Teacher-Student Interaction and Academic Performance at Utah’s Electronic High School

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A growing phenomenon in K-12 education is virtual schooling, primary and secondary education offered through Internet or Web-based methods (Clark, 2001). In 1997, only two states had virtual schools. Eleven years later, 46 states offer significant online learning opportunities for students (Watson, Gemin, Ryan, & Wicks, 2009). Virtual schooling is gaining ground as a viable choice in an increasingly diverse educational landscape.

Despite the rapid growth of virtual schools, attrition remains a challenge (Barbour & Reeves, 2009; Rice, 2006; Smith, Clark, & Blomeyer, 2005). While many factors contribute to student success or failure, one factor that may be central to student success in virtual schools is teacher-student interaction. Teacher interaction has proven to be a significant factor in student success in post-secondary distance education (Jung, Choi, Lim, & Leem, 2001; Picciano, 2002; Swan, 2001). However less is known about the relationship between teacher-student interaction and academic performance in successful teacher behaviors and interaction in K-12 online environments (Rice, 2006; Smith et al., 2005). This study seeks to fill this gap in the virtual schooling literature by examining the relationship between teacher-student interactions and course completion among students at Utah’s Electronic High School (EHS).

Specifically, this study addresses the following research questions:

1. What is the correlation between student perceptions of the quality and frequency of teacher-student interaction and student academic performance and progress in self-paced, asynchronous online secondary courses?
2. How do teachers with high and low course completion rates interact with their students in self-paced, asynchronous online secondary courses?

Method

This study used a mixed-methods design. We sampled students and teachers using survey and interview techniques respectively. Table 1 identifies the number of participants, data collection strategies, and statistical/qualitative analyses employed.

The quality of interaction was examined by student reports on the nature of the interaction related to social, instructional, and procedural-type interactions. The quantity of interaction was measured by students’ perception of frequency of interaction.
Table 1. Research Method Overview

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<th>Research Question</th>
<th>Participants</th>
<th>Data Collection Technique</th>
<th>Method of Analysis</th>
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<td>1</td>
<td>Sample of 36,791 student enrollments from February 1, 2008-January 31, 2009</td>
<td>18-item, cross-sectional survey; fixed response</td>
<td>Descriptive statistics; Non-parametric test including Chi Square Test for Independence and Mann Whitney</td>
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<td>2</td>
<td>6 teachers with top 30% and bottom 30% course completion rates</td>
<td>Semi-structured telephone interviews</td>
<td>Thematic analysis, Cross-case comparisons between teachers</td>
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Data Sources

The setting for this study was Utah’s state-led Electronic High School (EHS), one of nine virtual schools operating in Utah. EHS is the largest virtual school in Utah and one of the largest and oldest in the U.S. with approximately 36,000 students enrolled and active in a course over the past year (K. Webb, personal communication, April 30, 2009). EHS has 75 part-time instructors and offers 92 unique courses to a diverse student body. The program uses a rolling-enrollment model, where students enroll at any time during the calendar year. Consequently, students proceed through the course at their own pace with little, if any, student-to-student interaction. This program characteristic likely emphasizes the importance of teacher-student and student-content interaction.

Results and Discussion

Of the 36,791 student enrollments sampled, 13% of the sample had invalid email addresses. Consequently, only 32,094 surveys actually arrived in students’ inboxes. 1,129 students completed the online survey, resulting in a 3.5% response rate. 55.1% (n=507) of the sample successfully completed the course while 44.9% (n=622) of the sample were non-completers and failed to complete the course.

Of the 18-items, completers and non-completers showed significant differences on several items using a Chi-square Test for Independence with a $p=.05$. While all four procedural items were significantly different for completers/non-completers and by final grades, there were some items that showed more stark contrasts. In response to the item My teacher clearly communicated what I needed to do to successfully complete the class. A cross tabulation showed that completers and non-completers responded differently at the $p=.000$ and Eta: .167. Approximately three times as many non-completers than completers disagreed with this statement and felt that they did not have a clear understanding of the course expectations. It would be difficult for a student to make progress in a course when they do not fully understand what is required in order to make progress in the course. Similarly, non-completers were twice as likely to indicate that they had difficulty understanding what they were expected to do on course assignments. There are several implications around these findings. Teachers could over communicate expectations, provide model works, and assume that student progress is a result of lack of understanding as opposed to student apathy. This fits with research regarding novice, young learners who tend to need more structure and increased guidance when learning new tasks.
In terms of feedback interactions, non-completers expressed more difficulty getting help from teachers when they did not understand the material (item 5). Twice as many non-completers than completers perceived it difficult to get help with $p=.002$ and $Eta=.107$. Further investigation could examine what kind of help students were receiving, what type of help they were expecting, and whether they knew how to access help.

In regard to social interactions, one question of interest was how comfortable students felt interacting with their teacher (item 10). As expected, lower performing students were less comfortable interacting with their teacher than their more successful counterparts with $p=.000$ and a practical significance $Eta =.129$. Only 12% of A students disagreed with the statement that they felt comfortable interacting with their teacher in contrast to B, C, and non-completer students who were twice as likely to disagree with the statement at 22.8%, 26.8% and 24.1% respectively. Possible implications of this finding is that the lack of student engagement many not be a function of the content difficulty or motivation, but rather, students’ sense of comfort and connection with their instructor. The teachers interviewed for this study said that virtually all interactions were over content/feedback in comparison to social or procedural interactions. Interview results also indicated that communication between teachers and students occurred primarily only when students initiate the contact. Teachers could foster social interactions in order to open the door for future interactions over content once the student felt safe in asking and approaching his or her teacher.

Researchers also wanted to also understand if there were differences in teacher reported behaviors and attitudes for those with high and low course completion rates. Six teachers across three disciplines were interviewed. Overall, high-completer teachers had less experience teaching face to face and online compared to low-completer teachers. However, low-completer teachers did have higher class sizes, with the exception of the lower division math course. Our original intention was to match teachers in high and low completion categories by course and grade level, the data did not fall into such clean categories. Consequently only one course fell into the top and bottom 30%, U.S. History.

Several common themes were found among teachers with high and low course completion rates reported behaviors. The majority of interactions teachers had with students were instructional in nature, involving grading assignments and giving feedback. The majority of communications between teachers and students were student initiated. Almost all of these communications took place over email with the exception of the lower-division math teacher who indicated that about 15% of her student communications happened over the phone. Finally, all teachers indicated that they had few procedural interactions with their students.

In terms of differences, high-completer teachers expressed more social interactions in contrast to low completion teachers that had virtually no social interactions. However examples of social interaction were limited to giving personalized feedback on a singular “about me” assignment where the student describes him or her self. For high-completer teachers two of the three sent out emails to their students who were nearing inactivity encouraging them to submit an assignment to avoid being automatically dropped from the course. That said, such emails were delivered in an unsystematic and unscheduled fashion. In contrast, only one low-completer teacher sent out emails to near inactive students, though she did this in a systematic, regularly scheduled manner. Finally, two of the three high completer teachers talked more about adapting the assignment to help struggling students be successful in comparison with low-completer teachers who would show no difference how they treated the different types of students.

Again, there were several common themes that wove across both high- and low-completer teachers regarding the perception of their role. One such theme was that teachers expressed the view that the curriculum was the teacher. As one teacher said, “The material on there is the teacher essentially.” Similarly others viewed themselves in more subordinate, removed roles such as graders and teachers in contrast to the more active instructional teaching role. Teachers did not express the view that feedback

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was a critical form of instruction. Instead they saw it as grading—something subordinate to the role of disseminating content. These sentiments were best illustrated by the following teachers’ responses to our question, “How would you describe your role at EHS?”

Well, that would it is probably different than face-to-face because you are displaying the information right there with the student. And with EHS, it’s already done on the computer system and so a lot of the times the role you just get to grade the papers. And then just answer questions. But as far as like being, I almost want to say a mentor because you can see that student you can talk to them right then, and it is definitely different that way. Almost like, here’s professors’ assistant. Here is a bunch of papers and you just kind of grade it.

In summary, there were more commonalities among high-and low-completer teachers than there were differences. A major weakness of this study is that while the we tried to move beyond perceived learning or satisfaction to tie interaction to student academic performance, we do this on self-reported data. That is, we examine student and teacher reported behaviors and perceptions as opposed to their actual behaviors. Perhaps if we were to examine actual behaviors, we would find greater distinctions between teacher behaviors for high- and low-completion courses.

Scholarly Significance of the Study

Several factors make this study significant. Many studies examining student success focus on incoming student characteristics. While these factors are useful to know, they are outside of the institution’s control. In contrast, the institution can influence teacher interactions and behavior through professional development and monitoring. Also identifying factors that facilitate interaction, administrators and educators can design more effective instruction, strategies, and policies to help diverse learners succeed in online learning. Finally, this research can shed light on whether social, instructional, or procedural interactions correlate more strongly with student success, thus helping teachers to know what types of interactions to emphasize in an online course.

References


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