

Instructor Moderation and Student Engagement in Synchronous Computer Conferencing: A Mixed Methods Study

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Abstract

Current learning theories emphasize the value of instructor-led engaged collaborative dialogue for student engagement in learning. This research study attempts to develop a deeper understanding of the relationship between teacher moderating practices and student engagement in a synchronous environment through the analysis of 44 transcripts from over 11 weeks of classroom discussion in a moderated synchronous online course. The study used a mixed method design where the results of the quantitative analysis were used to select cases for further qualitative analysis. The quantitative analysis revealed that student intellectual engagement was a function of both students' participation and the number and quality of teacher postings. The qualitative analysis of online discourse allowed the identification of key themes and practices for effective online moderating. It is important to note that if certain moderating behaviors or practices correspond to or promote different forms of student intellectual engagement online, there will be vast practical and theoretical implications. The results of this study can link both the processes as well as the learning outcomes of computer conferencing to student intellectual engagement, emotional engagement, and behavioral engagement. As such, it fills a significant gap in synchronous conferencing literature, where, eventually, research can extend to online training programs and curricula.

Purpose of the Study

Online learning has received a great deal of attention, with the bulk of research focusing on asynchronous environments. Synchronous communication, by contrast, despite its

popularity, has received less research attention. Of particular interest is the manner in which instructors manage the ebb and flow of classroom discussion and how this affects student engagement. The purpose of this research is to investigate what factors contribute to student intellectual engagement, particularly, what role teacher moderators play in enhancing student intellectual engagement through engaged collaborative discourse.

Conceptual Framework

Student Engagement

Online collaborative learning engages students in knowledge sharing, mutual inspiration, interdependence, and active learning through conversation, argument, debate, and discussion among peers, experts, and teachers or moderators (Bonk & Cunningham, 1998; Kaye, 1992). By student engagement, we mean that students become engaged emotionally, behaviorally, and intellectually in the collaborative discourse of a community of inquiry through the medium of computer conferencing (Ferdig et al., 2003).

The establishment of a community of inquiry is closely related to social and emotional interaction and support. Such emotional engagement is essential to knowledge construction by making the group interactions appealing and thus intrinsically rewarding, leading to an increase in academic, social, and institutional integration and resulting in increased persistence (Rourke et al., 1999). While emotional engagement is vital to the outcomes of online learning environments—synchronous and asynchronous—behavioural engagement of learners also indicates the richness or appeal of the learning environment. Behavioral engagement means that participants are attending, attentive, and participating (Lobel et al., 2002a). Such behavioral traits can be derived from computer log data such as arrival and departure time, system queries, and feature usage.

The key objective of computer conferencing is that learners undergo cognitive changes and intellectual growth by engaging in the inquiry process. Intellectual engagement in a community of inquiry emphasizes that participants reflect deeply on the issues of the prevailing task or subject matter and engage in deep levels of critical thinking (Newman

et al., 1997). The collaborative inquiry goes through the full cycle of the critical thinking process— problem initiating and brainstorming, problem investigation and meaning negotiation, and problem resolving and idea integration (Xin, 2002; Gunawardena et al., 1997). Moreover, inquiry combines interactions between the public shared world and the private reflective world (Garrison et al., 2000) through interactivity (Rafaeli & Sudweeks, 1996).

Online Moderating

While many corporate training settings favor independent study and self-directed online learning, some scholars favor maintaining strong levels of moderating or online leadership. While individual learning can occur through independent or self-directed study (Garrison, Anderson, and Archer ,2001), it is only through active intervention of a teacher or moderator that a powerful communication tool, such as collaborative computer conferencing, becomes a useful instructional and learning resource (Paulsen, 1995). Though the literature recommends extensive online moderating and guidelines, few experimental studies evaluate, much less certify, moderating processes or validate the optimal level or scope of online moderating. The present study addresses this.

Research Questions

This study investigates what factors contribute to student Intellectual Engagement in the collaborative discourse of a community of inquiry through the medium of synchronous computer conferencing by disentangling the relationships between teacher moderating levels and student engagement variables and the relationships among student engagement variables. The major research question and the sub-questions are:

What factors affect student intellectual engagement?

- 1) Do teacher moderating levels affect student intellectual engagement?
- 2) Do other aspects of student engagement variables - social-emotional and behavioral engagement variable affect student intellectual engagement?
- 3) Is there a comprehensive factor that collectively affects student intellectual engagement?

Research Context and Data Collection

The research context of this study was a Canadian university online three-credit course on interpersonal communications and relations, delivered through a real-time, interactive text, image, and animation messaging system called the Learnbydoing eClassroom. The eClassroom consisted of a main room and four breakout rooms for small online group activities and discussions. All eClassroom activities and interactions took place in real-time. Unlike most online courses in higher education, nothing occurred asynchronously (Lobel et al., 2002b).

The prime data source for this study consisted of 44 automatically archived conference transcripts from an online course, each with an average of 350 postings. In order to better understand the context within which these discussions worked and to help triangulate research results (Patton, 2002), the following additional sources of data were collected: (1) field notes taken while doing participant observation of each conference both in the main room and in the breakout rooms; (2) the 11 archived transcripts of the main room (called the “public” area) to better understand the context of the discussions in the breakout rooms; and (3) all class materials including the course syllabus, course readings, classroom activity agendas, and all of the course assignments. These data were used to help define the context of each conference.

Research Design/Variables/Data Analysis

The variables in this study fall into two major categories: teacher moderating levels and student engagement. Based on theoretical and statistical concerns, each of these variables was further divided into sub-categories. Based on the results of the preliminary data analysis, some of the sub-categories were combined. Figure 1 provides a schematic view of all the variables and indicators used after re-categorization and combination. Each variable was measured for 11 weeks across four groups.

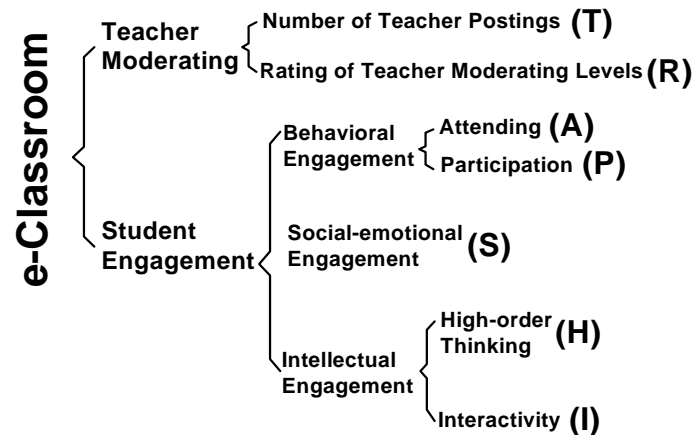


Figure 1

Teacher moderating levels consists of two constructs: number of teacher postings and rating of teacher moderating levels – addressing issues of both quantity and quality of the teacher postings. By adapting and combining Xin’s (2002) rubric for measuring online moderating with Anderson, Rourke, and Archer’s (2001) teaching presence model, we created a five-level scheme to measure the quality of teacher moderating-Rating of teacher moderating levels.

Student engagement is measured through three subconstructs: behavioural engagement, social-emotional engagement, and intellectual engagement. Behavioural engagement consists of two sub constructs: Attending and Participation. Social-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 higher-order thinking, messages of problem initiation, problem exploration, and idea integration are coded. In terms of computer conference interactivity, Initiation with a question, declarative, reactive, and interactive messages are coded (Hara et al., 2000; Henri, 1992; Rafaeli & Sudweek, 1996; Sarlin et al., 2003).

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. Nvivo 2.2 was used as an aid but the coding of the 44 transcripts was done manually.

Higher-order Thinking and Interactivity were treated as dependent variables and the remaining variables became independent variables. To answer the core question, it was vital to disentangle the complicated relationships among the independent variables. This meant that within the independent variables some would, in turn, be treated as independent and some as dependent. Thus, depending on the question, variables could be either dependent or independent.

Regression analyses were conducted to investigate the relationships between and among variables in order to identify what factors contribute to student Intellectual Engagement.

Findings and Discussion

Teacher moderating levels and student intellectual engagement

There is an interesting relationship between the Number of Teacher Postings and student Intellectual Engagement. Regression analyses showed that the Number of Teacher Postings had a linear relationship with both Higher-order Thinking and Interactivity. A higher number of teacher postings was connected to increased student Intellectual Engagement. With R square equaled to .330 (Higher-order Thinking) and .340 (Interactivity), a tentative conclusion can be drawn that the Number of Teacher Postings explain 33 percent of the changes in student Higher-order Thinking and 34 percent of the changes in Interactivity.

How did the Rating of Teacher Moderating Level relate to student Intellectual Engagement? Regression analyses showed that the Rating of Teacher Moderating Levels had a linear relationship with both Higher-order Thinking and Interactivity. This study

shows that higher Rating of Teacher Moderating Levels resulted in better direction of discussion and higher Intellectual Engagement.

Student behavioral engagement and student intellectual engagement

Regression analyses showed that the relationship between Attending and Higher-order Thinking was quadratic and the relationship between Participation and Higher-order Thinking was linear. Symmetrically, regression analyses showed that the relationship between Attending and Interactivity is quadratic, whereas the relationship between Participation and Interactivity was linear. These linear and quadratic relationships provide a strong reason to postulate that there may be an optimal level of Attending in terms of Intellectual Engagement and Participation.

Regression analyses showed that within the limitations of the contexts of this study, the higher the Participation, the higher the Higher-order Thinking and the Interactivity; that is, the higher the level of Intellectual Engagement.

Additionally, nonlinear regression results showed that if Attending was too low, which meant that if students did not “listen” or failed to pay attention, then the Intellectual Engagement would also be low. If Attending was too high, which meant that, students only “listen” without “talking,” then there would be low Participation. As a result, there would be low Intellectual Engagement because Participation has a significant linear relationship with the two indicators of Intellectual Engagement.

Student social-emotional engagement and student intellectual engagement

Regression analyses showed that student Social-emotional Engagement did not have a significant effect on either Higher-order Thinking or on Interactivity.

The finding that Social-emotional Engagement was not significantly related to student Intellectual Engagement contradicts the popular assumption in online learning literature that stresses the importance of student Social-emotional Engagement.

This study's analyses showed that none of the relationships of student social emotional engagement with other variables is significant except Attending and Participation. Social-emotional engagement did not lead to student Intellectual Engagement directly. Teacher moderating levels did not have a significant effect on student Social-emotional engagement directly; rather, teacher moderating levels had a significant effect on student Behavioral Engagement. It is fair to conclude that teacher moderating levels influenced student Behavioral Engagement, which then led to higher student social-emotional engagement. In other words, Behavioral Engagement led to social-emotional engagement, which in turn led to student Intellectual Engagement, but social-emotional engagement did not directly lead to student Intellectual Engagement. In short, the moderating behaviors of teachers led to higher intellectual engagement but had no direct effect on student Social-emotional Engagement.

What contributes to student intellectual engagement-the comprehensive factor?

The core issue of this project was to determine if and how other student engagement variables (A, P, and S) and teacher moderating levels (T and R) influence student Intellectual Engagement variables (H & I). After all the branch analyses were performed, a comprehensive factor was sought that could most efficiently express what influenced student Intellectual Engagement through the collaborative discourse of a community of critical thinking in the medium of synchronous computer conferencing. Statistical analyses revealed such a comprehensive factor - the product of the Number of Teacher Postings (T), the Rating of Teacher Moderating Levels (R), and student Participation (P). The comprehensive factor consisted of T, R, P, yet excluded A and S, which had previously been theorized as related, directly and indirectly, to Intellectual Engagement. This comprehensive factor had a statistically significant effect on student Intellectual Engagement, accounting respectively for 49.1% of Higher-order Thinking and 52.2% of Interactivity.

Student Intellectual Engagement is influenced by the product or the combination of the Number of Teacher Postings, the Rating of Teacher Moderating Levels, and student Participation. The product of T, R, and P can be seen as an index of teacher-student participation and a kind of quality/importance/rating of the participation. The product of the Number of Teacher Postings and the Rating of Teacher Moderating Levels ($T \cdot P$) measures the overall impact of teacher moderating - both quantity and quality. The product of the overall impact of teacher moderating and student participation ($T \cdot R \cdot P$) provides an overall measure of teacher-student participation. The more actively moderators posted in a synchronous online learning conference, combined with a higher quality of moderating, the more active the student participation, and, consequently, the more elevated the levels of Higher-order Thinking and Interactivity. Put briefly, the higher the product of T, R, and P, the better the student Intellectual Engagement.

Therefore, to moderate the collaborative discourse of a community of critical thinking in the medium of synchronous computer conferencing, the teacher moderator's goals should not merely be to have social-emotionally engaged students, but rather to have students attend to each other's thoughts and ideas and actively participate as a group. When teachers moderate, the quantity and quality of their moderating should focus on students Attending to each other, which will increase their Social-emotional Engagement and their willingness to actively participate. Rather than simply trying to create a safe or comfortable environment, teachers who try to get students listening and responding to each other will be rewarded with higher Intellectual Engagement. In contrast to what Cazden (2001) found in the teacher-student I-R-E (Initiation-Response-Evaluation) classroom discourse model, this data showed that Intellectual Engagement was brought

about by effective teacher moderating, not simple initiation-response discussion. Thus to ensure that students have higher Intellectual Engagement, teachers need to facilitate a common-logue that engages the whole group.

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