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Strictly Business: Teacher Perceptions of Interaction in Virtual Schooling

Abigail Hawkins, Michael K. Barbour, and Charles R. Graham

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Abstract
This study explored the nature of teacher-student interaction from the perspective of eight virtual school teachers in an asynchronous, self-paced, statewide, supplemental virtual high school. Using intensity sampling, eight teachers who varied across discipline, grade level, and course completion rates were interviewed, revealing that the majority of interactions were student-initiated and instructional in nature. The main procedural interactions focused on notifications sent to inactive students. Social interactions were minimal and viewed as having little pedagogical value. Institutional barriers such as class size and an absence of effective tracking mechanisms limited the amount and types of interaction teachers engaged in. Study implications and future research are discussed.

Introduction
A growing phenomena in K-12 education is virtual schooling, primary and secondary education delivered through Internet or web-based methods (e.g., Clark, 2001). The use of distance education at the K-12 level began with the use of correspondence education in British Columbia in 1919 (Dunae, 2006). Similarly, British Columbia again led the country with the introduction of two K-12 web-based programs in 1993 (Dallas, 1999). Other provinces followed with their own district-based online programs (e.g., Manitoba, Ontario, Alberta, and Newfoundland and Labrador). By 2000, the Canadian Teachers Federation (2000) estimated that there were approximately 25,000 students enrolled in K-12 online courses. A decade later, Barbour (2010a), reported there were between 150,000 and 175,000 students enrolled in K-12 distance education programs in Canada.

Similarly, in the United States only three states had statewide virtual schools in 1997 but, thirteen
years later, all but two states had significant online learning opportunities for students (Watson, Murin, Vashaw, Gemin, & Rapp, 2010). The first national survey on K-12 distance education estimated there were 40,000-50,000 K-12 students (Clark, 2000). More recently, Picciano and Seaman (2009) estimated that 1,030,000 K-12 students were enrolled in one or more online courses, representing a 47% increase over a two-year period. This growth is expected to continue.

Attrition in online learning, including at the K-12 level, has been a significant challenge (Berge & Clark, 2005; Simpson, 2004; Zucker & Kozma, 2003). Many factors, both internal and external to the student, likely contribute to persistence. One factor that may be central to student success in virtual schools is teacher-student interaction (Tallent-Runnels, Thomas, Lan, & Cooper, 2006), since it has proven to be a significant factor in post-secondary distance education (Anderson, 2003; Fredericksen, Pickett, Shea, Pelz, & Swan, 2000; Wallace, 2003). Student perceptions of the quality and quantity of teacher-student interaction have also been positively correlated with course satisfaction and perceived learning (Jung, Choi, Lim, & Leem, 2002; Picciano, 2002; Rovai, 2000; Rovai & Barnum, 2003; Shea, Fredericksen, Pickett, Pelz, & Swan, 2001).

While a significant amount of research in distance education in higher education has focused on the role of interaction in relation to outcomes, less is known about its importance at the K-12 level (Rice, 2006; Smith, Clark, & Blomeyer, 2005). It may be speculated that teacher-student interaction is important in both contexts. However, researchers caution generalizing research findings of adult learners to younger learners, who often lack the ability to regulate their own learning compared to their adult counterparts (Barbour & Reeves, 2009; Cavanaugh, Gillan, Kromrey, Hess, & Blomeyer, 2004; Cavanaugh, Barbour, & Clark, 2009; Rice, 2006).

The purpose of this study was to explore the nature of teacher-student interactions in an asynchronous, self-paced, statewide, supplemental virtual high school. We begin this article by examining what is currently known about interaction in K-12 online learning. Next, we describe four themes that emerged from interviews with eight virtual school teachers. Finally, we conclude by discussing practical changes this particular virtual school could make to improve teacher-student interaction, along with several avenues for future research.

**Literature Review**

There are many perspectives on interaction in distance education. Moore (1989) was one of the first to deconstruct interaction, identifying three types: learner-teacher (i.e., exchanges serve to motivate, teach, clarify, support, and encourage); learner-learner (i.e., exchanges among students with or without the teacher’s presence); and learner-content (i.e., exchanges directly with the subject matter). Later Hillman, Willis, and Gunawardena (1994) added learner-interface interaction characterized by the exchanges the learner has with the technology itself. Finally Sutton (2001) identified vicarious interaction, characterized as students passively observing and learning from the interactions of their peers and/or teacher as another form of interaction in the distance education model. Less common modes of interaction also discussed in the literature include teacher-content interaction, teacher-teacher interaction, and content-content interaction (Anderson & Kuskis, 2007).

The centrality of interaction in distance education and learning can be found in Garrison, Anderson, and Archer’s (1999) communities of inquiry (COI) conceptual framework. According to this framework, meaningful learning occurs through the interplay of three constructs: teacher presence, cognitive presence, and social presence (see Figure 1). These constructs work together to create a community, foster critical thinking, and promote learning; and the absence or imbalance of any one of these constructs impacts both the sense of community and their learning.
1. **Teacher presence** is the "design, facilitation, and direction of cognitive and social processes for the purpose of realizing personally meaningful and educationally worthwhile learning outcomes" (Anderson, Rourke, Garrison, & Archer, 2001, p. 5). Behavioral indicators of teaching presence include clearly communicating course objectives and instructions, facilitating student progress and learning, and providing meaningful feedback to name a few.

2. **Cognitive presence** is the ability of participants “to construct and confirm meaning through sustained reflection and discourse” (Garrison & Arbaugh, 2007 p. 161). Behavioral indicators of cognitive presence include events triggering exploration of the subject, integration of new knowledge to construct meaning, and resolution enabling learners’ application of new knowledge to authentic contexts beyond the classroom.

3. **Social presence** is the ability for participants to project their personality and conversely feel a sense that others in the community are real people as well (Garrison, Anderson, & Archer, 1999). It is the ability to establish a sense of immediacy, connection, and co-presences between participants in spite of a distributed medium (Nippard & Murphy, 2007). Behavioral indicators of social presence include humor, self-disclosure, and the use of informal language to show affection.

The role of interaction is found in both the social and teacher presence constructs. Both constructs emphasize the importance of teacher-student interaction through clear expectations, group collaboration, productive discourse, and meaningful feedback. Typically, social presence emphasizes student-to-student interactions and community building, while teacher presence emphasizes teacher-to-student interaction. However, in rolling enrollment models where there is little, if any, student-to-student interaction, the teacher often assumes the role of facilitating the social presence as well (DiPietro, Ferdig, Black, & Preston, 2008; Roblyer, 2006). Though researchers have described both the types of interactions and their interplay at a conceptual level, less is known about the nature of interactions that actually occur in online learning, particularly in virtual school environments.

In order to focus more specifically on the nature of student-teacher interaction, this research uses a theoretical lens that looks at three specific dimensions of student-teacher interaction: instructional, procedural, and social interactions. These three dimensions of student-teacher interaction have been synthesized from the work of several researchers (Mason, 1991; Berge, 1995; Xin, 2002; Wallace,
2003; Heinemann, 2005). Heinemann’s (2005) research identified the instructional, procedural, and social functions of student-teacher interaction. In referring to the different types of roles online teachers must take on when moderating discussions, Berge (1995) outlined four specific functions: pedagogical, social, managerial, and technical. We combine the managerial and technical functions that have the purpose of providing administrative help to the students, into the procedural category. Finally, Wallace (2003) identified six instructor roles that have a direct impact on student-teacher interaction: (1) social, (2) procedural, (3) expository, (4) explanatory, (5) cognitive task engagement, and (6) learning assistance interactions. The last four functions outlined by Wallace can be thought of as more detailed aspects of instructional interactions between teacher and student.

We used the lens of instructional, procedural, and social functions of interaction to organize and examine the literature because it afforded a better understanding of the actual nature and purpose of the interaction as opposed to just showing participants involved in the interaction (i.e., student-to-student, student-to-teacher, student-to-content, etc.). The following section describes the specific research related to these dimensions in the K-12 virtual schooling context.

**Interaction in Virtual Schools**

In contrast to a sizable amount of interaction research in higher education distance education (e.g., Anderson, 2003; Fredericksen et al., 2000; Wallace, 2003), less is known about interaction and successful teacher behaviors in K-12 online environments (DiPietro, Ferdig, Black, & Preston, 2008; Rice, 2006; Smith et al., 2005). This section examines the limited K-12 online learning interaction research organized around the three teacher-student interaction types often cited in the literature: instructional, procedural, and social.

**Instructional/Intellectual Interactions.** Instructional interactions are exchanges related to the subject matter including teaching, clarifying, responding to questions, or providing feedback. Cavanaugh, Barbour, and Clark (2009) examined open-access K-12 online learning literature and found that teacher behaviors related to active learning and feedback were the most frequently cited among online teaching standards. The authors also suggested its frequency in the literature pointed to its perceived value by both the research and practitioner communities. However, the scope of their study was limited to a frequency count of K-12 themes referenced only in the open-access literature, which comprised less than half of the literature on K-12 online learning they identified. The study also failed to limit the scope of analysis to literature reporting research. Finally, the authors only conducted a frequency count of articles focusing on these variables. They did not examine the outcomes related to these teacher behaviors.

Research on teacher-student instructional interactions has emphasized the importance of feedback in relation to student satisfaction and persistence. Weiner’s (2003) qualitative study of a cyber charter high school found limited teacher-student interaction was a “major concern for cyberschoolers” (p. 49). Students reported that the lack of timely feedback was frustrating, impeded learning, and led to feelings of being “ignored, lonely, or lost” (p. 49). While this study captured the importance of interaction from the student perspective, it was a single case study of a full-time program still in its infancy. Additionally, as a full-time program, at the time of the study it accounted for only a small percentage of K-12 online learning programs.

**Procedural/Organizational Interactions.** Procedural interactions are exchanges related to course policies, procedures, and student progress. Teachers in distance education have to assume a different role in virtual management techniques than those in traditional classrooms (Davis et al., 2007). Several studies highlighted the importance of tracking student progress. According to DiPietro et al.’s (2008) study of sixteen teachers at Michigan Virtual School (MVS), teachers indicated that organized, structured content with clear deadlines helped keep students motivated and on track. MVS teachers also leveraged course data on student participation to help identify who needed to be reached out to. However, a significant flaw in DiPietro et al.’s study was how participants were selected. “Successful” teachers were identified by the school administration, and no further external variables (e.g., student performance data) were used to justify the “successful” label. Additionally, while DiPietro et al. classified the results of their study as “best practices,” there was no verification made that these practices indeed led to improved student performance or were even implemented.

The Idaho Learning Academy (IDLA) offered another way to monitor and track student progress. IDLA teachers were required to write weekly progress reports for each student and identify teacher support that could help move the student along (Roblyer, 2006). Further, teachers were required to contact inactive students by telephone, though the study did not indicate how an inactive student was defined or how frequently these calls would transpire. While these practices sound valuable, they were not based on systematic research evidencing their effectiveness. Additionally, Roblyer’s data were interviews from only three virtual school administrators, and it was thus limited to the opinions of those leaders relative to their own programs.

**Social/Supportive Interactions.** Supportive interactions are exchanges that offer support, encouragement, and perceptions of immediacy and connectedness. Research in K-12 online learning is still in its early stages, and the teachers focus on their work in social media by using platforms such as Facebook, Twitter, and Instagram to communicate with their students. These interactions are important for building a strong relationship between the teacher and the student, which can improve the student’s motivation and engagement in the learning process. Social interactions also help teachers to understand the students’ needs and adapt their teaching strategies accordingly. However, there is still a need for more research to understand the impact of social interactions on student outcomes in K-12 online learning.
environments indicated that supportive interactions are important to virtual high school student motivation and progress (DiPietro et al., 2008; Mulcahy, Dibbon, & Norberg, 2008; Nippard & Murphy, 2007; Roblyer, 2006; Weiner, 2003). Common themes in this literature included the importance of interacting with students to nurture, encourage, motivate, and retain them.

A qualitative study of virtual high school students in a rural Canadian province found that struggling students missed having social interactions with a classroom teacher (Mulcahy et al., 2008). Researchers found that students, feeling too intimidated to approach their online instructors, frequently turned to “real teachers” in their brick and mortar classes to ask for help. Nippard and Murphy (2007) also examined students from the same rural province and found that the mediums for social exchanges in the virtual classroom were different between teachers and students. Teachers interacted socially using traditional tools, such as two-way audio and whiteboards, whereas students showed social presence and exchanges by using instant messaging. While interesting, the transferability of these studies is problematic. Mulcahy’s research setting was three rural, isolated high schools in a remote portion of the province where the relationships students had with their face-to-face teachers were likely more intimate than those of most urban students (Kannapel & DeYoung, 1999), while Nippard and Murphy’s (2007) study examined interaction in online courses, where 40%-80% of the instruction was delivered synchronously—a delivery modality highly uncommon among virtual schools.

A few studies have examined ways teachers can promote social interaction and teacher immediacy in virtual school settings. Teachers in DiPietro et al.’s (2008) study highlighted the importance of continual contact and monitoring. The authors speculated that students interpreted these behaviors as signs that teachers cared about their experience and success in the course. Furthermore, Roblyer’s (2006) work provided more examples of concrete actions schools had taken to encourage students to successfully complete, including: welcome emails, intake interviews, weekly telephone calls, 24-hour turnaround time on student inquiries and assignments, and telephone conversations with students and parents. Again, to students, these actions could signal that someone cared about their learning experience. However, neither of these studies tied these behaviors to student performance metrics.

**Methodology**

For the purpose of this study, we explored the nature of interaction in an asynchronous, self-paced, supplemental virtual high school from the perspective of the teachers. This led to the following research question: How do teachers perceive their interactions with students? To address this research question we used a case study methodology (Yin, 2003). Case studies are appropriate when one is trying to understand a phenomenon within its own context and, as such, Utah Electronic High School (EHS) was selected as the case for this study.

Interviews were the primary means of data collection for this study. From December 15, 2009 through February 13, 2009, we conducted eight semi-structured telephone interviews with selected teachers. While Weiss (1994) stated that telephone interviews were not as effective as in-person interviews, they were considered the next best option, given the logistics of teachers spread across large geographical distances. All interviews were digitally recorded and transcribed verbatim. Following the six-stage data analysis strategy outlined by Ruona (2005), we used constant comparative method to code the content, allowing us, through an iterative process, to identify similarities and differences across the data (Ezzy, 2002). As codes emerged, they were grouped and mapped back to the original theoretical constructs of interaction types: instructional, procedural, and social.

**The Case**

This case study is bounded by the experiences of instructors at the Electronic High School (EHS), a virtual high school in Utah. Virtual schools vary significantly in the United States. According to Watson et al. (2010) virtual schools fall along a continuum of several defining variables including whether the program is full-time or supplemental, how the school is administered (i.e., district, state, private, etc.), and the degree of teacher-student and student-student interaction. Established in 1994, EHS is one of the oldest and largest state-led virtual high schools, with 48,112 student enrollments in 2008 (Center for Educational Leadership and Technology, 2008). The majority of students attend brick-and-mortar schools, supplementing their coursework with one or more of EHS’ 66 unique courses, with multiple sections taught by 75 mostly part-time teachers. EHS is a unique virtual school in several respects: first, it operates on an open-entry/open-exit model where students can start and stop at any time. As such, courses are designed primarily to be completed independently and delivered asynchronously with little or no student-to-student interaction. Additionally large class sizes limited the amount of teacher-to-student interaction. EHS primarily offered supplemental courses to students who are taking their coursework residually or through home-school. All teachers, with the exception of one full-time instructor, worked part-time for EHS and the majority held other full-time jobs outside of EHS. While the majority teachers in virtual schools teach part time elsewhere (Watson et al., 2010), other aspects of EHS’ model are atypical of most virtual schools.
Participants

Participants were selected using intensity sampling (Patton, 2002). Examining course completion data from February 1, 2008 to January 31, 2009, four teacher-subject area pairs were identified across grade levels and disciplines from the top 30% and bottom 30% of course completion rates. Table 1 details the teachers who participated in the study.

Table 1: Study Participants and Class Characteristics

<table>
<thead>
<tr>
<th>Discipline</th>
<th>English</th>
<th>Mathematics</th>
<th>Science</th>
<th>Social §</th>
</tr>
</thead>
<tbody>
<tr>
<td>High/Low Completion</td>
<td>H</td>
<td>L</td>
<td>H</td>
<td>L</td>
</tr>
<tr>
<td>Quarter 1 course/grade</td>
<td>Eng. 12</td>
<td>Eng. 9</td>
<td>Lower-Division</td>
<td>Upper-Division</td>
</tr>
<tr>
<td>Quarter 1 completion rate</td>
<td>20.8%</td>
<td>5.1%</td>
<td>15.2%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Course completion rate*</td>
<td>39.2%</td>
<td>7.5%</td>
<td>22.6%</td>
<td>0.0%</td>
</tr>
<tr>
<td>Quarter 1 course size</td>
<td>106</td>
<td>985</td>
<td>197</td>
<td>108</td>
</tr>
<tr>
<td>Course size (quarter units combined)</td>
<td>183</td>
<td>1821</td>
<td>388</td>
<td>138</td>
</tr>
<tr>
<td>Face-to-face teaching (n = years)</td>
<td>14</td>
<td>14</td>
<td>15</td>
<td>14</td>
</tr>
<tr>
<td>EHS teaching (n = years range)</td>
<td>3-5</td>
<td>10-15</td>
<td>3-5</td>
<td>10-15</td>
</tr>
</tbody>
</table>

*EHS offered courses by quarter credit. Thus the English 9 course consists of English 9 quarter 1, quarter 2, quarter 3, and quarter 4.

All participants were highly qualified teachers, according to No Child Left Behind. Six of the eight teachers worked part-time for EHS and full-time in face-to-face schools during the day, while one worked full-time for EHS and another worked part-time for EHS and nowhere else. The English 9 teacher had significantly higher student numbers since she worked full-time at EHS compared to the part-time teachers.

Results and Discussion

Several patterns emerged from the data. In this section, we organized the themes we discovered under the broader theoretical constructions of instructional, procedural, and social interactions discussed in the research literature.

Instructional/Intellectual Interactions

The majority of interactions teachers described were intellectual-instructional in nature. The primary instructional interaction took the form of teachers giving students feedback on their assignments, followed by teachers responding to student questions. Teachers reported spending from 60% to 95% of their time on these types of interactions. In describing their workflow, all teachers responded first to student questions and then proceeded to grading student submissions. Brain’s description reflected that of the other teachers:

It’s probably just going to boil down to they’ll ask me and I’ll respond back if they have a specific question. Or if the assignments come in that aren’t up to the quality or there are mistakes in them, then I’ll interact back with them….So that is mainly what I deal with as far as the interaction: questions they ask or feedback on the assignments.

This was consistent with Ferdig et al.’s (2009) review of national standards and best practices in online teaching where she discussed the importance of prompt, meaningful feedback in virtual settings.

Initiation of interaction. Clear patterns emerged regarding who initiated contact. Student-driven contact was the case for almost all interactions, and teachers reported that the majority of these interactions were instructional in nature. This interaction pattern matched teachers’ expectations for online interaction Teachers expected students to initiate contact through submitting assignments or when they had problems with understanding the material. This expectation began when the student first enrolled. Only one teacher sent out a welcome email indicating next steps, while the remaining teachers relied on the student to read the course welcome bulletin and complete the first, ungraded assignment (i.e., a brief student biography providing an introduction). As Mark, a US history teacher said, “I don’t really take any action until they start doing their work.” This sentiment was echoed by Brian, “Typically my communication back to them is only when they ask me questions…. I don’t have
contact otherwise.” When asked whether they treated struggling students differently from more successful students, Carl articulated it best:

> It would be the same as any of the other students. I just, you know, well, if they ask for extra help. That’s not a problem. If they do that, I’ll give them the extra help that they need. But if they don’t let me know that they are having a problem, I treat them like any other student.

Essentially teacher interaction was reactive, not proactive. There was no “pushing” or “harping” on students to participate in the course. Instead, “They [(i.e., the students)] have to initiate the interaction.” Conversely, Murphy and Rodriguez-Manzanares’ (2009) articulated the importance of virtual school teachers establishing initial and ongoing contact to maintain student motivation as opposed to relying solely on student-initiated contact.

Understanding the context of EHS is helpful to understanding why teachers took this approach to interaction. From February 1, 2008 to January 31, 2009, the student load for teachers ranged from 2 students to 1726 students, with the average student-to-teacher ratio being 233:1. Although, on average, almost half of the students had not submitted a single assignment, it was still a high volume of students that teachers had to attend to. The increased workload is consistent with Coffin and Stevens’ (2002) evaluation of a supplemental, Canadian virtual school, who recommended that due to the additional time and work required to interact with students that virtual teachers have a lower student-to-teacher ratio than in their walled classrooms. Holly, an EHS math teacher, recounted that three days prior to our interview, she received 138 assignment submissions. The following day she received 131 to grade. With the volume of students and an absence of an automated tracking system, teachers relied on the students to monitor their own progress through the course.

When asked to describe successful students at EHS, teachers repeatedly used the terms “self-motivated” and “independent” with regard to learners who could work without fixed deadlines. Student progress through the course was their responsibility. When students in her face-to-face program said they wanted to drop out and take the course online, one teacher responded with the following:

> I’ll say, you know you can do it, but it is tough. You have to be so self-motivated because there is no one telling you, “Okay today this assignment is due.” And you really have to care, and you have to learn on your own and there is no one there to explain it to you. You have to read the material. If you don’t get it you can ask questions but there are a lot of times your teacher is not available there 24/7. We check our email. We check our messages, but we aren’t there. So if you are working on an assignment, you’ve got to have the know-how to find the information—get online, go to the library. They have to be really self-motivated. Well, it’s not a remedial class. It’s tough.

Student success was attributed to internal factors such as motivation, self-regulation, and perseverance. However, we know from DiPietro et al. (2008) that this level of self-discipline was difficult for young learners to achieve. At EHS it appeared to be no different from the teachers’ perspectives.

Unfortunately, students who likely needed help the most were the least likely to receive it in this system. Research shows that struggling students are less inclined to ask for help and have fewer help-seeking strategies compared to their more successful counterparts (Barbour, 2007). EHS served a large population of students seeking credit recovery. Credit recovery courses are often taken by at-risk students (Barbour, 2009), where at-risk students are defined as those students likely to “drop out, flunk out, be pushed out, or ‘age out’ before successfully completing their course or schooling” (Watson & Gemin, 2008, p. 4). The implications of this approach to interaction may be that more struggling students fall through the cracks at higher levels than students more prone to contact their instructor.

**Promptness of interaction.** In spite of the large volume of students, teachers articulated interaction behaviors described by Nippard and Murphy (2007) and DiPietro et al. (2008). Teachers recognized the importance responding promptly to student-initiated contact in order to help them advance through the course. As Holly stated, “The most important single thing the teacher can do is give very prompt feedback and prompt answers to questions.” Teachers expressed the desire to turn around student work within 24 hours, if possible. As twelfth-grade English teacher Molly stated, “I think that they appreciate that I’m on top of it and I check their work so that they can move on and I’m not holding them back.” However, the ideal wasn’t always possible given the reality. Carl, a social studies teacher expressed this well:

> I have some students that will send in an assignment, and if you don’t have it graded that day, they are sending emails all over the place and “how come there is no score yet?” And so I have to tell them, “Well, when you have 500 students you take them as
they come in. You have to be a little bit patient.”

Sheer logistics, such as class size, impeded interactions and response times.

Additionally, half of the teachers allowed students to resubmit assignments that were not up to grade-level performance. While this may be evidence of a lack of clear expectations for performance in an online environment, it also spoke to teachers’ focus on mastering the material and caring more that students understood the content than self-preservation through reduced workloads. This activity reflects in practice Ferdig et al.’s (2009) online teaching standard of accommodating student differences.

Absence of face-to-face feedback. Teachers also missed the physical sense of immediacy when interacting with the students. Several mentioned that the absence of non-verbal cues that would help the teacher re-clarify, teach, or explain feedback or content was something they missed. The US history teacher, Mark’s comment on the matter was symptomatic of what many teachers felt:

One thing that I miss is the face-to-face exchange because I see in their eyes or in their facial expression or body language if they have given up on this. If whatever we are talking about is boring and I should move on. My mostly handicapped son is among other things profoundly deaf. So we communicate with him in sign language. So one of the things I teach in my day class, is the sign for boring. So they sign it out instead of hollering out “Oh this is boring.” Instead they can give me a subtle sign that this is boring, and I can move on to something else. If a student doesn’t get it [at EHS], I don’t see that. And I’m not sure, or I just proceed on, or they proceed on through the course, and I think that they have understood it. (emphasis added)

For some teachers, the absence of the physical cues made it difficult to know why students were disengaged and to identify the appropriate intervention to re-engage students. While Nippard and Murphy (2007) spoke of teacher immediacy, from the teachers’ perspective, student immediacy was just as critical. The absence of the physical meant an absence of signposts to student understanding.

Overall, teachers expressed that the majority of their time was spent on instructional interactions, namely providing feedback on assignments. Students were expected to initiate interaction, followed by teachers responding as promptly as possible. Class sizes and volume of assignments forced teachers into reactive, as opposed to proactive, modes of interaction with all types of students. The absence of visual cues to express confusion further compounded the absence of teacher responsiveness.

Procedural/Organizational Interactions

Teachers identified procedural interactions as the next most common form of interaction at EHS. Common procedural interactions included fixing broken links, answering questions around grading criteria, responding to questions around course navigation, and sending out reminders to remain active in the course message board. Teachers reported spending from 2% to 25% of their time on these types of interactions. With regard to the various procedural interactions, the teachers stressed the importance of notifying students about being dropped.

Automated progress alerts. While the majority of interactions were student initiated, there was one exception. Teachers initiated email contact before a student was automatically dropped from the course due to inactivity. Inactivity was defined as not submitting an assignment for over a 30-day period. These “warnings,” or “reminders” as different teachers called them, were automatically set up to encourage the students to progress through the class. As Tamara put it, “There are some students that are enrolled that I never see their work. And those are the ones we end up dropping, but we notify them first that they’ll be dropped from the class.” Extended inactivity triggered teacher interaction. However, in all but one instance, the notification was an impersonal statement warning of their being dropped with no inquiry as to the reasons for inactivity on the part of the student. Additionally, the single email to engage with the course came as students neared the 30-day mark as opposed to several emails sent periodically over the course of the 30-day period of inactivity. The level of teacher engagement with inactive students was far less than what Roblyer (2006) found at three successful virtual schools where communication policies for active and inactive students included reaching out by telephone, email, and student/parent consultations.

Several issues also surfaced as a result of the “you need to get going” emails. One teacher noticed that many of the emails were undelivered as student email addresses were invalid. As Molly noted, “at school, you’d see them or you could talk to their other teachers. [But at EHS,] I didn’t really have any other way to track them down.” Consequently, teachers were limited in their ability to follow up with students and understanding/discussing why they were inactive. Murphy and Rodriguez-Manzanares’ (2009) research with 42 virtual high school teachers echoed a similar sentiment. They found teachers struggled to reach out to inactive, struggling students and the strategies they could
use to diagnose student problems in a face-to-face setting (i.e., approaching the student in the hallway or talking with another faculty member in the lounge) were not the same ones available in an online setting.

Once students passed the 30-day inactivity threshold, they were automatically dropped from the course. However, frequently, students who had completed some work in the course approached teachers and asked to be re-enrolled. This took additional teacher time to reinstate the student—time that could be spent on more pedagogical interactions.

**Social Interactions**

Social interactions were the least common form of interaction among EHS teachers, and often took the form of “personal comments” students made in their assignments or teachers’ responses to such comments. Additionally, if the email notification included words of encouragement, this could also be viewed as form of social interaction.

**Mechanisms for social interaction.** Ways for teachers to get to know their students were limited to students completing an “about me” assignment and any personal information they revealed in subsequent assignments. Similarly, students were able to get to know their teacher through an online teacher biography. However, not all of the teachers knew where the tool to create their biography was or if it was fully functional in the new learning management system. Students also got to know their teachers if they revealed personal facts in response to the student’s initial self-disclosure (e.g., “I like to read too”, “You have a great name. I have a daughter-in-law named Mindy”, “We have a Labrador too,” etc.). Nippard and Murphy (2007) argued the importance of teachers establishing social presence in the form of humor, self-disclosure, and informal language to help foster a sense of connection and community.

**Barriers to social interaction.** One reason for the absence of social interaction was the absence of time on the part of the teacher. As Tamara, a science teacher, put it, “I make sure that I comment about something that they wrote…so that they know I’ve read it….But I won’t go into too much detail. I don’t have time for it but I do want them to know that I read what they wrote.” Lai and Pratt (2009) found teachers often regarded social exchanges as unproductive in a synchronous online learning program. While in Lai and Pratt’s study time was constrained by limited access to the technology, EHS’ constraints were due to a high volume of students (i.e., a 233:1 student-to-teacher ratio for mostly part-time teachers). Regardless of differences, teachers in both settings intentionally limited social interactions, favoring those more instructional in nature.

Another possible explanation for the absence of social interaction was that teachers might not consider it an important part of the instructional process in the online environment. When asked how students got to know the teachers, Carl stated, “Um. [pause.] Wow, I don’t really have anything on the website or the program to let them know really anything about me! [laugh.] To tell you the truth I don’t even know if there is a spot for that.” It was as if this teacher had never considered it important for the student to get to know him. Mark perceived these “chit-chat” interactions as a waste of student’s time saying, “they want to get through it and not chit-chat with the teacher and so I try to keep it more of a professional and business approach to their online education.” Another teacher felt that if he spent time being “personal” and “connecting” it would take up all of his time and “the return on investment, I don’t think would be good enough to justify it.” These quotes illustrate that teachers did not perceive social interaction as an important part of the online teacher-student relationship. From a constructivist viewpoint, social interaction is central to instruction and fuses the content and participants together as a community (Bransford, Brown, & Cocking, 1999). It is also paradoxical to note that these were the very types of interactions teachers enjoyed in the face-to-face classroom. For example, Mark expressed it well by saying, “For me, I’m a person that likes to meet one-on-one with kids because I like to know who they are.”

Furthermore, teachers who did see the value of social interactions expressed hesitation about revealing too much or having their physical and virtual worlds collide. Molly recounted the feelings she had when meeting, in person at her brick-and-mortar school, one of her online students whom she had taught for over a year.

It worried me when that student wanted to meet me face-to-face. I was really uncomfortable. These are my online students, and they are different. Well it turned out great. And I’m glad I did it. But it is kind of a mental thing. These are my online kids, and they are removed from me personally. They don’t see me, and they don’t know my life kind of a thing.

Ironically, while teachers hesitated to reveal information about themselves, they simultaneously lamented not getting to know with their students. Teachers felt “removed” from their students who were too often “nameless” and “faceless” when the only interactions were instructional in nature. As Brian put it:

I don’t know exactly how to word this. I care if they are passing. I care if they are
understanding. But I don't know them to care. So it’s not a personal caring. It’s a
generalized, “I hope you do well.” And once in a while a student will [reveal] by the way
they word things, you can just tell they struggle in general in school, and I kind of feel
hopeful that they make it through and survive and accomplish those goals. But I don’t
actually put a face to anybody. They don’t know me and I don’t know them. We’re just
connecting through a cyber space here.

This quote illustrated Brian’s desire to get to know his students better and his hopefulness for their
well-being, a common theme among the EHS teachers. They wanted their students to succeed,
recognizing that for many this may be the student’s last chance to “salvage” their education.
However, the majority of their interactions were limited to content-based instructional exchanges, as
opposed to motivational ones. Bransford, Brown, and Cocking (1999) illustrated the importance of the
social exchanges, describing it as the glue that connects the content and participants together to
create a rich learning environment.

Conclusions and Implications

The majority of interactions were instructional in nature with most contact being initiated by the
students. Teacher interactions focused on providing feedback on assignments and answering student
questions, with promptness being seen as particularly valuable. The main procedural interaction
teachers reported focused on notifications sent to inactive students. Teachers viewed social
interactions as having little pedagogical value and were often concerned about boundaries in the
student-teacher relationship. Finally, barriers such as class size and an absence of effective tracking
mechanisms limited the amount, and types, of interaction teachers engaged in. Consequently,
teachers had a limited view or capacity to engage in interactions beyond those focused on content.
The absence of interactions beyond those instructional in nature caused teachers to feel that their
role had been reduced to that of a grader or tutor.

Based upon these themes, along with the limitations of EHS’ instructional model, there are four
implications for practitioners in this and similar environments. First, teachers can take proactive
measures to reach out to students on a weekly basis through an email sent out to all of the students
asking how they are doing, and specifically asking if they are struggling with anything in the course
and inquiring if there are actions the teacher can take to support them for in the coming week
(DiPietro et al., 2008). Second, smaller class sizes and a space within the learning management
system for teachers and students to talk beyond instructional exchanges could help both groups feel a
greater sense of immediacy and connectedness. EHS could also implement onsite mentors to support
students and be on the ground if EHS teachers needed help reaching struggling students (Davis &
Roblyer, 2005). Third, teachers should get into the habit of providing a certain level of self-disclosure
to students (Nippard & Murphy, 2007). This could be included in the weekly email, or in the feedback
provided to students on their assignments. Finally teachers should make students more aware of
different ways in which students can communicate with their teacher, such as chat and discussion
forums within the learning management system (Davis et al., 2007). These practices may help to
reduce both teachers’ and students’ sense of isolation, distance, and anonymity.

In addition to these implications for practice, there are also three areas of future inquiry. First,
researchers can examine teacher-student interactions from a more ethnographic perspective to
understand what teachers and students are actually doing online. While this study was limited to
teacher-reported behaviors, more research could examine interactions actually occurring in the
distributed space as intended behaviors and implemented behaviors are not always aligned (Fishman,
Marx, Best, & Tal, 2003; Schneider, Krajcik, & Blumenfeld, 2005). Second, this study focused solely
on the teachers’ experience. Future research could examine from the students’ perspective
interactions and what is valuable in an online setting (Cavanaugh et al., 2009). Finally, due to the
fact that EHS has such a high population of non-completers, it would be wise to focus on the
experiences of this population of students to uncover reasons for disengagement, withdrawal, and
stopping out (Barbour, 2009; Barbour & Reeves, 2009). Understanding the experience from the point
of view of these students could assist in modifying the design and delivery on online instruction that
should benefit all students.

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