchronous computer conferencing is the primary learning tool of an increasing number of web delivered computer programs designed for educational use at the university level. Using this type of program the student dials into a central database and views the input of fellow students and instructors in written form. The “conversations” are threaded, one following another in longitudinal form, and are posted in a bulletin board environment. Responses are crafted and stored on the database for others to read. Discussions can take place at any time or place and can have time lapses between contributions to any number of branching threads. Typically these “discussions” constitute the vehicle for learning. This format requires a set of communication skills unique to this environment and in many respects different from those utilized by students in a traditional classroom. The purpose of the study is to

examine the impact of the asynchronous learning environment on individuals within a learning community.

## **Analysis of the Literature**

### **Convenience of Access**

Distance learning is not time or place dependent, which enables a student to access the virtual classroom in more flexible ways than a traditional classroom. As Wellburn (1996) observes, the virtual classroom provides 24 hour a day accessibility for students. However, the convenience may be perceived as pressure when there are no parameters for how long a student can be “in the classroom” especially if that student feels compelled to read through every branched thread in order to stay informed. Loomis (2000) reports time management skills have the greatest impact on whether or not the asynchronous environment is perceived as a convenience or a hindrance. Hiltz (1997) also notes that due to the convenient daily access students work harder to keep up with the constant flow of input from students and instructor.

According to students in Hara and Kling’s (2000) Indiana University case study, the process of online communication is more time consuming than the traditional classroom. Students reported they were “overwhelmed by the volume... and fell behind in reading and responding on-line” (p.11). Technical difficulties were also a factor causing frustration for many of the students in Hara and Kling’s study. These problems varied from downloading instructional materials to prolonged loss of access due to hard drive failure. Palloff and Pratt (2001) suggest that the platform of an online course should become transparent as the student becomes engaged in the learning process.

Christensen and Anakwe (2001) found that the flexibility of the online environment was most appealing to nontraditional students with more external responsibilities while Harrell (1999) found that these same responsibilities can cause frustration in separating academic endeavors from home life.

### **Quality of Communications**

In the asynchronous learning environment, the bulletin board consists of threaded posts which branch as the class progresses through a number of assignments. A primary post is typically the beginning of a subject and any notes or replies occur beneath the original post in hierarchical order, based on the time of the note’s posting, rather than subject matter. This means that although the design of the bulletin board is longitudinal, it is by no means linear. This non-linear, branching approach to discussion has many implications for the communication process taking place among students, and between students and instructors.

In most educational conferencing programs all communications become a permanent record of the learning community’s interactions, unlike the traditional classroom where conversations are transitory. This “conversation permanence” has interesting implications for the quality and substance of communications.

A student does not have to wait her turn as in a classroom; all students can work simultaneously. This cascading organization of communication makes “the collaborative advancement of knowledge the principal focus of class activity” (Hewitt, Scardamalia & Webb, 1997, p.5). According to Hiltz (1997) this collaborative advancement must be

established from the beginning of the course by regular student contributions to the class discussion; these contributions must be rich in content.

The format of simultaneous contributing is not without its drawbacks. As Hewitt (1997) points out, the asynchronous environment allows for communications which expand and branch, but offers no support for converging those contributions in a meaningful way. To accomplish effective convergence individual students must make convergent meaning from branching posts by mentally looping information, which is organized sequentially according to time of post, rather than content. Even if a post addresses many previous notes it can only be posted under one primary post without a time consuming cut and paste job. The threaded conversations thus become more divergent over time, contributing to both a sense of information overload and confusion about the intellectual focus of the [learning] community (Hewitt, 1997).

The longitudinal nature of communications also affects the nature of the contributions. Since a poster generally responds to a previous note, personal reflection may be inhibited by the need to tie one's ideas immediately to those of others. In addition, a reply is posted to one other student, causing the conversation to drift away from the core issues of the group. Hewitt (1997) suggests that this environment supports "simplistic add-on behaviors...discouraging higher levels of note connectivity" (p.4).

In the traditional classroom a student can gain insights into another's thoughts and attitudes through a combination of non-verbal cues such as body language, voice inflection, and even insights based on a fellow student's personal experiences. According to Hewitt (1997) these cues allow one individual's ideas to take precedence over another's. In the asynchronous environment these cues are absent, leaving only written conversation with which to distinguish personality and experience. The reader takes all posts under equal consideration. This contributes to the sense of information overload.

LaRose and Whitten (2000) disputes the phenomena of equal consideration of contributions in the asynchronous environment: "A pecking order of status can be readily established through evidence of course content mastery and computer skills manifested in the student dialog. Thus social incentives and status incentives are present that parallel those found in [real-time] teacher-students interaction"(p.7).

According to Hara and Kling (2000) another issue with the quality of communication is the lack of immediate feedback. Feedback is more problematic in a text based asynchronous environment where students may be attending class at any time. In Curtis and Lawson's (2001) study, Exploring Collaborative Online Learning, they observed that while feedback responses were high in the asynchronous environment, there was an absence of "challenges to the input of others...[inhibiting] the more robust exchanges that are part of the 'challenge and explain' cycle" (p.9-10).

Gilly Salmon (2001) has developed a model of interactions in the asynchronous learning environment which has a stair step arrangement with five ascending stages:

- Stage One: Access and motivation. Here platform, hardware, software and other access issues are resolved. This phase is over when the student successfully posts the first message.
- Stage Two: Online socialization. In this stage students define themselves in relation to others, and in relation to the goals of the class. Empathy and mutual respect are developed in this phase.

- Stage three: Information exchange. At this stage information flow between students, instructor and the environment increases dramatically and becomes the focus of the environment.
- Stage four: Knowledge construction. At this stage participants exchange ideas and construct knowledge around information, ideas, and shared experiences
- Stage five: Development. At this stage participants become independent learners who critically assess their own learning process.

Previous studies address the process of knowledge construction in an online learning community (Curtis & Lawson, 2001; Salmon, 2000), how it differs from the traditional classroom (Hewitt and Scardamalia, 1996; Palloff & Pratt, 2001; La Rose and Whitten, 2000) and how to address those differences in relation to student scores and satisfaction (Hara & Kling, 2000; Salmon, 2000; Christensen & Anakwe, 2001). This study seeks to verify and extend conclusions drawn by previous researchers in the field of distance learning and its impact on knowledge construction based on the types of communication facilitated by the asynchronous environment and the students' (subjective experience) perspective of the online environment.

### **Research Questions**

This study examined the advantages and disadvantages of knowledge construction in an asynchronous learning environment. Specifically it sought to determine:

- 1) What is the pattern of communication in an asynchronous environment and how does it flow through the semester,
- 2) What is the level of involvement at the beginning, at the middle, and at the end of the course?
- 3) What types of interactions were taking place at each of these junctures?
- 4) Did these levels and types of involvements meet the needs of the students?

### **Methodology**

#### **Population**

The population is a cohort of Masters of Science in Curriculum and Instruction MSCI students (n=18) in a graduate program which utilizes the web-based course management system WebCT exclusively. The participants were a natural group, i.e., they elected to become members of a cohort using online delivery methods to complete a graduate program and were, therefore, volunteers. Fifteen of the students were females and three were males. All had previous K-12 teaching experience. All individuals were given the opportunity to complete the subjective survey at the conclusion of the on-line course. Nine of the eighteen cohort members voluntarily completed the survey.

#### **Instrumentation**

An ethnographical approach combining informal survey, observation, and case study was used to gather and analyze data concurrently. The time frame for the study was a two year interval. The comparison of the information gathered from these sources will validate inferences about the impact of the asynchronous learning environment on learners.

## **Data Collection**

At the end of the course, “Using Technology for Inquiry and Collaboration” (hereafter referred to as ED 630), a voluntary survey of the cohort was implemented. The survey employed a combination of Likert scale and open-ended questions for further elaboration (See Appendix 1). Archival documentation of the bulletin board communication tool was collected at the end of ED 630. This documentation was examined for patterns of communication and knowledge construction. Information from both sources was gathered about personal reflections on the learning experience.

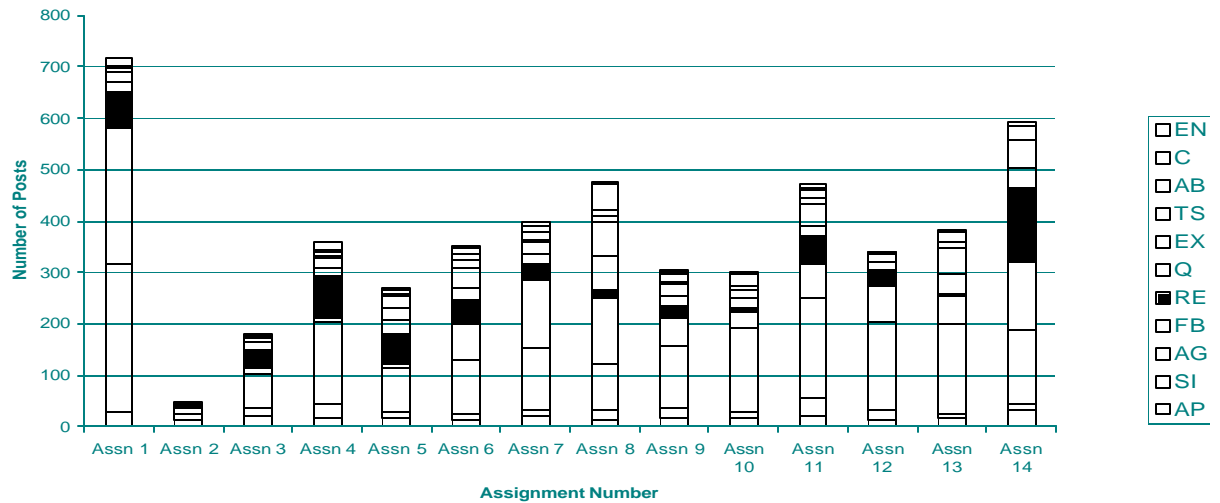
## **Data Analysis**

The archives of the asynchronous forum were examined for patterns of communication which indicate collaborative learning. Each communication was analyzed and assigned to one of 11 categories of communication:

- **AB**- Add-on behaviors are generalizations that could be directed to any post, do not contribute any dimension to the conversation, are designed simply to fulfill the discussion requirement and tend to repeat the original post in abbreviated form.
- **AG**- Agreement/Acknowledgement posts demonstrate that the poster read another student’s assignment by addressing specific aspects of the original post while adding no new information, feedback or reflection,
- **AP**- Assignment Posts are the primary posts of the discussion board, are created to fulfill class requirements, and are required and defined by syllabus.
- **C**- Collaborations are communications intended to organize or structure future projects related to course assignments between two or more people.
- **EN**- Encouragements are general “you can do it” type posts which do not offer suggestions for how to “do it”.
- **EX**- Explanations are posts which answer specific questions and generally stem from an earlier statement which resulted in a request for clarification, of a viewpoint or experience.
- **FB**- Feedback adds knowledge in some form to the original posts through an evaluative response, which may extend or elucidate information, offer another viewpoint or suggestion, or make generalizations or summative comments.
- **Q**- Questions are requests for clarification, information, or instructions, phrased as a direct question.
- **RE**- Reflections are posts which make personal meaning by weighing the value of a statement or information and placing that idea in a familial context, often through recalled experience.
- **SI**- Social Interactions are “Hello,” “how are you,” general solicitous comments which are not content related, and are often humorous in content.
- **TR**- Troubleshooting/Protocol type posts relate directly to matters of the course structure, the platform or other tech issues having to do with course completion.

Posts fell into a combination of as many as three different categories depending on content so that the numbers for each category exceed the total number of posts. All instructor posts were listed as explanations due to the nature of their content. Each of the communications was then grouped according to the assignment it addressed. These groupings were entered into an Excel spreadsheet to determine the flow of each type of communication throughout the semester long course.

**Figure 1. Patterns of Communication in the Asynchronous Environment**



Each of the assignments was examined in terms of Salmon’s (2001) model of learning in the asynchronous environment based on levels and types of interactivity.

**Figure 2. Stages of Interaction**

Salmon’s model of interactivity	Stages of interaction for Ed 630
Stage 1 Access and Motivation	Occurred before students logged onto the bulletin board
Stage 2 Online Socialization	Assignment 1 Assignment 2
Stage 3 Information Exchange	Assignment 3 Assignment 4 Assignment 13
Stage 4 Knowledge construction	Assignment 5 Assignment 6 Assignment 7 Assignment 8 Assignment 9 Assignment 10
Stage 5 Development	Assignment 11 Assignment 12 Assignment 14 Assignment 15

The surveys were used to explore the levels of satisfaction/frustration with the environment.

## **Results**

### *Categorization of Communication Patterns*

One of the questions surrounding an online instructional environment is what constitutes a class session. Because the asynchronous environment is not time dependent, all the posts dealing with a certain assignment constitute a class session. ED 630 was divided into 14 lessons, each with a week's worth of time allocated for posting the assignment and responding to the primary (assignment) posts of fellow students. The class was consistent in moving forward to a new assignment each week. All assignments were submitted to the bulletin board for response from the group. Various students fell behind for an assignment or two due to varying factors such as platform/computer issues, personal issues, and work related demands on time. All students finished the course in the prescribed time frame. These issues were generally shared in the bulletin board and were met with encouragement or social interaction type responses. Late assignment posts generally did not receive as much response as the group was focused on a new topic.

Assignment 1 directions were to post an autobiography that responded to a series of queries addressing personal learning preferences and online educational needs. In response to assignment 1, agreement and social interaction posts far exceeded all other categories for the semester, approaching 300 postings for each type. Reflections numbered 66. Questions and explanations focused on the personal and professional histories of students.

Assignment 2 asked students to evaluate the learning community after reflecting on the educational biographies posted for assignment one. While the numbers of all post types fell drastically, the predominant number were again, agreement and social interaction posts numbering ten and eleven respectively. During the first two assignments minor protocol issues were ironed out. One student who had previous experience with the platform observed that the number of posts was already very high and volunteered some suggestions for organizing and reading bulletin board messages as well as posting messages in such a way as to make them convenient for others to read. These first two assignments fell under Salmon's (2000) stage two-online socialization. The two primary categories of communication for these assignments focused on sending and receiving messages designed to create a sense of community. The small number of trouble shooting posts confirms suggestion that stage one is over before students become visible to their peers because they have worked through the process of getting onto the platform and resolved any problems by the time they post their first messages.

Assignment 3 asked the students to focus on how they, as individual educators, build and maintain classroom communities in their work environment. There were a series of personal queries as well as a reading prompt. Agreements and reflection trended upward during this assignment while feedback, questions and explanations rose slightly denoting a cycle of concrete information sharing. This assignment marks a transition between stage two-online socialization and stage three-information exchange. Salmon (2000) states that in this stage participants are occupied with "exploring known (to them)

answers or on aspects of problems or issues” (p.31). A typical question/explanation cycle looked much like this:

Val, I’m curious about the simulation you mentioned in this posting. I must have missed something prior to this, would you mind filling me in?? J.Q. (personal communication, February 11, 2001)

Jan- the simulation I mentioned is called Discovery One- a simulation on the colonies. The students have to learn the geography of the colonies, complete tasks to earn passage to America, and once there develop a strong colony. I don’t know who enjoys it more, the kids or me. I also do a Civil War simulation which we’re almost ready to begin. V. P. (personal communication, February 22, 2001)

Assignment 4 asked students to respond to a reading assignment which was posted in the WebCT platform. There were no specific queries, only a request for thoughts and insights. Agreement and reflection posts spiked for this exercise. Explanation posts continued an upward trend while question posts stabilized. This assignment drew stage three interactions as information began to flow freely between participants. During this assignment the messiness of the asynchronous environment became apparent as threads began to diverge. The instructor posted expectations for posting, reading and responding, and emphasized that the goal was to learn from each other. She received some interesting responses:

Thanks for the direction. A student can only type “good job I agree with that” so many times. I have so much more to say when there is something to disagree about. I wonder if that will happen. L. A. (personal communication, February 9, 2001.)

This participant early on perceived the lack of challenge and explain cycles that stimulate critical thinking through conflict in the face-to-face environment. Another student posted this:

Thanks for the insight and you are right in this short six weeks I have learned more about people I have taught with than in the past years of teaching and have become acquainted with many other fine educators. S. K. (personal communication, February 13, 2001)

In responding to another participants assignment post this student struck upon the constructivist nature of participant interactions in the asynchronous environment:

When I was reading your thoughts it dawned on me how alike your classroom must be to ours online- we are also writing to explore our beliefs and are validated by our peers. We are learning from each others experiences. V. P. (personal communication, February 11, 2001)

These posts demonstrate that it is possible for participants to reveal themselves and their experiences in a way that makes them "knowable" online.

During the fifth week students performed Internet research of a specified topic and reported their findings to the bulletin board. This was the first exercise requiring participants to go beyond the platform or their personal experiences to access information. Agreements and reflections trended downward during this assignment but were still the predominant posts at 87 and 59 respectively. Questions spiked at 28 along with trouble shooting posts at 24, while explanations were stable. Assignment 5 marked the beginning of more individualized assignments. The assignment posts tended to



summarize and evaluate the information each student found in the Internet search. Those who did not evaluate their findings in the initial assignment post did so as a process of interactions with other students about their findings. This evaluation process prompted more of a value laden question/explanation cycle. During week five interactions between participants involved more risk-taking, i.e., students tended to honestly assess not only the information but themselves as well, as in the following discussion over an article on professional development schools:

Both you and I wrote about the PDS without adding our personal comments. We just posted our findings. Now let's get down to the nitty-gritty. What do you really think of PDS? How would this more clinical approach change the face of education? I can see where it would make us appear to be more professional, don't you? S. W. (personal communication, February 18, 2001)

Sharon, I think the key word you used was "appear" to be more professional. If used correctly, PDS could be effective. I'm very interested in research- too bad we don't have more time during the school day for more professional development. I find my planning period slipping away each day! I don't know if we need more of a clinical approach to education, however, I feel I am now at a standstill and want to learn more- a different approach. Maybe it would be more effective. J. J. (personal communication February 24, 2001)

This assignment represents a transition from stage 3-concrete information exchange to stage 4-knowledge construction. Participants grappled with issues that did not have clear answers, sharing experiences and perceptions in order to make sense of the material they shared. They attempted to negotiate meaning by putting information into a collective perspective based on personal shared experiences. Participants took the perspective of the article, measured the perspective against their own experiences and made value judgments which were theory or practice based. An example of a practice based value judgment is this student's reflection on an article about teacher expectations:

This article made me do some thinking. If it is in the best interest of the students for teachers to be as unbiased as possible why do they send cum [cumulative] folders etc. to us before we ever get a chance to meet our class? Personally, I do not want to read about last year. I know cum folders have their place, but I do not want my expectations tainted by what I may read. Many things can change, and quickly, about the student. I would rather take my chances and see what comes along. Sometimes all a student needs is a fresh slate. J. D. (personal communication, February 20, 2001.)

During this time frame a conversation developed about levels of participation in the discussion board and the protocol for participation, contributing to the elevated number of trouble shooting posts. This thread developed as a result of mid-term assessments which were sent to each participant via private email, and included statistics on number of log-ons and posts. The ensuing debate about course expectations spilled over into Assignment 6 as students articulated their approaches to dealing with the information glut.

Assignment 6 required students to compare and contrast different perspectives regarding professional development. This assignment was a formalized extension of the type of constructivist interactions which occurred spontaneously in assignment five. Agreements, feedback and reflection were the predominant posts, with feedback posts

rising sharply. Trouble shooting posts remained high due to the ongoing conversation over posting protocol. Assignment 6 responses demonstrated all the attributes of Salmon's (2000) stage four knowledge construction. Socially constructed meanings developed based on the sharing of insights and experiences and the collaborative development of ideas. Threads of discussion expanded and brought in more tangential topics. One student's assignment post spawned threaded discussions on budget cuts, personal technology skills, student technology skills, professional training, attendance at conferences, in-service topics and union membership. The thread addressing post protocol and course expectations became heated when a participant who was regarded as a master teacher by her peers posted the following communication which she titled "The Numbers Game":

OK, I'm confused. I did not realize that when I joined this class, I would become involved in a numbers game. I knew it was my responsibility to post and respond weekly, but in my naiveté, I did not know that the number of times I read would be compared to the number of times I responded. Since I love to read, I have enjoyed reading other people's responses and have actually read some more than once. In the numbers game, this counts against me. I also thought that nothing more needed to be said about some postings. Enough is enough. In fact, I think we were told we did not need to respond to all postings. I guess that I am disappointed that a software program report may influence the quality of our work in an attempt to make our numbers look good. How do you feel? S. W. (personal communication, February 24, 2001)

This post solicited 23 responses addressing the nature of the platform and the expectation of the course. One student aptly named this threaded discussion "panic posts." Many of these posts addressed how people chose to learn in this environment. As a participant of the class the author posted this "calm down" response:

Sharon and others, it's true that WebCT does accumulate numbers on how many times you log on and how many times you post. I have looked at these numbers. However, I do not believe that you should be in any way concerned about posting just to keep up with the Jones.... And who responds out loud to everything everyone says in a regular class? I can say with the greatest conviction that the numbers the software accumulates are not for the purpose of grading, although they might correlate to learning style for the purposes of instructional research. A. P. (personal communication, February 26, 2001)

Even though students were very upset about the perception that they might be graded on the number of posts they looked to each other for input to resolve the posting issue rather than to the instructor, indicating a growing sense of community. They also examined their own cognitive processes in relation to the asynchronous environment, a hallmark of constructivist learning. These exchanges would be highly unlikely in the traditional classroom where the instructor is "ever present".

Assignment 7 asked all students to read a prompt which had been made available through the platform. While this assignment replicated Assignment 4 in design, the response pattern shows a different set of communications. Assignment 4 precipitated eight feedback responses while Assignment 7 captured over 130. Feedback peaked for the entire course after an upward trend beginning from Assignment 5. Agreements also peaked after an upward trend from Assignment 5. Add on behaviors rose possibly

because all students responded to the same reading prompt. Once in the knowledge construction phase substantive interactions remained constant as participants relied on their ability to learn from each other. Posts during Assignment 7 followed the same pattern as Assignment 5 and Assignment 6, due to participants' increasing confidence in the ability to construct knowledge as a group. Students also began to speculate collectively about outcomes for the course as well as their culminating projects for the completion of the cohort graduate program.

Assignment 8 asked participants to consider their own possibilities for action research projects. Students were to compare and contrast interests with those of others. Levels of feedback remained high at 130 while questions and explanations spiked to 66 and 68 respectively. Agreements dropped to 89 and reflection posts dropped to fifteen, the lowest number since the second week of the class. Collaborations shot up 51, the highest number for the entire course. Collaborations tended to center on the group of educators who worked in the same physical locations, as demonstrated in this post:

We are very fortunate to have so many teachers from the middle school taking this class together...After our meeting tonight, it became very clear to many of us...that the new PowerGrade system our school district is using would be a great topic for action research. K. H. (personal communication, March 7, 2001)

This post solicited 28 responses, many of which enlarged on the original post:

I like this idea because it not only includes what we need to be doing anyway... (notifying parents of failing grades, giving feedback in a timely manner, and recording grades and comments) into what we want to research. We will be able to include SPED, regular Ed, teachers, and also parent viewpoints. D. S. (personal communication, March 8, 2001)

For this assignment students took various positions as they weighed the pros and cons and considered possible outcomes of various research projects. Posts which were not collaborative in nature consisted of individual experiences with topics under discussion as in this feedback response to a participant who was considering block scheduling as a research topic:

I'd like to give a little input about the block schedule...All four of my children have had a chance to experience the block schedule...they have all been happy with it for several reasons. They felt like they had a much better opportunity for questions and assistance with their teachers, especially in the math classes. Any industrial arts classes were great because they actually had time to work, not just setup and take down. D. S. (personal communication, March 16, 2001)

Assignment 8 continued the stage four-knowledge construction with the caveat that much of the agreement was replaced by questions, explanations and collaborations, revealing a higher intensity of knowledge exchange than in the previous three assignments. This was most probably due to the open ended nature of the assignment with no fixed reading prompt or set of queries. Assignment 8 marks the apex of the knowledge construction stage.

Assignment 9 represented an extension of the process that took place in Assignment 8. The assignment asked students to read a brief explanation of the action research cycle. Feedback, questions, explanations and collaborations fell off sharply and

agreements again became predominant with 121 postings. The brevity of this assignment solicited the most brief assignment posts and responses in the bulletin board. Assignment 9 fell into the stage four but represents a downward trend in knowledge construction as it brought some closure to the discussions taking place in Assignment 8.

Assignment 10 asked students to examine two web sites focusing on action research in education. One site was organized in a PowerPoint format while the other consisted of a complex set of links and search functions. For this assignment agreements rose to 160 while feedback and reflection both dropped drastically. Add on behaviors jumped to 22, the highest number for the course. One of the first posters for this assignment compared the two sites in terms of ease of navigation and a general bandwagon effect occurred which accounted for the increase in add on posts. While this assignment was designed to elicit knowledge construction based on exploration of the two sites most of the participants did not take the time to deeply explore the more complicated of the two sites and substituted a superficial comparison for a close examination of the information presented. This assignment was done toward the end of March, and students may have been experiencing mid term slump. Duffy and Jones (1995) extensively documented the phenomenon of midterm slump in Teaching within the Rhythms of the Semester. However, the failure of students to perform a detailed analysis of the second, more complicated site may also have represented a case of information overload.

Assignment 11 presented four case studies with a set of queries for consideration. Students were asked to respond critically to each. Although it served as a preparatory assignment for the reflective writing in Assignment 12 required for admission to the MSCI program this assignment deserves individual examination for the communication pattern it generated. Agreements spiked to 194, the highest since the first assignment while feedback and reflection both rose as well. Explanations also spiked to the highest point for the course due to instructor commentary on every assignment post. This assignment acted as a catalyst for participants to transition to stage five-development. Students explored their own thinking processes and ideas in relation to each of the cases studies. Participants relied heavily on mental models derived from past experience to address each case. Responses often explored the unknowns of each situation and proposed alternative solutions. Participants also commented on their own situations in relation to the case studies, as in this response:

Julie, the nice thing about these case studies is they allow you to think about them. I looked at my classroom and played the what if game. Every setting is different. B. H. (personal communication, March 31, 2001)

Many of the feedback posts articulated a high level of emotional involvement with the case studies:

The public emphasis on grades, to me, is appalling. I know students who can attain A's without stretching a brain cell. Yet the students who work like mad to make progress are not considered as successful by others, just because of grades. J. D. (personal communication, April 1, 2001)

Social interactions also rose to the highest level since assignment one. Gilly attributes this to coping skills required for stage five interactions.

Assignment 12 involved two tasks. The first was to complete the reflective writing assignment for admission to the MSCI program. The second task was to reflect

on the individual learning process for the course. Participants completed the first task and mailed it without posting their work to the bulletin board. The participants had become so thoroughly accustomed to posting their work for public viewing and response that the mail-in assignment led to a threaded discussion expressing confusion and disappointment over lack of consensus building through sharing ideas. For the second exercise in Assignment 12 agreements, feedback and reflection remained the highest three post types, as in assignment 11. Participants reflected and provided feedback on their individual learning processes as well as group learning processes. Participants also reflected on how the group had evolved using the online format and how the learning process was affected by the asynchronous environment. This reflection on the interaction between learning and technology is a key element Salmon's (2000) stage five development process.

Most participants stated that they did not mind the distance aspect of the course and articulated a number of advantages to the asynchronous environment. Many of the participants noted that waiting to respond until they had read a message two or three times afforded them a sense of leisure in the reflection process. Others cited the ability to fit the class into their personal schedules. Participants also mentioned that more thinking and responding occurred online than in a traditional classroom and that personalities are reflected in the more intense interaction on the bulletin board. One participant stated the advantages for an individual who is shy:

I much prefer this to a classroom setting, since I'm a bit uncomfortable in groups. I'm not a great writer but after doing this I'd rather write than speak to a group.

This gives me a comfort zone. J. Q. (personal communication, April 26, 2001)

Another student expressed her sense of community like this:

I feel the "cohortiveness" of the group. I do have a sense of what it would be like as a blind person though. I'm working without visuals, but have a keen sense of the cohesiveness of the group. V. P. (personal communication April 11, 2001)

These communications support the notion that in the asynchronous environment there is equal consideration of all posts. Another participant mentioned how the interests of others prompted her to expand her knowledge in areas she would not otherwise have explored. Many students expressed a high level of comfort with the platform and increased confidence with technology. Much of the communication revolved around the egalitarian nature of the bulletin board.

Some of the negatives mentioned were lack of feedback from the instructor, the lack of concrete examples of successful work, the perceived need to go online every day, lack of face time, and the repetition of ideas leading to a constant struggle to keep up with the reading.

Assignments 13, 14 and 15 all revolved around the posting of the final project and will be considered together. The instructions for Assignment 13 were to prepare and post an outline of the final project which was a literature review. Trouble shooting posts rose slightly for this assignment due to outline formatting problems in the platform. Agreements and feedback were the two most prevalent posts while reflection fell sharply due to the concrete nature of the assignment. Questions and explanations also increased drastically from assignment 12 as participants sought clarification about the projects of fellow students. Interactions focused on concrete knowledge exchange bringing the class back stage three-information exchange.

Week 14 and 15 assignments were to post the final project and provide reactions to the final projects of classmates. In effect students were given two weeks to post and react rather than one week as in all the previous assignments due to the depth of the final project. Feedback and reflections both increased drastically with reflections reaching a high point for the course at 148. Agreements dropped to 144, the first time they fell below the level of reflection posts for the course. As a matter of closure, students communicated at level 5 interactions, again reflecting on how the projects of individuals had evolved and where speculating about the evolution of such projects during the course of the MSCI program. They further evaluating individual and group learning.

### *Voluntary Survey*

Of the total population of 18 students who completed the course, 9 answered the survey. In answering the two questions dealing with online communications over half of the respondents had some prior experience with discussion groups. One had no prior experience and two had posted to discussion groups regularly. Over 75% of the group had taken one or two internet courses before and the remainder had taken three to five courses prior to enrolling for Ed 630.

In the survey section dealing with student experience and assessment of communication in ED 630, eleven of the questions were Likert scale type responses. The remaining six questions were open ended questions asking for further explanation of responses to Likert scale questions.

Seventy-seven percent of the respondents stated that they attempted to read every post while the remainder read what they had time for. Seventy-seven percent also stated that there were too many posts to deal with effectively while the remainder felt that the number of posts was acceptable to the learning environment. The respondents who felt comfortable with the number of posts also responded that they posted to the board “when they got a chance.” This correlation seems to indicate that since these students did not feel pressured to post they had more time to read the posts of their fellow students.

Over half of the respondents stated that the quality of discussion was enhanced by the ability to post to any thread at any time. Those who felt it enhanced the quality of discussion mentioned that everyone could post her own thoughts in her own time and that students who would be listeners in the traditional environment could express their thoughts and be reinforced. Negatives mentioned were redundancies in responses and that by the time the responses were all examined the reader had forgotten the content of the original post.

Eighty-eight percent responded that levels of interaction were higher in the online environment than in the traditional classroom. Students who felt that levels of interaction were higher mentioned that everyone responded to everyone at one point or another, indicating that they perceived the student to student interaction as increased in comparison to the traditional classroom. One student mentioned that pressure to post “for the grade” impacted the levels of interaction, but that the ability to “address an archival conversation” increased the levels of response. This student perceived that the anytime/anywhere capability of the asynchronous environment not only enhanced the quality but also increased the levels of response.

Seventy-seven percent of respondents stated that communications became more divergent due to the increasing number of threads. Those respondents who stated that

communications became more divergent over time cited such contributing factors as varying opinions, unrelated material being brought into the conversation, more ideas being introduced, the apparent unrelated manner of reacting to the posts, i.e., not tying various conversations together, and burnout over time.

Eighty-eight percent of respondents stated they were comfortable with the level of feedback. One student mentioned thoughtfulness and helpfulness of responses. A number of students mentioned that the quality varied, that some of the responses were well thought out while others simply responded to “boost their numbers”.

The respondents were split between the opinion that the course was more student directed than a traditional or that the course was more self-directed. Respondents who stated that the class was more student-directed mentioned advantages such as ownership and responsibility for learning, that everyone was paying attention to what was said, and questions were directed to each other rather than the instructor. Respondents who felt the course was more self-directed mentioned that the online format allowed room for individual discovery and exploration of topics, the ability to work at one’s own pace and in one’s own style, and that the students were not all being “led down the same path” by the instructor. One student mentioned that, for her, the student-directed nature of the learning environment was sometimes a disadvantage when things “aren’t black and white.”

All statements about the impact were positive. Respondents pointed to advantages such as the increased connectedness between students, increased support, increased rapport, flexibility of access, and the ease with which a wide range of opinions and experiences were shared. One student addressed her experience as a floater in the online environment, stating that, “Though we have never met most of our classmates in the flesh it is possible to build bonds.” Another summed up the general opinion, “Basically I think the overall impact of receiving insights, ideas, and knowledge from others in other areas is a positive, effective medium for building community as well as global knowledge. In other words, any time you expand your horizons you’re doing yourself a favor”. This student intuited Hewitt’s (1997) idea that in the asynchronous environment participants must figure out who and where the divergent interests of the group intersect to create meaning.

The questions with the greatest agreement (more than 75%) dealt with issues of interaction and feedback while questions gleaned the greatest divergence of responses dealt with approach to completing assignments. Every respondent expressed high levels of satisfaction with the asynchronous environment’s impact on knowledge construction while the primary source of dissatisfaction was repeatedly expressed over the numbers of posts and the corresponding pressure to read every post.

## **Implications for the Asynchronous Learning Environment**

### *Communication Patterns*

Participants in ED 630 quickly moved from Salmon’s (2000) stage one- access and motivation to stage four-knowledge construction. This was due to the rapid development of security in the learning community as evidenced by the high number of social interactions for assignment one. While these interactions dropped drastically in assignment two and were relatively low for the rest of the course, they constituted an integral part of the conversation. Socialization posts tended to occur in groupings, never

as isolated posts; they were essential to the development of the collaborative atmosphere of the online class.

Agreements were the dominant posts type for the entire course, surpassed twice by feedback posts during Assignments 7 and 8 and by reflection posts in Assignment 14. Agreements were for the most part an essential element of substantive discourse. In combination with the other three primary types of posts- feedback, reflection, and the question/explanation cycle agreement denoted high level participation while in the absence of those types it acted as a substitute for knowledge construction.

Assignments 3 and 4 established the information exchanged phase which developed the confidence the participants needed in their own group expertise, and was a necessary prerequisite to knowledge construction. Assignment five marked the transition to stage four knowledge construction. Agreements, feedback, reflection, and the question/explanation cycle were the dominant types of interaction for both information exchange and knowledge construction. The primary difference in these two phases was not the type of interaction but the substance- concrete knowledge and experience or speculative theory and possibility. The participants remained in this stage (with a lapse during Assignment 10) until Assignment 11 when they transitioned to stage five- development.

Stage five development is defined by independent learning and reflection on the learning process. Interestingly, students showed some resistance to this stage when they expressed discontent over submitting Assignment 12 without sharing with the group. In doing so they reflected on the cohort's learning style- which might be categorized as learning by consensus building. Analysis of the bulletin archive in light of research questions one, two, and three reveals that students transitioned to stage three information exchange by Assignment 3, transitioned to stage four knowledge construction by Assignment 5, which was one third of the way through the class, and remained there until spurred by the parameters of Assignment 11 to move to stage five development. Instructional design seemed to play a large factor in levels of involvement. Interactions focused on agreements, feedback, and reflections, their levels varying according the parameters of the assignment.

### *Satisfaction levels*

Relating to research question four, all the participants said they enjoyed the asynchronous environment for learning, namely the quality of communication it provoked. The convenience of the asynchronous environment appeared to be a double edged sword. Many participants expressed a sense of being overwhelmed by the number of posts and discussion threads and the subsequent need to sort out meaning. All were content with the richness of exchange. While it is true that asynchronous communications can be unwieldy for students to evaluate due to their diverging nature, Hewitt (1977) suggests, "This is where new ideas are nurtured and developed" (p.6). The threaded discussions also forced students to prioritize information and to compare perspectives without bias. This study confirms Arbaugh's (2000) conclusion that students' perceived learning is increased by constructive interactions of the asynchronous environment more so than the format's convenience or ease of use.

Students also mentioned the notable absence of the instructor, who in the case of ED 630, was also the moderator. A number mentioned the desire for greater feedback and



concrete examples of “the right way” While Hara and Kling (2000) noted the logistical difficulties in keeping up with a large group of students who are contributing to the class discussion around the clock, there is a deeper reason for the comparative silence of a moderator/instructor. Introducing a moderator, who steers the conversation or interacts at the level of a participant, detracts from the egalitarian nature of threaded discourse and tends to produce followers in a moderator-centered discussion. The introduction of moderated discourse would de-emphasize the process of “summarizing and synthesizing ideas” at the individual level (Hewitt, 1997, p.6). One participant summed up this notion:

One of the most difficult things for me has been the lack of direction on various assignments. While this has been frustrating at times, it has taught me to be more reflective. I now understand that right or wrong is not the goal but educational growth through trial and error and consideration of different issues presented. K. H. (personal communication, April 15, 2001)

Curtis and Lawson’s (2001) notion that there is a notable absence of disagreements and challenges in the asynchronous environment held true for this class. This element may have been absent from the bulletin board exchanges because in the traditional classroom the moderator is visibly present to keep verbal exchanges from getting out of hand. Maybe the students were apprehensive of conflict. Maybe the permanent nature of the conversation compelled them to “play nice”. When they were forced to submit an assignment without reaching a consensus on the correct answer, many participants expressed discontent. However the void left by this absence seemed to be filled by a gentler version in the question/answer cycle.

Participants expressed strong satisfaction with the egalitarian nature of the bulletin board. They mentioned that everyone contributed and was responded to in ways that validated their contributions, debunking la Rose’s notion that a pecking order develops in the asynchronous environment.

Levels of satisfaction expressed in the bulletin board were consistent with those expressed in the volunteer survey, indicating a very high level of satisfaction with the quality of learning and varying levels of frustration with time management issues and the effort required to extract meaning from the asynchronous learning environment. Analysis of the bulletin board posts and the volunteer survey worked together to provide a clear answer to question four.

The elements of asynchronous environment that make it difficult to negotiate are the same ones which cause reflection and evaluation on the part of the learner. Comfort level may not be a large factor in overall learning. In the learning community of an online classroom all students’ ideas become “objects of inquiry” because they are made publicly available (Hewitt & Scardamalia, 1996). The goal of the online learning community is to extend the knowledge of the collective and the responsibility for this lies equally with each learner in community.

The asynchronous structure of communication promotes higher order thinking skills among the students in a distance education course because of its egalitarian, divergent, student directed influence on individual understanding. Is it necessary or desirable for every student to derive the same usefulness from a community of learning? Do we all have to learn the same thing? In the asynchronous environment learning is constructed by the dynamics of group participation, but the individual determines what knowledge is gained.

## References

- Arbaugh, J. (2000, December). How classroom environment and students engagement affect learning internet-based MBA courses. *Business Communication Quarterly*.63 (4). Retrieved July 26, 2001, Proquest database.
- Christensen, E., & Anakwe, U. (2001). Receptivity to distance learning: The effect of technology, reputations, constrains, and learning preferences. *Journal of research on Computing Education*.33 (3). Retrieved July 20, 2001, Proquest database.
- Curtis, D., & Lawson, M. (2001, June). Exploring collaborative online learning. *Journal of Asynchronous Learning Networks*, 5(1). Retrieved July 13, 2001 from [http://www.aln.org/alnweb/journal/Vol5\\_issue1/Curtis/curtis.htm](http://www.aln.org/alnweb/journal/Vol5_issue1/Curtis/curtis.htm)
- Duffy, K., & Jones, J. (1995). Teaching Within the Rhythms of the Semester. Jossey Bass Publishers: San Francisco.
- Hara, N., & Kling, R. (2000). Students' distress with a web based distance education course: An ethnographic study of participant experiences. Retrieved April 24, 2001, from Indiana University School of Library and Information Science Web site: <http://www.slis.indiana.edu/CSI/wp00-01.html>
- Harrell, W. (1999). Language learning at a distance via computer. *International Journal of Instructional Media*, 26 (3), 267-282.
- Hewitt, J. (1997). Beyond threaded discourse. Retrieved April 2, 2001, from University of Toronto Web site: <http://csile.oise.utoronto.ca/abstracts/ThreadedDiscourse.html>
- Hewitt, J., & Scardamalia, M. (1996, April). Design principals for the support of distributed processes. Retrieved April 11, 2001, from University of Toronto Web site: <http://csile.oise.utoronto.ca/abstracts/distributed/>
- Hewitt, J., Scardamalia, M., & Webb, J. (1997, March) Situative design issues for interactive learning environments: The problem of group coherence. Retrieved April 3, 2001, from University of Toronto Web site: [http://csile.oise.utoronto.ca/abstracts/situ\\_design/](http://csile.oise.utoronto.ca/abstracts/situ_design/)
- Hiltz, S. (1997). Impacts of college-level courses via asynchronous learning networks: Some preliminary results. *Journal of Asynchronous Learning Networks*, 1(2). Retrieved June 26, 2001 from <http://www.aln.org/alnweb/journal/issue2/hiltz.htm>
- LaRose, R., & Whitten, P. (2000, October) Re-thinking instructional immediacy for web courses: A social cognitive exploration. *Communication Education*.4 (1). Retrieved June 30, 2001, Proquest database.
- Loomis, K. (2000, March). Learning styles and asynchronous learning: Comparing the LASSI model to class performance. *Journal of Asynchronous Learning Networks*, 4(1). Retrieved June 26, 2001, from [http://www.aln.org/alnweb/journal/Vol4\\_issue1/loomis.htm](http://www.aln.org/alnweb/journal/Vol4_issue1/loomis.htm)
- Palloff, R., & Pratt, K. (2001). Building Learning Communities in Cyberspace. San Francisco CA: Jossey-Bass.
- Salmon, G. (2000). E-Moderating: The Key to Teaching and Learning Online. Sterling, VA: Stylus.
- Wellburn, E. (1991). Information telecommunications and learning: A review of the research literature. Occasional paper. Education Technology Center of British Columbia.

Wellburn, E. (1996). The status of technology in the education system: a literature review. Retrieved March 7, 2001, from [http://www.cln.org/lists/nuggets/EdTech\\_report.html](http://www.cln.org/lists/nuggets/EdTech_report.html)

## Appendix 1

### Questionnaire for ED 630

WEB CT, the distance-learning program we have been using for our class, is considered an asynchronous computer conference environment. This means that students dial in to a central database and view the input of their fellow students and teachers in written form. Responses can be crafted and stored on the database for others to read. Discussions can take place without having to coordinate a common meeting place or time. The following questionnaire addresses your perceptions about communications in the asynchronous learning environment, and how they affect the student's learning experience. Please **circle** the letter next to the phrase which best reflects your Internet learning experience. The options for response are gradational. Please choose the response that most closely matches your experience. Some of the questions offer you a chance to qualify your answers. Thanks for the input!!

The first two questions deal with experience prior to participating in ED630.

1. How much previous experience have you had with bulletin boards or chat rooms using the Internet? This may include interest groups outside the educational environment.
  - a. None
  - b. I have participated in one or two discussions groups
  - c. I have posted to a discussion group occasionally (once or twice a month).
  - d. I have posted to a discussion group regularly (weekly or more).
  - e. I have read and posted to discussions daily
  
2. What previous experience do you have taking a course using the Internet as the delivery system?
  - a. ED 630 is my first experience with online delivery
  - b. I have taken one or two internet courses before
  - c. I have taken three to five Internet courses before.

The following questions deal with your experience/ assessment of communications using the asynchronous environment of WEBCT.

1. How much time did you spend reflecting on and designing your responses before posting to the bulletin board?
  - a. More than I would have in the traditional classroom environment
  - b. Less than I would have in the traditional classroom environment
  - c. About the same as in the traditional classroom environment
  - d. It varied with the subject matter of the thread
  
2. How much of the threaded discussion did you read?
  - a. I made an effort to read every primary post.
  - b. I read posts containing subject matter that interested me
  - c. I concentrated on posts of certain individuals
  - d. I read whatever I had time for and did not discriminate or choose certain posts

3. How often did you post a response to the bulletin board? I made a best effort attempt to reply to every primary post.
  - a. I posted only to those discussions that interested me.
  - b. I posted primarily to people, not subject matter
  - c. I posted when I got a chance.
  
4. How did the bulletin board environment affect the nature and quality of your posts? (Please consider only responses, not primary posts.)
  - a. I found I was more concerned with public scrutiny of my responses and made an effort to “craft” a quality response, than I would have in a traditional setting
  - b. I felt more spontaneous about my responses, knowing that I would not “see” classmates.
  - c. My responses were no different than they would have been in a traditional classroom.
  - d. I spent more time in reflection before responding because the “statements” of my classmates were “permanent” and therefore I could take more time to consider them.
  
5. What do you think about the number of posts?
  - a. There were too many to deal with effectively
  - b. The number of posts was acceptable to the learning environment.
  - c. There were not enough posts.
  
6. What do you think of the quality of posts?
  - a. The posts offered a rich source of discussion and exchange.
  - b. There was too much off topic discussion on the bulletin board.
  - c. The bulletin board environment is too impersonal, with no chance to really get to know my fellow students outside their responses to assignments.
  - d. The combination of assignment discussion and off topic conversation was comfortable for me.
  - e. The threaded environment allows everyone to “talk” at once.
  
7. How did this affect the quality of discussion?
  - a. It enhanced the quality of discussion
  - b. It detracted from the quality of discussion
  - c. It did not alter the quality of the discussion
  - d. Please explain why you responded as you did in questions #7.
  
8. How do you perceive the level of interaction in the asynchronous environment?
  - a. Levels of interaction were higher than the traditional classroom
  - b. Levels of interaction were lower than the traditional classroom
  - c. Levels of interaction were the same as the traditional classroom

9. If you believe levels of interaction were altered by the asynchronous environment, why is this so?
  
10. Do you believe that threaded discussion in an asynchronous environment becomes more convergent or more divergent over time?
  - a. More divergent
  - b. More convergent
  - c. Stays the same
  
11. Given your response, to Question #10, why was this so?
  
12. Do you feel that you received enough feedback for your assignment posts? (These would be your primary posts dealing with weekly assignments.)
  - a. There was so much it was difficult to keep up with.
  - b. I was comfortable with the level of feedback
  - c. I did not receive enough feedback to my posts.
  
13. What do you think about the quality of the feedback to your assignments?
  
14. What is your assessment of the direction of this class?
  - a. It was more self-directed than the traditional classroom
  - b. It was more student-directed than the traditional classroom
  - c. It was more teacher-directed than the traditional classroom
  
15. Consider your answer to Question #14. Is this an advantage or a disadvantage? How?
  
16. In your view what is the overall impact of asynchronous communications on a knowledge building community?
  
17. What was your profile according to the Keirsey Personality Indicator we took at the beginning of the course?

Thanks for your time and effort: )!!

