

# Linkage between Instructor Moderation and Student Engagement in Synchronous Computer Conferences

Shufang Shi  
Unya Mishra  
Michigan State University

Curtis J. Bonk  
Indiana University

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## Problem Statement

Current theories of learning have emphasized the value of dialogue for student engagement and achievement (Cazden, 2001; Bruffee, 1992). Research has also shown that the nature of classroom discourse depends greatly on the teacher (Anderson, Rourke, Garrison, & Archer, W., 2001). These issues are relatively well understood in face-to-face classrooms. However, the advent of online learning has raised more questions about student interaction and the role of teachers in such contexts. We need to develop a better understanding of how teachers can provide effective online mentoring and scaffolding to facilitate student engagement with each other and with their subject matter (Bonk, 2003).

Perceptions of online teachers' roles in distance education remain quite varied and controversial (Lobel, Neubauer, & Swedburg, 2002). Although online instruction literature increasingly emphasizes the importance of moderation and leadership (Anderson, et al., 2001; Feenberg, 1989), it remains unclear how online moderating are related to student engagement and interaction. The purpose of this research is to develop a better understanding of the relationship between moderator behavior and student engagement in synchronous computer conferencing learning environments.

## Theoretical Perspectives

Current interest in collaborative learning—both in face-to-face and computer-mediated classrooms—is grounded in socio-cultural and socio-constructive theories (Duffy & Cunningham, 1996; Vygotsky, 1934, 1978). Learning is seen as a process of negotiating community membership through various social interactions (Wenger, 1998) with peers, experts, and teachers (Kaye, 1992). Proponents of computer conferencing have often argued that such social-constructivist perspectives may be particularly amenable to this new medium (Bonk & King, 1998; Bruce & Levin, 1997). They argue that computer conferencing may help students maximize both their own and peers' learning through the use of collaborative activities and discussions.

The teacher plays an important role in online discussions. While individual learning can occur through independent or self-directed study, it is only through active intervention of a teacher or moderator that collaborative computer conferencing becomes a useful instructional and learning resource (Garrison, Anderson, & Archer, 2001). Though the literature recommends (e.g. Garrison & Anderson, 2003; Salmon, 2000) extensive online moderating and guidelines, few experimental studies evaluate, much less certify, moderating processes or validate the optimal level or scope of online moderating.

## Research Questions

As we have argued above, the relationship between moderating level and student engagement is complicated. Thus the major task of this study is to investigate the relationship between teacher moderating levels and student engagement. Taking a mixed research method approach, both quantitative and qualitative questions are asked:

1. Quantitatively, how are teacher moderating levels associated with each of the three student engagement variables? Is the effect of moderating levels on one student engagement variable higher than on another student engagement variable?
2. Qualitatively, what does the process of the collaborative meaning construction look

like? What is the transactional nature of the relationship between teacher moderating levels and student engagement?

As the first step of a large scale study, our answers to the research questions are based on a preliminary analysis of a small portion of the large data set. Additional analyses are underway and will be presented.

### **Research Design**

The current research applies a mixed method approach—a combination of qualitative and quantitative approaches. Its quantitative character is evident in the process of converting communication content into discrete units and calculating the frequency of occurrence of each unit. It is quantitative also in that it extends the descriptive results of content analysis to inferential hypothesis testing (Borg & Gall, 1989; Rourke, Anderson, Garrison, Archer, 2001) which intends to certify the relationship between the predictor variable of moderating levels and outcome variables of student engagement.

### **Data Collection**

The prime data source for this study will be the automatically archived conference transcripts from an online three-credit course offered at a Canadian University. This course on interpersonal communication is delivered through a real-time, interactive text, image, and animation messaging system and it is one of the first synchronous technologies that offer a visual representation of participant interaction. This course is unique also in the respect that all activities and interactions happen in real-time, i.e. in synchronous mode (Lobel, et al., 2002).

Though the transcripts form the main data for the study we plan to collect other data to triangulate the results (Patton, 2002). These additional data sources include course syllabus; course readings; classroom activity agenda developed by the teaching team and delivered to each teaching staff two days before class once a week; class preparation—one hour online meeting of the teaching staff immediately before class, and course assignments. These data will help better understand the context of each conference.

### **Data Analysis**

The predictor variable of the study is moderating level. By adapting and combining Xin's (2002) rubric for measuring online moderating with Anderson et al.'s (2001) teaching presence model, this researcher has created a five-level rubric to measure the moderating level. In this model, the minimal level of moderating (level 1) includes when the moderator: opens discussion, establishes the computer conferencing agenda, and observes conference norms. At the high end of moderating (Level 5), the moderator strongly weaves and summarizes participants' ideas in addition to performing the previous moderating levels or functions. Though termed as "levels," the scale embraces both the quality and quantity nature of moderating.

The outcome variables of the study are student engagement and its sub-constructs. Student engagement is measured through three indicators (sub-constructs): behavioral engagement, social-emotional engagement, and intellectual engagement. While computer log data provides behavioral engagement information, emotional engagement is assessed through emotional expression and group cohesion attributed to closeness, warmth, affiliation, attraction, and openness (Rourke et al, 1999). Interactivity and higher-order thinking are considered key indicators of intellectual engagement in this inquiry. In terms of computer conference interactivity, declarative, reactive, and interactive messages are coded (Hara et al., 2000; Henri, 1992; Rafaeli & Sudweek, 1996; Sarlin et al., 2003). In terms of higher-order thinking, messages of problem initiation, problem exploration, and idea integration are coded.

Given that the synchronous conferencing messages are relatively short, content analyses focus on individual message units as the unit of analysis. A message unit is considered a posted message that is automatically numbered by the system. Inter-rater reliability (Krippendorff, 1980) is determined using Cohen's kappa.

### **Preliminary Findings and Discussion**

With the purpose of revealing relationships between teacher moderating behaviors and student engagement which may later lead to the articulation of a model or framework for online teacher moderation, we have conducted preliminary analyses of the data here. To date, we have looked at the relationship between number of teacher postings and student attending and participating, two indicators of student behavioral

engagement. Second, we compared the outcome variable (student engagement) of two different groups—one with an overall high moderating level (Level 5) and the other with a somewhat lower moderating level (Level 2).

To look at the relationship between predictor variable teacher posting and outcome variables attending and participation, a correlation analysis was performed. The Pearson correlation between teacher posting and student attending as well as student participation were significant, respectively. The comparison of a portion of the outcome variable (student engagement) of two different groups—one with an overall high moderating level (Level 5) and the other with a somewhat lower moderating level (Level 2) provided interesting findings. Findings show that in these two groups behavioral engagement and intellectual engagement are about the same, whereas emotional engagement is at least two to three times higher in the group with low moderating level. Further analysis of one indicator of intellectual engagement—higher order thinking—shows that there are minimal differences in the frequency of problem initiation. However, the level of exploration is higher in the group with a high moderating level compared to the group with a low moderating level. In contrast, the level of idea integration is higher in the group with low moderating level compared to the group with high moderating level.

One interesting finding that emerged was the striking difference in the number of creative ideas offered by students in these two groups. The group with a high moderating level only produced three main ideas for their project, whereas the other group with a low moderating level produced up to seven different ideas for their project. Even though idea generation was not considered intellectual engagement in prior research, we think these differences are worth exploring in the other online classes. We are interested in the number of unique ideas or solutions produced by group members since it is a sign of creativity and divergent thinking.

Our preliminary analysis of a small sample of the data indicates some interesting trends. As we forecasted, there appear to be a difference in student engagement levels when group discussions are moderated at different levels. However, higher levels of moderation might not be associated with higher levels of student engagement. Consequently, we believe that there is a need to discover how to effectively moderate student behavioral, emotional, and intellectual engagement. Higher moderating levels might be more conducive for more student exploration, but may interfere with idea integration, emotional expression, and creative ideas.

### Significance of the Study

This study explores student engagement in relation to online moderating in synchronous computer conferencing. Eventually, research in this area can extend to online training programs and curricula. The results of the study could allow researchers and practitioners develop better protocols for moderating online discussions. Such knowledge is essential if online learning (particularly synchronous conferencing) is to achieve its full potential.

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