

Pre-Service Teachers' Perceptions of Asynchronous Online Discussion on Blackboard

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The purpose of this phenomenological study was to understand students' perceptions of using asynchronous online discussion as a learning tool. Six pre-service teachers who took a course in educational technology applications for secondary grades at a Rocky Mountain region mid-sized university were selected to be interviewed. Phenomenological data analysis was used to analyze the interview data. The interviewees' perceptions of the asynchronous online discussions centered around purposes, group size, tools for learning, advantages/disadvantages, and the instructor's role. The findings of this study provide instructors with helpful information on how students perceive asynchronous online discussion and also provide instructors with possible interventions to enhance students' motivations for participating in asynchronous online discussion. Key Words: Asynchronous Online Discussion, Pre-service Teachers, Phenomenology, Instructional Design, and Teaching Online

Introduction

When I, Hsin-Te, first came to the United States from Taiwan for my master's degree, I was confused about the term "distance delivered" on the available courses list. I asked one of my friends what "distance delivered" meant, and I found out that there were online classes offered at most universities in the United States. When I took my first class about the topic distance learning, I was surprised to discover the fast growth of online learning in the United States. My interest in the study of online learning emerged and I am now working on research related to this topic.

For decades, distance learning has been a fast-growing resource for learning. The advent of the Internet and the World Wide Web (WWW) has turned teaching and learning into a new age of distance learning. Universities are adding or converting traditional courses and programs to web-based instruction or online learning environments (Davidson-Shivers, Tanner, & Muilenburg, 2000). Also researchers have conducted, or are conducting, studies on online learning because of the new trend in the field of education. Some have found online instruction increases student participation, while others have reported that students prefer the traditional face-to-face format (Christopher, Thomas, & Tallent-Runnels, 2004). Regardless of this incongruity, online learning is growing and has become a trend all over the United States and the world.

Online learning is growing quickly in higher education today. More and more online classes are offered in universities and colleges. Online learning seems to be an inevitable trend in the world of technology and distance learning. Take a Rocky Mountain region mid-sized university for example. There are more than 75 online courses, including both undergraduate and graduate, offered each semester. According to

Levin (1997), online teaching and learning presents new challenges for faculty, students, and administrators in higher education institutions. Teachers and students have to find the most effective and efficient way to benefit and flourish from the online experience. Learning management systems, such as Blackboard (<http://blackboard.com>) and WebCT (<http://www.webct.com>), have been developed to help implement online classes, including teaching and learning. On campus, many face-to-face classes also use Blackboard as a course supplement. Instructors make use of one of the features of Blackboard called “discussion board” as a tool to increase the interaction in online classes. However, some people do not like using discussion board to teach or learn because of low student participation and motivation, and also because of the long time spent in reading and replying. On the other hand, other people report positive feedback and attitudes towards the use of asynchronous online discussion. Positive feedback and attitudes bring hope for the improvement and the ongoing implementation of online discussions.

Asynchronous online discussion is an effective way for the instructors and learners to interact in the online settings. Asynchronous online discussion does not require all the participants to be present or be available at the same time. Black (2005) indicated that “asynchronous discussion allows students to read and respond out-of-time” (p. 5). The discussion board is a “room” designed for both the instructors and learners to share experiences, opinions, ideas, suggestions, and feedback in order to compensate for the absence of face-to-face interaction of online classes. If the “room” (the discussion board) is available and functioning, but the users do not decorate or organize the room well (use the discussion board in creative and useful ways), the room will turn out to be an unappealing and useless room (no learning will take place). This analogy indicates that the instructors have a responsibility to make the discussion board a stimulating and organized room that meets the needs of the learners and facilitates student participation in the asynchronous online discussion. According to the experiences of discussion board users, we, the authors, firmly believe that it is possible to improve the low participation and quality of asynchronous online discussion. The first step is to investigate the current use of asynchronous online discussion, and then select possible and effective interventions for facilitating students’ participation in the online discussion.

Blackboard discussion board has been used at our university for over five years. Some teachers and designers also have been trying hard to improve the teaching strategies and discussion board interface to boost learning and teaching effectiveness. An important basis for enhancing the effectiveness of using discussion board and facilitating students’ participation is users’ perceptions and comments. The purpose of this study was to understand pre-service teachers’ perceptions of asynchronous online discussion on Blackboard. The research question of this study was: What are pre-service teachers’ perceptions of asynchronous online discussions? The result of this study will provide instructors who are implementing, or will implement, asynchronous online discussion with information on students’ perceptions of online discussions, and how instructors might implement online discussions.

Methodology

In this qualitative study, we sought to examine the phenomenon of asynchronous online discussions (Merriam, 1998; Stewart & Mickunas, 1990). Merriam identified five characteristics of qualitative research, which were evident in this study. First, qualitative researchers aim to understand the phenomenon of interest from the participants' perspectives, not the researcher's perspectives. In this study, we were interested in understanding the use of asynchronous online discussions from the participants' perceptions. Second, the researcher must physically go to the participants and the setting (the field) to collect data. In this study, we conducted in-depth interviews to collect the data. Third, the researcher is the primary instrument for data collection and analysis. In this study, Hsin-Te, also the instructor of the participants, was the major instrument for this data collection and analysis. Fourth, qualitative researchers primarily employ an inductive research strategy. In this study, we purposely selected the participants, interviewed the participants, and arrived at the final conclusion through narrowing down categories and statements derived from the participants' perceptions. Last, the result of a qualitative study is richly descriptive, not a numeric report. In this study, we portrayed the participants' perceptions through the use of rich quotes.

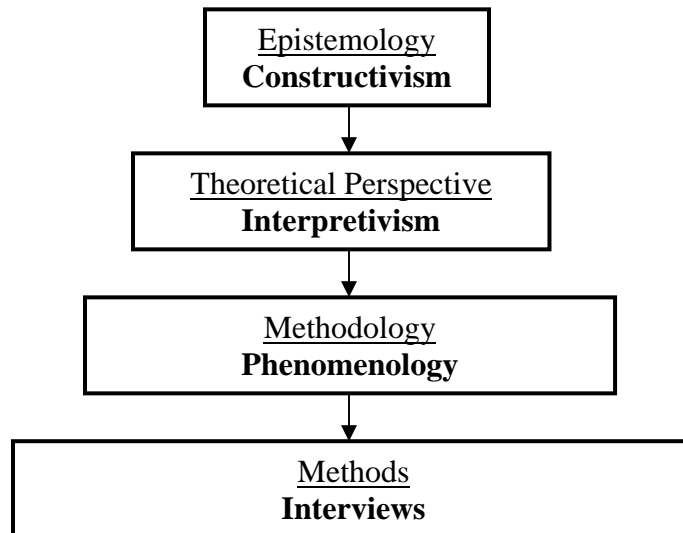
Creswell (1998, 2007) and Merriam (1998) indicated that there are several types of qualitative research designs. Among the different types of qualitative research design, we defined this study as a phenomenological study. Phenomenologists describe structures of consciousness in human experiences and depict the meaning of the lived experiences for several individuals regarding a concept or the phenomenon (Creswell, 1998, 2007; Polkinghorne, 1989). What appears in consciousness is the phenomenon. Phenomenologists assume that socially constructed realities exist and that the meanings individuals give to their experiences should be the objects of study (Bogdan & Biklen, 1992). Patton (1990) indicated that phenomenology is based on the assumption that there is an essence or essences to shared experience. A phenomenological study draws from the philosophy of phenomenology in its focus on experience and interpretation (Merriam). Moustakas (1994) further indicated that phenomenology is the first method of knowledge because it begins with "things themselves." Phenomenological researchers often view participants as interpreters of their studies (Van Manen, 1990). Additionally, the researcher who conducts a phenomenological study seeks to discover and understand the essence or structure of an experience (phenomenon) by using data that are the participants' firsthand experience of the phenomenon. The purpose of a phenomenological study is to describe and understand meanings or essences of a lived experience or phenomenon. In this study, we sought to describe and understand pre-service teachers' perceptions of using an online discussion board on Blackboard through their experiences. Therefore, this study is a phenomenological study depicting the phenomenon of pre-service teachers' experiences of using asynchronous on-line learning.

Research Framework

Each social researcher must decide his or her framework to guide the research process (Crotty, 1998). Crotty proposed four elements of social research composing the framework of research process: (a) epistemology, (b) theoretical perspective, (c)

methodology, and (d) methods. Based on Crotty's model, we have decided our framework for this study (see Figure 1). As a researcher, a personal philosophy of the nature of knowledge is necessary in order to study the knowledge existing in this world. The research epistemology is an important rudder, which provides direction toward the pursuit of knowledge. Constructivism is that rudder we hold to seek meaning in the sea of knowledge. We believe knowledge is constructed through our personal experiences with life and engagement with learning activities. As constructivists we reject pure subjectivism and seek instead to understand the interplay of the human mind with the object world. Under the guidance of this epistemology, interpretivism is the theoretical perspective for conducting this study. Interpretivism shapes the way we research the world. Interpretivism is an attempt to understand and explain human and social reality (Crotty). The way to understand and explain human and social reality is via the experiences of individuals. The unprejudiced meanings of people's experiences may be investigated through gathering data "by way of unstructured interviews in which only open-ended questions, if any, are asked" (Crotty, p. 83). Consequently, interpretivism was the theoretical perspective that framed this study designed to explore participants' perceptions. In terms of methodology, we applied phenomenology to the research methodology of this study, which has been addressed earlier in this article. As for the method of this study, we conducted in-depth interviews to collect data in order to answer the research question, which was described earlier in this article.

Figure 1. *Research model based on Crotty's (1998) four elements of social research.*



Researchers' Roles

Hsin-Te had the primary role in conducting this research study. He was the course instructor of the participants, and he also conducted the interviews, transcribed, and performed the initial analysis of the data set. Maria, Hsin-Te's research professor, met with him throughout the study in order to help frame the initial research design, articulate the theoretical framework, discuss emerging findings, check for bracketing of the

researcher's experiences, and write the final article and revisions. Maria served as an overall peer check (Merriam, 1998) in this regard. For example, Maria read and wrote comments on Hsin-Te's research journal. Hsin-Te and Maria then met and discussed the research process in a reflexive manner. It is of interest to note here that while Hsin-Te initially found asynchronous online discussions to be an exciting instruction possibility, the experience of teaching the students, analyzing the study data, and reflecting with Maria enabled him to see limitations to this instructional method. This is just one example of how the nature of collaborative research influenced the study.

Participants

The participants in this study were six undergraduate pre-service teachers who took a one-credit course in educational technology applications for secondary grades at a Rocky Mountain region mid-sized university. In this class, pre-service teachers learned how to integrate technology into teaching, including the use of an instructional design model for the design of technology-integrated lesson plans in conjunction with the use of teaching strategies. Some other topics related to the use of technology in teaching were also included in the course content. There were three sections of the course offered. The six participants voluntarily agreed to participate in this study. All the participants in this study have been assigned pseudonyms.

Two students from each of the three class sections were purposely selected according to their performance to be in the study. The two students from each group included one student with satisfactory course performance and one student with unsatisfactory course performance in the asynchronous online discussion. The criteria used were the students' frequency of participation and the length of the postings on the discussion board assessed after the six-week participation in asynchronous online discussion. If the students had low frequency of participation and short postings, this was not necessarily inferred as them being unsatisfactory students overall. Those students might have great knowledge of the discussion topic, but they were not interested in the online discussion. The classification of satisfactory and unsatisfactory performance was used only for the purpose of the study to expand the diversity of the data because we wanted to know if there was any difference of perceptions between students who had satisfactory and unsatisfactory performance. Therefore, there were three participants (Ben, Faith, & Iris) classified as students with satisfactory performance in asynchronous online discussion and three participants (Carl, Helen, & Laura) classified as students with unsatisfactory performance.

Setting

The three classes met once a week for fifty minutes over the course of a sixteen-week semester in a classroom with the use of Blackboard as the course supplement. Hsin-Te, in the role of instructor of the three class sections, put the class syllabus, schedule, announcements, course materials, discussion questions and assignments on Blackboard, and asked the students to visit the site at least twice per week. One of the class sections was assigned to be a whole-class discussion group. One of the other two class sections was divided into four three-student discussion groups, while the other class section was

divided into two eight-student discussion groups. All these groups had to participate in the online discussion, which was part of the class activities throughout the semester. In those classes, the instructor posted discussion topics related to the course content. Students were asked to participate in the asynchronous online discussion by posting opinions, sharing experiences, giving feedback, comments, and suggestions. The instructor let students know all the information about discussion activities via Blackboard announcements and e-mails. There were five asynchronous online discussion activities throughout the semester. Each discussion activity lasted for two weeks. The participants were selected and interviewed after they had experienced three asynchronous online discussion activities.

Procedure

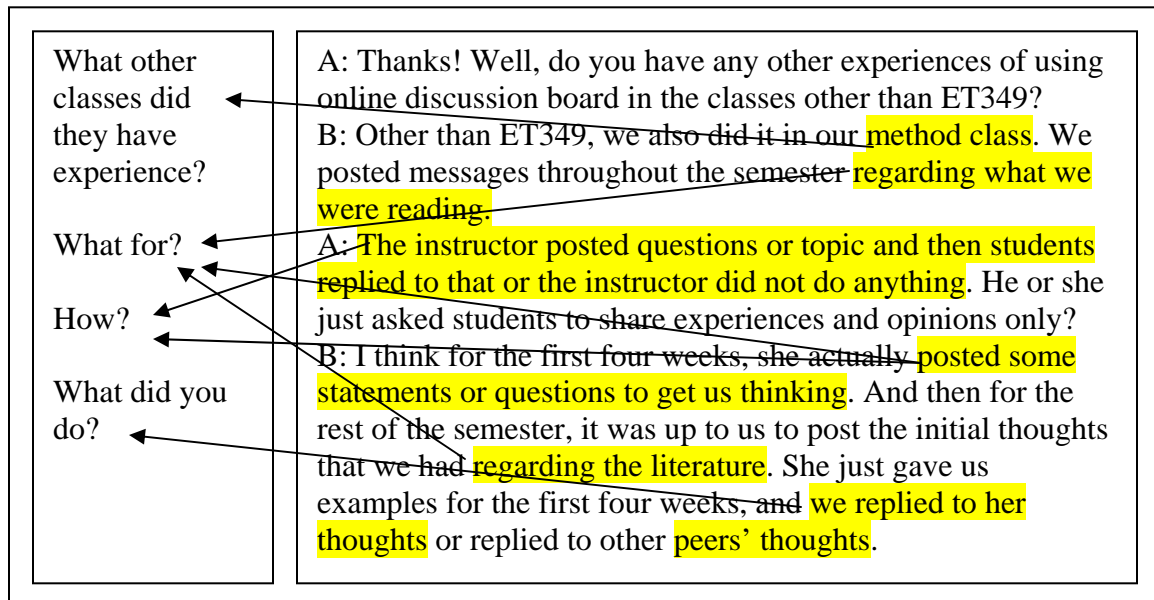
After receiving Institutional Review Board approval, all the interviews were pre-arranged through e-mail and were conducted after the interviewees signed the consent form. Each interview took around twenty minutes for about fourteen interview questions. All the interviews were conducted within two weeks with each interviewee. A semi-structured interview guide was prepared and given to the interviewees at the beginning of each interview. As fitting with a phenomenological design, the semi-structured interview guide provided a framework of open-ended questions that left room for unanticipated topics. Before conducting the interviews, Hsin-Te asked interviewees if they had any questions or concerns about the interview. All the concerns and questions were answered before each interview began to avoid confusion during the interview. All the interviews were tape recorded with the approval of the interviewees. During the interviews, Hsin-Te attempted to bracket (Creswell, 1998, 2007; Moustakas, 1994) his personal experiences as much as possible in order to explore the perspectives of the participants to the fullest extent possible. Bracketing is a reflexive process where the researcher attempts to identify possible biases and set these mentally aside as they enter the world of the participants (Magnuson, Black, & Lahman, 2006; Moustakas). The bracketing was enhanced through the use of a research journal (Janesick, 1999) and meetings with Maria. For example, while Hsin-Te has a positive perspective regarding online teaching and learning, Maria has had several negative experiences. These were discussed in an effort to enhance both Hsin-Te's and Maria's perspectives and to set these biases aside in order to listen more clearly to what the participants had to share.

Triangulation was used across the interviews to strengthen the credibility and dependability of the data. We checked and compared each participant's response during and after the interviews with the other participants' responses. In addition, member checks were also used to strengthen the study validity by returning the transcriptions and tentative interpretations based on the transcriptions back to the participants for reviewing to make sure that the interpretations were plausible. No participants found any mistakes or inappropriate statements. As the findings emerged, we utilized peer debriefing by asking two of our colleagues to comment on the findings and to see if the findings were understandable. The findings were corroborated by the participants and colleagues. By using triangulation, member checks, a researcher's journal, and peer examination, the trustworthiness of this study was strengthened.

Data Analysis

The recorded interviews were transcribed within two weeks after they were conducted. There were three transcriptions of the interviews with students with satisfactory performance (Ben, Faith, & Iris) from the three different groups. There were also three transcriptions of the interviews with students with unsatisfactory performance (Carl, Helen, & Laura) from the three different groups. Phenomenological data analysis was used as the major data analysis method in this study. The transcriptions were read carefully to get a general sense of the overall data. Keywords were marked and notes were taken throughout the reading to sketch ideas for coding. Figure 2 shows an example of coding process. Later, we compared all the codes and notes of the six transcriptions, and then developed themes for this study (see Table 1).

Figure 2. An example of coding process in this study.



As seen in Table 1, we compared each participant’s statements and marked themes by putting together statements each participant had in common. Based on the minor themes, we developed the major themes. In this way, we developed sixteen minor themes from the interview data, and pared down the data to represent five major themes (see Appendix A). After the major themes were developed, participants’ statements were sorted into those themes. Findings and conclusions were drawn according to the developed major themes and sorted materials. Creswell (1998, 2007) suggested the procedure of phenomenological data analysis: (a) organize data, (b) read and take notes, (c) describe meaning of participants’ experiences, (d) find and list statements, (e) group statements into meaning units, (f) construct description of experiences, (g) present the essence of experiences, and (h) make interpretations. Taking into consideration Creswell’s suggestions, we analyzed the interview data of this study following several steps: (a) transcribing, (b) reading, (c) organizing data, (d) identifying, (e) comparing, and (f) describing (see Table 2).

Table 1

Example of the Development of Themes

Name	Statements	Minor Themes	Major Theme
Helen	<ul style="list-style-type: none"> - Method class - The teacher posted questions or statements for thinking - We replied to teacher's questions regarding what we are reading (literature) and to peers' messages 	<ul style="list-style-type: none"> - Classes taken using online discussion before - Purposes of using online discussion in the classes 	<ul style="list-style-type: none"> - Purposes: What did instructors use asynchronous online discussion for
Ben	<ul style="list-style-type: none"> - Conceptions of schooling - In the schooling class, the teacher gave online discussion activities, and we answered the same questions or the same stuff online - The instructor posted questions and asked us to participate, and then we went back and responded to other students' opinions later - Entire class, not group discussion 		

Table 2

Hsin-Te and Maria's Data Analysis Procedure

Procedure	Description
Transcribing	The six tape recorded interviews were transcribed within two weeks after the completion of the interviews.
Reading	The transcripts were thoroughly read.
Organizing Data	Keywords were marked and notes were made in the process of reading.
Identifying	Meaning units were identified according to the keywords and notes.
Comparing	Examining and comparing each participant's meaning units, minor and major themes were developed.
Describing	Based on the emerged themes, interpretations were made and conclusions were drawn.

Findings and Discussion

Based on the students' experiences, the findings help contribute to a better design of instruction which effectively adopts asynchronous online discussion a teaching and learning tools. In the following section we will depict findings in the areas of purposes, group size, tool for learning, advantages and disadvantages, and instructor's role.

Purposes: What Did Instructors Use Asynchronous Online Discussion For?

In the world of distance learning, one of the most important elements of a successful online course is that students can interact with one another and with instructors as they would in the traditional classroom (Irvine, 2000). There are a variety of methods of implementing online interaction, such as using e-mails, chat rooms (synchronous messaging), and discussion boards. E-mails are used for instructors to send messages to a student, a group of students, or everybody in the class. Chat rooms are known as an electronic synchronous communication tool. People who log onto the same chat rooms will be able to talk to one another by typing messages. In some chat rooms today, people can even talk to one another vocally if they have microphones and loudspeakers set up or see each other as they talk using web video cameras. Discussion boards are known as an electronic asynchronous communication tool. Discussion boards are a place where people can post messages, read messages, and reply to other people's messages for the purpose of sharing and exchanging ideas and opinions. Instructors and students are used to using e-mail as a tool for communication. However, not all instructors and students know how to use a discussion board as one of the teaching and learning tools. Discussion boards serve the purpose of learning more than just communication. According to Harasim (1993), online discussion is considered as a learning environment where students can achieve higher conceptual knowledge than traditional face-to-face learning through interaction of knowledge and experience among students. Online discussion allows an exchange of ideas and enhances students' interest in other students' comments. Online discussion is also implemented in hybrid courses, in which instructors deliver instructions both face-to-face and online. Instructors of complete online courses and hybrid courses take advantage of online discussion boards and have students participate in the online discussion to gain additional opportunities for learning through online interaction.

Students interviewed indicated that they had experiences of using online discussion as a learning tool in a method class and conceptions of schooling class. In those hybrid classes, in which both face-to-face and online instructions were used, instructors used online discussion board as an after-class discussion activity and after-class communication channel among students. As for after-class activity, instructors posted questions or statements for students to think about and share their ideas, feelings, and thoughts on those questions or statements. According to Helen, one of the interviewees, the instructor "actually posted some statements or questions to get us thinking, and then for the rest of the semester, it was up to us to post the initial thoughts that we had regarding the literature." According to the participants, this is the most popular way of using online discussion board for instructors. In the classes, Hsin-Te posted questions or topics and asked the students to participate in the asynchronous discussion instead of typing a paper, and turn it in to me. As for the after-class

communication, the online discussion board was a room for students in the same class to communicate with one another for group work or ideas exchange after class, when e-mail addresses were not available to the whole class. Iris said, “We didn’t have class very often, so that’s the only way we communicated with each other. We were kind of forced to use it because there’s no way to communicate with classmates or group members.”

Based on the students’ experiences, most instructors used the online discussion board as a tool for after-class discussion assignment and communication among students and instructors. The purpose for using an online discussion board varies according to instructors’ teaching styles and course objectives. Discussion boards could be devoted to discussions of particular readings, topics, or assignments, and it could be used for smaller work groups within the class (Suler, 2004). In addition, the discussion board also enables students to ask questions about course requirements and activities. Although most instructors used the online discussion board for the purpose of having students participate in after-class discussion, and of communicating with one another, an online discussion board actually serves more purposes in terms of learning and teaching based on the students’ experiences, which can be found in the following paragraphs.

Influence of Group Size on Asynchronous Online Discussion

Does size matter? The answer to this question is subjective because of personal preferences. However, group size is an important factor that people have to take into consideration when talking about group discussion. Much research about the influence of group size has been conducted in face-to-face discussion settings. According to Fay, Garrod, and Carletta (2000), in small five-person groups, the communication is similar to dialogue and group members are influenced most by the people they interact with. Interaction is an important element of a successful discussion, and a small group size has better interaction. Therefore, smaller group size contributes to better quality. The average discussion group size, according to the six pre-service teachers interviewed, was about 6. Those students thought that an appropriate group size led to appropriate amount of messages for reading and replying without losing track of time, and it was also conducive to generating a variety of opinions and feedback. Ben’s opinions best indicated the benefits of a smaller size group discussion.

Definitely, 30 is too much for a class. I think the only problem with 4 or 5 people in one group is that if it’s not a very interesting topic, some people might not have opinions right away, you know. They’re just somewhat not caring on the topic, and don’t have the opinions. So I think maybe 7 people might be good in an online discussion group. In the class, at first I didn’t have that much to say about it. But after I read other people’s opinions, then I got interested in responding to people’s messages more than the topic. Seven is a good number. It is big enough to bring enough people’s opinions, at the same time it is not too big for everybody to read. You know in a 30 people class, it’s so difficult and ...boring to read so much same stuff. I think that’s another reason to keep it smaller.

Ben thought that reading was difficult and boring in a big discussion group, and not enough ideas would be prompted in a group too small. Ben's thought corresponded to Vrasidas and McIsaac's (1999) finding that four people were not enough to generate productive asynchronous discussion. Other interviewees had the same opinions as Ben, they preferred small group discussion. Laura also shared her opinions.

I kind of like the small group just because you could focus on what each person was doing, and what each person said and you could respond to that instead of...it's kind of overwhelming when you have to respond to 35 people and what they are saying.

Small group discussion reduced students' burdens of reading and replying a lot of messages, and it also increased the quality of the online discussion because students could focus on the several messages and have in-depth thinking and responding.

There is another issue regarding a large group online discussion. When Carl was asked if he would read the posted messages, he replied, "Probably, as long as there are not too many people. If that's the entire class discussion, I will probably not read at all." Carl's response refers to a social psychology term; social loafing, the tendency for individuals to reduce their work effort as they work in a group (Latane, Williams, & Harkins, 1979). Furthermore, individuals working in a larger group are less productive than those working in a smaller group (North, Linley, & Hargreaves, 2000). Some people do not contribute to the group project or discussion because they know that other people will contribute to the group work, but the whole group will receive the same grades as others. In a small group, there is much interaction and everybody's contributions are valued and needed. This is why students learn better in a small group than in a large group. Sugrue, Rietz, and Hansen (1999) indicated that students achieved higher exam scores in a small group relative to a large group, as well as significantly lower student satisfaction in the large group. In asynchronous online discussion, group size matters in terms of interaction, but too small or too large discussion groups do not improve the interaction of students in the discussion (Yeh & Ku, 2005). Small group discussions of around 6 people could lead to productive and quality online discussion. The students' preferable group discussion size corresponds to the finding of group discussion size of 6 in Yeh and Ku's study.

Using Online Discussion as a Tool for Learning

While online learning is spreading quickly in higher education, teachers and students are trying their best to adjust themselves to the new change of teaching and learning. Before I, Hsin-Te, came to the United States, I had never taken any online classes, and those new concepts of online learning and teaching were like a shuttle taking me to the new world of learning and teaching with technology. In my first online class, I was so surprised at the wonderful features of the online learning management system. I found that the discussion board was the most amazing room and I enjoyed visiting and making use of its multiple features that contributed to learning and teaching an online class. It is interesting to know that many students and instructors are using online discussion board as the learning and teaching tool in their own ways. The following

paragraphs will provide an overall view of the participants' use of online discussion as a tool for learning.

Every student has his or her habits for using the online discussion due to their daily schedule of work and classes. Some prefer logging onto the online learning management system every day and some log on only several times per week. According to Yeh and VanBuskirk (2005), a high percentage of students post their responses either on or several days prior to the day when classes met. This indicated the pattern of the students' use of online learning management system, and participation in asynchronous online discussion in the class that adopted online learning management system as the course supplement. For the interviewees, most of them participated in the asynchronous online discussion two or three times per week. One of the interviewees participated several times the first week, and then once per week. Helen participated only once per week. She knew that every time she participated, it would take a large chunk of her time, so she preferred to participate only once per week to save time for her other homework. The interviewees were undergraduate students, and they took many classes every semester. Busy schedules kept the students in a rush back and forth to classes every day, so that they seldom sat in the lab participating in the online discussion. Also, some students were not interested in asynchronous online discussion. Some of them logged onto the online learning management system right before or after the class met, in the lab, to make good use of the break time between classes. Participation in the asynchronous online discussion two or three times per week was seen as satisfactory due to students' busy schedules and lives.

When students were on the discussion board, they had different habits when reading and responding to messages. In a big discussion group, students would read only the first several messages or pick out some interesting messages to read. In a small discussion group, students would read all the messages posted on the discussion board. Faith said, "I would read probably first ten through, and after that, I would click, if the same thing, I would move on. If someone says something different, I will read all the way through." Carl replied that he would read all the messages posted "as long as there are not too many people."

Students also had habits when replying to people's messages. Among the interviewees, most of them responded to discussion questions, read people's messages, and replied immediately if time was allowed. If time was not allowed, they would reply later. Carl said, "I usually read, and if I have time, I replied. If I didn't, I just read it and started to think about what I could say and replied later." Time was an important factor for students to participate in the asynchronous online discussion. Many students preferred having online discussion activities right after or before classes began in order to save time for other work. Yeh and VanBuskirk (2005) indicated that most students logged onto the learning management system several minutes prior to the class or right after the class. When the students saw the information about the discussion activity, they decided to post their responses on the same day when they came to the class. For some students, they favored thinking about people's messages and replying later. When Iris was on the discussion board, she read the posted messages, thought about those messages, talked about those messages with people, and got back to them. Therefore, it seems better for instructors to give students a longer period of time to participate in each online discussion

activity, so that students would have enough time to read and reply to messages in terms of their daily schedules and routines.

On the discussion board, there were many messages posted, and most students would skip the long messages. Iris would only put a few sentences that were to the point, so that people could get through them. She said, "I don't like wordy messages because that feels like wasting my time." Carl also said, "I can do pretty short, just a few words. Uh...just try to keep it condensed." However, some short replies like "I agree" and "I don't think so" would not be helpful or meaningful. It is difficult for people to respond to those kinds of replies. "...if you just got a short little message, then it cuts off communication. For the vocal communication [face-to-face communication in real life], if you just say I agree or I disagree, it stops communication," said Helen. Some people wrote longer messages when they had strong feelings and had much to share. Faith shared her opinions on message length.

When I really feel strongly about something, I put probably about three to five sentences, which on the message board are pretty long. Um...but when I just have a joke or sarcastic remark, it would just be one line. Just a couple of words.

Most students did not like writing much in the message; however, sometimes it depended on their feelings or emotions. When asked her preference of writing short or long messages, Helen replied, "It depends on how it strikes me."

Among the interviewees, two indicated that they were wordy persons and liked putting quite a few words in one message. Laura, majoring in English, thought it was easier for her to express herself in a lot of words. Ben said, "Uh...I am a history major, so I tend to be a little bit wordy. So when I begin typing, it's...my thinking out on the computer. So... there're quite a few words sometimes." It is interesting to know that the two interviewees who liked putting quite a few words in messages majored in English and History, which requires the ability of reading and writing extensively. Maybe students' majors have influence on their habits of reading, writing, and replying to messages in asynchronous online discussion.

Online learning provides another way of learning for people who are not able to be in the classroom in person due to scheduling or distance from the campus. The nature of online learning is learning anytime and anywhere, which isolates students from one another during learning (Northrup, 2001). To overcome this isolation, teamwork or collaboration that requires interaction should be assigned (Berge, 2002). Teamwork or collaboration is the strategy instructors can use to give students an opportunity to work with one another in the online learning environment. Instructors can assign students group projects or online discussion tasks. If students can work together through online communication tools, such as e-mails and discussion boards, the feeling of isolation will be minimized. Interaction is an important factor that could promote the effectiveness of online learning. In the study of Gorsky, Caspi, and Chajut (2003), they mentioned four kinds of interaction in distance education: (a) instructor-learner, (b) learner-learner, (c) learner-subject matter, and (d) vicarious-interaction. In this study, we investigated the learner-learner interaction. According to most of the interviewees, they were curious about how classmates thought about the same topic, and they looked forward to receiving

replies from their peers. Faith shared how she felt about receiving replies from other people.

Um...it's always fun to see what people would like to say after you say something. Um...to think about how they think about your opinions. I did have one person disagreed with me with one posting. That's OK because they brought [up] a couple of good points. Um...and the responses I got were pretty typical. So...it worked.

When asked how she felt if nobody replied to her, she said, "A little bit disappointed. But not destroy my world. I don't think I would like to be involved in the online discussion that has no one replying to my responses." Most students expected people's responses to their own messages. However, if the students' messages were short, they would not expect any replies because there was nothing to say about the messages. Helen said,

...if I would say...this is what I am thinking about this author, or you know about this subject, then ...I think I am asking for peoples' opinions back.... The shorter ones, like I agree I disagree, those responses, you pretty much know if someone is gonna respond to that for the answers.

Therefore, the effectiveness of interaction on the online discussion board depended on the content of the posted messages. It could be inferred based on Helen's response that short and boring messages would not get responses.

Online discussion board serves many purposes. Instructors use it as a tool for teaching. How do students learn through online discussion? The comments on learning through online discussion turned out to be positive. They thought online discussion was a different way of learning that was helpful as long as it was used correctly. Laura said,

I think it's good just because it's a different way to learn and like the world now, there is a lot of technology. So...I think it's good to learn in a different way, not just from the teacher in the classroom.

Some interviewees also expressed their interest in teaching with the use of online discussion board if possible. Ben said, "Yes, I think it definitely has its place." With the use of online discussion, students could learn through different thoughts, ideas, and experiences. "It's very important to read other people's messages and see what they said and their opinions are," said Ben. Helen's response revealed her eagerness for learning through online discussion. She said, "Yep! Yep! I like to know what other people are thinking and if they are learning the same thing as I am. I would like to know what perspectives they are coming from and how they're interpreting the information." Online discussion also gave opportunities for students to be involved with more thinking. Some interviewees indicated that people's different opinions brought up ideas they had never thought about before. The following was Faith's response.

You learn kind of the same way you learn in the class. There're different opinions and different people's thoughts bringing into the table so that you can work together. I like the reply that disagreed with mine because that brought up something that I have never thought about before. Um...so that helped me learn a little bit more about what I was talking about parents on our discussion. So I think it helps you learn by getting different opinions from people.

In addition to learning through people's thoughts, ideas, and opinions, online discussion was also a tool for collaborative work. "We could use it for the project we are working on, communicate for that..." said Iris. Helen also said, "...the ease of not only being able to discuss things with students in class but also being able to share the files to post." Therefore, with the features of discussion board, students could exchange files and get suggestions on assignments on discussion board, which makes collaborative work easier and more convenient.

Advantages and Disadvantages

Online discussion is a new tool for learning, and it may be useful and helpful. To take advantage of online discussion, knowing the disadvantages of online discussion is also important, so that instructors will be able to know what to improve. In this study, we investigated both the advantages and disadvantages of using asynchronous online discussion as the learning tool based on pre-service teachers' perspectives.

"Um...I like the accessibility. It's really nice to be able to access that at home...It's good to sit on my bed with my laptop," said Helen. With the use of asynchronous online discussion, discussion could take place anywhere, even on a lovely bed with a cup of coffee and music. Ben said,

I like the fact that you don't have to schedule a special time to meet with your group. You can just get online and do it whenever you want – the best convenience for you! Obvious, that's the best thing about it!

Many students like the accessibility and flexibility of asynchronous online discussion, especially for people who have busy schedules. Faith's opinion revealed her love for using asynchronous online discussion.

The fact that I can do it at 2:00 in the morning is OK... I am not that much a morning person typically. I will get up, but I can't have a discussion at 9:00 in the morning. It's difficult for me. The ability to say oh you know I got 5 minutes. Let me type something on the discussion board very quick. The fact that you can do it within 5 to 10 minutes when you are running from school to work is nice. Um...it's really time convenient.

Some of the interviewees also indicated that it was convenient to be able to go back to the discussion board to review messages people posted, so that they would not forget what people wrote. They could bounce ideas off people and exchange files on the

discussion board. In addition, they enjoyed the fact that there was more time for thinking and reflecting before responding than in the face-to-face classroom. With the advantage of keeping track of what people think and say on a discussion board, the common problem of forgetting what people say in the classroom has been solved. Durham (1990) stated that students have more time to read, think, and post their responses through online discussion. "I like the opportunity to bounce ideas with other people. Have more open communication," said Iris. Carl's opinion indicated the importance of time for thinking.

I like that you can do it whenever. You can look at somebody's comments and think about it, and then you come back and respond. If you have a verbal discussion, you don't have much time to think about the comments. You have to come up with something right away. But with online discussion, you can take your time.

Face-to-face discussion may be a way for some people to think and learn. However, not everybody feels comfortable talking in front of people. "I think some people who are too shy to speak out in class would be more willing to write a little something about what they are thinking or write a question whatever to participate in the discussion online," said Helen.

As for the disadvantages of using online discussion, many interviewees thought that the lack of vocal quality and facial expressions were the biggest problems. This is something that non-vocal communication cannot include. We have heard from people who have had the experiences of getting misunderstood in an e-mail message. Ben shared with me his experience.

Tones of voices, expressions are not on the computers. One time I sent an e-mail to people. I meant it one way, but the words came out in an entirely different way to the persons who received the e-mail because my tone of voice and facial expression were not expressed in the e-mail, so....that's something that you have to be very careful. If that is a controversial topic, be careful of that! People might misunderstand what you write.

Although asynchronous online discussion serves good purposes of learning, students and instructors have to pay attention to the disadvantages of online discussion in order to prevent the negative influences caused from using asynchronous online discussion. For example, any type of discussion may cause misunderstanding; however, it seems that online discussions, perhaps due to their informal, quick, and faceless nature, are more problematic. The problem of miscommunication is not one that may be completely solved. However, if online users are aware of possible communication problems perhaps this problem may be avoided. Therefore, both students and instructors need to ensure the real intentions or meanings of written messages before they make any response in order to avoid misunderstanding caused by the lack of vocal quality and facial expressions.

Instructor's Role: Providing Interventions

Based on the students' experiences, they think instructors play an important role in motivating and promoting students' participation in online discussions. Lang (2000) indicated that a good discussion, whether in class or online, required teachers to facilitate the engagement of students in a dialogical process that contributed to the understanding of a topic or issue. Through the interviews with the students, Hsin-Te, who was also the instructor of the interviewees, learned what students needed and how he might have helped them participate actively and effectively in asynchronous online discussion. The following findings and discussion will reveal implications for instructors on how to implement online discussion.

According to the interviewees, their motivation for participating decreased for the following reasons: (a) people's low participation, (b) boring and dry topics, (c) too many messages on the discussion board, (d) not enough time, (e) no grading, (f) not knowing how to use the discussion board, (g) people's responses are not constructive, and (h) instructor's "mean" feedback. The majority of the interviewees thought that grade was the most important motivator. Faith said, "It's kind of rare that students right now unfortunately will do something without a grade...I think the most motivating factor would be getting a grade." Yeh and VanBuskirk (2005) indicated that grading had the most effect in enhancing students' participation in online discussion. It would be better if students' participation in online discussion could also determine part of students' grades. However, appropriate and clear guidelines should be provided for students before they are asked to participate in online discussions because providing students with clear guidelines about participation, grading, and the usage of online discussion board can contribute to productive discussions (Suler, 2004). Iris mentioned that she did not know how to use an online discussion board. Obviously, clear guidelines could solve this problem.

Many interviewees mentioned that boring and dry questions or topics would decrease their motivation. To encourage participation, instructors should use interesting and discussable questions or topics. When topics or questions are interesting, more students posted messages. According to Suler (2004), students may feel unwilling to post again when they post a message and receive no response. "...if nobody in the group is motivated, and nobody is really posting anything, I will probably lose my motivation too," said Carl. He then said, "As long as teachers ask good questions, I think that will motivate everybody to participate." Therefore, if the topics or questions were interesting, the learner-learner interaction would be improved.

Many interviewees indicated that they lost patience for reading and replying to all of the messages when there were too many messages on discussion board once. The interviewees also mentioned that their motivation was reduced if there were too many people in the discussion group. Therefore, dividing the whole class into small discussion groups would be helpful. In addition, instructors' participation plays an important role. Instructors' presence online, much like that in class, can help inspire productive discussion (Suler, 2004). When asked what the instructor could do to enhance her motivation, Laura said, "Give us a guideline to start off, check frequently to make sure that you are using it, and give feedback to the group. Don't just leave the student to discussion only." Therefore, instructors should participate in the discussion and give

constructive feedback. "...because that's their classes, and they should be part of the class, even if it's online," said Laura. Apparently, students expected instructors' participation and constructive feedback.

Helen indicated that time limitation was also a factor that reduced her motivation for participating in online discussion. She said, "If that's just a one credit class, and there is so much work to do other than online discussion, I might not want to participate in the discussion more often." Therefore, instructors should balance the workloads of discussion activities and other assignments to encourage students' participation in asynchronous online discussion. The best way is to have a longer duration of each online discussion activity so that students would have more time for thinking, and they would not regard online discussion as a burden.

Through the interviews with the students in terms of their experiences and opinions on online discussion, the five aspects of online discussion including purposes, group size, tool for learning, advantages and disadvantages, and instructor's role have been depicted and discussed. These findings offer useful and constructive information on the use of asynchronous online discussion. After analyzing all the participants' interview data, it is not hard to understand why Helen, Carl, and Laura did not have satisfactory performance in online discussion. It is not because Helen, Carl, and Laura were not good students or they were incapable; it is because they were not interested in asynchronous online discussion, had busy schedules, were unmotivated due to large group size, lack of interest in the topic, lack of guidelines for online discussion, or the lack of instructor's proper interventions. According to the students' experiences and opinions, it can be implied that instructors play an important role to facilitate students' learning in asynchronous online discussion.

Conclusion

Asynchronous online discussion is a new way of learning. Many students and instructors are not used to this format, and they also do not know how to use an online discussion board. However, we have heard on campus from instructors and students who have used online discussion board as a tool for teaching and learning that they hold positive attitudes towards asynchronous online discussion. They appreciate asynchronous online discussion because of its accessibility, convenience, and flexibility. Jewell (2005) indicated that classes no longer need to be limited to their fifty-minute time slots; asynchronous online discussion makes it possible for learning to occur throughout the day. No matter where instructors and students are, asynchronous online discussion could occur any time when students and instructors to share experiences, ideas, feelings, and opinions. They can also exchange files on a discussion board. Collaboration occurs not only in face-to-face classes, but also online. Asynchronous online discussion offers another option for learning and teaching. According to the findings of this study, asynchronous online discussion serves a satisfactory purpose in learning, in terms of the pre-service teachers' perspectives if instructors implement it in an appropriate and productive way.

The pre-service teachers' perceptions of asynchronous online discussion in terms of their experiences and opinions of using asynchronous online discussion can contribute to the knowledge base for those instructors who are using or planning to use

asynchronous online discussion. In order to improve the quality of asynchronous online discussion and increase students' participation, it is suggested that instructors (a) limit the size of the asynchronous online discussion group to a reasonable number such as 5 or 6, (b) participate in the discussion with students, (c) provide timely feedback, (d) offer clear guidelines and rules of posting messages, replying to messages, length of messages, and the deadline of each discussion forum, (e) keep track of students' participation and give reminders, (f) avoid dry topics and try to use interesting topics, (g) give credits to students' participation, and (h) clarify any misunderstanding caused by the lack of facial expression and vocal quality. It is the instructors' responsibility to ensure the effectiveness and quality of asynchronous online discussion.

Limitations to the study are as follows: (a) Hsin-Te was the instructor of the participants throughout the study, (b) the participants were pre-service teachers (another disciplines or degree level may produce varied findings), and (c) participants varied in experience with online learning. In future research, participants from different classes of different disciplines could be included to broaden our understanding of the width and depth of students' perceptions of online discussion. Participants should not be limited to pre-service teachers. Also, it is suggested that researchers do not use their own students as participants in order to reduce potential bias. In this way, research results could be more widely applied to a variety of disciplines, not only the field of educational technology for teacher education. Finally, online teaching strategies should be investigated to enhance the effectiveness of, and participation in, asynchronous online discussion based on the findings of this study. In the words of Faith, "As far as the tools of e-learning, I really like the online discussion board. I think it's helpful as long as you use it correctly and monitor very well by a teacher or facilitator. It could be very helpful."

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Appendix A

Major and Minor Themes

First heading level: Major themes

Second heading level: Minor themes

Third heading level: Statements from the data

- **Purposes: What did Instructors Use Asynchronous Online Discussion for?**

- Classes taken using online discussion before**

- Method class
 - Conceptions of schooling
 - Method class

- Purpose of using online discussion for those classes**

- After-class discussion. Teacher posted questions and students posted responses.
 - After class communication among students
 - Post messages regarding what we read throughout the whole semester.
 - Post questions or statements for thinking and discussing.
 - Sharing ideas on what we learned in class.

- **Influence of Group Size on Asynchronous Online Discussion**

- Perceived best group size (5-7 people)**

- Appropriate amount of messages for reading and replying
 - A variety of opinions and feedback
 - Higher probability of getting the first posted message from other people

- Perceived best group size (4-10 people)**

- Appropriate amount of messages for reading and replying so that you will not lose track of time.
 - A variety of opinions and feedback
 - Easier to focus on what people said and to respond to all the messages.

- **Using Online Discussion as a Tool for Learning**

Participation

- Several times the first week after messages posted, and once per week later
- Three times per week.
- Before and after the questions posted
- Twice per week
- Once per week so that it won't take too much time.
- Twice per week
- Check messages once and reply once.

Reading and replying

- Respond to the question, come back later and read people's messages, and reply to the interesting one immediately.
- Read messages and reply a few days later after thinking about what to reply
- Once read something interesting, reply immediately.
- Read the first several messages, and skip the rest if all the responses are similar.
- Read through the whole message if the message has different opinions.
- Read all the messages if there are not too many.
- Reply to messages after reading them immediately if time is allowed.
- Read messages and reply immediately to save time.
- Pick up messages from people I know only for reading and replying.

Message length

- It depends. When feel strong, 3 to 5 sentences. If not, just a sentence.
- Not too wordy. Just a few sentences that are to the point.
- History major. Wordy and quite few words sometimes when the message is interesting.
- Wordy messages are a waste of time.
- It depends on how the messages strike me. When feeling strong, I will write a lot of words.
- Just few words to keep it condensed.
- Longer messages promote thinking while short messages like "I agree" cut off communication.
- English major. It's easier to put a lot words to express how I feel and what I want to say.

Expectation for replies

- Feel a little bit disappointed if nobody responds to his or her messages.
- Expect to receive replies.
- If not required, I don't expect responses.
- It depends on what I write and if I want to know people's opinions on my responses.
- Expect to receive replies because we are gonna be teachers, we have something in common
- Feed disappointed sometimes when I need people's feedback.

Interaction

- Curious about how people think about the same topic.
- To know what people think about the same topic is very important.
- Expect to receive replies from other people.
- The fact is that not many people replied to other people's messages.
- To know what people think about the same topic is very important.
- Expect to receive replies from other people.

Learning from online discussion

- It's like the way how people learn in class.
- Learn through people's different thoughts, ideas, and experiences.
- People's opinions bring up something I have never thought about before.
- Get answers to questions I have from classmates.
- Help with doing assignments.
- Communicate with group members for the group project.
- Get suggestions from classmates.
- Learn through people's different thoughts, ideas, and experiences.
- People's opinions bring up something I have never thought about before.
- More time for thinking.
- Get suggestions from classmates.

Commenting on the online discussion

- It's helpful as long as it's used correctly and monitored.
- It's a good learning tool.
- Students can do some thinking and discussing outside the class.
- It's worthy to use online discussion board.
- It definitely has its place.
- Online discussion should not dominate the class, but good to be used as one of the tools for learning.
- It's a good learning tool if the teacher knows how to intervene.
- I will use it to teach because there is no sort of time constraint.
- It's a good tool to help people participate in discussion, especially for shy people.
- It's a different way to learn with technology.

- **Advantages and Disadvantages**

Advantages

- Get on the discussion anytime and anywhere I want.
- Flexible schedule.
- Go back to the discussion board to review messages people posted.
- What I write will be recorded so I won't forget what I write.
- Have more open communication.
- Bounce ideas with people.
- Have enough time to share ideas with people.
- Have enough time to reflect on what other people said before responding.
- Get on the discussion anytime and anywhere I want.
- Flexible schedule.

- Think and come back anytime later to reply messages.
- Share files through discussion board.
- Bounce ideas with people.
- Fast and easy.
- Good chance for shy people to participate in the discussion.

Disadvantages

- Difficult to express humor in words, especially sarcastic humor.
- There is no vocal quality.
- No facial expressions.
- Can't get the emotions of other people.
- Have technical problems of using discussion board.
- Too many people in the discussion group so that it takes too much time to read and reply.

• **Instructor's Role: Providing Interventions**

Ways used to facilitate participation by those teachers

- Grading
- Interesting topics
- Controversial topics
- The only way for communication
- Grading
- Guideline
- Giving examples
- Sharing instructor's thoughts first.

Motivation reduced

- People's low participation.
- Boring, dry or vague topic.
- Instructor's mean feedback.
- No grading.
- Don't know how to use discussion board.
- People's responses are not constructive.
- Too many messages posted, especially there are a lot of long messages.
- The participation is low.
- Don't know how to use discussion board.
- There is too much other work to do in that class (time limitations).
- Boring, dry or vague topic.
- It's not required.

Ways to facilitate participation

- Post questions right before or after class
- Instructor's comments on the postings.
- Guideline (rubric) for participating in online discussion.
- Instruction of how to use discussion board.
- Instructor's feedback.
- Instructor's participation.
- Grading.

- Explanation of the discussion questions or topics at the very beginning.
- Interesting topics.
- Track students' participation.
- Instructor's comments on the postings.
- Guideline for participating in online discussion.
- Instruction of how to use discussion board.
- Instructor's feedback.
- Instructor's participation.
- Grading.
- Small group discussion.
- Balance the time of discussion and other work in the class.
- Interesting topics and specific questions.
- Track students' participation.

Instructor's feedback

- Feedback is huge, a good motivator.
- Feedback increases motivation.
- It's great to have teacher's opinions.
- Feedback is huge, a good motivator.
- Feedback makes students aware of teacher's participation.
- Instructor should provide feedback because he or she is part of the class too.

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