What Happens as Learning during Asynchronous Text-based Discussions In an Online Learning System ?

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Abstract

The purpose of this instrumental case study is to provide further understanding of what happens as learning through the use of asynchronous text-based discussions in an online learning system as one component of a graduate seminar on qualitative research. Synchronous and asynchronous communication has become an essential component in many online learning environments. The correspondence between the students' approaches to learning and their perceptions of the contribution of the online learning system to the quality of their verbal interchanges can provide a better understanding of what happens as learning in the online learning environment. Three sources of data were collected from ten graduate students: a) electronic logs of the students' written interactions in the discussions section of the online learning system, b) student responses to a 60 item survey eliciting judgments and written responses to open-ended questions about their learning experiences in the online learning system, and c) comparisons of student pairs and their perceptions of how they approached their own learning. The results show that the number of messages generated by pairs is not markedly different. All the students agreed that classroom face to face verbal interactions led by the teacher were more important to their content learning than asynchronous online verbal interactions with a peer through the online learning system. Pairs of students with more evidence of engaging in dialogue and discourse had one person in the pair who had deep learning motives and strategies. Although students rated many aspects of the online learning system environment as positive, the actual proportion of academic dialogue and discourse produced by at least two of the five pairs did not correspond to the positive stance of all students toward the online learning system's contribution to learning.

Purpose.

The purpose of this study is to understand how the quality of students' verbal interchanges corresponds to their perceptions of the contribution of an asynchronous communication (messaging) system (which is part of an online course management system and learning environment) to their learning and their approaches to learning? The online course management system and learning environment used in this study is the commercial Blackboard Learning System, which is informally referred to as (WebCT) by faculty, staff and students, probably due to the popularity of (WebCT) as an online system used by the university before the purchase its purchase by Blackboard. The Blackboard learning system offers different course tools for the students as well as instructor tools to manage the course. Among the tools offered to students there are tools for checking announcements, checking the course calendar, following a threaded-discussion or communicating through email. This instrumental case study [1] attempts to provide further understanding of what happens as learning through the use of the online asynchronous communication (messaging) offered as a tool in the online learning environment as one component of a graduate seminar on qualitative research. It is noteworthy to mention that the course management system and learning environment are offered by the university to all students as the online platform for all undergraduate and graduate courses.

Perspectives.

Web-based courses are numerous and allow students to perform various learning activities in a virtual classroom [2], including reading, messaging, conferencing, accessing documents, and participating in interactive activities [3]. Synchronous and asynchronous communication has become an essential component in many online learning environments. In these environments, language is used to communicate messages. Language serves as a psychological tool to mediate

higher order thinking through social interaction [4-6], and knowledge evolves through a process of negotiation within a discourse community [7, 8]. Asynchronous online discussions are now widely used as a substitute for, or complement to, courses designed to promote students' active learning[9]. In asynchronous electronic discussion groups, the " interaction in the group is very task-oriented, stays task-oriented and reflects high phases in knowledge construction" [10].

Merrill [11] identified 4 major principles for the design of technology learning environments which enable active learning to occur: (a) learners are solving real world problems; (b) existing knowledge is activated as a foundation for new knowledge; (c) new knowledge is applied by the learner; and (d) new knowledge is integrated into the learner's world. For active learning to occur during asynchronous on line discussions, students must engage in dialogue which in turn leads to the production of academic discourse. Discourse is both oral and written [12, 13]. It is oral and written conversation of text quality [14]. It is this text quality which represents evidence of relating concepts and ideas in a cohesive manner. In the threaded discussion component used for exchanging messages in the form of a discussion in the online learning system, discourse is generated across many messages rather than in one message during all the weeks of a course. Dialogue is embedded in discourses and represents the turn taking of participants in elaborating on a single dominant topic [15]. Sequences of dialogue arise from interactive events where one party initiates a topic and the other responds often with a comment on the initiators' elaborations of the general topic. Strings of interactive events with multiple topics, which are related to each other, create discourse of many forms. Both forms of dialogue and discourse shape the opportunity to learn by creating a social and genre context that differentially mediates content encoding, and creates a climate of cooperative learning that enables progressive thinking about the content which goes beyond each individual's social and academic contributions. Researchers need to first describe how threaded discussion component of the online learning system enables consistent academic dialogue and discourse to arise throughout a course before they can draw reliable inferences about the contributions of their written interactions to types of learning like those described in [11]. In [16], Doig argued that what makes scientific dialogue possible is the nature of the social conditions from which it arises: respect for the point of view of others during conversations, the provision of supporting evidence or reasons for evidence as well as claims, arguments, speculations, predictions, and hypotheses, and the presence of problems that promote uncertainty and have no trite answer. Doig also stipulates that a teacher is needed who plays the role of a weaver of ideas and concepts in order to guide students' verbal interactions as a process into meaningful texts. This raises the question of whether students and researchers perceive what happens as communication on threaded discussion component of the online learning system achieve the ends that Doig portrays as scientific dialogue.

Methods.

This instrumental, single case study [17] seeks to study the issue of how the activity of asynchronous online communication arising during threaded discussions within an online learning system as one component of a graduate seminar promotes students active and deep learning . The boundaries of this case study a graduate seminar course taking place over 13 weeks using the online learning system as one means of promoting student learning in combination with face to face classroom instruction. The reliability and internal validity of case studies largely depend upon the triangulation of multiple sources of data to describe the same phenomenon. The unit of analysis in this study is the quality of the academic verbal interchanges arising among five pairs of graduate students in online discussions within the online learning system and students' perceptions of the contribution of these verbal interchanges in the context of the online learning system. Dialogue is formed by initiation of a message by a member of the pair, response by the other in the form of a message and a comment on a topic raised in the original message. Comments are believed to be different than responses because they elaborate on the sender's major topic and offer the opportunity to generate discourse as defined earlier. Responses without comment may center on the sender's rather than the receiver's problems,

issues, and proposals and preclude the opportunity for discourse to emerge. Survey data was collected to triangulate patterns of dialogue and discourse to students' perceptions of the online learning system's facilitation of student learning through dialogue. Since students worked in pairs to construct dialogue and discourse focused on qualitative research, the assessment of the compatibility of the learning approaches of members of a pair served as an alternative window into what was happening as verbal interchanges and what students perceived to happen during their use of the online learning system to promote their own learning.

Participants.

This study took place in a course where the teacher ratings were significantly above the departmental mean for items assessing the instructional effectiveness. Ten graduate students were enrolled in the course. Of the 10 students, 2 were males and the remainder were women. All students had previously attained a Master's degree in Education, Psychology, Social Work or Health Sciences. Three students were Asian, and 7 were Caucasian. Student academic majors were in psychiatry, social work, learning sciences, special education and general educational psychology. Students engaged in the online learning system discussion tool as a medium for asynchronous online interactions beginning in the fourth week of the course through the 12th week. Participants were required to send each other written messages via the discussion tool provided through the online learning system each week, but were also allowed to seek other alternatives if they found this more efficient. Assignments structured the goals for interchanges between pairs of students. Assignments were of two types: a) to answer a set of questions about the assigned reading material and then post them online (on the online learning system) and discuss those questions deemed to further promote their understanding of the content of the seminar, and b) to share preliminary and polished proposals for a qualitative research study which was the end product for the seminar.

Data Collection.

In this study, we collected three major sources of data: a) electronic logs of the students' written interactions in the discussions section of the online learning system, b) student responses to a 60 item survey eliciting judgments and written responses to open-ended questions about their learning experiences in the online learning system, and c) comparisons of student pairs and their perceptions of how they approached their own learning based on [18].

Data Analysis.

Codes were used to analyze electronic messages of students during the course as dialogues, and sequences of dialogues making up discourse. To determine when discourse occurred in segments of the transcript, it was necessary to initially be identified as a sequence of dialogues. First, the subsuming topic of each dialogue made up of an initiation, response and comment on the response was identified. Then the coder continued to read the message until a new topic arose, or until the dialogue event ended and was followed by a new dialogue or message with a different topic. Each tentatively identified discourse unit was then analyzed to confirm its status as a text, by using the criteria for text cohesion in [19].

Results.

Table 1 shows the codes describing students' verbal interactions on the online learning system in each student pair for the 13-week course. Especially noteworthy are the large differences between pairs in number of academic dialogues produced and in number of discourse quality interactions arising during the course. On the other hand, the number of messages generated by pairs is not markedly different. ***Table 2*** shows the participation of pairs in the online learning system each week. All pairs participated more actively in the course when they were required to

present their partner's research proposal in the 5th and 6th week of the course. This emphasizes the fact that the nature of the academic assignments influenced the rate of participation in generating messages. The online learning system survey assessing students' perceptions of its contributions to their learning was generally positive. However, all the students agreed that classroom face-to-face verbal interactions led by the teacher were more important to their content learning than asynchronous online verbal interactions with a peer on the online learning system. ***Appendix A*** provides the voices of students regarding the positive and negative contributions of WebCT to their learning. ***Table 3*** shows that pairs which participated least and had lower rates of dialogue and discourse were prone to approach learning in terms of motive and strategies at a surface level. Pairs of students with more evidence of engaging in dialogue and discourse had one person in the pair who had deep learning motives and strategies.

Discussion.

In [15], Burbules and Bruce claim that the usefulness of forms of discourse will depend upon: (a) the form of interaction and its relation to context, (b) the activities and relations among participants, (c) differences among the participants themselves, and (d) the subject matter being discussed. The results of this study support the first three claims. Students rated the instruction in the course to be an average of 4.7 on a 5-point Likert scale based on 22 items used to evaluate instruction throughout the university. Therefore, what happened during the verbal interchanges through the online discussion in the online learning system was not based on students being unmotivated by the quality of the course, and this was also reflected in the agreement by all students that classroom face to face discourse contributed more to their academic learning than their verbal interactions with a peer. Although students rated many aspects of the asynchronous discussion component of the online learning system environment as positive, the actual proportion of academic dialogue and discourse produced did not mostly correspond to the positive stance of all students toward the asynchronous discussion's contribution to learning. One reason why student pairs may have varied substantively in their production of academic discourse is that at least one of the pairs did not have a deep approach to learning [20-27]. The teacher's presence as a facilitator of academic verbal interactions appears to be advocated by both deep and surface learners.

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Appendix 1 *Student Open Ended Responses to the questionnaire about their experience through the online learning system and their discussion*

I find it difficult to focus on the topics and dialogue with my discussion partner.

5- Although we have a different level of experience, the exchange of information was very useful.
5- My partner and I are at the same level in most cases we complemented each others understanding on given topics
5- It is not difficult to focus on the topic, but sometimes to really have a dialogue, because of time, and depth of the topics we are studying.
5- Since we are taking a face 2face class together, I find it easier and less time consuming to talk to him f-2-f.
5- I understand my partner -the dialogue is clear
5- The lag time between responses is too great to feel like a discussion (there was minimal dialogue).
5- We checked each other's messages regurlarly. Also, we both tried to explain our ideas as clearly as possible it worked.

I find writing down my ideas to prepare for online discussion facilitates my thinking to a higher level.

8- It forces me to reflect upon my ideas. Also, my partner's input to what I have witten provides insights.
8- Preparing answer to the prepared questions was helpful but management and engaging in dialogue was challenging
8- I agree this is true in both the discussion and the exercises from the book.
8- I hope so.
8- I think that for me it was the main help: clarify ideas for someone else to understand, so that I would be more ready for the class discussion.
8- I used them to write my proposal and engage in discussion.
8- I am mostly paraphrasing information I find in books, not applying it much.
8- It helps me to think more about the information than just reading alone

How at the end of the course I value on line discussion.

15- It asks me to be ready for the course as much as possible and then to make the most of the course
15- It is a tool that aids in my understanding and learning.
15- I prefer a face 2 face discussion.
15- It helped me to clarify ideas and concepts
15- It is more relaxed way of getting through the material. I appreciate being with someone I know well and comfortable with.
15- It forces me to be more organized. Also, it resulted in several useful insights.
Negative
15-I found that often, it was a perfunctory process, i.e., answer the question for the sake of doing so.
15- It felt superficial. I did not find the exchanges yielded a lot of feedback. It was difficult to engage in dialogue. I found it frustrating at times.

My discussion partner and I co-regulate our learning in on line discussion.

13- Each of us had areas where we had more knowledge and we are able to correct each others' thinking when we couldn't we looked things up on the net.
13- We can expand on each other's ideas; feedback is an excellent means of co-regulating our learning.
13- For sure, to be obliged to synthesize, clarifies one's ideas for the partner, is helpful in learning.
13- We shared ideas.
13- We always provided each other with valuable insights

On line discussion causes me to verify my thinking more than in class discussion.

18- Online discussion is interesting but in-class discussion and teaching is more important.
18- I do not have the impression it is more than in class.
18- I think the in-class is more stimulating for me because it is with more people, more diverse ideas, and it is in real time.

18- It is impersonal
18- My partner, at least in the beginning, asked questions. In the last weeks, WebCT became a chore. In the weeks prior to the last class, we e-mailed each other outside WebCT because it was a pain to always check the site to see if there was a message
18- In-class discussion is more personal, and ideas can be exchanged more easily. Also, in-class discussion involves the input of more than just two people (and it includes the professor).
18- I think that both are highly useful an in my understanding of learning and learning.
18- Sometimes. (yes, but there is a time constraint).

On line discussion helps me organize ideas for my thesis.

23- I got input from my partner, which was very useful. It forced me to think more about my thesis.
23- The questions we were given to answer in the course.
23- I am able to reflect on the material by writing it down and I appreciate the feedback
23- Only at the beginning of the course where we initiated our proposal draft..
23- It helped me cut my proposal into small parts to be worked at. But this is more due to the course organization
23- It is always a challenging way to manage and understand the subject matter. It is a good way.
23- I have changed ideas so often things sometimes get a little cloudy.
23- I have made several changes already.
23- The questions were not applicable
23- From the perspective of my partner rather than me.
23- I often posted up-dates on my project and the answers I prepared for the questions. Occasionally we would find the same questions confusing and plan to discuss them in class. It definitively felt more like "show and tell" than higher level learning.

On line discussion helps to modify my thinking as I design the research methods for my study Research proposal.

27- Reflecting upon my ideas and getting input helps me come to new realizations.
27-It is difficult to answer because i do find participation in class motivating; however, i do not find the discussions on line very motivating.
27- My partner asks for reasons and clarifications that doesn't come to my mind at first. At least as a beginning researcher.
27- You work in an active way to cope with the subject matter.
27- I find the in-class discussion more helpful
27- When I misunderstand elements and they are clarified then my ideas about my research change.
27- I see where I need to clarify certain points that maybe obvious to me but not to others (such as my research partner).
27- It was the questions we were given to discuss.
27- The dialogue was lacking in my experience.

My discussion partner's inputs are helpful to my design of my research.

38- Because my partner did not know my approach, she asked good questions. However, i could not say that it motivated me to greater heights since I already do my work and always prepare for class.
38- I really learnt a lot for the initial questions of my partner.
38- I want to emphasize that the teaching in the classroom is necessary, but WebCT is a useful tool to cope with all issues discussed in class.
38- I think it is the way the course and questions are designed.
38- Our interests are far away apart . This is the perfect opportunity to work through it.
38- It offers insight or an alternative viewpoint that is refreshing from my own. It is a "constructive feedback" voice.
38- We are the same level of knowledge, this is helpful. We did not use WebCT because mine was not allowing me to post, but we used email to discuss.
38- I found reading Creswell and writing responses to the exercises facilitated my learning.
(Why not using WebCT)- We used MSN a few times because it occurs in "real-time" which is a bit more satisfying and time efficient; I think time and stress management was a challenge to posting info in time for dialogue; I suspect English as a second language was a perceived barrier to candid discussion.

Information initiated by students

- I wished that WebCT had been used for the partner to come up with a joint project instead of me answering her questions which sometimes were redundant.
- I also found the part about talking about my partner's research difficult and at the end it was seldom requested.
- WebCT is not conducive to a conversation. The formatting of the documents is difficult (e.g., i had to enter my comments in caps to differentiate them from my partner's answers).
-What I would have enjoyed would have been a weekly chat online about the chapter/topic. Then, this is a conversation with back and forth answers.
-I did enjoy the pairing and welcomed my partner's questions. I just did not enjoy the format.

Table 1

Comparison of Individual and Pairs Quality of Verbal Participation during the Course

	Number of WebCT log ins*	Number of messages for course	Number of participations in dialogue	Number of academic dialogues	Number of academic discourses	Number of words generated
Pair 1: A	198	22	15			
B	166	19	14			
Total			29	7	6	6,331
Pair 2: C	202	18	4			
D	202	8	2			
Total		26	6	2	1	8,493
Pair 3: E						
F	161	10	8			
Total	104	13	20			
		23	28	5	3	7,361
Pair 4: G	251	16	37			
H	254	18	33			
Total		34	70	18	10	30,520
Pair 5: I	155	20	7			
J	170	15	9			
Total		35	16	5	1	6,462

* In another Graduate Course

Table 2

Participation from week 4-11 of the course*

Week	Participation for Pair 1	Participation for Pair 2	Participation for Pair 3	Participation for Pair 4	Participation for Pair 5	Mean Participation
4 and 5	0	6	17	42	13	15.6
6	0	0	1	13	4	3.6
7	8	0	1	0	0	1.8
8	17	0	0	8	0	5
9 and 10	4	0	9	6	0	3.8
11	0	0	0	1	1	0.4
Total	29	6	28	70	18	5.0

* Participation refers to the frequency of contributions to on-line discussion by the 5 pairs of students for 11 weeks of the 13 week course. Each week is devoted to a different topic. Weeks 4 and 5 were devoted to discussion of 4 qualitative research approaches and the development of a student research proposal and week 6 to philosophical and theoretical frameworks, week 7 to focus the study, week 8 to data collection. 9 and10 were devoted to ways of representing and analyzing qualitative data and week 11 to creating a narrative report. The remainder of the course was devoted to off line individual preparation of the final qualitative research proposal.

Table 3

*A comparison of the pairs of students approaches to learning on the SPQ**

	Deep Motive	Deep Strategy	Surface Motive	Surface Strategy	Achieving Motive	Achieving Strategy
Pair 1: A	+	+	--	--	0	-
B	--	-	0	+	-	-
Pair 2: C	0	--	--	--	-	+
D	0	0	-	-	0	+
Pair 3: E	-	0	-	0	+	-
F	-	--	0	+	0	-
Pair 4: G	0	0	--	-	-	+
H	0	0	-	-	-	+
Pair 5: I	0	-	0	-	-	+
J	0	-	0	+	+	-

* Note. The Study Process Questionnaire scores are based on the norms provided in Biggs J. (1987) Study Process Questionnaire Manual. Student Approaches to Learning and Studying. Hawthorn, Australia: Australian Council for Educational Research. Scores reflect a normative value of --Well below average, -Below average, 0 Average, + Above average, and ++Well above average. Pairs are judged as incompatible in approach to learning when their scores fall in opposite normative values for 3 of the six categories.