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Stripping the Wizard's Curtain: Examining the Practice of Online Grade Booking in K–12 Schools

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Abstract

Online grade booking, where parents and students have access to teachers' grade books through the Internet, has become the prevailing method for transmitting daily academic progress for students across the United States. However, this practice has proliferated without consideration of the potential relational impacts of the practice on parents, teachers, and students. Arising from a comprehensive literature review and thematic analysis of participating individuals' comments and quotes in online mass media sources, a conceptual framework is offered to describe relevant dialectical tensions undergirding online grade booking, informing future research and practice that better supports home–school communication.

Key Words: dialectical tension, online grade booking, parent portals, home–school communication, student information systems, social ecology, parenting

Introduction

In recent years, online grade books (OGBs), accessible not only to teachers and to school administrators but also to students and parents, have provided all members of school communities with transparent and accessible information about students' progress (Note: The words *parent/parents* are used throughout to refer to adults raising a student, to match the federal definition of *parent*

involvement—this includes grandparents, legal guardians, and others; OGBs = parent portals/student information systems). The widespread use of OGBs has been bolstered by (1) the No Child Left Behind Act's (NCLB, 2002) inaugural definition of parent involvement—the first to exist in the Elementary and Secondary Education Act—as "the participation of parents in regular, two-way, and meaningful communication involving student academic learning and other school activities" (Title I, Section 1118); and (2) the requirement that school districts applying for Title II funds must have in place a process for effective use of technology to promote parent involvement and increase home–school communication (Title II, Part D, Section 2414.b.9). OGBs are now the norm for recording and transmitting grades in the United States' K–12 schools (Gartner, Inc., 2011; McKenna, 2016). Surprisingly, no prior comprehensive study of the impact of OGBs on the relationships between home and school, nor on participants' personal experiences with OGBs, has been conducted.

Public media coverage of OGB use and impact on students, teachers, and parents noticeably increased beginning with the 2006–07 school year (Bird, 2006; Dawson, 2007; Edutopia, 2007; Lacina, 2006; Torres, 2007; Villano, 2008; Weeks, 2007), concurrent with the entrance of NCLB kindergarteners into middle school. Thus, the first students whose entire secondary school experience (Grades 6–12) involved online grade booking are now available to inform the field. Through the OGB, parents may check on their child's grades, assignments, and attendance without directly communicating with their child or their child's teacher. Students check this information without directly communicating with their teachers, as well.

Similar to other educational software, the way in which online grade books are designed affects the kinds of experiences students and teachers have (Lynch, 2011). However, parents are now an additional participant in the technology experience, drawn into online educational software use through the online grade book. Computer scientist Jaron Lanier, in his work describing the impact of technology on society, cautions life must not be "turned into a database" (Lanier, 2010, p. 69). We propose here that, in several ways, the online grade book is a database-centered construct that appears to have changed communication between students, parents, and teachers, particularly at the secondary school level, and deserves careful attention. Most prior studies of OGB use have concentrated on its effects on student achievement. No systematic review or theoretical analysis of the effects of these systems on relationships between the partners involved—students, teachers, and parents—has been reported to date in the literature. The purpose of this article is to provide such review and to identify theoretical underpinnings of OGBs through thematic analysis of participants' online comments in mass media, in order to create a conceptual

framework that can guide the use of and the future research on these systems that affect the home–school partnership.

Review of the Literature

Historical Background

While school systems' use of computer technology to track student data began in earnest in the 1970s (Hafner, 1992), teachers' use of computers to record and process their students' daily grades gained momentum in the early 1980s. Teachers often used financial or statistical spreadsheet programs prior to the later development of the first DOS (disk operating system)-based grade book application in 1987 (Excelsior Software, 2008; Vockell & Kopenec, 1989). In 1991, Integrated Services Delivery Network (ISDN) telephone technology was first used to transmit student grades to parents (Scantron Corporation, 2014). Parent and student access to grade information via the Internet has become widespread in the last decade. This is largely attributable to NCLB mandates to centralize information and increase the accountability of schools, resulting in the addition of parent and student "portals" to school information systems. Such transparent and publicly accessible accountability systems, metaphorically referred to by one school administrator (quoted in de Vise, 2008, para. 22) as "stripping the curtain from the Wizard [of Oz]," provide parents and students with access to data on grades, attendance, evaluations, and general classroom activities from any Internet-connected device including computers, tablets, or phones (Bird, 2006; Klobas & McGill, 2010).

Online grade books have been shown to (1) save time for teachers by updating student data automatically (Vockell & Fiore, 1993), (2) provide information that enables adjustments to the curriculum (Gartner, Inc., 2012), (3) help in monitoring student progress (Bird, 2006; Villano, 2008; Vockell & Fiore, 1993), and (4) keep parents informed (Bird, 2006; Villano, 2008). The majority of teachers have accepted the use of these online grading systems (Migliorino & Maiden, 2004), and, in most school districts where OGBs are in use today, teachers are mandated to use them (Gartner, Inc., 2011). It is estimated nearly all American public school districts now engage to some extent in sharing grades online with parents and students (McKenna, 2016).

Secondary School Issues

The significance of the transition to online grade booking may be more relevant to secondary educational settings, where grading becomes more important (Lacina, 2006) and where the student is most often in classes/subjects with multiple teachers per day. This increases the number of members of the

student's instructional team while decreasing the depth of knowledge of any one team member about a given student (Rogers & Wright, 2008). In this secondary school context, the OGB provides all users with a common source of information that tracks students' daily academic progress. Secondary school is also when parents increasingly view grades as a reflection of their child's achievement (Pilcher, 1994) and as impactful on the student's future due to association with college and career aspirations (Lahey, 2013). Use of OGBs allows parents who desire it and have access to Internet devices and knowledge of how to use them to increase involvement with their child's education (Zieger & Tan, 2012) and to make informed decisions related to their child's academic progress (Villano, 2008). For secondary parents, this access is unprecedented, as secondary school historically has been the time when students are expected to become more independent and to manage their own academic progress with less support (Eccles et al., 1993). Subsequently, due to the access now afforded parents through OGBs, the responsibility for a child's educational process is perceived to be shifting, with parents regarded as educational accountability partners with some responsibility for their child's achievement (Caspe, Lopez, & Wolos, 2006–07).

Unintended Consequences of the Practice

Despite the perceived benefits of greater transparency regarding academic progress and facilitated communication between school and home, parents, teachers, and students have acknowledged problems with and unintended consequences of OGBs. Reliance on OGBs as the primary method by which student progress is transmitted to families isolates persons who do not have readily available Internet access, those who do not speak the language in which the information is presented, and those with limited literacy or technology skills.

Even for those with Internet access, parents appear to use OGBs with a lack of consistency (Murray, 2011), and teachers post information on an irregular or unpredictable basis (Gronke, 2009). Additionally, while the opportunity for communication between parents, teachers, and students increases with OGBs, this does not mean parents choose to take advantage of this opportunity (Mathern, 2009; McKenna, 2016). While increasing a proactive stance among parents would be the ideal, Selwyn, Banaji, Hadjithoma-Garstka, and Clark (2011) found parents' use of the system was instead passive or reactive, resulting in parents communicating with their child's teacher only when there was a problem that needed attention. Further complicating this situation was the use of OGBs to disseminate information, with limited opportunities for open dialogue between parents and teachers (Selwyn et al., 2011). Furthermore, Strømsø, Grøttum, and Lycke (2007) note an increase in technical and

organizational questions when learning to use computer-mediated communication, rather than exchanges concerning the student's progress. A 15-year veteran teacher echoed this finding in an interview with one of the authors during the research for this article, stating, "I wish I could have a conversation about kids, instead of about the online grade book" (V. Stroud, personal communication, March 6, 2012).

The widespread implementation of OGBs also has resulted in the identification of areas of needed improvement in the technology and its use. Teachers and researchers have expressed the need for increased professional development with school data systems (Gartner, Inc., 2011; Ho, Hung, & Chen, 2012; Migliorino & Maiden, 2004). However, it is apparent from our work as researchers in schools that parents often are confused by the information displayed in the OGB and would also benefit from training. Ferrara's study (2015) specifically investigated the use of Parent Involvement Facilitators to assist parents, in part, in understanding how to use the online grade book. Students have commented on frustration and anxiety created by having to log in to track their progress in the OGB and the tensions that are created by parents having access to their grades yet limited understanding of the data they see (Hoffman, 2008; Lahey, 2013; Murray, 2011). Student complaints range from accusations of parental "snooping," parents invading students' privacy, and a lack of caring demonstrated by parents when asking students about their grades. Fear of punishment and the frequency with which it may now happen due to constant access to the students' grades 24/7 was summarized well by one student's comment, "Before, the screaming and disappointment only had to be endured four times a year. Now it can happen every night" (Hoffman, 2008, para. 36).

Communication Dynamics Between Parents and Teachers

Through parental access to the OGB, schools aim to increase student academic achievement, literacy, graduation rates, and attendance (Bird, 2006; Englund, Luckner, Whaley, & Egeland, 2004; Harvard Family Research Project, 2006; Jeynes, 2012; Senechal & LeFevre, 2002; Sheldon, 2007). Efforts to engage parents at the secondary level are particularly necessary because, without them, teachers and parents usually do not clearly define the responsibility or expectations of communication, sometimes leading to a loss of communication in secondary school communities (Adams & Christenson, 2000). As mentioned previously, a spike in national public media coverage of OGBs occurred around 2007. We note this time point was concurrent with the entrance of NCLB's kindergarteners into their middle school years when students typically leave self-contained classrooms and become accountable to multiple teachers per day.

Prior to the introduction of OGBs, teachers relied on traditional methods such as written notes, phone calls, emails, personal conferences, and summative report cards to convey student progress on a periodic basis. However, as Thompson reported in 2008 in a study of communication between parents and teachers, only a small percentage of parents communicated with their child's teacher on a consistent basis, and the majority of academic communication between teachers and parents was related to grades and homework.

In a follow-up study four years later, after OGBs became prevalent nationally, Thompson and Mazer (2012) reported parents using email as the primary mode of communication with the child's teacher. Most OGBs have direct links to email for each teacher, making the process of parent contacting teacher quite easy, which we propose contributed to this shift in parent behavior shortly after online grade booking became a more common school practice. Also in 2012, in a high school study by Zieger and Tan on technology and school communication, parents/guardians of ninth graders in one suburban high school were asked if a poor grade or a "missing grade" on an assignment shown in the OGB resulted in their contacting the teacher; 58% responded yes. Additional probes revealed 73% of those parents/guardians who reported contacting the teacher do so when the student's overall grade (i.e., semester or quarter average) is poor, while 13% contacted the teacher when the poor grade is on a major assignment. Finally, 15% of responding parents/guardians stated that they contacted the teacher every time a poor grade was posted to the OGB (Zieger & Tan, 2012). When one considers a high school teacher can be responsible for teaching 150–225 students per day, the volume of contact with teachers resulting from OGB implementation is substantial.

While most parents believe it is important for them to be involved and that they have a role to play in their child's educational process (Bracke & Corts, 2012), many parents may lack the knowledge, opportunities, or time (Caspe et al., 2006–07; Henderson & Mapp, 2002; McKenna & Millen, 2013). Additionally, parents may view involvement in older students' management of day-to-day academic tasks as inappropriate due to an expectation that students should be more independent of their parents by their teen years and that such involvement is counterproductive to preparing students for college and/or career (Lahey, 2013).

For those desiring to be involved, the communication obstacles faced by parents are exacerbated in secondary school, when parent involvement often decreases (Henderson & Mapp, 2002). OGBs, aside from their role in the recording of student progress by the teacher, facilitate communication and transparency with regard to student achievement, participation, attendance, and behavior. However, as OGBs are Internet-based programs that incorporate

convenient email communication to teachers (Baker, 2011; Thompson, 2008; Zieger & Tan, 2012), a new form of highly involved "helicopter" parent (Carney-Hall, 2008; Weeks, 2007) has emerged. If Zieger and Tan's (2012) results are generalizable, approximately 9% of parents who use the OGB contact their child's teacher every time a poor grade is posted, regardless of the importance of the grade to the child's overall academic standing. A variant on helicopter parents, "snowplow parents" (O'Laughlin, 2013) seek preemptively to remove barriers to their child's education. We propose the OGB enables this group with newfound currency to "plow" through obstacles for their children by manipulating their schedules and managing their time in ways not previously possible when the student was the only party in the home with detailed information on assignments, due dates, and class activities. Such vigilant parenting practices challenge research that indicates students' needs for autonomy beginning with adolescence (Eccles et al., 1993). We propose the OGB encourages these parenting practices due to (1) the perception that the frequency with which the parent checks the child's OGB is a reflection of parenting skill or commitment, and (2) evidence of parents attempting to remain connected to their students via an "electronic umbilical cord" while they are at school and maturing.

Thematic Analysis of Participants' Online Comments

To date, most OGB studies have explored their effect on raising student achievement and have been limited to single school or single district studies of limited scale (Bird, 2006; Cameron, 2011; Edgerton, 2013; Mathern, 2009; Migliorino & Maiden, 2004; Seldow, 2010; Zieger & Tan, 2012). With the exception of one small study of 10 teachers in a single school (Mize, 2011), the interpersonal or relational experiences of the OGB communication triad participants (students, parents, teachers) have not yet been described in detail in scholarly literature, nor has there been association of their experiences to established educational theory. In an attempt to "strip the curtain" on the participants' experiences and to create a conceptual framework through which online grade booking's impacts on parents, teachers, and students can be discussed, we conducted a thematic analysis of readers' posted comments to online mass media articles on OGBs.

Method

Between May and December 2014, over 400 online comments and quotes were compiled electronically from seven mass media articles on online grade booking (Dawson, 2007; Edutopia, 2007; Gilbert, 2011; Gronke, 2009; Hoffman, 2008; Lahey, 2013; Murray, 2011) and analyzed thematically (Marshall

& Rossman, 1999) as one text set. Comments or exchanges between respondents or unrelated to OGBs were discarded from the text set during analysis. Multiple independent readings of the comments in the text set were performed, with three readers grouping comments based on commonalities within the expressed sentiments and experiences. Additionally, if the author's role (parent, teacher, student) was mentioned or could be inferred contextually from the comment, it was noted for later use.

Collaborative analysis of the independently created comment groups showed research in three fields—relational dialectics, parenting, and social ecology—as primary for describing the OGB participants' experiences. Subsequent iterative readings of the comments resulted in coding using existing theoretical frames (dialectical tension, parenting psychology, and systems theory, specifically, which will be further described in the Discussion section below) and then categorizing comments further by representative theoretical concepts (see Table 1). Taking this approach of connecting OGB participants' experiences to existing theory using established terminology allows for recognizable naming of the experiences, using concepts that are widely understood across disciplines and readily comprehensible to school community members, to serve as lenses for examination in future school-based practice and research.

Conceptual Framework

This analysis of participants' experiences yielded the conceptual organization and interrelationships between concepts shown in Table 1, with dialectical tension theory most frequently used to describe OGB experiences and to which expressions of parenting and systems theories were often associated. If more than one applicable concept was present within a participant's comment (e.g., a parent who commented on the connected and separateness concept of dialectical tension theory but also on parental self-efficacy), the comment was coded in multiple categories.

From our review, it appears dialectical tension theory provides the greatest value for understanding OGB participants' experiences and creating ways to improve the practice. Comments from all members of the OGB communication triad—students, teachers, and parents—showed evidence of the dialectical tension concepts of (1) connectedness and separateness, (2) certainty and uncertainty, and (3) openness and closedness. Thus, describing users' experiences through these concepts helps us to understand the effects of the practice on students, parents, and teachers, in order to develop ways to lessen the tensions. The second theoretical frame present, parenting psychology, with its associated concepts of parental self-efficacy and expectancy outcome, provides insight into parents' motivation and expectancies as they participate in the

OGB experience. This insight can help schools create better recommendations to parents for their use of OGBs. The third frame, systems theory, rather than describing the actual participants' personal experiences, instead describes the levels within school systems and our greater political system at large where the actions and consequences related to online grade booking are taking place. Applying the concepts of microsystem, mesosystem, exosystem, and macrosystem (Bronfenbrenner, 1977, 1979) to the comment set allows for identification of the agents and agencies tasked with creating or reforming practice to be more sensitive to the needs of teachers, parents, and students. Because systems theory describes the *location*, so to speak, of the participant's interaction with OGB rather than their personal experience, these concepts: (1) when present as a multiple code, are understood to contextualize the dialectical tension and parenting psychology concepts, and (2) were applied to comments only when the participant directly expressed the location of the interaction in the comment.

Table 1. OGB Experience Conceptual Framework

Theoretical Frame	Applicable Concepts	Evidenced within (Mi=Microsystem; Me=Mesosystem; Ex=Exosystem; Ma=Macrosystem)	Primarily Affects (P=Parents; T=Teachers; S=Students)
Dialectical Tension	Connectedness & Separateness	Mi, Me	P, S
	Certainty & Uncertainty	Mi, Me, Ex, Ma	P, T, S
	Openness & Closedness	Mi, Me, Ex	P, T, S
Parenting Psychology	Self-Efficacy	Mi, Me	P
	Expectancy Outcome	Mi, Me	P, T

Findings, Discussion, and Future Research

To illustrate the concepts represented by participants' experiences and the coding system used, we present emic comments or quotes within the discussion of each concept related to OGB use. At the end of each section, we propose relevant questions to be explored in future research related to the applicable concept.

Dialectical Tension in Participants' Experiences

From our inductive analysis, it becomes clear the application of dialectical tension theory is primary to understanding OGB participants' experiences and the OGB's effects on the OGB communication triad. While the term *dialectical tension* is used in communication theory literature primarily to describe personal relationships, such as family or romantic partnerships, its use has been extended to describe relationships in the workplace (cf. Putnam, 2004). Until now, however, it has not been used to describe the school-to-home communication triad nor specifically applied to the practice of online grade booking.

As a field, relational dialectics describes the major types of internal contradiction (i.e., dialectical tensions) that occur in interpersonal relationships (Baxter, 1994). The focus of relational dialectics is on the ways oppositional forces create situations that are either "both–and" or "either–or" (Putnam, 2004). These contradictory aims, in the specific case of OGBs, cause internal tension for the triad members. Each of these contradictions can be examined from the points of view of the parties involved in the communication, in this case, the triad of parent, teacher, and student.

Various communication theorists, using different terminology to represent the internal conflicts experienced by the parties engaged in communication, describe three major types of dialectical tension. For the purposes of this review, we use the terminology of Baxter (1988), on whose work later interpretations are widely based.

Connectedness and Separateness

Baxter (1988) refers to the first type of dialectical tension as connectedness and separateness. With respect to OGBs, the student and the teacher in the communication triad, who have a closeness with parents but need also to maintain distance to promote the healthy development of autonomy in the student, realize this tension. Comments expressing connectedness and separateness include:

> Constantly checking up on them [students] only reinforces a child's dependence on their parents and stunts their growth into a fully functioning, independent adult. (parent commenting on Lahey, 2013; coded as Connectedness & Separateness)

> I shouldn't HAVE to check up on my child—it's HER responsibility to keep her grades up, and let us or her teacher know if there is a problem. I'm not going to solve all of her problems for her the rest of her life. She has to learn to do that on her own. (parent commenting on Murray, 2011; coded as Connectedness & Separateness)

Parents should keep checking their kid's grade and continue to try and help them in school. My parents used to always get on my case about missing assignments and zeros which the teacher messed up on, and I have a perfectly healthy relationship with them. Don't listen to these idiots saying you should give them space. They need to be pressured and supported in school in order to have a good future. They will thank you later. Trust me. (former student commenting on Gilbert, 2011; coded as Connectedness & Separateness and Parent Expectancy Outcome)

For students to be fully responsible for their actions, they must be able to self-monitor academic work and respond independently to academic expectations of the teacher, without parental involvement. Thus, while both the student and teacher likely desire a close relationship with parents and for them to be involved and informed, this need for autonomy simultaneously creates dialectical tension between the members of the triad. Research questions that arise from this concept include, how may we endeavor to raise autonomous students, able to independently manage their schooling, while also providing parents with the information they need to support their students in this quest?

Certainty and Uncertainty

The second type of dialectical tension, in Baxter's terms (1988), is referred to as certainty and uncertainty. While later renamed predictability and novelty (Baxter, 1994), we have chosen to use Baxter's 1988 terminology because we believe *certainty* and *uncertainty* would be more likely the words used by OGB participants themselves to describe their feelings. This tension primarily affects parents and the teacher but also, to some extent, the student. Comments expressing this concept demonstrate most parents expect the teacher to provide parents with regular, predictable updates about their child's academic progress, whether through the posting of grades to the OGB or via other methods, such as calling home or sending a note. In turn, most teachers expect parents to check the OGB on a regular and predictable schedule and believe that by doing so parents will obtain an accurate representation of student achievement from the information posted.

There's no consistency among teachers as to how often they post grades. There can be as much as a 3 or 4 week lag between postings. (parent commenting on Lahey, 2013; coded as Certainty & Uncertainty and Mesosystem)

To avoid hassles from parents who wanted to see grades as soon as an assignment came due, I never posted the assignment until it was graded. Which sadly meant that parents couldn't use the grade reporter to keep up with current assignments and due dates. (teacher commenting on Lahey, 2013; coded as Certainty & Uncertainty and Microsystem)

I'm in 9th grade. While I get all A's, teachers make mistakes every day that make a grade temporarily drop from an A to an F. It happens every day, in most classes, and the teachers don't check their mistakes. Convincing parents that this is a simple mistake is stress that is not needed. (student commenting on Gilbert, 2011; coded as Certainty & Uncertainty and Microsystem)

I wish teachers would put some grades on [the OGB], because seeing a 2.5 as my GPA really freaks me out. (student quoted in Lahey, 2013; coded as Certainty & Uncertainty and Microsystem)

Clearly, tension arises when parents and students have a level of expectation for OGB practice that is inconsistent with that of the teacher or when the teacher fails to provide additional methods of sharing information if the OGB alone might be misleading, ineffective, or untimely. Future research and practice should endeavor to answer questions such as how can teachers provide parents and students with a reasonable expectation for timely posting of grades and a shared understanding of what the posted information means? How can parents and students be encouraged to use the system in a supportive way and without unnecessary frustration?

Openness and Closedness

Last, the third major source of dialectical tension is referred to as openness and closedness (Baxter, 1988). This tension is experienced by teachers and students, but also by parents. The triad members can appreciate that the sharing of information—openness—allows for full participation in the academic support system for the student, but, at the same time, the members value privacy—closedness—and recognize that it is sometimes better not to disclose some types of information or information just "for information's sake." Representative comments include:

It [the OGB] does have an enormously positive impact for the parents who now are plugged in and aware of what is due, when it is due, if it was turned in, and if it was understood. Each year I have these types of parents whose students previously struggled, but now with the added access they are now better able to adjust and support at home. I love these parents! (teacher commenting on Murray, 2011; coded as Openness & Closedness, Parent Expectancy Outcome, and Mesosystem)

I don't think kids have privacy. It's not like anyone asked our opinion before they gave parents the passwords. (13-year old student quoted in Hoffman, 2008; coded as Openness & Closedness)

I don't like where this is going—at ALL. We're simply too happy to hand over every privacy and freedom in exchange for perceived "convenience."

Now, we are training the next generation to expect 24/7 monitoring! (role unknown, commenting on Gilbert, 2011; coded as Openness & Closedness)

I worry that this can cause teachers to "have" to grade on a prescriptive schedule. When I am tracking through and writing on 50 5–7 [page] papers, I want latitude to assess those papers thoroughly and to use them as tools for teaching as well. (teacher commenting on Gronke, 2009; coded as Openness & Closedness)

Questions arising from this concept include: How may we find a balance between information that should and should not be shared in the OGB? What practices might we undertake in order to provide students with a feeling of privacy and autonomy while also providing parents the tools and information they need to support students' learning? How can we honor teachers' discretion of what information to disclose in the OGB and when?

In summary, relational dialectic theory presents a novel way to describe the tensions created by online grade booking interactions within the OGB communication triad. Each triad member may struggle with one or more of the three major types of internal contradiction, thus magnifying the potential for interpersonal conflict with this practice. In addition, the conflict perceived by the triad member may not be related to the specific information (i.e., grades, attendance, behavioral notes) being communicated among the triad members, but instead be related to the *practice* of online grade booking itself.

Parenting Psychology

The second theoretical frame present in the participants' comments was related to parenting psychology, specifically the concepts of parental self-efficacy and expectancy outcomes. As part of social learning theory (Bandura & Adams, 1977), self-efficacy and expectancy outcome are general ways of understanding behavior and expectations of personal effectiveness. Within the comment set, parental self-efficacy and expectancy outcome are expressed primarily from the parents' perspectives; however, teachers also opined on the concepts.

Parenting Self-Efficacy

Coleman and Karraker (2000) define parenting self-efficacy as parents' self-referent estimations of competence in the parental role or as parents' perceptions of their ability to positively influence the behavior and development of their children. We propose OGBs provide parents with a new medium of perceiving and influencing their effectiveness as parents which, in turn, likely influences parents' interactions with their children and teachers.

It speaks to all your neuroses as a parent, all this need to control, that pressure to make sure everything is perfect. (parent quoted in Hoffman, 2008; coded as Parent Self-Efficacy)

[I]t's been a fabulous parenting tool. I think every school should implement it, especially in high school, when kids don't talk to parents and parents can't talk to each teacher. (parent, quoted in Hoffman, 2008; coded as Parent Self-Efficacy and Mesosystem)

So . . . . . . [sic] The definition of bad parenting now extends from parents who do not engage with their child's academic progress all the way through parents that check in daily? It would seem that there is little room for the parents to catch a break so far as the teachers are concerned. (role unknown commenting on Murray, 2011; coded as Parent Self-Efficacy and Microsystem)

Extending from Bandura's (1977) seminal study on self-efficacy, OGB use is hypothesized here to influence parents' perceptions of self-efficacy as it relates to (1) their ability to use the OGB to influence their child's overall educational process, (2) the OGB adding to parents' "toolkits" for effective parenting, and (3) the OGB's perceived effectiveness at enhancing parents' ability to communicate with their child's teachers. Parents' perception of self-efficacy may be increased and reinforced by consecutive successful attempts, that is, performance accomplishments, at using the OGB and positively influencing their child's education. This is the strongest source of efficacy because it involves personal experience (Bandura & Adams, 1977). However, some parents may lack the perceived controls that facilitate effective decision-making—time, knowledge, language, and support—to actualize the performance accomplishment (Olmstead, 2013). One question arising from perceived controls is how do schools and teachers support parents and their students by removing the barriers to accessing the OGB? For example, for those parents that do not have access to the Internet via a smartphone, tablet, or computer, or for those who have limited literacy levels, what supports need to be put in place, and should the same expectations for using the OGB be maintained for all parents? A second question that arises is how can students and parents increase their performance accomplishment with the OGB (i.e., effectively use the OGB)? The OGB allows students and parents to react to their grades, but how can students and parents be *proactive* with the information provided by the OGB?

Physiological state, specifically elevated autonomic arousal, can affect perceptions of self-efficacy and has not yet been considered as a factor in parents' use of OGBs. The following comment describes the emotional and physical stress parents can experience in OGB use:

We have this feature in our school, and it is very stressful for me to go in there and look at they're [sic] grades. My daughter is very smart and not interested in school work. She is a C student, and at first I loved this feature, but eventually gave up using it because I was always angry and tired of hearing excuses from my daughter as to why her grades were bad. It's a lot of work. I now wait for report cards and give her chores for every bad grade and reward her for good test scores. It's so much better. (parent commenting on Gilbert, 2011; coded as Parent Self-Efficacy and Microsystem)

Parents are more likely to experience increases in self-efficacy when they are not overburdened by aversive affect; negative perceptions of parenting self-efficacy have been shown to be accompanied by elevated autonomic arousal (Bugental & Cortez, 1988). In some instances, through the OGB, parents who feel powerless in educational decision-making due to prior negative experiences in school (McKenna & Millen, 2013) may feel empowered by OGBs because they are able to obtain school information without interacting with the school directly (which can elicit a negative physiological response). On the other hand, parents who feel the OGB does not increase their self-efficacy but instead elicits feelings of unpleasant arousal (nervousness about seeing their child's grades, guilt for violating students' privacy, hopelessness with regard to how they can assist their child to do better in school) are far less likely to use OGBs, even if access is available and use expected by schools. Regarding parents' physiological state, we must ask, how can parents feel safe and empowered to influence their child's education with the information provided by the OGB?

Additionally, parents comment on the OGB as an informational tool in making decisions regarding their child's education, activities outside of school, and in applying disciplinary consequences at home. We have observed this behavior directly during our time spent at school sites, where we have witnessed parents presenting their children with information gained from the OGB (sometimes in advance of the teacher presenting grades back to students) and delivering consequences or rewards as a result of certain grades or behaviors. Parents who perceive they use the OGB successfully to make decisions, thus reinforcing their perception of self-efficacy as a parent, will be more motivated to check their child's OGB. However, this can lead to hyperchecking of the OGB and has allowed for helicopter/snowplow parents (Lahey, 2013; Weeks, 2007). This prompts the following research questions: For those parents who use the OGB as part of their decision-making process, how often should they be expected to check the OGB? How should parents who check repeatedly and make frequent contacts with the teacher, possibly becoming a hindrance to the child's development or imposing unreasonable expectations for the teacher, be handled by the teacher and/or school?

Expectancy Outcome

Expectancy outcome refers to persons choosing to engage in behaviors that they *expect* will result in a specific outcome. In the case of the OGB, expectancy outcome can be represented by parents (and teachers) using the OGB because they expect that such use has a direct positive impact on students' educational achievement.

> Personally, I find the tools to be useful. I check about 1x/week. Better to find out where my kid is struggling so I can get her help than wait too long and not allow her the opportunity to improve. (parent commenting on Lahey, 2013; coded as Parent Expectancy Outcome)

> As a parent of 3 school-aged children and a long time teacher, I have to say that this kind of accountability has been a long time coming and is the best improvement I've seen in our school system. Parents (including me) can see nearly instantly how their kids are doing, so they can intervene in a timely manner instead of not getting bad news until a mid-term report or the end of the quarter. (parent who is also a teacher commenting on Dawson, 2007; coded as Parent Expectancy Outcome and Macrosystem)

> Grades are for feedback and to help the child improve. If they or their parents (depending on the age of the child) don't get this information, how can the child grow? How can the parent work on the concept at home with the child? (parent commenting on Lahey, 2013; coded as Parent Expectancy Outcome and Microsystem)

While the OGB's ability to inform users of grades, homework, attendance, and so on is well documented, only limited studies report actual data regarding the impact of OGB use on raising students' grades. These studies have been conducted predominately at single school sites and in private schools where families have greater access to technology and possibly more homogeneous parent beliefs and commitment to responding to school requests. Questions that result from this issue include: Does the OGB have a significant impact on student achievement, and is that achievement in the form of higher grades, more knowledge, or both?

In addition, differences between participants in expectancy outcomes that result from using the OGB may inhibit or negatively affect the relationship and communication between the participants. For instance, a teacher may believe the OGB to be of only moderate value to a students' overall achievement and post grades less frequently than is believed to be necessary to a parent who believes OGB use to have a high impact on his/her child's grades. As well, expectancy outcome across teachers and across parents will likely vary in diverse

communities where age, experience, parenting practices, cultural traditions, income, and access to technology may vary widely. With regard to this issue, what effect do the divergent views of expectancy outcome with the OGB influence the triad's use of the OGB? In addition, how do the different expectancy outcome beliefs regarding the OGB influence communication and relationships within the triad?

Social Ecology

Participants' comments indicate another theoretical perspective from which to view the issue of parent involvement in the development of OGBs. Systems theories posit that the child, parent, and teacher form a system of interactions that can be analyzed and interpreted (Banathy, 1996; Senge, 1990). The theorist whose foundational work we will incorporate in this discussion is that of Bronfenbrenner (1977, 1979), who describes several levels of systems that affect human development, with each one nested in the next: the microsystem, mesosystem, exosystem, and macrosystem. OGB impacts span across multiple levels within school systems, with lower level interactions situated within higher ones (e.g., microsystem interactions occurring in the home and classroom are positioned within all higher levels of the system).

The Microsystem

The microsystem level consists of the direct interactions of individuals who are working together with the OGB. Here, the microsystem would consist of the parent, student, and teacher, who interact through the communication process using OGB at home and in school.

> I think having these things at school are great. IF (big IF) the teacher is responsibly keeping grades up-to-date. I really have nobody to point the finger at but myself if I'm not well aware of how my child or children are doing in class….Really takes a lot of responsibility off of the school and puts it back on the parent—where it belongs. (parent commenting on Murray, 2011; coded as Certainty & Uncertainty, Parent Self-Efficacy, and Microsystem)

> My school's portal works fine, but for the last 2 yrs teachers have rarely updated the information there. Lazy teachers use it as an excuse not to deal with parents. Frankly if I heard "check the portal" one more time I would throttle them. Also not every family has a computer, smart phone, or Internet. We did not for a long time. When I told that to one of my son's teachers, I was told to go to the public library to check the portal. (parent commenting on Lahey, 2013; coded as Certainty & Uncertainty and Microsystem)

The analysis of this microsystem involves how the process and relationships between parents, teachers, and students within this system affect each of the participants. One question that could arise from this level of systems theory is, who is responsible for the communication between the three participants regarding grades? In the past, the one primarily responsible has typically been the teacher. Do OGBs change that dynamic, insofar as the responsibility may have shifted in part or in whole from the teacher to the parent or the student? Another question could be: How does the change in communication affect the responsibility for motivating students who are not doing well to improve? Does it mean the teacher who has traditionally been in the motivator role now gives it or shares it more with the parent and student? In addition, to what extent does the OGB process improve or hurt the overall relationship between the participants and in what area of relationship?

The Mesosystem

The next level of systemic influences is the mesosystem. This system level describes the interaction between two or more microsystems. In this instance, mesosystem concerns/questions could entail the variables in the relationship between the parent–teacher–student microsystem and the microsystem of the administrative leadership of the school. This microsystem usually includes the school's administrators, department chairs, and parent leadership.

> Many school districts (or at least the high schools) do impose a mandated standard grade posting window, typically 2 weeks, to avoid these kinds of problems [teachers not posting grades often]. Otherwise teachers end up with lots of emails and pressure from parents asking why they haven't posted results the day it's due (as stated in the article). Standardization helps set expectations for parents as much as for teachers. (teacher commenting on Lahey, 2013; coded as Certainty & Uncertainty and Mesosystem)

> Half the stuff my kid's teachers post online is incorrect, usually because they input the wrong code showing it "missing" or they plug in an "F" until they can get the assignments graded. After stressing out my kid over it a few times I confronted the principle [sic] that he either needs to get the teachers trained or quit using the system. My kid does "forget" to tell me things, but I was a teen too, and I knew how to prioritize, and he is learning that too. That's part of the learning experience. He can learn it now or have a helicopter boss when he is older. (parent commenting on Gilbert, 2011; coded as Certainty & Uncertainty and Mesosystem)

Questions regarding OGBs that may be pertinent to this level of system research include: What performance expectations of the system's participants

are changed by OGBs? For instance, is school leadership now responsible for setting clear guidelines for the teacher's mandated role in the process or for parents to avail themselves of the OGB information on a regular basis? Another question could be, now that student performance data is readily available to all stakeholders, who has the responsibility (teacher, leadership, parents) for making sure these educational needs are addressed in a timely manner to forestall academic failure?

The Exosystem

The third level of Bronfenbrenner's theory is the exosystem. This is a level of analysis that does not involve the participation of the OGB participants directly but affects what happens in the other systems. For this study, the school district in which each school is located determines the financial support, technical details, and policies for the OGB process. An example of this may be a district policy that stipulates that each teacher will use the online grade booking system and that parents are expected to use it, also.

> I've been told by school administrators that teachers are not required to post, though most do…it's a lot of money to spend on a system that not all the teachers use, or use inconsistently….I get that teachers can't have personal communication with every family, but that means the [OGB] needs to be updated frequently. Can't have it both ways—you either have greater direct communication with the families of students who are not meeting expectations, or make it easier for parents to monitor their student via the [OGB]. (teacher commenting on Lahey, 2013; coded as Certainty & Uncertainty and Exosystem)

> [The OGB has] created a culture where teachers feel pressured to give a grade every day or two. Quality, meaningful assessments often take time to develop, execute, and score. I sometimes have students working for days at a time on a paper or project. On the portal it looks like we're doing nothing; in the classroom, they're researching and writing. I simply tell parents at open house that the portal is a response to our "instant gratification" culture and cannot substitute for a real dialog between parents, students, and teachers. (teacher commenting on Lahey, 2013; coded as Openness & Closedness and Exosystem)

Questions arise, such as, what action may be taken against a teacher who does not use the OGB, or does not use it within the district policy (e.g., posting grades in a timely manner)? Additionally, is it possible for schools to mandate a parental behavior related to academic support, particularly if that behavior is counter to the parents' beliefs about parenting? How are such situations to be handled in a respectful and supportive manner if the parent refuses to participate in the OGB system?

The Macrosystem

The last level is that of the macrosystem, which Bronfenbrenner (1979) describes as "constancies, in the form and content of the lower order system that exists or could exist at the level of the subculture or culture as a whole, along with any belief systems or ideology underlying such consistencies" (p. 26). In the case of OGBs, this may consist of national trends in use and content.

It fuels the bad pedagogy that centers around checking boxes and using tests too heavily as a tool of monitoring. (parent commenting on Lahey, 2013; coded as Macrosystem)

All this really is yet another way to attempt to replace community with technology. It's not really a new thing. At one time, if the student had issues, the teacher would simply visit or call the parent and tell them what was going on. Now that contact is essentially nonexistent other than the obligatory five minutes every semester so we get to look at a computer instead. It's simply systems replacing relationships. I suppose whether that's a good thing or bad thing is open to discussion. (parent commenting on Lahey, 2013; coded as Macrosystem)

We note that the two comments presented here are particularly thought-provoking and indicative of the larger questions facing our schools with regard to the directions of education in an environment of increasing accountability and demands on teachers. The significant questions arising here are ones not centered on the OGB *per se*, but on education: How do we provide quality instruction and assessment and build school communities where people and personal interactions are valued and prioritized amid the opposing forces of time and money?

Conclusion

While online grade booking is a relatively recent addition to educational practice, it appears to now be "locked in" (Lanier, 2010) and likely to remain an integral part of the data-based school accountability systems of the 21st century. The conceptual framework and analysis presented here can inform future research studies on OGBs as they seek to (1) address the internal tensions experienced by and varied expectations of the members of the student–teacher–parent communication triad; (2) create programs that educate all triad members on appropriate, supportive use of OGBs and on the positive and negative impacts of the practice; (3) develop innovations and supports that facilitate required use of OGBs by persons who find it difficult, inappropriate, or undesirable; and (4) respond to the notion that OGBs are an educationally sound systemic

response to the greater policy issues existing in this new age of legislated expectations of parent involvement, school transparency, and accountability.

However, regardless of the avenues pursued in future research, we must be reminded that our greater aim is facilitating *communication* between school and home, rather than the sharing of mere *information,* which appears to be the current state of the technology and its use. Within our efforts to strip the curtain from the wizard further and to improve the technology and practice of online grade booking, a recognition of the distinction between these two distinct purposes is key to building and sustaining successful relationships for all participants in the school community.

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online grade booking in middle and high school and served as the initial inspiration for us to take up this line of research.

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