Student Interaction Experiences in Distance Learning Courses
A Phenomenological Study

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Abstract

This paper focuses on one of the most significant challenges in distance learning, the student-to-student interaction issue, by studying the interaction experiences of a group of students who have had a distance education experience. It addresses questions such as the current status of student interactions, the students' perceptions of such interactions, and the pattern emerged from such interaction behaviors. Using a phenomenological method, this study found out that the student interaction phenomenon in distance education was intertwined with many factors and themes. In order to foster an interactive learning community and encourage student interactions, all of the administrators, faculty, and staff in a distance education program need to collaborate with each other at an institutional level.

Introduction

Overview

Do students in distance education courses need interactions with their classmates? Jacob said, “no, because throughout the course, I don’t think my classmates will really know more than me. Why would they know more than me? Yeah, exactly, why do I think they study more than I do? So if I have questions, I would go straight to the professor." Young said, “I think that the student interactions were very important – the initial meeting, the icebreaker the bird camp – it allowed us to actively form this community of learners. We got into a collegial, non-competitive learning environment where it wasn’t about who has the best grade, it’s about look we all gotta succeed.”

Two students taking distance education programs, two wildly opposing viewpoints. What are the factors that make some students think interactions are necessary and important while others feel that they do not need them? Do these factors work differently under different situations such as different types of courses or with different learning styles? Many unanswered questions about distance education programs such as these are begging to be discussed as the growth rate for online enrollment in higher education far exceeds the growth rate for the entire higher education student population. But, because of the relatively infrequent face-to-face interaction between an instructor and the students, distance education has brought many new challenges to the teaching and learning process.

Topic and Purpose

This paper focuses on one of the most significant challenges in distance learning –interactions. Moore (1989) identifies four types of interactions in education: learner-content, learner-teacher, learner-learner, and learner-technology. In this paper, the main focus is the learner-learner interaction because few studies have focused on this issue. Although studies have shown the sense of isolation and low-motivation among distance education students (Boulos, Taylor, & Breton, 2005), they have failed to present the whole picture of the interaction phenomenon. For example, what kinds of interactions exist among students? How often do they contact each other? Are they satisfied with the way they interact? What is the pattern emerging from their interaction behaviors? All of these questions have not been studied adequately in the current research. Therefore, the purpose of this phenomenological study is to address the above questions by studying the interaction experiences of a group of students who have taken a distance education course.

Potential Significance

Distance education is a newly developing area, which requires many more studies in order to keep abreast with this rapidly developing phenomenon. Several studies have pointed out the positive relationship between the teacher-student interaction and student satisfaction and student retention (Kuh & Hu, 2001; Tinto, 1987; Tello, 2002). However, few studies have focused on the student interaction issues in distance education. Therefore, in studying the student interactions in distance education, this paper investigates an important area related to the overall quality in the field because student interactions have long been known as an important factor affecting learning outcomes. Thus, studying students' interaction experiences in distance education courses will improve our understanding of distance education and also foresee student learning outcomes from the whole institutional perspective including the administrative and teaching levels.

General Research Question

The general research question was "How do students perceive and describe their experience of interactions with other students in distance learning courses?" In this question, the key components are "how", "students", "perceive", "describe", "experience", "interactions", and "distance learning". As Moustakas (1994) points out the key words in a phenomenological study question should be defined, discussed and clarified in order to clarify the intent and purpose of the study. Therefore, it is necessary to explain the key words well before conducting the study. In my question, "students" refers to the participants and they are students in a higher education institution. "Perceive" means how participants see the phenomenon. It implies that different people see the same phenomenon differently. "Describe" refers to the meaning of the phenomenon. What does the phenomenon mean for the participants? "Experience" is the internal act of consciousness. It focuses on the conscious reflections of the phenomenon. "Interactions" is a kind of action that occurs between two or more objects where the action has an impact on each other. Here, it refers to any contact between students. It can be an email, a phone-call, or a face-to-face meeting. "Distance learning" is online learning by utilizing technology.

Review of Related Literature

Background

Distance education is also called distance learning, e-learning or online learning. Unlike conventional classroom learning, it is not bounded by space and time. In fact, teachers and students are commonly separated by space and time, although they may choose to interact synchronously or meet periodically over the length of the course. Distance learning also needs to use technology. In the early days of distance education, radio and television were the media used to conduct educational activities. Currently, the methods have extended to the internet, email, software, video, tapes,

cameras, etc. In comparison, instructors and students may choose to use technology in a conventional classroom teaching but is optional.

Because of the alternative approaches of distance education, it has grown rapidly in the past five years. According to the Sloan Survey of Online Learning, in the year of 2002, 81% of all institutions of higher education offered at least one fully online or blended course. Among public institutions, the number is even as high as 97% with 49% of them offering an online degree program. At the same time, over 1.6 million students took at least one online course during fall 2002 and among all U.S. higher education students, 11% took at least one online course (Allen & Seaman, 2003). In 2003, 2004, and 2005, the enrollment has jumped to 1.98 million, 2.35 million, and 3.2 million respectively. The three-year continuous 20% to 30% growth rate in online enrollments far exceeds the overall rate of growth for the entire higher education student population. Simultaneously, around 50% of all schools kept an optimistic attitude toward distance learning and identified online education as a critical long-term strategy in the three years (Allen & Seaman, 2004; Allen & Seaman, 2006).

Besides fostering common educational practices in conventional classrooms, distance education is portrayed as possessing more potential and thus more promise in promoting student interactions and enhancing learning outcomes by utilizing advanced computer technology. For example, Bruce et al. (2005) suggest the web has the ability to provide student interactions and multiple paths for learning. Learners can have greater control over information access, individualized pacing and timing and with more support in the inquiry process. Lebaron and Miller (2005) advocate the vast possibilities offered by effective online design: entry to a global range of resources, 24/7 interaction within a purposeful learning community, convenience of access, and opportunities for reflective dialogue.

However, because of the limited opportunities for face-to-face interactions between an instructor and their students, distance education has brought many new challenges to the teaching and learning process. Wang and Newlin (2000) point out that little is known about the characteristics of students in distance education courses. As a result, effective curriculum design is hindered by the lack of understanding of the characteristics, attitudes, and needs of the students in these courses (Smith, 1997). At the same time, the faculty needs to develop skills in helping students adjust to the unique features of distance education. However, the lack of adequate training may prevent them from fully participating in the distance education practices (Galusha, 1998), especially considering that they have to spend twice as much time in preparing and delivering an online course as compared to a traditional course (Willis, 1994). With all of the challenges facing distance education, studies show that distance learning students desire content and motivational support beyond course materials and are limited in their success without it (Williams, 2006).

Researchers have long pointed out the importance of student interactions in the teaching and learning process. Vygotsky (1978) states collaborative learning is necessary in building one's own cognitive process. Among group members, if they cannot share their knowledge effectively, it can lead to poor learning outcomes (Soller, 2004). To test the difference of collaborative learning and individual learning, Ellis et al. (1994) compares the problem-solving results between fifth graders who worked with a partner and those who worked alone. The result shows that 75% of the paired students solved the problem with new mathematical rules while only 32% of the students working individually came up with a solution.

To promote learner-centered education, the American Psychological Association (APA) designed a document -- Learner-Centered Psychological Principles -- to provide a guideline of the factors affecting learning in the 1990s (APA Work Group of the Board of Educational Affairs, 1997). It includes 14 principles which are grouped into four domains: cognitive and metacognitive factors, motivational and affective factors, developmental and social factors, and individual differences factors. Principle 11 relates closely with student interaction issues under the developmental and social factors. It states that learning is influenced by social interactions, interpersonal relations, and communication with others. As one of the principles have been repeatedly verified over the years (McCombs and Vakili, 2005), it confirms the idea that learning is enhanced by having positive relationships with other learners and permitting them to learn from each other in a trusting environment (McCombs, 2004).

Following the same principle, multiple researchers push for the idea of building an online learning community within distance education courses. In this community, the knowledge is co-constructed among the community of learners and not "delivered" from a single instructional source (Burbules

and Callister, 2000). Besides active communication, interaction, online presence, and moderated discussions, the formation of an online community is one of the key elements for high-quality online education. Fostering interactivity in an online community is the main indicator of success in online courses (Bender, 2003; Salmon, 2001). Swan (2003) points out that learners' interactions among classmates is one of the five areas of interactivity. Therefore, promoting student interactions in distance education courses is important for setting up an online learning community.

Theoretical Framework

Although the value of interactions has been recognized by researchers, the student interaction issue in distance education has not been well studied. Some researchers point out that the current inadequate understanding of the effectiveness of distance education is due to the lack of theoretical frameworks. That can be especially problematic for phenomenological studies because phenomenology falls in the "before" area of theoretical framing (Creswell, 1998, P. 86). Therefore, a theoretical framework is needed before the data collection and analysis process. For this paper, a potential theory - Cognitive apprenticeship theory was selected. The detailed discussion of this theory is as follows:

Based upon the constructivist teaching pattern, cognitive apprenticeship theory emphasizes external support provided by the educators in the learning process. Heuristic content, situated learning, modeling, coaching, articulation, reflection, exploration, and order in increasing complexity are the primary characteristics of a cognitive apprenticeships model (Wilson and Cole, 1994). It suggests creating a student-centered learning environment in which learners think and reflect on their thoughts in a joint intellectual effort in accordance with collaboration.

Essentially, cognitive apprenticeship theory aims to foster a culture in which learners intuitively believe that they can learn better if they share knowledge among themselves and interact with each other. Discussions in this learning process will facilitate individual cognitive growth so that learners will come to their own conclusions based on collaboration through interpersonal communication. From an instructional perspective, information is spread among the learners by means of observation and guided practice.

Cognitive apprenticeship theory is applied broadly in the area of distance learning in terms of media and learning interaction. Research shows that the outcome of traditional education and distance education are the same, only if one selects the appropriate teaching material and method, including student-to-student interaction and timely teacher-to-student feedback (Moore & Thompson, 1990; Verduin & Clark, 1991). In general, the collaborative learning culture promoted by the cognitive apprenticeship theory can be applied into all the situations of the teaching and learning processes. However, because of its unique application for the distance education field and the urgent needs of such theories in the field, the cognitive apprenticeship theory is very helpful in planning distance learning courses.

In this paper, the student interaction experience will be assessed by investigating if the students have had positive interactions with other students and if they have developed a collegial and supportive relationship between each other. During the courses, whether the students have been encouraged to interact with other students and what are the factors affecting student interaction in a distance education course is also studied.

Design and Methodology

Overall Approach and Rationale

This study employed phenomenological methodology for a couple of reasons: first, the research question is concerned with the experience of the participants, and phenomenology is concerned with "the meaning of the lived experiences for several individuals about a concept or the phenomenon" and "exploring the structures of consciousness in human experiences" (Creswell, 1998, P. 51). Therefore, this methodology works to help find out whether interactions exist among students in distance education. Second, besides finding out the meaning of the experience,

phenomenology also concerns the inward consciousness of the participants. Since interaction is an issue full of personal feelings, it is important to investigate the underlying consciousness beneath their experience. Thus we can grasp a whole picture of the phenomenon.

Population Selection and Access

In this study, two criteria were required in selecting the participants: they have taken distance education courses and they could consciously articulate their experiences, which were determined in a pre-selection interview process. At the same time, this study tried to follow the maximum variation sampling techniques. In selecting the co-researchers (participants) for this study, the co-researchers should have (1) studied or were studying their online courses in various types of institutions such as community colleges, public universities, and private universities, (2) were of a wide age range, (3) majored in different disciplines, (4) came from different ethnical backgrounds, and (5) possessed a wide range of experiences with distance education. The goal of this sampling method was not to generalize, but rather to see the pattern emerging from a variety of backgrounds (see Appendix B).

To follow the criteria for population selection and access, the following steps were used to select the participants:

1. A statement of purpose was prepared and sent to a large community of students who had taken or were taking distance learning courses. The statement included the intention of the study and an invitation to have a short interview with the researcher.

2. For the people who responded to the letter, a 10-minute interview was conducted with each person. There were two purposes for the short interviews: a. To inform the interviewees the purpose of the study and their rights in the study process. b. To find out if the interviewees were suitable and if they had time to commit to this study.

3. With mutual agreement, the selection of participants was finalized. In general, the purpose of this process was to remove “any misconceptions and anxieties that the participants had about the research and to leave them with a sense of dignity” (Blanck etc., 1922, P. 961).

Data Collection Procedures

Interview

Phenomenological studies primarily rely on in-depth interviews to collect data. The appropriate number of participants is ten or less and the in-depth interviews can go as long as two-hours for each session (Creswell, 1998). A semi-structured interview protocol was selected for this paper. It allows more variation than traditional structured interviewing and reflects the importance of co-construction between the research and participants. The interview protocol was designed according to my general research question and the theoretical framework (see Appendix A). In total, five co-researchers were interviewed multiple times over the process with each interview ranging from forty-five minutes to two hours.

Other Methods

Besides in-depth interviews, a search was conducted to find a variety of documents to collect more data for this study. The documents were: (1) the course syllabus in which any of the course requirements were related to student interactions, (2) public documents such as federal and state regulations related to distance education, institutions’ mission statements and distance education design protocols, and (3) documentations and articles from a variety of distance education associations and journals.

Data Analysis Procedures

Epoche

Moustakas (1994) points out that "the Epoche, a Greek word meaning to stay away from or abstain … In the Epoche, we set aside our prejudgment, biases, and preconceived ideas about things". As a result, "the world in the bracket has been cleared of ordinary thought and is present before us a phenomenon to be gazed upon, to be known naively and freshly through a "purified" consciousness" (P. 85). It is an important step before the start of the data analysis process. To achieve such "purified" consciousness, I wrote down my past distance learning experience and cautioned myself of imbedding it in the tone of asking questions, in the way of interpreting the results, and in the process of writing up the conclusions. To further reduce the prejudices I might bring to the study, this procedure and the following ones were preceded with the triangulation method listed in the trustworthiness section.

Horizonalization

Horizonalization is a procedure in selecting the significant statements for each individual co-researcher. In doing so, I followed Van Kaam's (1959, 1966) criteria for determining the horizons under Moustakas's recommendation. The two requirements are: (1) whether it contains a moment of the experience that is necessary and sufficient constituent for understanding it, or (2) whether it is possible to abstract and label it? If so, it is a horizon of the experience. Expressions not meeting the above requirements were eliminated. Overlapping, repetitive, and vague expressions were also eliminated or presented in more exact descriptive terms. The horizons that remained were the invariant constituents of the experience. Therefore, repeatedly reading the transcripts and combining it with the nonverbal communication indicators as written in the notes, reduced each transcript into several horizons.

Phenomenological Reduction

It is the process of continually returning to the essence of the experience to derive the inner structure or meaning in and of itself. Data were then clustered into themes, and repetitious statements were removed. This step was also combined with further thematizations by bringing together initial themes into more all-encompassing ones. Boyatzis (1998) points out that a good thematic code should have five elements: a label, a definition, two descriptions (indicators and qualifications), and examples. In deciding the themes of the co-researchers' essential experience, Boyatzis's criteria was followed.

Exhaustive Description of Student Interaction Phenomenon

Student interaction phenomenon is a very complex issue. Many factors are intertwined together to make it hard to comprehend at a glance. Therefore, the description of this phenomenon was grouped into five factors and their sub-themes. To capture the richness of such experiences and the intertwined nature of the themes, a model was created to describe this process (see Appendix C). The detailed descriptions of student interaction phenomenon are presented in the results section.

Trustworthiness

As for the phenomenological methodology, Creswell (1998) points out some verification methods specifically to be used. For example, rich and thick description is one of them. In reading Moustakas (1994) and Polkinghorne (1989) and combining the standards set up by other researchers

such as Lincoln (2000)'s eight standards, a triangulate procedure was designed to warrant the trustworthiness and credibility of this study (see Figure 1). It benefits this study by providing corroborating evidence and utilizing multiple theories, resources, and methods.

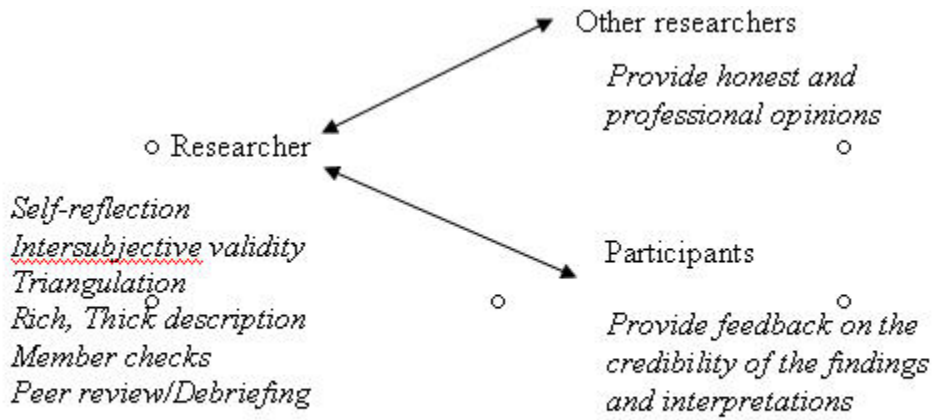

Figure 1 Triangulate Trustworthiness Method

Study Results

The amount of student interactions in a distance education course was affected by multiple factors and these factors also interacted with each other making the student interaction behavior quite a complicated phenomenon. The dominant factors identified in this study are the instructor factor, the learner factor, the course factor, the difference from a traditional course factor, and the convenience factor. Under each factor, several themes were built to further explain the complexity of such a construct and the interactions among the themes were also presented (see Appendix C).

Instructor Factor:

There are three themes under this factor: course design, teaching style, and use of technology. From the data analysis result, it is quite obvious that the instructor factor, especially the course design theme, was critical in determining the amount of student interactions in a distance education course. From the co-researchers' experiences, the instructor had to be the one who deliberately took the effort to initiate student interactions. The instructors not only needed to require some method of student interaction in their syllabus or in other course materials, they also needed to be very explicit about such requirements using methods such as including student interaction as part of the grade or stating clearly that students need to ask questions and respond to their classmates through the semester. For example,

> I think you have to be the professors that were more effective and be more exclusive that they told us to ask the questions, to use the board to ask questions and something like that… Being very clear about the course learning goals and promoting as much as interactions as possible through the medium. I don't think it's very beneficial if professors just post information online on the blackboard site or whatever the system they are using and just let students to do on their own (Andrew).

> It makes a difference again depending upon the way the class is moderated. You have to at the onset be very clear what the requirements are, and what the expectations are. You have to provide some degree of resources. The hardest thing is to get traction, to get started (Young).

Teaching style is important to student interactions no matter whether the student studied a traditional course or a distance learning course. Some instructors liked to give lectures and did not facilitate interactions between students in their course. Other instructors encouraged student to interact using group projects, discussion sessions, asking students to email each other or posting messages on the discussion board. As a result, students had more opportunities to interact with each other in their courses. All of my co-researchers brought this issue into light when they mentioned their distance education experiences. For example,

> Some professors let you discuss in the class. Some instructor speaks a lot and you don't have time to discuss with your classmates. Interaction with students is totally different depend on the professor. I do have a class that you need to talk a lot. Other classes you don't really say a word until you leave (Jacob).

> Instructor plays a major role as well. If the instructor is he just I want to teach the course, come to the class, that's it. It's highly discouraging student communication. But I met instructors in the regular class, traditional class, where he encourage students to email stuff around and post news and bring something they want to discuss or email or post to blackboard or something, that might help. So depends on the professor (Judd).

Current distance education practices in general utilized some computer technologies such as the internet and instructional software such as blackboard. Therefore, how well an instructor used such technologies had an impact on the quality of their teaching. The institutions faced difficulties in putting instructors abreast with current technology development, and more importantly in understanding how the instructors can use the technology in an innovative way that makes a difference in student interactions. Just like Andrew said that,

> We have much large potential to facilitate interaction than what we current do … If the teacher has to know how to use it and they have to be conscious about how they are going to use it… (However) faculty doesn't want to get trained and also a lot of them are not comfortable with technology yet until the level they can get beyond the basics and think about the innovation.

Learner Factor:

Another equally important factor identified in this study is the learner factor and there are three themes under it: learning style, motivation, and satisfaction. Similar to the teaching style under the instructor factor, different learning styles also had an impact on the interaction process. Some liked to go to class and interact with other students, while others liked to study on their own and not interact with other students or interact with other students as little as possible. Such differences in learning style can be seen from students' discussion of their satisfactions with distance education courses. For example,

> So it depends on your learning style as well. If you like to work on your own and figure out things on your own, perhaps to learn from the group you might have to do more work than on your own, it depends on the learning style (Jacob).

> It depends on the types of students and the course. And if the course is really difficult and it cause lots of explanation from the

> professor you know it's not like something you can just pass. That will be hard. It also depends on the students. Some students they can learn easily by the book or they learn easily by coming to the class and listen. It depends (Judd).

For the students who liked to have the support from their classmates, the lack of interactions in distance education courses decreased their interests in such courses. On the contrary, for the students who are independent learners and like to figure out things on their own, the lack of student interactions appeared to have little impact on their preference of distance education. Therefore, learning style showed as a factor in deciding how much a student will interact with other students and how satisfied they are with the distance education courses.

Motivation which mainly deals with the motive a student has to interact with other students was an important factor in assessing a student's desire to initiate interactions. Judging from the co-researchers' experiences, the motivation to interact with other students in distance education courses was strikingly low. Many of them stated that there was not any incentive for them to email other students or post and respond to the message board. For example, Andrew said,

> If it (interaction) is not part of the course, um…written in the syllabus, so it usually doesn't happen. (laugh…) so…um…because you are not really motivated to do it. It's no real kind of incentive to do more work… There isn't enough time to be innovated on your own. So it's really how the teachers use the system that affects how the course goes.

The low motivation to interact among distance education students can be explained by combining it with the convenience issue. When the students took advantage of the convenience that distance education gave them by not coming to classes in a physical location, they had more flexibility in working on other things in their lives. As a result, they did not want to put more time and effort in interacting with other students if they were able to pass the course by themselves anyway.

The satisfaction the students felt toward a distance education course was related to the student interactions in a large degree. The majority of the participants thought the interaction is an important component of their learning experience. For example,

> I didn't, I didn't like it (the distance education course) as much as a traditional class because I really didn't … I didn't talk to (my classmates), I don't know, I didn't even talk to the teacher (Chad). The most successful course I think is the professors had us to do a lot of discussion. So lots of posting to the discussion boards and responding to each others' posts and asking questions to dialogue um… to start a dialog. Also having us to collaborate on a project (Andrew).

Difference from a Traditional Course Factor:

Another factor that emerged from the data analysis process was the differences from a traditional course factor. The three sub-themes are self-study, self-discipline, and different time frames. The majority of the co-researchers portrayed their distance education courses as self-study courses. For example,

> But overall, we prepare ourselves. We take notes and so forth but that's it. That's the way I take online course. I think it is a self-study course (Chad). The biggest difference I would say is learning the materials on your own by yourself instead of having someone teach the material to us. Actually being a teacher. That's the biggest problem (Jacob).

Such perceptions of distance learning courses led to independent learning styles among students. The students thought they needed to study by

themselves and did not want to contact their classmates. As a result, they were less likely to interact with their classmates. These students' perceptions of distance learning courses were closely related to the instructors' course design strategies. If an instructor only sent the course syllabus and reading list at the beginning of the course and expected the students to do everything on their own, it was easy for students to draw a conclusion that online courses are self-study courses. From another angle, such perceptions also indicated the failure of including interactions in distance education courses.

Self-discipline is a topic mentioned by every co-researcher. It basically means that students have to set up a schedule to study in order not to procrastinate. Contrary to a traditional class, the distance education course did not give the students the opportunities to discuss many issues in the classroom every week. Therefore, the students needed to make sure that they finished the amount of the work every week so they would not fall behind schedule. Since the students usually had other things to do, it was easy to procrastinate and do everything at the last minute. For example,

> It's harder on the students because when we meet in classroom you kind like encourage… the classroom study encourage and motivate students to like study. They enforce it. Because if you don't come to the class, discipline yourself and then most likely you will not succeed (Judd).

> It is very hard to be motivated to get the work done. And if you do an online class, you really have to be a good time manager, because it's easy just not to do the work sometimes. Because you don't go to the class, the only thing get you motivated to get stuff done is the due date so in that perspective, it is hard. You have to really be able to plan yourself and plan your time because no one will do it for you (Andrew).

There was generally a supportive relationship between self-discipline and student interaction. Student interaction can help students' self-discipline by keeping them on track. At the same time, a student who was self-disciplined had a better chance to interact with other students. Young shows us that,

> You can't just sit in your corner and then expect everybody to believe that you did the work. There has got to be something, and in order for it to be effective it needs not to be an end of semester hurdle that you jump over. It needs to be ongoing feedback so that people can basically take corrective actions if corrective actions are needed. They can check with others and say I need to do a little something because I'm falling behind.

At the same time, because most students in distance education courses sent information to each other by email or posting on the message board, they usually did not get the responses right away. Therefore, there was a time differential between asking questions and receiving responses. Some students were not comfortable with such time lagging. As a result, they did not like the way students interacted with each other in distance education courses and felt isolated or anxious. For example, Andrew did not mind the time lagging issue. He said,

> But online you have to post something and then write about it and explain it and then wait for somebody else to respond to you. So it might take a little more time … for that process. It would be just in different time frames. I think you just have to give somebody more time to do that.

> However, Young did not like it. He said,

> One of the things is that you got to have a wide enough pipeline so that students don't get frustrated with responses. In other words, if I'm typing a response, I don't want to hit a letter and then have to wait.

Course Factor:

The course factor included two themes: difficulty and type. Difficulty means how difficult a course was. Some of the co-researchers divided their courses into higher division courses and lower division courses. The more difficult a course, the more the course required student interactions and vice versa. For example, Judd stated that,

> But if it is higher division courses, I would rather take a traditional class… because of student interaction for that one. You get help from your friends, you can meet, and do group project, even to study together.

The type of courses also mattered to the amount of student interactions in distance education courses. Some subjects required more student interactions than others. For the type of courses that required more student interactions, it was natural to see more student interactions happen. As an example, Jacob who is an independent learner, said that,

> So if I have questions, I would go straight to the professor. I tried to figure out things on my own… (However) Math classes aren't as factual. Yeah, it deals with lot more with formulas, equations when to use each one. I do think that I definitely would ask my classmates and also study more time with my professor.

Convenience Factor:

Another factor was the convenience factor. As discussed earlier, the time and space separation in distance education courses provided convenience to the students by allowing them more flexibility in managing their time and activities in their personal lives. Although this feature of distance education does not relate to student interactions directly, it is closely related to the learners' motivation and the instructors' course design as mentioned earlier. Therefore, it was an important component in determining student interactions.

Conclusion

The student interaction phenomenon in a distance education setting is intertwined with many factors in an institutional setting. Therefore, in order to understand student interactions in distance education courses better, an investigation into this issue with a bigger picture in mind is needed. The major implications of this study impacts the areas of complexity, learning community, and learner differences as it pertains to student interactions in distance education.

Complexity

The student interaction issue was never an isolated issue which only matters between students. It actually related to the whole components of an institution. Cox (2005) applies the institutional theory to higher education institutions and concludes that six basic components underly the institutions' capacity of offering distance education courses. The six basic components are Administrative commitment (allocating resources), Online student support services (registration, advising, providing access), Full-time online coordinator (assisting course development and online teaching issues), Internal/External financial and technology resources (computers, online course management system), Online professional development (developing faculty online knowledge), and Adequate faculty participation (enough innovators supporting online education). From our study results, we can draw the conclusion that the design of a distance education course or program in a large degree related to the amount of student interactions occurring in a course. For the courses or programs that encouraged student interaction and counted it as part of the evaluation of

student performance, it was natural to see more student interactions in them.

A common theme in the study results section showed that instructors played an important role in this picture. John Cowan, a renowned professor for his work in fostering learner-centered courses in British Open University, suggested the instructors to count the issues they value into part of the grade (Lebaron and Miller, 2005). For example, if an instructor values student interaction, then he or she needs to state in the syllabus that student interaction will count for x amount of the grade. If not, it is easy to let students complete the courses without interacting with other students.

However, in order to add the six basic components supporting distance education discussed in this paper, instructors need tremendous assistance from the administrators. The administrators need to enlist the help of financial and technology technicians, teachers' training staff, and a team of online program coordinators in order to provide an online course successfully. In fact, all people affected by distance education programs should be responsible in improving the quality of the online courses. Drawing from the successful experiences of Andrew and Young, the program and curriculum design largely affected the amount of student interaction in a distance education course. The design which clearly imbeds the component of promoting interactive activities had a better chance to increase students' satisfaction with the courses.

Learning Community

In the study, several participants perceived their distance education courses as self-study courses because their instructors only uploaded the syllabus and readings online and let them follow the syllabus. In their description of distance education experiences, we can tell that there was no sense of an online learning community in the course of their study. To an extreme, some students even thought self-study is the way that distance education works. However, numerous studies have pointed out the idea of learning as a social activity (Bandura, 1977; Vygosky, 1978) and the necessity of building an online learning community (Bender, 2003; Salmon, 2001). Therefore, how to proceed to set up such a community is an important topic for many online courses and program administrators and designers. One recommendation drawn from this study is setting up initial meetings to get students familiar with each other and to identify the different areas of knowledge their classmates possess. Building on that foundation, it will be more likely for the students to take the initiative to contact each other and learn from each other.

At the same time, another issue worth discussing here is the mono-communication method used among the co-researchers in this study. For example, we only see text-based communications such as email, discussion boards, instant massaging, and newsgroups as the only way to communicate with other students. Other communication methods such as the telephone, video conferencing, or interactive software were rarely or never used. Considering the vast potential computer technology brings to us, innovation on this area should be included as part of the plan in building our online learning communities.

Learner Differences

Lin et al. (2005) applies Jung's eight-psychological-type theory into investigating the individual learner's reaction to distance education. Jung's eight psychological types are the combination of introversion, extraversion, intuition, imagination, thinking and feeling. The conclusions the authors draw are (1) the ways individuals tend to interact with the online media are consistent with their ways of interacting with their traditional face-to-face learning environment and (2) the distance education environments can provide an integrative approach in which each of the psychological type can be honored. For example, for an introvert learner, asynchronous written discussions offer them time to think and reflect before posting their thoughts; for an extrovert learner, viewing different perspectives otherwise unavailable improves their learning experiences.

Although our study displayed the differences between the different types of learners and their reactions to student interactions in distance education, it is not nearly as complicated as Jung's eight psychological types. However, the piece of the instructors' intention of compromising different

learning styles was missing. Previous studies have shown that online courses tend to use pedagogies that are same for all the students (Kapitzke and Pendergast, 2005). However, in order to meet the diverse needs of all students in an online context, both the course design and the pedagogical approach need to be re-conceptualized (Husmann and Miller, 2001). Therefore, this study reminds us again the importance of designing courses that fit all the students' needs. Judging from this study, there is a relationship between learning style and the amount of interaction. However, if we combine learning styles with the principle of building an online learning community and the psychological type theory, learners with different learning styles should all be active in the interaction activities because such activities can satisfy every learner's needs if the course design and pedagogical approach is re-conceptualized.

Limitations

There are several limitations in this study: (1) although the focus of this study is student interaction, it is also beneficial to conduct interviews with instructors, administrators, and other related personnel. By only interviewing the students, it is harder to see the whole picture of this phenomenon because it intertwines with so many other issues in an institutional setting. (2) It is also meaningful to separate the distance education into different types such as synchronous and asynchronous distance education, pure and hybrid distance education depending on if meeting in a physical space. As mentioned in the data analysis section, different types of distance education have an impact on the student interaction behavior. (3) Student interactions can also be distinguished as direct interaction (as in e-mails, chats, calls to one-another) and indirect interaction (as in cases when they all participate in a common bulletin board, but don't directly talk to one another.) A comparison of different modalities such as written, spoken or images could have been implemented. Such distinctions of interactions would improve the quality of systematic analysis of this phenomenon.

In conclusion, student interaction is a complicated issue that needs more research to increase our understanding as it applies to distance education. By interviewing and observing the students who have taken distance education courses, this phenomenological study not only reminds us of the complex nature of this issue, it also presents us an interactive relationship of the related factors and themes underlying the interactive behaviors of students. To follow the factors and themes further, we can investigate how exactly all the factors and themes play a role in the interaction process and thus design a better distance education model to encourage student interactions and build an online learning community. At the same time, we can also use the factors and themes as the foundation to investigate its relationships with the components in an institutional setting or the social setting and thus see the bigger picture of this phenomenon. In a sum, there are many possibilities for us to continue researching this issue and appreciate the importance and complexities it brings to distance education.

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Appendix A:

Interview Protocol

My general research question is “How do students perceive and describe their experience of interactions in distance learning courses?”

The subset questions include:

1. Tell me your overall experience with distance education. Do you like it?

2. Tell me about your experience of the student interaction in distance education?

3. Have you contacted your classmates at all over the length of the course?

4. If yes, how do you contact them? By what methods? What is it like?

5. How often do you contact your classmates? Do you contact them more when an assignment is due, when the exam is coming, or other times (specify)?

6. Are they satisfied with the way you interact with your classmates? What does that feel like? What makes you satisfied?

7. Based on your experience so far, what are things you wish you can change to make your interaction with your classmates better?

Appendix B:

Co-researchers' Information

Pseudonyms	# of online courses taken	Course Title	Major	Type of institution the courses offered	Interact with classmates	Ethnicity
Jacob	1	Information System Design	Business	Four-year Public University	No	Mixed
Judd	1	Information Decision Support System	Management Operation (Business)	Four-year Public University	No	Asian
Chad	1	Advanced Web Design	Art	Two-year Community College	Only with a relative	White
Andrew	5	Part of the Masters' program in Computing and Education	Education	Private Research University	Yes	Asian
Young	10	Part of the Masters in Educational Technology program	Education	Small Private University	Yes	African-American

Appendix C

Student Interaction in Distance Learning Course Chart