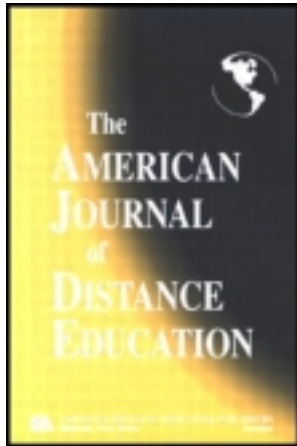


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Jered Borup^a, Charles R. Graham^a & Randall S. Davies^a

^a Brigham Young University

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The Nature of Parental Interactions in an Online Charter School

Jered Borup, Charles R. Graham, and Randall S. Davies

Brigham Young University

A belief commonly held in the K–12 education community is that parents can have a positive impact on their child’s learning. However, little research has examined parental involvement in an online learning environment. In this study, researchers using survey data found that generally students and parents viewed parent–instructor and learner–parent interactions as motivational. Students viewed learner–parent interaction as significantly more motivational than did their parents. The quantity of reported parental interactions was generally negatively correlated with course outcomes. These negative correlations may be the result of parents’ tendency to increase interaction levels following poor student performance and may not reflect the actual impact of parental interactions on individual student learning.

The U.S. Department of Education (2010) stated that parents need to be more fully integrated into children’s learning activities, a role that includes increasing and improving interactions with their children and their children’s teachers. Such interactions have an important role in their child’s learning for a variety of reasons. K–12 students tend to have an external locus of control, with fewer metacognitive skills and self-regulation abilities than adult learners (Cavanaugh, Barbour, and Clark 2009; Cavanaugh et al. 2004; Moore 1989). Thus most K–12 students require adult supervision to encourage and monitor their learning (Cavanaugh et al. 2004). In traditional brick-and-mortar schools, these custodial and supervisory responsibilities are performed by teachers and administrators. However, K–12 online enrollments are increasing rapidly, and more and more students are taking courses from home (Picciano and Seaman 2009), requiring parents to assume more of the traditional teacher responsibilities. This condition may make parental involvement more important in K–12 online learning than in traditional education settings (Liu et al. 2010; Russell 2004). Unfortunately, the current parental involvement literature focuses mainly on the traditional face-to-face setting (Black 2009; Liu et al. 2010). Although researchers may glean insights from this research, Liu et al. (2010) warned that the effects of parental involvement may be different in an online environment than on traditional face-to-face student learning.

In this article, we attempt to address the gap in the literature and quantitatively examine parental interactions during online learning. This research addressed the following questions for an online charter school called the Open High School of Utah (OHSU):

1. What are students' and parents' perceived quantity of course-related parental interactions?
2. What motivational value do students and parents place on course-related parental interactions?
3. Does the quantity of parental interactions reported by students and parents correlate with course outcomes?

In this article we first describe the previously identified types and subjects of interactions that occur in educational settings. Next we review the previous research regarding parental interactions in K–12 face-to-face and online environments. Following, we share the findings from our research conducted at OHSU and discuss the implications. Finally, we identify the limitations of this research and suggest ways future researchers may work to improve our understanding of the impact of parental interactions on online student learning.

LITERATURE REVIEW

Moore (1989) argued that, without distinctions between the different types of interactions, the term *interaction* would become meaningless. To this end, Moore wrote an editorial identifying three types of interactions: learner–content, learner–instructor, and learner–learner (Moore 1989). He explained that learner–content interaction is the “defining characteristic of education” (2); it occurs when learners spend time with content materials resulting in an increase in understanding. Moore believed learners’ interactions with their instructor and peers can also have several learning benefits. For instance, learner–instructor interactions can maintain student motivation, present new information, model skills and attitudes, help students apply their learning, assess student learning, and provide feedback. In addition, learner–learner interactions can help learners develop group interaction skills as they stimulate and motivate learners to engage in learning activities (Moore 1989).

Burnham and Walden (1997) did not consider grouping interactions by type to be sufficient, asserting that interactions should also be categorized by their subject. Table 1 summarizes the articles that have attempted to classify interactions according to their subject and to the roles that instructors fulfill when interacting with students (Berge 1995; Gilbert and Moore 1998; Hawkins, Barbour, and Graham 2011; Heinemann 2005; Offir et al. 2002). All authors identified course content as an important subject of interactions. All authors also viewed interactions as having a social element when topics are not directly related to the course content. Similar to social interactions, procedural interactions are not directly related to the course content but set

TABLE 1
Identified Subject of Interactions

<i>Article</i>	<i>Identified interaction subjects</i>			
Berge (1995)	Pedagogical	Social	Managerial	Technical
Gilbert and Moore (1998)	Instructional	Social		
Hawkins, Barbour, and Graham (2011)	Instructional/ Intellectual	Social/Supportive	Procedural/ Organizational	
Heinemann (2005)	Intellectual	Social	Organizational	
Offir et al. (2002)	Content-related	Social	Administrative	

assignment requirements and course timetables. Gilbert and Moore (1998) recognized this similarity and grouped procedural interactions in the category of social interactions; however, all other authors viewed procedural interactions as a separate subject. Online learning requires students to be skilled at using the course interface and learning tools (Hillman, Willis, and Gunawardena 1994), and students tend to seek help from the instructor when technological problems arise (Weiner 2003). Berge (1995) grouped these interactions regarding technological issues as their own category, whereas Hawkins, Barbour, and Graham (2011) and Offir et al. (2002) grouped them with procedural and administrative interactions. These discrepancies are not surprising, and some interactions likely have overlapping subjects and purposes (Berge 1995). Only Hawkins, Barbour, and Graham examined and categorized interactions in the K–12 online environment.

Although Hawkins, Barbour, and Graham's (2011) teacher interviews showed that the aforementioned forms and subjects of interaction exist in K–12 online learning, two additional types of interaction should be examined: learner–parent and parent–instructor. Research on these two types of interaction in an online setting has been limited. However, K–12 face-to-face research may provide insights into how learner–parent and parent–instructor interactions may impact online course outcomes.

Parental Involvement in Traditional Learning

In an attempt to summarize the vast research on parental involvement in a face-to-face setting, this section describes three meta-analyses that included 116 studies (Fan and Chen 2001; Hill and Tyson 2009; Jeynes 2005). Fan and Chen's (2001) meta-analysis, the largest of the three, found a correlation coefficient of 0.25 between overall parental involvement and academic achievement. Although this shows a low-to-moderate correlation, Fan and Chen stated that in the social sciences it "should not be regarded as trivial" (11).

The meta-analyses identified some dimensions of parental involvement to be more strongly correlated with academic achievement than others. For instance, Fan and Chen (2001) found that parental home supervision practices such as limiting students' off-task behavior and distractions had the weakest relationship with student performance and that parents communicating high expectations had the strongest relationship. Similarly, Jeynes (2005) reported that parental style and expectations were more strongly related with educational outcomes than setting rules or attending school activities. Additionally, Hill and Tyson (2009) found parental help with homework to have the lowest correlation with students' academic achievement.

These low correlations "should not be interpreted simplistically" (Fan and Chen 2001, 13). Some parental interactions such as help with or supervision of homework are likely in reaction to poor student achievement and/or behavior. Thus a high volume of these parental interventions may actually improve student performance for individual students but would show a low or negative correlation across many students with varying performance levels (Fan and Chen 2001; Hill and Tyson 2009).

Parental Involvement in Online Learning

A national survey found that forty-three of the eighty-one responding virtual schools had policies in place regarding the frequency of parent–instructor interaction, and thirteen were in the process of creating similar policies (Cavanaugh et al. 2009). The majority of these policies explicitly

required teachers to contact parents regarding student progress, but the frequency of contact ranged from weekly to quarterly. All of the existing policies required more frequent contact with parents of low-performing and absentee students. Although these policies emphasized the frequency and topic of contact, the mode of communication was typically not specified, with only 26% of policies addressing the need for the interaction to be synchronous (Cavanaugh et al. 2009). Although these types of parental interactions appear commonplace, Black, Ferdig, and DiPietro (2008) found that few virtual schools actually track parental involvement activities, and Liu et al. (2010) noted researchers have neglected to give proper attention to parental involvement in virtual schooling.

Some research has indicated that parents fail to understand their role in children's online learning (Boulton 2008; Litke 1998; Murphy and Rodriguez-Manzanares 2009). Following interviews with online students, parents, and teachers, Litke (1998) found that many parents either were uninvolved or tended to increase their involvement following academic problems. Litke concluded that parents need to more fully understand their essential role in their child's online learning. Similarly, Boulton (2008) interviewed all twenty-two students enrolled in a supplemental online high school course and found that students expected their parents to assume the motivation and supervision roles of a traditional face-to-face teacher. However, most parental support did not last long, and only three students successfully completed the course. Boulton recommended that online programs "consider planned parental involvement for students working from home" (17). Murphy and Rodriguez-Manzanares (2009) interviewed forty-two online instructors and recommended that online teachers encourage parental involvement through regular school-to-home communication because K-12 students require someone at home to encourage them. More specifically, following interviews and school and home observations in a blended high school setting, Waters and Leong (2011) recommended that parents be trained in four specific roles: (1) organizing their child's time, (2) incentivizing and motivating their child, (3) providing learning support when needed, and (4) acting as managers to ensure that their child adequately progresses in learning course content.

The research cited earlier relied primarily on qualitative methodology. In contrast, Black (2009) used survey data to quantitatively measure parental involvement in a virtual schooling context. He found that parents perceived a higher level of parental involvement than did students. Black also found no significant relationships between student- and parent-reported level of parental involvement and student course grade. However, Black performed the same analysis using only the responses for which both the parent and student completed the survey and found a significant positive relationship between parental praise and student performance. In addition, a significant negative relationship was found between parents' reported level of engagement in instructional activities and students' grades. Although the cause of the negative relationship is unknown, Black hypothesized that parents lacked the knowledge and skills to adequately aid their student's learning and/or that an increase in involvement might have followed (not necessarily preceded) poor academic performance.

METHODS

This research was conducted at OHSU, an online charter school that completed its inaugural academic year in the spring of 2010. OHSU was particularly appropriate for this research because

a high level of parental interaction is promoted. At the start of each academic year, OHSU holds a face-to-face parent orientation to introduce parents to OHSU faculty and familiarize them with the learning management system. OHSU also orients parents to their rights and responsibilities via a parent organization in which all parents are automatically enrolled. Each school day, students and parents are provided an opportunity to contact teachers (Wiley 2009). Additionally, instructors spend four hours a day identifying and contacting struggling students and their parents in an effort to more fully engage students in the course (OHSU 2010).

Participants

According to the school charter, during the 2009–2010 academic year 127 freshman students were enrolled in OHSU and were taught by seven instructors (Wiley 2009). The following year OHSU added a sophomore class to bring total enrollment to 250 students and the number of instructors to fourteen. The majority of students take all six of their courses from OHSU. The school's 2009–2010 annual report stated that during that school year about 95% of students were Caucasian, 19% were economically disadvantaged, 8% were identified for special education, and 46% were formerly homeschooled (OHSU 2010). The 2010–2011 annual report reported that about 97% of students were Caucasian, 14% were economically disadvantaged, 5% were identified for special education, and 21% were formerly homeschooled (OHSU 2011).

To ensure the inclusion of a large majority of students, two core freshman English courses were chosen for analysis: one from the second semester of the 2009–2010 academic year and the other from the first semester of the 2010–2011 academic year.

Data Collection

Two surveys created by the researchers were administered to students enrolled in the two selected courses and their parents. Surveys were used for data collection for two primary reasons: (1) surveys allow a broad response and (2) OHSU had not previously tracked or recorded the amount of parental interactions. To access the most accurate data required directly asking those participating in the interactions.

The surveys were designed to measure the time that parents and students spent on course interactions and determine the percentage of their interactions that was focused on social, content, and procedural topics (see Table 2). In addition, the surveys asked students and parents to report the motivational value of course interactions. Student surveys measured three course outcomes: course satisfaction, student perceived learning, and change in disposition toward the course content. Parent surveys measured parents' satisfaction with the course and their perceptions of student learning (see Table 3). In addition, researchers used end-of-semester course grades as an indicator of student performance. Although the study focused primarily on parental interactions, the surveys also measured learner–instructor, learner–learner, and learner–content interactions; these interactions, however, are reported only as reference points by which to view parental interactions. The full analysis of learner–instructor, learner–learner, and learner–content interaction can be found in Borup, Graham, and Davies (2012).

A content expert on the research team examined these surveys to verify evidence of content validity (i.e., whether the construct was adequately addressed by the questions being asked). An external measurement expert also examined the items' rating scales. Parent and student

TABLE 2
Operational Definitions of Interactions

<i>Interaction type</i>	<i>Definition</i>
Learner–Parent	Parents' and students' time spent interacting with one another regarding the course
Parent–Instructor	Parents' time spent interacting with their student's instructor talking (face-to-face or on the phone), text-chatting, writing/reading e-mails, etc.
<i>Interaction subject</i>	<i>Definition</i>
Content	Interactions focused on improving content understanding by clarifying, explaining, expanding the course material, etc.
Procedural	Interactions focused on course requirements, assignment due dates, grades, technical issues, course expectations, etc.
Social	Interactions focused on motivation, encouragement, personal interest, clubs, humor, service projects, etc.

TABLE 3
Survey Items Used to Measure Course Outcomes

<i>Course outcome</i>	<i>Survey item</i>
Student course satisfaction	On a scale of 0 to 5, how satisfied were you with this course? (0 = <i>not at all satisfied</i> and 5 = <i>extremely satisfied</i>)
Student perceived learning	On a scale of 0 to 5, how much did you learn in the first semester of this course? (0 = <i>you learned nothing</i> and 5 = <i>you learned a great amount</i>)
Student change in disposition	After taking the first semester of this course I enjoy learning about the content area much more than I did before I took the course. (1 = <i>strongly disagree</i> and 6 = <i>strongly agree</i>)
Parent course satisfaction	On a scale of 0 to 5, how satisfied were you with the first semester of this course? (0 = <i>not at all satisfied</i> and 5 = <i>extremely satisfied</i>)
Parent perceived student learning	On a scale of 0 to 5, how much do you feel that your student learned in the first semester of this course? (0 = <i>your student learned nothing</i> and 5 = <i>your student learned a great deal</i>)

surveys were then pilot tested using think-aloud sessions with two students and parents who had previous online learning experience (i.e., students and parents voiced their thoughts and actions while they took the survey). This was done to improve the readability of the items and to ensure that participants understood what they were asked. Minor changes to the wording of some items were made as a result of this analysis.

Procedures

Soon after the selected semesters had ended, researchers obtained e-mail lists from OHSU and sent an e-mail to parents and students, including a link to additional information about the study. In accordance with the institutional review board's protocols established for this study, parents and students were given the option to read and sign the informed consent page digitally. The study design required paired student–parent surveys; thus prior to analysis researchers removed

any survey that was not part of a student–parent match. The pairing required that the surveys contain identifying information; when the pairing was complete, all identifying information was removed.

Data Analysis

To answer the first study question, researchers used descriptive statistics to present the amount of time participants reported spending in various types of course interactions. The Wilcoxon signed-ranks test—a nonparametric equivalent to the paired-samples t test—was used when making statistical comparisons between parent and student reports. The Wilcoxon signed-ranks test was used rather than the standard t test because the assumptions for using the t test analysis were not met (i.e., the response data were not normally distributed, and equal variance between comparison groups could not be assumed). To address the second study question, researchers used descriptive statistics to report the motivational value of reported parent interactions. Students and parents indicated the motivational value of interactions using a six-point scale. Results were somewhat normally distributed, allowing researchers to use a one-way analysis of variance (ANOVA) and paired-samples t test analysis to make mean comparisons between parent and student responses. Researchers analyzed data for the third study question by correlating the time students and parents reported for parent interactions with course outcomes. The Spearman rho correlation was used rather than the typical Pearson correlation coefficient because response distributions were markedly skewed, which violated the assumption of normality required for using the Pearson correlation.

RESULTS

Parent–student paired survey responses from the winter 2010 semester ($n = 37$) were combined with those from the fall 2010 semester ($n = 46$). Prior to analysis researchers examined the data for errors, and one fall 2010 paired survey was removed; thus 82 usable parent–student paired survey responses were generated from the student population of 250. Of the 82 surveys, 42 student respondents were female (51%) and 77 parent respondents were students' mothers (94%).

Research Question 1: Quantity of Interactions

Parents and students were asked to report the average number of minutes they spent in course interactions per week. Initial analysis found that seven students and three parents reported unrealistically high amounts of some types of interactions—positive outliers that adversely affected distribution means. To better represent the average number of minutes students and parents spent in course interactions, the ten surveys containing extreme outliers were removed when calculating descriptive statistics. Although ten participants reported unrealistically high numbers, it can still be assumed that they spent a relatively high number of minutes in course interactions compared with other participants. Based on this assumption, researchers included survey results from these participants when making comparisons using the Wilcoxon signed-ranks test, which is not affected by outliers.

TABLE 4
Amount of Interaction Reported by Parents (Minutes per Week)

<i>Type of interaction</i>	<i>n</i>	<i>Median</i>	<i>M</i>	<i>SD</i>	<i>Skewness factor</i>	<i>% of total interaction</i>
Learner–Parent	79	60	86.0	74.3	1.1	90.4
Parent–Instructor	79	5	9.1	14.2	2.2	9.6

TABLE 5
Amount of Interaction Reported by Students (Minutes per Week)

<i>Type of interaction</i>	<i>n</i>	<i>Median</i>	<i>M</i>	<i>SD</i>	<i>Skewness factor</i>	<i>% of total interaction</i>
Learner–Parent	75	90	128.0	141.4	2.1	20.9
Learner–Instructor	75	30	42.3	45.3	1.7	6.9
Learner–Learner	75	30	92.2	126.5	1.8	15.0
Learner–Content	75	300	351.1	222.7	1.5	57.2

On average, parents reported spending about an hour and thirty-five minutes per week on learner–parent and parent–instructor interactions—about 90% of it in learner–parent interactions (see Table 4). About 65% of parents (fifty-one individuals) reported having an average of five minutes or less of parent–instructor interaction per week, and 40% (thirty-three individuals) reported having no interaction with the instructor over the course of the semester. In contrast, only five parents reported having no learner–parent interactions.

On average, students reported spending about ten hours and fourteen minutes per week in learner–parent, learner–content, learner–instructor, and learner–learner interactions (see Table 5). The majority of this time, five hours and fifty-one minutes (57%), was spent in learner–content interactions. However, students also reported that a large portion of their course interactions were learner–parent interactions (21%), surpassing their learner–learner (15%) and learner–instructor (7%) interactions. A Wilcoxon signed-ranks test found that students perceived a significantly higher level of learner–parent interactions than did their parents ($z = -2.1, p = .039$).

Students and parents were also asked to estimate the portion of their interactions that focused on the content, course procedures, and social matters (see Tables 6 and 7). Parents and students were similar in the percentage of time that they reported spending on learner–parent interaction focused on the content, course procedures, or social matters. For instance, students and parents agreed that about 40% of their total learner–parent interactions was focused on the content. Parents are typically not content experts, and it was originally hypothesized that a smaller percentage of learner–parent interaction would be spent discussing the content and a larger percentage would be social. Surprisingly, students reported their interactions with their parents as similar in subject to their learner–instructor interactions. Students reported that topics focused on course content and procedures made up the majority of their learner–parent (82%) and learner–instructor (85%) interactions. In contrast, students’ learner–learner interactions were largely social (59%).

TABLE 6
Amount of Interaction Reported by Parents Disaggregated by Their Subject (Minutes per Week)

Type of interaction	Subject of interaction	n	Median	M	SD	Skewness factor	% of total interaction
Learner–Parent	Content	79	20.1	34.3	39.3	1.9	39.9
	Procedural	79	18.6	32.6	37.7	1.7	37.9
	Social	79	9	19.0	27.6	2.1	22.1
Parent–Instructor	Content	79	0	2.4	4.4	2.1	26.4
	Procedural	79	.1	5.2	8.9	2.2	57.9
	Social	79	0	1.4	3.9	4.1	15.7
Total	Content	79	22.8	36.7	41.1	1.8	38.6
	Procedural	79	24.3	37.9	41.9	1.5	39.8
	Social	79	9	20.5	29.0	2.1	21.5

TABLE 7
Amount of Interaction Reported by Students Disaggregated by Their Intended Subject (Minutes per Week)

Type of interaction	Subject of interaction	n	Median	M	SD	Skewness factor	% of total interaction
Learner–Parent	Content	75	25.8	50.6	66.7	2.1	39.5
	Procedural	75	32.4	54.3	63.8	2.0	42.4
	Social	75	9	23.1	37.5	2.8	18.1
Learner–Instructor	Content	75	8	17.7	26.0	2.7	41.9
	Procedural	75	10.8	18.2	20.5	1.8	43.1
	Social	75	2.7	6.4	10.8	3.0	15.0
Learner–Learner	Content	75	7.8	22.1	31.8	1.8	24.0
	Procedural	75	4.5	15.9	25.7	2.3	17.3
	Social	75	12	54.2	97.3	2.7	58.8
Total	Content	75	68.8	90.4	90.2	1.5	34.4
	Procedural	75	76.5	88.5	78.7	1.5	33.7
	Social	75	36	83.6	114.4	2.4	31.9

Research Question 2: Motivational Value of Interactions

In order to address the second research question, parents and students reported on a six-point Likert scale (1 = *strongly disagree* to 6 = *strongly agree*) whether the different types of interaction they experienced “helped motivate [them] to learn the course content.” The number of respondents varied because students and parents were asked to respond only if they had experienced that type of interaction. In addition, all parents used the same Likert scale to report the motivational value they perceived in some interactions that did not directly involve them (i.e., learner–content, learner–instructor, and learner–learner interactions). Overall the majority of parents and students viewed all types of interaction as motivational (see Tables 8 and 9). The following sections address specific student and parent perceptions.

TABLE 8
Motivational Value of Interactions Reported by Parents

<i>Interaction type</i>	<i>n</i>	<i>Agreed</i>	<i>% agreed</i>	<i>Median</i>	<i>M</i>	<i>SD</i>
Learner–Parent	76	67	88.2	4.5	4.5	1.1
Parent–Instructor	45	40	88.9	5	4.5	1.1
Learner–Instructor	82	73	89.0	5	5.0	1.1
Learner–Learner	82	59	72.0	4	4.1	1.4
Learner–Content	82	68	82.9	5	4.5	1.3

Data analysis showed no difference in the motivational value reported by parents for learner–parent, parent–instructor, and learner–content interactions (4.5). However, parents reported that learner–instructor interaction motivated their students the most (5.0) and learner–learner interactions motivated students the least (4.1). A one-way ANOVA found that parents believed learner–instructor interactions motivated their students significantly more than learner–learner interactions, $F(4, 362) = 28.3, p < .001$ (see Table 8).

Students reported that their learner–instructor interactions had the highest motivational value (5.1) and learner–content interaction had the lowest (4.2). A one-way ANOVA found that students' reported motivational value for the different types of interaction differed significantly, $F(4, 346) = 37.928, p < .001$, and a post hoc test found several significant differences. The motivational value of learner–parent interactions reported by students was significantly higher than learner–content ($p = .000$), learner–learner ($p = .008$), and parent–instructor ($p = .001$) interactions. In addition, students reported that learner–instructor interaction motivated them significantly more than learner–content interaction ($p = .010$) (see Table 9).

Several paired samples t tests were conducted to determine if students and parents differed significantly in the motivational value they reported for the different types of interaction. Students reported learner–parent interaction as significantly more motivational ($p = .002$) than did their parents. Students ranked their learner–content interaction as significantly less motivational than did their parents ($p = .011$).

Research Question 3: Correlations Between Interactions and Course Achievement

The third research question asked whether the quantity of parental interactions reported by students and parents correlated with the six measured course outcomes: (1) students'

TABLE 9
Motivational Value of Interactions Reported by Students

<i>Interaction type</i>	<i>n</i>	<i>Agreed</i>	<i>% agreed</i>	<i>Median</i>	<i>M</i>	<i>SD</i>
Learner–Parent	75	73	97.3	5	5.0	0.8
Parent–Instructor	59	47	79.7	4	4.3	1.4
Learner–Instructor	74	65	87.8	5	5.1	1.1
Learner–Learner	62	50	80.7	4.5	4.4	1.2
Learner–Content	81	67	82.7	4	4.2	1.1

end-of-semester percentage grade, (2) students' perceived learning, (3) students' course satisfaction, (4) students' change in disposition toward the course content, (5) parents' perception of the level of their student's learning, and (6) parents' course satisfaction. Due to the skewness of interaction frequency distributions, researchers used a Spearman rho correlation analysis. The results are presented in Tables 10 and 11.

Students' reported time spent in learner-parent interactions was negatively correlated with almost all course outcomes, although the negative correlation was significant only with the time they reported spending in learner-parent interaction regarding the content ($\alpha < .05$) and their reported change in disposition toward the content ($r = -.25, p = .021$). These

TABLE 10
Correlations Between Students' Reported Quantity of Interaction and Course Outcomes

<i>Interaction type</i>	<i>Interaction subject</i>	<i>Student grade</i>	<i>Student perceived learning</i>	<i>Student course satisfaction</i>	<i>Student improved disposition</i>	<i>Parent perceived learning</i>	<i>Parent course satisfaction</i>
Learner-Parent		-.08	-.01	-.21	-.18	-.18	-.15
	Content	-.00	-.07	-.18	-.25*	-.18	-.14
	Procedural	-.12	-.07	-.13	-.07	-.14	-.13
	Social	-.05	-.03	-.15	.06	-.14	-.08
Learner-Instructor		.10	.12	.09	.21	.01	-.01
	Content	.08	.14	.12	.29*	.01	-.06
	Procedural	.07	.16	.14	.15	.12	.13
	Social	.01	.11	.08	.23*	-.02	-.07
Learner-Learner		.26*	.20	.29*	.31*	.29*	.29*
	Content	.17	.19	.24*	.30*	.29*	.30*
	Procedural	.16	.17	.23*	.18	.31*	.33*
	Social	.29*	.12	.17	.21	.23*	.22*
Learner-Content		.06	.19	-.06	.10	-.07	-.23*

*Significant at the $\alpha = .05$ level.

TABLE 11
Correlations Between Parents' Reported Quantity of Interaction and Course Outcomes

<i>Interaction type</i>	<i>Interaction subject</i>	<i>Student grade</i>	<i>Student perceived learning</i>	<i>Student course satisfaction</i>	<i>Student improved disposition</i>	<i>Parent perceived learning</i>	<i>Parent course satisfaction</i>
Learner-Parent		-.09	-.16	-.20	-.14	-.11	-.18
	Content	-.03	-.14	-.24*	-.25*	-.15	-.18
	Procedural	-.28*	-.09	-.09	-.09	-.12	-.15
	Social	.04	.02	-.01	.10	.05	.08
Parent-Instructor		-.02	-.12	-.10	-.12	-.01	-.03
	Content	.03	-.02	-.01	-.03	.00	-.05
	Procedural	-.04	-.21	-.19	-.14	-.01	-.05
	Social	.06	-.05	-.01	-.09	-.02	.04

*Significant at the $\alpha = .05$ level.

negative correlations contrasted to the largely positive correlations found between course outcomes and students' reported quantity of time spent in learner–content, learner–instructor, and learner–learner interactions.

Parents' perceptions of their students' learning level and parents' course satisfaction had significant positive correlations with students' overall reported time spent on learner–learner interactions as well as with all three of the intended subjects of learner–learner interactions (i.e., course content, procedures, and social topics). Finally, a significant negative correlation was found between students' reported time spent on course interactions and parents' reported satisfaction with the course ($r = -.23, p = .043$) (see Table 10).

Parents' reported time spent on learner–parent and parent–instructor interactions showed mostly negatively correlations with the measured course outcomes, three of which were significant at the $\alpha = .05$ level. Parents' reported time spent on learner–parent interaction regarding the content had a significant negative correlation with students' reported course satisfaction ($r = -.24, p = .027$) and with students' reported change in disposition toward the content ($r = -.25, p = .023$). In addition, the time that students reported they spent on learner–parent interaction regarding course procedures had a significant negative correlation with student grade ($r = -.28, p = .012$) (see Table 11).

DISCUSSION

Quantity and Quality of Interaction

Research for this study attempted to measure the quantity of the different parental interaction types and subjects that occur in an online learning environment. Students reported spending nearly 40% more time interacting with parents regarding the course than they reported interacting with peers and over 300% more than they reported interacting with their instructor. This supports researchers' claims that parents' role in student online learning is crucial (Boulton 2008; Liu et al. 2010; Murphy and Rodriguez-Manzanares 2009; Waters and Leong 2011). However, a large variance was found in the reported levels of learner–parent and parent–instructor interaction. This variance in part confirms Litke's (1998) grouping of parental involvement levels as absentee, supportive, and participatory.

The researchers also found a large variance in parents' reported quantity of parent–instructor interaction, with over 40% of parents reporting no interaction with their student's instructor. This could be a reflection of OHSU's policy that requires teachers to focus attention on lower-performing students (OHSU 2010). The large majority of students viewed parent–instructor interactions as motivational (97%), which supports previous suggestions that student performance might increase if teachers worked more collaboratively with parents (Boulton 2008; Murphy and Rodriguez-Manzanares 2009).

This research found that students viewed learner–parent interaction as significantly more motivational than perceived by their parents. This finding indicates that parents may not fully understand the motivational value of their interactions with their student. It was also found that a large portion of the reported learner–parent interactions focused on the content. Shulman (1987) claimed that effective teaching requires a “special amalgam of content and pedagogy that is uniquely the province of teachers” (8). As a result, parents' content interactions with students

may prove more effective when aided by teachers. For instance, teachers can make the content and other educational resources available to parents along with teaching suggestions and tips.

Relationship of Outcomes to Parental Interaction Levels

The large majority of parental interactions were not significantly correlated with course outcomes, and most were negatively correlated. This finding replicates Black's (2009) research that found a negative correlation between the level of parental involvement and online student performance. Similar to Black, we hypothesize that the correlations likely reflect the OHSU parental interaction policy that encourages instructors to contact parents of low-performing students as well as some parents' tendency to engage in interaction with the instructor and their student following academic problems. If a large proportion of parental interaction occurred in reaction to poor student performance, the correlation that results from examining a large group of students could mask the true benefit of parental involvement on individual student learning. The benefit of parental involvement can be seen in the fact that a large majority of students and parents reported that learner–parent and parent–instructor interactions were motivational. These and Black's correlations may be lower than similar correlations in a face-to-face context (Fan and Chen 2001) because parents are more available and responsive to struggling students' needs in an online learning environment.

Also it is simplistic to assume that a high level of parental involvement is required for high student achievement. Litke (1998) hypothesized an inverse relationship between the amount of responsibility students accept for their own learning and the amount of parental involvement that is required for student success. Thus, when examining self-regulated students with an internal locus of control, researchers might expect to find low correlations between student achievement and parental interactions.

In contrast to the negative correlations reported earlier, the amount of time students reported interacting with their peers was significantly correlated with their parents' satisfaction with the course. This positive relationship may be a reflection of parents' concerns regarding their children's social development (Cavanaugh et al. 2004) and their desire for their children to interact socially with their peers (Shoaf 2007).

Limitations and Future Research

Although this study had an acceptable response rate of 32.8% (Cook, Heath, and Thompson 2000), the survey was administered to parents and students of a new online charter school with a small student population, resulting in a relatively low number of respondents ($n = 82$). Future research should be conducted in larger, more diverse settings. This type of research may result in different findings because “budgets, availability of personnel, size of the school, state models, and models of instruction are all likely to change the roles that are expected of an online educator” (Ferdig et al. 2009, 496) and in turn the level of parent involvement.

Future research should also seek to understand how some parent characteristics, such as education level and socioeconomic status, influence parents' ability to effectively engage in educational interactions with students. In addition, the research relied primarily on parent and student perceptions obtained through surveys. Although these perceptions are insightful, they can be biased. For instance, in this research students reported a significantly greater total

amount of learner–parent interaction than did their parents. In contrast, Black’s (2009) survey research found that parents perceived a higher level of parental involvement than did students. Researchers should be aware of these differences and consider the subjective nature of self-report data. Interviews, e-mail communications, analytic data obtained from learning management systems, and observations could be used to triangulate self-reported levels of parental interaction. Obtaining and analyzing this type of information from vulnerable K–12 populations can be difficult and laborious; however, its value outweighs the cost.

Future research should also look beyond quantity and examine the quality of learner–parent and parent–instructor interactions. Researchers should work to create a theoretical framework that identifies and categorizes the different types of parental involvement activities and sets forth hypotheses on how they might influence student learning. Rice (2006) stated that some of the blame for the lack of K–12 research can be attributed to “the lack of a theoretical rationale” (440). A theoretical framework may help increase the quality of online research. Mishra and Koehler (2006) explained that a framework not only helps guide researchers’ focus to what is important but also helps them ignore the insignificant. A framework could aid researchers to highlight best practices and identify the types of involvement that have the most impact on course outcomes. This type of information can have practical implications for K–12 online learning course designers and teachers; thus it has the potential to improve course outcomes for all students.

CONCLUSION

This research used parents’ and students’ self-reported data to describe parental interactions at OHSU, an online charter school. Researchers found a large variance in the reported quantity of learner–parent and parent–instructor interactions reported by students and parents. About 40% of parents reported having no interaction with the instructor. Although students and parents reported that learner–parent and parent–instructor interactions positively affected students’ learning motivation, students’ and parents’ reported quantity of parental interactions largely correlated negatively with course outcomes. These negative correlations may reflect parents’ tendency to increase interaction levels following academic problems and instructors’ tendency to spend a high percentage of their time interacting with low-performing students in attempting to more fully engage them in the course. Thus a large percentage of these interactions would result in the low or negative correlations without reflecting the actual impact on student learning at the individual level.

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