Factors that Influence Participation In Online Learning

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Abstract

This study explored what factors influenced learner participation in two sections of a graduate online course at a Midwestern university. Findings indicated that online learner participation and patterns of participation are influenced by the following factors: technology and interface characteristics, content area experience, student roles and instructional tasks, and information overload. Effective online learning requires interdependence for a shared understanding of learning goals in a learning community. Monitoring student participation and patterns of participation closely can help instructors identify student needs and scaffold learning accordingly. (Keywords: online learning, learner participation, asynchronous discussion, interface design, information overload)

Educational institutions are increasingly adopting and implementing online learning. The rapid and expanding use of online education in K–12, two-year colleges, and four-year university courses has been documented by the National Center for Education Statistics (NCES, 2003). Educators, researchers, and instructional designers are faced with the task of understanding the pedagogical implications of online learning.

Learner participation in online learning is often related to the percentage of grade weight assigned to discussions (Jiang & Ting, 2000). Criteria for evaluating and assessing online discussions, the written nature of online discussions (Liang & Creasy, 2004), course design and instructor interventions (Bullen, 1998; Vrasidas & McIsaac, 1999), and learner background knowledge (Ross, 1996) can influence participation. Several researchers have examined whether learner participation patterns differ. Mason (1994) found that learners fall into three distinct groups in their online participation: active participants, lurkers (those who read messages but do not post messages), and those who do not take part. Taylor (2002) investigated students' participation patterns in accessing and contributing to online discussions and whether these participation patterns influence academic achievement. He named the three groups he found: workers, proactive participation group; lurkers, peripheral participation group; and shirkers, parsimonious participation group. Workers participated actively in the discussions and visited the class site regularly whereas lurkers participated occasionally, but mostly in a "read-only mode." Shirkers performed the minimum required with fewer postings and visits to the class site. Taylor recommended that parameters for levels of learner participation should be defined so that the reasons for varying degrees of engagement can be unpacked.

Pedagogical design elements in course management systems and discussion board interface may affect participation and learning. Online discussion is influenced by how people interact with the discussion interface (Hillman, Willis & Gunawardena, 1994). Hewitt (2001, 2003) studied patterns of learners' responses and how discussions evolve over time. He (2003) argued that many discussion participants adopt the strategy of examining "unread" messages and pay comparatively little attention to older ones. He noted that growth patterns of participation owing to the abandonment of older messages may be a strategy for learners to cope with busy discussion conferences and information overload. Hewitt further argued that the abandonment of older threads or messages can create changes in the topic. His studies are significant in understanding the influence of interface and learners' participation habits on learning outcomes in order to effectively structure online discussions.

Learner participation is an essential element for active and engaged learning (Bloom, 1984; Chickering & Gamson, 1987; Fleming, 1987). Learners may adopt new personas and may not feel obligated or pressured to participate in online communication when they do not see each other (Palloff & Pratt, 1999). In this article, the authors define participation as taking part and joining in a dialogue for engaged and active learning. Participation is more than the total number of student postings in a discussion forum. Understanding the issues that influence participation in the online environment is essential for effectively designing and facilitating online discussions.

The research questions that guided this study were: In the two sections of an online graduate course:

- What factors influence learner participation?
- Are there any differences in the factors that influence learner participation between the two classes?
- Are there any differences in the patterns of learner participation between the two classes?

METHOD

The case study approach was used to achieve a comprehensive and in-depth understanding of the factors influencing participation in two sections of a graduate online course: Planning for Technology. One section (Group A) included 13 inservice teachers, and the second section (Group B) included 12 students. Three of the Group B students were not inservice teachers—two worked in higher education, and one worked in a non-profit educational organization. Three students in Group B who were in the K–12 education system were also involved in district technology planning. (It is important to know that these three students in Group B had been already working in planning for technology in their districts, as they brought in a lot of their experiences to the class discussions, which enriched them.). Two students in Group B who acted as facilitators had previous experience in facilitating online discussions. None of the students in Group A had previous experience in facilitating online discussions. Three students in each group acted as facilitators to lead the online discussions.

The course included planning for technology, staff development, facilities and infrastructure, grant writing, evaluating the use of technology, and integrating technology. Three graded discussions and three non-graded discussions took place. For each graded discussion, three students volunteered for one of the following tasks: the facilitator, critical reflector, and summarizer each week. For each discussion, three (different) students volunteered to have one of those tasks. At the beginning of the class, the students were informed of these roles and the responsibilities for each role. Then students volunteered on each role. Students had reported that they took the role with which they were most comfortable. These roles were described as follows:

Facilitator: Initiate the discussion, oversee the knowledge building process, the flow and direction of information.

Critical reflector: Analyze and critique the posts, promote questions, engage the rest of the group to think critically about the issues related to the topic.

Summarizer: Summarize and reflect on the discussions and submit a two- to three-page report to the instructor to be posted for the class.

The instructor provided assessment criteria (Table 1, page 216) and several guiding questions for each week's discussion (Table 2, page 216). The class was to ask and respond to questions, and raise issues and concerns with respect to the discussion topic. All of the students were asked to submit at least a one-page reflection and their tasks concerning each discussion (Appendix, page 228).

Data Sources and Analysis

Multiple sources were used to collect, analyze, and triangulate the data: two questionnaires (one given at the beginning and the other given at the end of the course), asynchronous discussion transcripts, student-to-instructor e-mail transcripts, and asynchronous discussion reflections. The first questionnaire consisted of demographic questions and questions based on a five-point Likert scale to investigate students' technology skills and perceptions of online learning. Thematic data analysis was used to analyze the asynchronous discussion posts, e-mail messages to the instructor, reflection papers at the end of the three graded discussions, and the end-of-course questionnaire. "Thematic analysis is a process for encoding qualitative information" (Boyatzis, 1998, p. vi). Each group's data and each data source were analyzed separately for patterns that were coded and sorted for emerging themes. An inductive, data-driven coding approach was used for these data. "Data-driven codes are constructed inductively from the raw information." (Boyatzis, 1998, p. 30). After the emerging themes were constructed in each group and each data source, overarching themes were developed for the final theme construction. The final categorization of the themes for each group were compared and contrasted to examine student participation and factors that may influence participation in online learning.

The discussion messages were analyzed for patterns of participation to answer questions such as how the students responded to each other, in what order, and whether there was a pattern in the way that the discussion worked in both groups. This analysis was implemented to gain an understanding of what factors may influence participation in online discussions. It also enabled data triangu-

Table 1: Asynchronous Discussion Assessment Criteria

Discussion is substantive and relates to key questions. (1)
Discussion is thought provoking, insightful, reflective, challenging. (1)
Discussion provokes interest and deeper investigation of the topic. (1)
Discussion is targeted for the knowledge construction of the group
   as well as self-learning. (2)
Posts documents, examples, etc. to be shared with the class. (2)
Uses personal/professional examples demonstrating application
   of key issues. (1)
Uses and refers to readings, literature review, theory, research to discuss
   position and insight. (4)
Analyzes others' discussions and reflects on the issues discussed (2).
Refers to others' discussions and addresses previous discussions posted (1).
Offers solutions and suggestions to the issues raised. (2)
Initiates discussion, raises an issue, concern, suggestion. (1)
Demonstrates understanding and interest in the topic. (1)
Feedback to class members is constructive, specific, and supportive. (1)
Demonstrates timely and valuable online presence. (5)

Table 2: An Example of the Guiding Discussion Questions— Discussion Three

Discuss the importance of evaluating the use of technology. What are the
   steps involved in evaluating and assessing the use of technology?
Discuss the importance of staff development. Who should be the stakeholders?
Describe and discuss a staff development program for technology in your
   workplace.
Describe and discuss components of a staff development model for
   technology.
Discuss the common characteristics of a successful vs. unsuccessful staff
   development.
How should be the incentives designed/planned? Intrinsic vs. extrinsic, or
   both…
Looking at your school or district or organization's technology plan, how do
   you think staff development is implemented? Is there anything you would
   do differently?
Discuss the concerns-based adoption model and its relationship to staff
   development and evaluation and assessment of technology programs and
   planning.
Discuss Everett Rogers' "Diffusion and Innovations" theory with respect to
   staff development and evaluation and assessment of technology programs
   and planning.
Please see the related Web sites and readings.

lation, double-checking findings, and examining relationships that converged (Miles & Huberman, 1994).

The study was limited to the context and setting of the two sections of a five-week summer graduate course. In case studies, researchers may be concerned with the transferability of research findings to other settings. Transferability is the extent to which findings can be applied in other contexts or with other respondents and can be achieved by providing thick descriptions (Lincoln & Guba, 1985). The context and the setting of this case study need to be taken into consideration to be able to make transferability judgments.

RESULTS

The questionnaire implemented at the beginning of the course gave a return rate of 65%. One third of the Group A students rated themselves as intermediate computer users while Group B students rated themselves as advanced computer users. The "Planning for Technology" course was the Group A students' second online course and they had less experience with online discussions compared to students in Group B. Group A students were new in the graduate program and were participating in an online cohort group, and the "Planning for Technology" class was only the second class they had taken. In their previous class, although it was online, online discussions were not extensively used. The majority of the students in Group B were far ahead in the program compared to Group A. Although the students in Group B had not previously taken online classes—only a few had online courses—they were exposed to online discussions in their traditional face-to-face classes. The course management system used in the college was WebCT and the students in Group B were familiar with the system's discussion board interface.

Participation Patterns

There were no significant quantitative differences found between the numbers of postings of the two groups in the three discussions (Table 3). Group A posted 49, 123, and 96 messages, which resulted in means of four, nine, and seven in each discussion, respectively. Group B generated 44, 90, and 79 postings in the discussions, which resulted in means of four, eight, and seven, respectively.

Table 3: Number of Messages Posted and Means of Group A and B in Three Graded Discussions

	Group A	Group B	Group A Mean	Group B Mean
Discussion I	49 messages posted	44 messages posted	4	4
Discussion II	123 messages posted	90 messages posted	9	8
Discussion III	96 messages posted	79 messages posted	7	7

In Group A, 10 of the 13 students maintained online presence and participated frequently in the discussions; three did not. During the first discussion, the majority of this group responded to the main question thread rather than an interactive pattern of dialogue with their peers. During the second and third discussions, however, an interactive pattern developed.

In Group B, eight students participated frequently in the discussions, maintaining an online presence. Four students' participation patterns did not indicate online presence and consistent participation. During the first discussion, three students posted two to three messages on the same day in response to the facilitator's original question thread. Two students posted messages within the same hour and one student posted messages within a couple of hours. One of these students, however, reported that he was adjusting to the online discussion format. A facilitator in this group reported:

> Everyone who did post was on-target with the types of information they included. People participated in the discussion and came back to reply/respond thoughtfully to others' postings. There was much follow-through from participants. People provided many outside resources to further the discussion and add to the learning [that is] taking place.

Another student in Group B emphasized that the nature of the class encouraged participation:

> This course is much different than those I have been involved with in the past in an online fashion. Many times the students are left to do their work and don't hear much from each other or the instructor unless they really need it. The manner in which you are [the instructor is] facilitating this course requires the students to keep on task, and much more interestingly, still maintain the "community" that develops among students in a course.

Technology and the Interface Characteristics

Students' technology skills and the discussion board interface design influenced the level of student participation and their reflective focus in the course. Students in Group B posted discussion messages that showed a higher reflection and problem solving approach to planning and implementation of technology in schools. The majority of students wrote in-depth reflections on the issues and sought solutions to problems in planning for technology. Students in group B often reported in their reflections that they strived to post information that could contribute to their peers' learning. This group referred to the readings and their peers' postings more frequently than Group A. They wrote: "The discussion helped me to realize the importance of…"; "As I read through the discussion postings, I began to reflect…"; "After reading many of your frustrations (Charles: '…Staff cannot see how technology fits with the curriculum') and successes (Jim: '…a PDA in lieu of pay')."

Although the majority of the students in Group B had not previously taken online courses, they had used the asynchronous discussion board of the course management system in a previous class. Two student-facilitators who had previous facilitation experience modeled exemplary leadership for the discussions. Unlike Group B, no one in Group A had experience in facilitating discussions. About one-third of Group A reported disorientation with respect to utilizing the discussion interface and understanding the discussions. Helen noted, "I am feeling like I

am from another planet. Everyone seems to have such a grasp on all this. I, on the other hand, am floundering to get it together." Dawn said that many times she had found herself confused and not sure what was being discussed. Luci felt that information was repeated, which made discussion difficult to follow:

> I took a different stance when it came to participating in the discussion. I read much more than I wrote…I felt that many things seemed to be repeated over and over so the end result of 123 posting (sic) was a little overwhelming. 96 (sic) [total number of posts in discussion three] postings seemed a bit more logical, for the evaluator and the audience. Sometimes there were even the individuals that posted 2–3 postings for each strand, even kept discussions going far after they were to end! That definitely added to the length of the readings.

Both groups favored the use of multiple threads in contrast to long, linear discussions. Luci wrote, "I really liked this method [multiple threads] of facilitating because it fit my learning style. I like to have things organized spatially." Dawn noted:

> It [opening multiple threads] seemed to make the discussion more friendly and easier to contribute to. When there was just one thread opened, there were usually a lot of people saying the same things as each other because there was nothing else to respond to. However, [with] multiple threads, people could respond to whatever they wanted at any time.

Few students reported that the writing required for the online discussions influenced their participation. They commented that it was challenging to put their internal dialogue into writing. Teresa from Group B wrote:

> In person, I tend to be vocal and question many things. Online though, I think if I had my way I would be more of a lurker. I am not a shy person, but I do lack confidence in myself and find that it is harder to put what I think in writing than to say what I feel.

Robert, from Group A, struggled with writing in a colloquial way:

> While there is little that I think that I am not willing to share, verbally I have struggled to communicate at a more colloquial level. I have eliminated from conversation a slew of words that no one understood, or used, and have found myself at times unable to fill the gap with a more ordinary term.

Content area experience and expertise

Group B had several students who were involved in technology planning. Analysis of the data showed that Group B engaged in an in-depth discussion of problems and solutions in this area. Posts frequently included the expert person's messages and responses to other students. (Figure 1, page 220, depicts an online participation pattern where each number represents one student, number 5 being the expert).
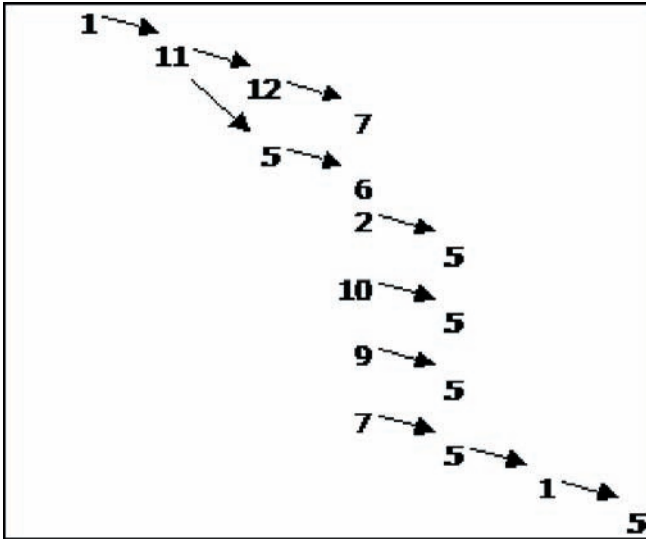
Figure 1. Participation Pattern of Group B Discussion with Expert Presence (Expert: #5)

In Group A, the discussions and reflections involved finding out how technology planning is implemented in schools. This group's level of engagement with technology and technology planning was less advanced than the other group. Student experiences and expertise with respect to technology planning influenced participation in the discussions. Amy e-mailed the instructor, "I'm sorry that I couldn't contribute to the discussion. I was trying to adapt to online class and find information that could be relevant to the discussion."

It was observed in both groups that some questions were not addressed in the way that the instructor requested. Following instructor intervention about the direction and flow of the discussion, the facilitator in Group A responded, "Thanks for steering us. – I [had] thought I was on the right track." There were a few comments from Group B regarding the questions that were not adequately answered. Ralph wrote, "The topic of assessing the use of technology was largely ignored during the week despite prompts from the instructor and the discussion facilitator. I think that's because this is an uncomfortable topic for many people…" In Group B, because the majority of the students were K–12 inservice teachers, the discussions involved issues of technology planning in the K–12 arena, even though planning in other institutions and organizations was to be discussed. John reported, "As one of the few students in class that is not part of the K–12 system, I find myself as an observer of the discussion rather than a direct participant." Ralph commented that not being able to find common background experience with the rest of the group hindered his participation in the discussion. Ralph further said:

I had difficulty participating in this discussion…I found myself logging in often to read and reread postings, but could not seem to get into the flow of the discussion. I feel like one of those lurkers mentioned in one of the other discussion threads."

Online roles and instructional tasks

It was observed that the students who were assigned specific roles maintained online presence throughout the discussions and participated more frequently than the rest of their group members. All of the students reported that student tasks and assessment criteria for the discussion influenced their participation. One student commented that he got frustrated with the requirement of "online presence," one of the essential criteria for course participation and assessment.

Five of the facilitators in both groups commented that they learned more about the topics in the discussions while they were facilitating. Matt said, "Facilitating the asynchronous discussion was certainly a learning experience. I was really struck by the dynamic nature of the discussion…one idea led to another. The result was a multi-layered discussion filled with helpful hints and useful ideas." The facilitators also reported that "knowing how much and how often to contribute to the discussion" was somewhat challenging. Matt commented, "I felt obligated to maintain a dominant presence in the discussion. Yet on the other hand, I did not want to overtly steer the course of the discussion in any one direction." Jennifer felt that being the facilitator was time consuming and hard to do. She wrote that her task kept her busy and did not allow her to look for outside resources to enhance the class learning.

Students who took on the critical reflector role struggled with posting messages that critiqued other students. Peter, from Group B, said critiquing posts and asking questions were "extremely difficult on this board as the other members generally did the exact same thing before I had a chance to." Heather, from Group A, reported, "Being a critical reviewer [reflector] was a challenge for me. Not only did I have to keep up with the readings, but I needed to keep up with all of the postings as well." Robert noted that figuring out when to participate and not interfering with the role of the facilitator kept him from fully participating in the discussions:

When I had the opportunity to check in on the discussion it seemed to be moving slowly. I was not sure if I should contribute yet as not much had been said. I did not want to interfere with the role of the facilitator. As the week moved along and I was unable to access discussion I missed several key places I would have liked to interject. I still felt not enough had been discussed but I tried to sum up the discussion by tying together several strands and promoting last minute contributions of thought with my own observations. It seemed even in the chat [asynchronous] format individuals were hesitant to speak their minds.

Information overload

One third of Group A students reported information overload and wrote the instructor that the readings and the workload were overwhelming. During the third week of the course, students e-mailed the instructor that posting and reading the discussion board were time consuming and stressful. They attempted to negotiate with the instructor to decrease the number of the assignments and discussions.

The class was frequently directed to read Web sites by the instructor and the students. Several students commented that keeping up with the Web site readings was difficult. Heather wrote, "I am still getting the hang of the asynchronous discussion. To be honest, it felt a little bit awkward for me. It was hard to get into the groove of reading other's postings and then responding. Following and remembering what each person said was another challenge." Amy commented that it was overwhelming to browse the Web sites posted and figure out what the instructor wanted them to learn. Robert reported, "Every time I log on I find so many more Web sites, I just can't visit them all. Am I the only one who feels swamped? I am putting in 16–20 hours a week…" Luci wrote, "I am feeling completely overwhelmed. I have done OK up to this point…I have barely had the time to read the discussion postings, let alone go surf the Web and look at all the sites posted." To eliminate or reduce information overload, Group A discussed that online courses need to involve less reading; the information provided should be "concise and task oriented." Robert wrote:

> Background reading and links have overwhelmed me for the time I have available and still I haven't gotten through everything. I think Saturday alone I worked from 12 to 6 and ended up with more questions than answers…Links are nice and all but I waste a lot of time searching through with minimal value. Are there any condensed readings where things are presented clearly?

Unlike Group A, Group B did not attempt to negotiate with the instructor on the assignments and did not report information overload. A few Group B students with no previous online course study reported that they were able to adjust to the pace of the course after an overwhelming start. A student wrote, "I found out that I need to plan my time better. I was gone for just a couple of days and [WOW] there were tons of new things to read and digest."

DISCUSSION

The purpose of the present study was to explore what factors influenced learner participation in two sections of a graduate online course at a Midwestern university. Findings indicated that online learner participation and patterns of participation were influenced by the following factors: technology and interface characteristics, content-area experience, student roles and instructional tasks, and information overload. There may be a reciprocal relationship among these factors. "Online learning requires the reconstruction of student and instructor roles, relations, and practices." (Vonderwell, 2004, p. 31). It becomes essential to understand the implications of online roles and tasks for learner participa-

tion, specifically in the context of a course that relies on interdependence, participation, and interaction.

Findings in the present study indicated that the facilitators and critical reflectors were actively involved in the discussions, owing to their roles and the assessment criteria set out by the instructor. A few of the critical reflectors struggled with the questions of how and when to post messages without offending other students or interfering with their roles. This finding implies that student roles, instructional tasks, and discussion assessment criteria influence participation levels and patterns. What roles encourage participation and how they influence learning outcomes need to be investigated to design and implement effective online courses.

The data analysis indicated that technology interface influenced student participation and interaction. Moore (1989) described learner-learner interaction, learner-instructor interaction, and learner-content interaction as the three types of interaction in a distance learning course. According to Hillman, Willis, and Gunawardena (1994), new technologies create a fourth type of interaction: learner-interface interaction. They defined learner-interface interaction as the interaction that takes place between a student and the technology used to mediate a particular distance education process. Swan (2004) argued that course interface can significantly impact the quality and the quantity of the interactions between peers, students, and instructor, and student and content. She stated that most research "implicitly views online discussion as not influenced by interface issues other than its asynchronous nature" (p. 17). In this study, several students in Group A reported disorientation and confusion when using the online discussion board. The interface used for the discussion affected these students' participation in the discussions.

Interface design that affords spatially and visually well-organized discussion can help enable coherent and meaningful participation. Instructors can utilize multiple-threaded discussions instead of single-threaded linear discussions when appropriate for the content and learners. The choice between single-threaded linear discussions and multiple-threaded discussions requires careful consideration, as both of these techniques may have their drawbacks and benefits. Under what conditions interface and online discussion design create disorientation and confusion, and how these hindrances can be overcome, need to be investigated.

Duration of the threads needs to be monitored to reduce repetition and information overload. In this study, the interface used for facilitating the online discussions, students' previous content knowledge, and the short duration and fast pace of the summer course may have influenced the level of information overload perceived by the two groups. Asynchronous discussions are currently based on text. "Computer text formats seem to influence how much time each individual spends on each text, which in turn influences how much information is remembered." (Lee & Tedder, 2004, p. 176). Students' experiences of disorientation and confusion with the discussion board indicated that interface design may result in information overload as well as cognitive overload. Following and remembering the discussion postings, then responding using appropriate writing conventions require concentration and time in order to entertain online information simultaneously.

Cognitive load theory attempts to describe the capacity of the working memory and how it may influence instruction and learning. Cognitive load can be defined as "a multidimensional construct representing the load that performing a particular task imposes on the learner's cognitive system." (Paas & van Merrienboer, 1994, p. 64). There is a need to research and clarify the distinction between information overload and cognitive overload and how they may interact. A clear understanding of these concepts can help teachers and researchers understand the factors that influence student participation, interaction, and learning in an online environment.

The repetition of responses posted in Group A may have been a result of students primarily responding to the instructor or questions initiated by the facilitator. There may be benefits to this pattern, as the participants respond to the main questions. The drawback is that the discussions take place only in a question-reply pattern that will not create a dialogue environment. Anderson (2004) argues that online courses that rely extensively on a model of discourse (using asynchronous discussion tools) "soon become[s] boring, and allow[s] much of the learning content to be focused on responding to teacher-initiated items, rather than challenging students to formulate their own questions and comments about course content" (p. 280). Group A's response pattern to the instructor-initiated questions also suggests a coping strategy to reduce the information overload they were experiencing.

Group B students responded to their peers' messages, creating a coherent dialogue, and they did not veer away from the main topic. It was observed that the students developed a sense of focus and synthesis in the discussions. Most of the students in Group B recognized when there was a topic that was being ignored by the rest of the class and commented on the issue. During the third discussion, the students rarely responded to a discussion thread with respect to "evaluating technology." Several students reported that they were not comfortable with this topic because of their limited background knowledge or experience. Hewitt (2003) argues that rather than persisting with a difficult topic, participants may inadvertently divert the discussion to a less important one. He notes, "it is arguably impossible for a shared direction to emerge if the participants do not recognize when topic changes occur, fail to notice when the discourse falters, and generally do not monitor how particular lines of inquiry are evolving." (p. 41). Instructors need to design ways to encourage students to follow topics that may be getting ignored or diverted, and scaffold accordingly.

Student reports on lurking have implications on how we describe participation and assess students. Lurkers can learn through vicarious interaction that occurs "when a learner absorbs and processes an observed interaction between others." (Sutton, 2001, p. 227). Rather than using the terms "lurker," Williams (2004) used a neutral term, Read Only Participants (ROPs), for those "who appear to contribute little to group discussions but who consider that they are actively following the course and learning" (p. 1). Student reflection papers or journals at the end of a discussion may enable alternative assessment methods

for instructors to check for student learning and progress. By the same token, online presence and participation is essential for motivation and ongoing dialogue among course participants. As Rovai (2000) stated, a low level of participation is insufficient to provide sustained benefit to onlookers and to create some sense of a learning community. Instructor expectations on student presence and participation need to be clearly communicated to students.

The findings in this study suggest that group development processes and group dynamics influence student participation and behavior. Each group reacted differently to the amount of workload in the course. Group A's attempt to negotiate with the instructor on the workload shows that this group possessed a different group dynamic. Students who take on leadership positions may influence group dynamics and interactions. Expert influence in Group A helped to create an engaging pattern of participation. In order to create an effective learning community, it is important to gain insight into group processes and how groups develop. Instructors can develop strategies for structuring the course as well as timely and strategic interventions for problems that may arise.

CONCLUSION

This case study explored what factors influence learner participation in the two sections of a graduate online course at a Midwestern university. Findings indicated that online learner participation and patterns of participation are influenced by the following factors: technology and interface characteristics, content-area experience, student roles and tasks, and information overload. Technology, the course interface, the behavior of the group, and the personas that students may take in an online learning course can influence participation and learning outcomes. Careful construction of online roles and tasks, and insight into how groups and learning communities develop, becomes crucial. Further research about group processes, how groups develop and roles emerge—such as leadership in an online group—and influence effective participation, may help instructors to understand group dynamics in online courses and to structure their courses accordingly.

There is a need to develop pedagogically user-friendly online course interface and management systems. Research that investigates issues of interface design, learner participation patterns, and cognitive load in online learning can enable instructional designers and educators to design effective online learning. Cognitive load theory can "provide guidelines to assist in the presentation of information in a manner that encourages learner activities that optimize intellectual performance" (Kirschner, 2002, p. 1). An update of the cognitive load theory is needed to understand how this theory works in online learning.

Students need to be prepared for technology, learning management, pedagogical practice, and the social roles required for online learning. Effective online learning requires interdependence for a shared understanding of learning goals in a learning community. Monitoring student participation and patterns of participation closely can help instructors identify student needs and scaffold learning accordingly.

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APPENDIX

A sample discussion thread

Group A	Group B
Message no. 1 In this thread, let's discuss the following. 1. What are your ideas for the reasons for staff development? 2. What factors are involved in creating a plan for staff development? 3. Who benefits from staff development? Why? **Message no. 2** I think the reasons for staff development are to keep us up on new ideas, to share our own ideas, and to keep up learning! The steps involved, I think, are to first know the needs of the staff, have the facilities to produce a good staff development inservice (hardware, software, etc.), and have the support to follow it through to the use in the classroom. If we do this, we will all benefit. **Message no. 3** While doing some research on the web I came across a web site that was is interesting in the fact that it talks about the 4 ways to integrate technology into the classroom. They are: 1. Technology as a curriculum 2. Technology as a delivery mechanism 3. Technology as a complement to instruction 4. Technology as an instructional tool. We need to keep these four areas in mind when developing teacher inservices. What do we want the teachers to be able to do at the end of the inservice? Which of these ways do we want them to take back to their classrooms? http://www.ericacve.org/docs/hopey/hopey_04.pdf	**Message no. 1** Wow! What a tremendous amount of information this week! I have had quite a few experiences delivering staff development opportunities in my district, but have always been strictly on the teaching side of things, rarely on the evaluating/needs side of it. The articles for this week's readings basically stress the importance of all three processes to staff development: Evaluating, Planning, Delivering. The staff development article stated that 25% of budgeted technology funds be used on staff development, and that these opportunities will ensure that all students are proficient by the 2013-14 school year… 1. Do you feel your district (or place of employment) has done an adequate job of gearing professional development opportunities to a specific purpose? Share successes or frustrations. 2. What is the follow through in regards to professional development opportunities in your place of work? (i.e. How is its success evaluated? Is there a follow-up meeting to share difficulties, successes?) 3. What are your thoughts on evaluating the use of technology I schools? Are you held accountable for using technology? How do districts ensure a return on their investment of hardware, software, and training? What data gathering tools would return the most valuable results of how technology is being used in the classroom?

Group A	Group B
Message no. 4 Most staff development is generic. It doesn't teach anyone a whole lot of anything...pricy speakers, limited new info, and disinterested faculty. Maybe have a development day with breakout sessions and things like that where they can choose who they see and what they learn. i hear you when you say you learn the basics of tech but nothing much further...teach me application, teach me ways to use it in my class, teach me ways to teach it to my students... **Message no. 5** I think everyone in the school benefits from staff development. Teachers because they learn to make their lessons better; Students because they learn more from the better lessons; Administration, because the all important test scores go up, and they get to talk about all the technology being used at their school; and parents because their students will be more excited about school and talk about what they are learning. **Message no. 6** 1. What are your ideas for the reasons for staff development? Obviously to improve the quality of instruction so that we improve the education of our children. Also, if done right it takes the onus off teachers and puts it on students. We probably work too hard and they not enough. 2. What factors are involved in creating a plan for staff development? A) One must look at resources available (i.e funding, but also many internally have skills to be shared) B) Staff buy in/current politics..don't overload,	I know this is a great deal to digest… I would like this week's discussion to evolve into a forum that will extract the key components to successful professional development opportunities, as well as the components that make certain opportunities failures. As we read and share our experiences, we should pay close attention to: 1. How professional opportunities are derived. 2. Methods of delivery 3. Methods of evaluation **Message no. 2** X city has done A TON to make sure that teachers have professional development opportunities, yet I don't see a lot of teachers in my building taking advantage of the training… The problem that I see is that the training is not brought to the building- the teachers have to go to sites after school and in the summer. This can especially be a problem because of the size of our district and the number of schools (it seems like the same sites get to host training repeatedly while others are forgotten). You have to give the district credit, I think, but teachers just aren't getting the training message. Here is a link to a page that shows what is going on in X city…… **Message no. 3** Jim, I visited the site you posted. I must agree with you in regards to the district doing its job as far as offerings. I particularly liked how the offerings were VERY aligned with the curriculum. They were not things like "Using Word" or "Tricks to searching the net". They were specifically related to math and science with a great use of technology! Well done! As a probing question to you and all: What are the best motivators to gain

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Group A	Group B
too many initiatives can have dire consequences C) Current staff usage of resources and their knowledge. D) What you as a planner or what the staff identifies as a vision they would like to pursue. D) When do you do it? 3. Who benefits from the staff development and why? Obviously the students if things are used effectively. Either the presentation is better, or the materials are better, or the students learn using the multiplicity of skills required to apply technology. The staff may benefit if it makes their work easier or less time-consuming. In some cases things are easier to replicate. Things may be easier to edit. People can share easier if it is on disk. Grades will be averaged by computer rather than calculator. Depending, tests may be assessed by computer. The school benefits mood-wise if kids and staff are happier. Also there is all that publicity or at least community goodwill when they learn of all these exciting things being done with computers. **Message no. 7** I really enjoyed hearing everyone's opinions about how we can bring change about in our schools. it was good to hear solutions instead of complaining (which i also love to do as well:)). I think most of us agree that we need more than a one shot workshop. This needs to be a continuing effort for staff development.	attendance at professional development opportunities? If they are "mandatory" will they lose their luster? I have always been under the philosophy that as a director of staff development opportunities you must play a few roles. First, you have to have a tremendous knowledge of what technology is currently available, and how it can be used in the classroom effectively. Secondly, you must be the driver of "the bandwagon". Show off all the neat technology to as many staff as you can, then use them! Let the teachers who have had successes with the emerging technologies teach the prof. development. Third: Roadside assistance. Make yourself available to staff to "team teach" to help support best practices with technology. **Message no. 4** It seems most of us would agree that mandatory training probably has a negative impact on teacher receptiveness and attitude toward integration. Maybe they should be made aware of the levels from the Concerns-based adoption model so they realize that what they are feeling and their attitudes toward technology use are normal?...