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A Look Inside the Black Box: Understanding Communicative Exchanges in Online Learning Environments

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A LOOK INSIDE THE BLACK BOX: UNDERSTANDING COMMUNICATIVE
EXCHANGES IN ONLINE LEARNING ENVIRONMENTS

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EXCHANGES IN ONLINE LEARNING ENVIRONMENTS

by

Sara Douglas

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ABSTRACT

A LOOK INSIDE THE BLACK BOX: UNDERSTANDING COMMUNICATIVE
EXCHANGES IN ONLINE LEARNING ENVIRONMENTS

by Sara Douglas

Participation in academic discussions and peer collaboration activities is
instrumental to student engagement, motivation, and mastery of course content. These
activities also improve 21st century skills, such as listening, managing diverse viewpoints,
and communicating effectively. Although online learning options in the United States
have dramatically increased in the past decade, there is limited evidence that online high
school courses offer sufficient opportunities for students to communicate and collaborate
with teachers and peers. The purpose of this mixed-methods study seeks to find out if,
how, and why students interact with others in online courses. Findings from observations
of five high school students engaging in online coursework indicate that they rarely, if
ever, engage in peer collaboration and academic discourse activities. Teacher
perspectives ($n = 49$), shared through an online questionnaire, show that academic
discourse activities are considered valuable and feasible, but there are numerous
challenges to successful implementation in online learning environments (such as
scheduling and timing issues). Taken together, findings reveal a troubling contradiction:
Whereas many online educators report facilitating activities promoting meaningful
communicative exchanges, direct observation shows that students seldom encounter such
opportunities, and when they are offered, students often choose to opt out. Further
exploration sheds light on several constraints as well as possible affordances for
providing interactive activities in online learning environments.

ACKNOWLEDGMENTS

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LIST OF ABBREVIATIONS

CCSS: Common Core State Standards
CSCL: Computer Supported Collaborative Learning
F2F: Face-to-face
ISTE: International Society for Technology in Education
K-12: Kindergarten through Grade 12
P21: Partnership for 21st Century Learning

DEFINITIONS

Academic discourse- a formal, reciprocal discussion, conversation, or chat (written or spoken communication) with another student and/or teacher in a way that expands learning

Asynchronous learning/course- instruction taking place and available to access outside of regulated time constraints or specific centralized locations

Dialogue- a form of communication utilized for addressing conflict; it values active listening, inquiry to see all sides, and identification of deeper issues in order to discover new options for resolution; it values others' positions and suspends judgment

Discourse- a formal conversation to communicate thoughts and ideas

Hybrid learning/course- the utilization of both online learning and face to face synchronous learning; often referred to as "blended learning"

Online learning/course- an educational environment where most or all of the course content, instruction, and interactions occur online (asynchronously 90% or more of the time) by means of a computer, typically over the internet; often referred to and used interchangeably with the term "virtual learning"

Peer collaboration- interdependent interaction between students (cooperatively working together) in order to solve a problem, create a product, or learn and master course content

Synchronous learning/course- instruction taking place at the same (regulated, set) time, typically face-to-face or through utilization of interactive software

Chapter 1: Understanding Communicative Exchanges in Online Learning Environments

An Unresolved Issue in Contemporary Education

When implemented effectively, online learning has the power to differentiate and personalize instruction, motivate students, improve content delivery, add course accessibility, decrease bias, and connect cultural divides (Cavanaugh, Barbour & Clark, 2009; Etherington, 2017; Hossain & Weist, 2013). For these reasons opportunities for learning through online coursework have greatly expanded in recent years. Although precise numbers of students enrolled on online courses are elusive (as reporting requirements differ among states), one research group noted there were close to three million Kindergarten-12th grade students enrolled in an online course in the 2014-2015 school year, with over 500,000 of those students enrolled in a fully virtual school, completing all their coursework online (Evergreen Educational Group, 2017). To prepare students for success in online college coursework and/or future career endeavors, five states currently require enrollment in at least one online (virtual) course for high school graduation (Etherington, 2017).

Although one would expect a corresponding surge in academic research examining distance learning coursework in K-12 online learning environments, in actuality few have been conducted (Allen, Seaman, Poulin, & Straut, 2016; Drysdale, Graham, Spring, & Halverson, 2013). Even fewer have targeted two crucial learning skills identified by the 21st Century Skills Framework: communication and collaboration (Miron, Shank, & Davidson, 2018; Partnership for 21st Century Learning [P21], 2007, Appendix A).

The lack of empirical studies investigating the presence of peer collaboration and academic discourse in online learning coursework presents a *problem of practice*: As online course options expand among K-12 schools and learners, there is little evidence that online students are provided opportunities to learn and practice key 21st century communicative skills. While best practices indicate that meaningful and purposeful interactions (such as academic discourse and collaboration with peers) improve educational outcomes, it is unclear whether these practices are observed and effectively integrated into online learning environments (Hattie, 2012; Kim & Pekrun, 2014).

Advances in Technology Outpace Research

Technological advances are outpacing educational research, design, and disciplined inquiry. For example, over half of K-12th grade students in United States (US) schools use digital tools from Google such as Gmail or Docs (Singer, 2017). Seventy million people are currently using Google's *G Suite for Education* applications (Viswanatha, 2017). I-Ready online reading and math assessments and lessons are currently utilized by over 6.5 million students (Curriculum Associates, 2019). Within just three years of its launch, Newsela, an online reading program, had been implemented in 75% of American classrooms (Weller, 2016). Technology is ubiquitous, yet researchers and educational leaders wonder who is monitoring best practices, successes, costs, and failures with this rise in technology integration in academic settings (see Allen, et al., 2016; Enyedy, 2014).

While most schools aim to enrich their curriculum with these technological resources, many schools also provide the option for students to enroll in fully online courses. In fact,

over 75% of districts in the United States currently offer blended instruction (which involves the utilization of both online learning and face-to-face synchronous learning) or 100% online only courses (Miron, Gulosino, Shank, & Davidson, 2017). As a result, online course options have multiplied in recent years, with many school districts offering the option for students to choose from hundreds of individual online courses. A large number of these online classes are provided by far-reaching corporate educational service providers such as K12 Inc., Pearson's Connections Academy, and Florida Virtual Schools. To illustrate, K12 Inc. has served over 1 million students since its inception in 2000, while Florida Virtual School reports 3.6 million semester course completions since 1997 (Florida Virtual School, *Annual Report 2016-2017*, n.d.; K12 Inc., 2019). Furthermore, despite the ongoing controversy regarding student outcomes, numerous schools offer all day, 100% fully online virtual education programs. Half of these schools are charter schools, typically using private (profit and nonprofit) education management organizations (EMOs) that offer flexibility for students but constrict opportunities for students and teachers to interact (Miron, et al., 2018; Yuan & Kim, 2014).

This growth in online course options for education can be partially attributed to greater access, improved marketing, and lowered costs. For example, one large corporate provider of online courses, Florida Virtual School (FLVS) noted in their 2016-2017 Annual Report that the average cost savings for each virtual student rounded to $2,700 compared to the instructional cost of a student in a traditional brick and mortar school (Florida Virtual School, *Annual Report 2016-2017*, n.d.). Another perceived benefit of online learning is the ability to personalize content and connect with others any time of

the day from anywhere. Yet with the advent of distance learning, reports of apathetic, isolated students in "personalized" online courses continue to grow (Enyedy, 2014; France, 2017; Gallien & Oomen-Early, 2008; Yuan & Kim, 2014). In addressing this concern, National Board Certified Master Teacher and educational leader/consultant Paul France (2017) asserts that personalization is unsustainable and "has the potential to isolate children from their peers and rob the classroom of community-building and interpersonal learning experiences, in effect *depersonalizing* kids' experiences" (p. 43).

As one would expect, scholars who have studied the ways in which students and teachers interact in K-12 online courses have come to the conclusion that outcomes improve with an increase in structured, academic, student-teacher/peer interactions (Borup, Graham, & Davies, 2012; Hmelo-Silver, Jeong, Hartley, Faulkner, 2017). Moreover, the vast majority of researchers agree that there is a need to investigate further. Therefore, as online course options continue to grow, stakeholders need educated responses to pressing questions: "Are children collaborating and engaging in meaningful discourse in online courses?" and "Are schools adequately preparing online students with 21st century communicative skills?"

Building a Case for Communication and Collaboration

Educational institutions set standards for learning and demand that districts, schools, teachers, and students strive to meet those standards. Key components of the new *Common Core State Standards* (CCSS) include collaboration and discourse. One literacy standard posits that students should "prepare for and participate effectively in a range of

conversations and collaborations with diverse partners" (ELA-LITERACY. CCRA.SL.1, Common Core State Standards Initiative [CCSS], 2017, see Appendix B).

Collaboration and communication are also activities highlighted in the *21st Century Skills Framework* (P21, 2007). This framework was developed over ten years ago with input from business leaders, teachers, and education experts. The framework describes the "skills, knowledge and expertise students should master to succeed in work and life in the 21st century" (P21, 2007, para. 4). Student goals within the Learning and Innovation Skills category include: critical thinking, communication, collaboration, and creativity, otherwise known as the "4 C's" (P21, 2007). Along the same line, the International Society for Technology in Education (ISTE) leadership team developed *Standards for Students*, stating students should "use collaborative technologies to work with others" (Standard 7.b, International Society for Technology in Education [ISTE], 2017, see Appendix C).

The present study focuses on two of the 4C's: communication and collaboration. These interactive, student-centered educational practices have been identified by numerous experts as important factors driving student motivation, academic success, and improved 21st century skills (Dietrichson, Bøg, Filges, & Jørgensen, 2017; Hattie, 2012; Mercer, 2000). These social activities also align with a sociocultural perspective promoting co-creation of knowledge (Vygotsky, 1987). This theory asserts that conversations with others help us make sense of the world, process our thoughts, and create new ideas. In addition, researchers have found that utilization of communicative social activities (e.g., discourse and peer collaboration) enhances and positively

influences subject mastery in online courses (Hossain & Weist, 2013; Lim, 2009; Swan, 2001). With advances in technology and a subsequent rise in online learning environments, further exploration is needed to determine if students are learning and practicing these crucial collaboration and communication skills in online courses.

The Present Study

Simply stated, the purpose of this study is to determine if 9-12th grade online learners are engaging in academic discourse and peer collaboration. If so, how? If not, why not? The exploratory literature review in Chapter 2 will begin with an overview of the historical context and growth of online learning environments. The chapter will review best practices for 21st century learning, with a subsequent treatise on the ability to improve student engagement in online courses through interactive activities. Specifically, the utilization of peer collaboration and meaningful discourse will be analyzed. A synthesis of this information will illustrate that although there has been a spike in online course offerings, observational studies of online high school participants have not kept pace. Similarly, although research has delineated best practices in online learning, few studies have noted if these practices are successfully infused into current online learning environments. Scant research delves deep by asking, "What are the affordances and constraints of implementing best practices in online K-12 learning environments?"

To illustrate, over 90% of studies analyzing online environments focus on higher education (Barbour, 2017; Drysdale, et al., 2013), and few of these investigate opportunities for online discourse and student collaboration (Kosko, Sobolewski-McMahon, & Amiruzzaman, 2014; Ronsisvalle & Watkins, 2005). Instead, the focus on

improving online courses, particularly within the K-12th grades, tends to center on content mastery as demonstrated by proficiency on state accountability assessments rather than 21st century skills (e.g., communication and collaboration) that could enhance and positively influence online education (Heppen, Sorensen, Allensworth, Walters, Rickles, Taylor, & Michelman, 2017; Lim, 2009; P21, 2007).

More specifically, the vast majority of studies within online or blended learning environments have analyzed student outcomes as determined by attrition and test scores. Even within that realm, deciding whether online courses have positively impacted student learning is an ongoing debate. Most studies within K-12 online environments indicate there is a negative or null value to online instruction (Cavanaugh, et al., 2009; Center for Research on Education Outcomes [CREDO], 2015; Lockee, Burton, & Cross, 1999; Miron, et al., 2018). All stakeholders concur that low grade point averages (and passing rates) of high school students in online math and English courses poses a major dilemma-if students fail these crucial courses, it often sets them on a trajectory of overall school failure.

This narrowing of interest on student test scores (rather than the comprehensive 4C's for 21st century learners) is problematic. While most researchers agree that interaction improves student motivation and engagement, which positively influence learning outcomes (Dietrichson, et al., 2017; Kim & Pekrun, 2014; P21, 2007), "the lack of student and teacher face-to-face interaction" was cited by New York's Department of Education as one of the top three challenges for online courses. Moreover, it appears that

few are willing to address this dilemma and discuss possible solutions (Allen, et al., 2016; Clements, Pazzaglia, & Zweig, 2015; Kosko, et al., 2014).

What could improve the current problem of student isolation and disengagement within online learning environments? Given that studies indicate that meaningful interaction, discourse and peer collaboration improve motivation and overall success (Hattie, 2012; Kim & Pekrun, 2014; Zwiers & Crawford, 2011), a curious observer might wonder, "Do teachers and students believe these activities are valuable? In what ways are online students involved in these activities? What are the benefits and challenges of participating in collaborative endeavors in online educational environments?" To answer these questions, the first step must be to take a peek inside the black box of online learning settings.

Exploration of Online Environments

This study explores the experiences of students and teachers working in online educational environments. The study was developed with three goals in mind: 1) find out, through direct observation, which interactions (peer collaboration and discourse) are actually occurring in online high school environments; 2) identify, through surveys, to what extent teachers perceive discourse and peer interaction to be valuable and feasible in online environments; and 3) explore, through surveys and student discussions, specific challenges and benefits of using these curricular activities in online environments.

Research suggests that there is promise for improving 21st century skills and content mastery through online peer collaboration, interaction, and discourse (Gallien & Oomen-Early, 2008; Lim, 2009; Yuan & Kim, 2014). Secondary students in mandatory online

math and English/Language Arts courses are most in need of these practices as students who fail these high stakes courses are at a much higher risk of dropping out (Christle, Jolivette, & Nelson, 2007). However, as demonstrated by the lack of empirical studies observing successful implementation of peer interaction and academic discourse among K-12 online learners, these students appear to be "out of sight, out of mind" as they typically work remotely from home. Therefore, new knowledge developed through an observational study of online student participants combined with data from an online educator survey (influenced by analysis of current best practices in communication and collaborative activities) could assist teachers, course designers, and policy makers in improving course content, adjusting procedures, allocating resources, and providing support where it will be most effective.

With those goals in mind, this study will address three research questions.

Research Question #1: How often are students engaging in curricular activities that support peer collaboration and academic discourse in online learning environments?

Research Question #2: To what extent do online teachers perceive these curricular activities to be valuable and feasible?

Research Question #3: What do teachers and students cite as specific affordances or constraints of implementing these curricular activities in online learning environments?"

A mixed methods approach will provide a comprehensive picture of peer collaboration and academic discourse in online courses. Data will be collected through student observations and online teacher surveys. First, observation of student participants completing their online coursework will address Research Question (RQ) #1, determining

how often students are provided an opportunity (and choose to participate) in academic

discourse and peer collaboration activities, such as peer editing or teacher-led discussions

requiring students to clarify, challenge, or build on one another's ideas.

Next, to determine the extent to which teachers perceive these curricular activities to

be valuable and feasible (RQ #2), surveys were emailed to online teachers and advisors

asking them to rate each component (as well as their perception regarding frequency) on

a scale of 1-5. Finally, open-ended questions posed to surveyed online educators were

used to collect detailed responses regarding affordances and constraints of incorporating

these interactive activities, targeting Research Question #3. Comments from student

participants (provided during observations) add further data to address the final two

research questions.

To recap, this research study aims to identify the types of communicative interactions

that are actually occurring in online school environments as well as determine if

academic discourse and peer collaboration activities are perceived as instrumental and

feasible in online school environments. Results will also inform stakeholders of the

current affordances and constraints of interactive, collaborative activities while offering

recommendations for improving 21st century skills within online school environments.

Potential Outcomes and Significance

Answering these research questions is of utmost importance as online learning

continues to expand within K-12 school environments. Currently, although collaboration

and discourse have been extensively observed and analyzed within traditional school

settings, it is not clear exactly how or whether these practices are successfully

implemented in online school environments (Kosko et al., 2014; Ronsisvalle & Watkins, 2005). The potential for a theory of action aimed at improving peer collaboration and academic discourse in online high school courses is great. Are today's online students participating in discourse and engaging in collaborative activities? It would be beneficial to find out if so, how? If not, why not?

In addition to these crucial 21st century relationship-building skills which serve as a means of motivation and success within an online classroom (Barbour, 2017; Yuan & Kim, 2014), these skills can also prepare students to effectively dialogue with others in an increasingly diverse society (Gardner, 2008; Gerzon, 2006; Pink, 2006). Newer technologies hold the promise of creating a social learning community, but this does not happen automatically, nor will it happen through under-examined online courses. Improved communicative exchanges will require direct and purposeful leadership and in-school structure and support. We must therefore enact "deliberate policies to support schools with the resources to know about their impact, and esteem them when they (the schools) demonstrate their impact on all students" (Hattie, 2012, p. 191). These policies must also be based on valid results from current research studies, few of which have included student observations alongside teacher surveys (Drysdale, et al., 2013; Kosko et al., 2014; Miron, et al., 2018).

To summarize, results from the current study will inform stakeholders of the current state of interaction among online learners. A gap in the literature will be addressed by conducting observations to determine the extent of peer collaboration and discourse occurring in online environments. This line of research will also identify which

collaborative activities and discourse interactions are perceived as valuable and feasible by teachers and students. Finally, a closer investigation into reasons why teachers and students do (or do not) utilize social interaction and collaboration within online courses will add practical knowledge to the field. Findings will reveal specific factors as challenges or keys to success in online environments. Outcomes from this study will be used to impart new recommendations for online learning environments and/or intervention.

In the end, incorporation of best practices for successful 21st century student learning includes application of skills such as working collaboratively with a diverse group of people. Asking students to engage in real time conversations through "spontaneous, authentic dialogue" (Goodwin, 2016, p. 82) has become an urgent global and educational issue (National Education Association [NEA], n.d.; P21, 2007). This connection can be made through meaningful discourse and robust collaborative activities. A thorough literature review in the following chapter illustrates how these essential communicative activities have the power to greatly improve online learning environments.

Chapter 2: Review of the Literature

Millions of students are currently enrolled in online courses. This number will undoubtedly increase with technological advances and higher demand (Evergreen Educational Group, 2017; Miron et al., 2017). As a result, it is essential that we thoroughly examine existing literature delineating best practices related to this relatively new educational landscape (Allen, et al., 2016; Barbour, 2017; CREDO, 2015).

This chapter provides a review of the literature specifically related to communication and interaction within fully online course environments (defined as academic courses provided through the internet, occurring asynchronously, and accessed outside of time and space constraints). Four core topics are addressed throughout this review of literature, namely: (1) historical context and growth of online learning environments in the 21st century; (2) best practices and pedagogy in online learning; (3) improving outcomes and student learning through specific interactions; and (4) gaps in research and the need for further study.

The current review will be limited to studies of students and courses primarily within online learning environments in rural, urban, and suburban settings across the United States. Analyses will include demographically diverse students and will address a wide range of academic abilities across a variety of online courses (e.g., general education, elective, credit recovery, and advanced placement). Currently, few peer-reviewed journals have published rigorous observations of student and teacher interactions within online K-12th grade educational environments. Therefore, while the current study targets grades 9-12, a number of seminal studies in higher education will be analyzed as well.

History and Growth of Online Education

Although previously offered in some unique circumstances, online course offerings became widely available to students in the mid 1990's. In 1992, the *Anytime, Anyplace Learning Program* was initiated by the Alfred P. Sloan Foundation (Picciano, Seaman, Shea, & Swan, 2012). This foundation set the stage for improving learning options as it granted millions of dollars for research of asynchronous learning networks. The Sloan Foundation's initial report in 2007 provided the first examination of K-12 online learning affordances and constraints, and provided a vision for the development and expansion of technologically advanced, accessible, low-cost, differentiated online courses as a way to improve student learning. The media and educational groups took note of this report as it included a compilation of data from 366 school administrators comparing online courses to blended learning, describing the nature of online learning while examining the ways in which it could benefit educational reforms (Picciano, et al., 2012).

From there, the popularity of online academic options spiked as technology became more widely accessible. There was a 47% increase in the early years between 2007 and 2009, with an additional growth of 26% between 2012-2014 (Allen, et al., 2016; Picciano et al., 2012). Currently 75% of all districts in the United States offer blended or online only courses (Miron, et al., 2017). Although controversial, 35 states allow fully online K-12 schools, enrolling over 523,000 students (Evergreen Educational Group, 2017; Miron, et al., 2018).

The number of online learners is likely to grow, particularly within the secondary school systems, given that 60% of American citizens believe high school students should

have the opportunity to earn credits through online courses (Bushaw & Calderon, 2014).

Districts seem to agree, with five states currently requiring enrollment in at least one

online course for high school graduation (Etherington, 2017). This requirement is

presumed to help prepare secondary students as they enter a technical career or join the

ranks of the nearly six million college students currently taking an online course (Allen,

et al., 2016).

Benefits of online learning. The reasons for the seemingly exponential growth of

fully online schools and online courses are as varied as the students who enroll in them.

When surveyed, students and their families state numerous reasons for a desire to pursue

online courses including: greater flexibility in daily schedules (often due to

extracurricular pursuits); advanced level course offerings; faster/slower pacing options;

improved safety; and increased parent involvement (Evergreen Educational Group, 2017;

Picciano et al., 2012). A number of families also cite their children's health concerns

(such as asthma or anxiety) as a reason to choose online courses. In sum, key

stakeholders are showing increasing interest in nontraditional course formats to meet the

varying needs of diverse student populations (Bushaw & Calderon, 2014; Picciano et al.,

2012).

Additionally, many districts have benefitted fiscally from the reduced operational

costs of hosting online courses. First, there are fewer building and facility costs given that

most students complete online work from home. Next, personnel costs are lower as most

online courses can be offered with higher student-teacher ratios. To illustrate, traditional

public schools report an average 16:1 student to teacher ratio, whereas hybrid or blended

schools (with some synchronous, face-to-face [F2F] interactions) have double that (32:1), while fully online virtual schools employ an average 45:1 ratio (Miron, et al., 2018).

Moreover, with a lens toward providing adequate and equitable learning environments for traditionally marginalized students, benefits of online learning include the ability to level the playing field. For example, in traditional school settings, underserved minority students are often treated with less respect, with demonstrably lower teacher expectations for student achievement (Berliner, 1986; Winfield, 1986). In online settings, teachers may not know the students' background, thus are theoretically less likely to discriminate based on race or socioeconomic status. Secondly, introverted or quiet students often feel more comfortable sharing and contributing in asynchronous (non F2F) environments (Picciano, 2002). Finally, students are able to access online courses during summer and winter session breaks, a strategy often used as a way to recover high school course credits lost during a previously failed (or unavailable) class. Those who are academically behind are less likely to be stigmatized if retained or enrolled in remedial courses, and those who are advanced can accelerate or extend their learning. Indeed, the possibilities for enhanced online educational experiences through the use of technology appear to be promising.

Challenges in online learning. Along with the many benefits and opportunities for online learning, numerous challenges need to be addressed. First, accountability standards and practices for providers of online learning lags far behind that of traditional school environments (Miron et al., 2017). Part of the problem is that too few stakeholders have attempted to correlate district and state policy with online student outcomes. To

illustrate, Stanford University's *Center for Research on Education Outcomes* (CREDO) "Online Charter School Study" analyzed the difference between charter school students in online environments compared to traditional brick and mortar schools. Overall, their mixed-methods analysis found a positive correlation between student academic growth in reading and clearly defined policies for class participation (CREDO, 2015). Although "increased participation" (otherwise undefined) was determined to be particularly beneficial among the online charter students, the researchers noted that specific policies and practices varied dramatically from state to state, making comparisons between environments challenging (CREDO, 2015).

Comparisons of online learning environments to traditional school settings are also challenging due to a lack of common definitions and vocabulary across diverse educational systems. For example, few stakeholders can easily and clearly articulate the differences between asynchronous, blended, hybrid, online, and virtual learning. (For the purposes of this paper, terms are defined on page xii.) Defining the problem succinctly, Enyedy states:

> The combination of a clear vocabulary for the features offered, a shared set of pedagogical goals for instruction, and a common set of topics to be taught would allow us to begin to effectively compare and evaluate these systems. Developing this consensus will require partnerships between developers who make the systems, researchers who evaluate them, and the teachers who use them. Without structures to bring these stakeholders together, it will be difficult to develop any common ground. (Enyedy, 2014, p. 15)

Without clear and coherent policies, practices, and verbiage among all stakeholders, it is hard to define what works best in online courses. The variation in policies and definitions creates too much noise to easily isolate the effects of instruction modalities.

Learning outcomes for online students. One consequence of this scattered discussion regarding online learning is that data on the effectiveness of online courses in grades K-12 is lacking. Case in point: an oft-cited report promoting online learning comes from a study supported by the US Department of Education by Means, Toyama, Murphy, Bakia, and Jones (2009). Findings from their meta-analysis of over 99 studies (n=9 in K-12 environments and n=90 in higher education) indicate that online students tend to perform better than those in F2F educational environments (Means, et al., 2009). What is rarely noted, however, is that only nine of the studies were conducted with K-12th grade students, four of which were excluded for insufficient data. Moreover, when separated by grade level, the authors found no significant positive effects for online learning for K-12 students.

In addition, the amoun*t* of online courses students take can make a difference in successful learning outcomes. Many researchers agree that particularly poor student outcomes are found in fully online K-12 schools versus hybrid (partially online) environments where students attend some on-site classes (Allen et al., 2016; Barbour, 2017; CREDO, 2015). Further analysis can help determine which factors influence effective student outcomes. For example, when segregated by type or sponsorship of school (i.e., those operated by for-profit, primarily large corporations versus local, district-sponsored) the on-time high school graduation rate for blended and online for-profit schools is approximately 50% compared to the national average of 83% (Miron, et al., 2018). National concerns over these statistics have spurred a series of state sanctions,

causing a first time ever 10% drop in student enrollment in the for-profit fully online/virtual school sector (Allen, et al., 2016).

It is worth noting, however, that success rates reported from studies funded by for-profit corporations (such as Florida Virtual Schools, K12 Inc., and Pearson's Connections Academy) show higher academic course completion rates than studies published by independent researchers and non-profit consultant groups (e.g., Ahn & McEachin, 2017; Evergreen Education Group, 2017; Miron, et al., 2018). This discrepancy in reported course completion rates may be due in part to the lack of agreed upon definition of success. For example, students may appear more successful if a school allows lower acceptable scores to pass a course (i.e., 60% versus 70%) or if there are generous grace periods to drop courses without transcript notation. Once again, it is hard to get a sense of "what works" if every school defines student success differently.

To further complicate matters, descriptions of student populations in online courses vary. Some reports state that student demographics in online schools include a larger percentage of "at risk" students who have failed other courses and are therefore utilizing online learning environments as a last effort for credit recovery (CREDO, 2015; Florida Virtual School, n.d.). However, each year, data from the National Center for Education Statistics shows that fully online and hybrid schools enroll far fewer minority and low-income students, while enrolling approximately the same number of special education students (Miron et al., 2018). In the end, the same question applies to all students, regardless of demographic make-up: Are they receiving an equal opportunity to work toward successful mastery of all educational standards?

In sum, although growing exponentially, there is little empirical evidence that online learning is as effective as F2F instruction in meeting academic goals, with even less evidence that they meet 21st century learning goals (Allen, et al., 2016; Barbour, 2017; Cavanaugh, et al., 2009). Most independent scholars agree that "the evidence base is becoming stronger and more convincingly negative for virtual schools" (Miron et al., 2017, p. 11). Nevertheless, for a variety of reasons, a large number of stakeholders find value in offering fully online courses to K-12th grade students. The onus, then, is on all participants to determine how to ensure best practices are incorporated into online learning environments. As research has shown, one potential strategy for improving student outcomes is the inclusion of interactive, collaborative, student-centered online instructional activities (Bannan-Ritland, 2002; Hmelo-Silver, et al., 2017; Vogel, Wecker, Kollar, & Fischer, 2017). These types of activities have been cited as a way to support and engage learners in any environment, thus a critical component in any type of educational setting.

Renown scholar John Hattie's analysis (2012) confirms that (as a tool) web-based learning does not appear to support student learning, yielding an effect size of just .18 compared to other factors that significantly improve student achievement such as classroom discussion (.82) and cooperative learning (.59) (Hattie, 2012, p. 266). This comes as no surprise given that child development specialists throughout the years have asserted the need for learning to be collaborative and social, with plenty of opportunities for high-quality discourse (Dewey, 1893; Vygotsky, 1978). Nevertheless, the long-term impacts and consequences remain largely unknown for students who might theoretically

complete coursework without any face-to-face interactions, meaningful discourse or peer

collaborations. Will they be able to successfully dialogue and work with others in an

increasingly diverse, globalized, and polarized society?

Best Practices and Pedagogy

Over 50 years ago, Vygotsky asserted that learning must be a socially interactive,

collaborative experience (Vygotsky, 1978). From birth to death, utilization of language

through interactions with others serves as the mediator for learning (Hawkins, Barbour,

& Graham, 2010). There is ample empirical evidence affirming that meaningful

interaction, discourse and peer collaboration improve motivation and overall success

(Alexander, 2006; Hmelo-Silver, et al., 2017; Mercer, 2000). Learner-centered theorists

and scholars posit that student success and enhanced learning is best accomplished while

working with others (American Psychological Association [APA], 1997; Wolfe,

Steinberg, & Hoffman, 2013; Zevallos, 2013). In fact, the APA's 11th principle states,

"Learning is influenced by social interactions, interpersonal relationships, and

communication with others" (APA, 1997, para. 17).

Pioneers in the field of education, from Socrates to Dewey (1893) to Gardner (2008),

have promoted academic, structured conversations as a way to enhance student

engagement and knowledge. In a highly publicized report of over 150 school practices

studied in traditional Australian schools over the course of 15 years, "classroom

discussion" is cited as the 7th most influential practice for student success (Hattie, 2012,

p. 266). Academic discourse, defined as a "formal, reciprocal discussion, conversation, or

chat (written or spoken communication) with another student and/or teacher in a way that

expands learning" has been shown to be a particularly beneficial instructional strategy. After studying 500 classes in five countries, Alexander (2006) argues that academic discourse motivates and engages students which then increases focus and drastically improves learning. Moreover, academic discussions are greatly enhanced if they include these five moves: (1) Elaborate and clarify; (2) Support ideas with examples; (3) Build on and/or challenge another's idea; (4) Paraphrase; and (5) Synthesize conversation points (Zwiers & Crawford, 2011).

In addition, numerous educational scholars assert that learners should have ample opportunity to collaborate with others on instructional tasks as this enhances perspective-taking and social competence (Bergstrand & Savage, 2013; Lin, Zheng, & Zheng, 2017; Pink, 2005). Based on a recent landmark study in a traditional school setting in the United States, the top three best interventions for students of lower socioeconomic status all center around interaction with others and included: Cooperative learning; small-group instruction; and feedback (Dietrichson, et al., 2017). Online environments, however, have reportedly offered fewer opportunities to utilize these effective teaching strategies, thereby negatively influencing student achievement (Lim, 2009; Moore, 2016).

Online educators have the ability to change this dynamic by actively engaging students in their learning. When focusing on communicative exchanges in online learning environments several key practices have been established by researchers. For example, utilization of social activities (e.g., discourse and peer collaboration) has been shown to enhance and positively influence subject mastery learned in online courses (Lim, 2009; P21, 2007; Swan, 2001). To further operationalize this concept of engagement,

researchers often refer to computer-supported collaborative learning (CSCL) pedagogy. With CSCL students utilize technology to collaborate through the use of tools such as online discussion boards, virtual simulations, and game-based learning. In a recent analysis of almost 200 published articles, researchers found that "Technologies that fostered a sense of community and facilitated interactions resulted in high frequency of collaboration, learning achievement, and satisfaction than technologies that did not" (Hmelo-Silver, et al., 2017, p. 2068).

Significance of engagement. No matter where students complete their schoolwork, remotely or in a traditional school setting, the fact remains that student engagement is consistently tied to student success (Dietrichson, et al., 2017; Hattie, 2012). This point matters greatly as stakeholders agree that low grade point averages and low passing rates of high school students in online courses pose major problems. Failing crucial courses such as math or English often sets students on a trajectory for school failure which then leads to student drop outs (Heppen, et al., 2017). Unfortunately, the dropout rate is particularly high among online learners (Miron, et al., 2018). The repercussions of dropping out of high school can be severe with statistically higher incidents of unemployment, crime, and poverty (Christle, et al., 2007). Family legacies often continue in the same pattern.

Specific guidelines proposed by Yuan and Kim (2014), described later in the chapter, can help online educators improve student outcomes through the creation of an interactive online community of learners. As they note, "The dropout problem can be attributed to a number of reasons, with a lack of interactions between learners and the

instructor constituting one of the main reasons" (Yuan & Kim, 2014, p. 1). Wolfe,

Steinberg, and Hoffman's (2013) synthesis of nine studies coincides with this idea- the

authors highlight student motivation and engagement as the key to student success. They

state, "Schools too often make students feel anonymous, powerless, disengaged and

alienated, then it is crucial that reform efforts seek to ameliorate rather than exacerbate

these conditions" (p. 200). Meaningful interaction with others through teacher-directed

activities (such as academic discourse) can help, particularly for online students who

might not otherwise have opportunities to interact with peers.

In sum, empirical studies delving into best practices for online education indicate that

a large component missing from students' lives is the lack of personal connection with

peers and teachers (Allen et al., 2016; Hawkins, Barbour, & Graham, 2011). Although

some scholars contend that students' exposure to math or English content in online

courses aligns with traditional site-based classrooms (Lockee, et al., 1999; Picciano,

2002), students in online environments are often not afforded the same opportunity to

practice essential 21st century skills alongside peers. Even though online courses offer

flexibility and access, they often "constrain" peer and teacher interactions, limiting the

effectiveness of the overall school experience (Gallien & Oomen-Early, 2008; Enyedy,

2014). Experts within online learning circles admit "the online environment can be a

lonely place" (Palloff & Pratt, 2005) and emotionally cold (Goodwin, 2016; Moore,

2016).

And yet improved conditions are possible and attainable. For example, teacher-

coached interactive activities could offer opportunities for students to learn essential

skills such as academic discourse, perspective-taking, and collaboration. One example is the inclusion of written scripts as a way to enrich conversations (Vogel, et al., 2017). As online educators in this study provided socio-cognitive scaffolding (e.g., role-playing) to help students explain, question, or argue, students significantly improved their collaboration skills compared to unstructured CSCL (Vogel, et al., 2017). Hmelo-Silver, et al. agree: Their meta-analysis demonstrated substantial learning gains, both in subject knowledge and in collaboration skills with the inclusion of structured asynchronous discussions in online K-12 learning environments. Furthermore, CSCL assists in the development of constructive evaluation of others' ideas and improved social relationships (Hmelo-Silver, 2017). These 21st century skills, however, must be recognized as valuable by teachers, students, administrators, and policymakers.

In fact, the need to infuse these interactive skills within educational settings has been addressed by a recent president. "I'm calling on our nation's governors and state education chiefs to develop standards and assessments that don't simply measure whether students can fill in a bubble on a test, but whether they possess 21st century skills" (Obama, 2009).

Setting comprehensive standards. The creators of the Common Core English Language Arts Standards (CCSS) agree. The CCSS authors and designers reasoned that in order "to build a foundation for college and career readiness, students must have ample opportunities to take part in a variety of rich, structured conversations" (CCSS, 2017, ELA Standard description, p. 7, para. 7). One specific Common Core ELA standard states that K-12th grade students in a "twenty-first-century" classroom should "prepare for and

participate effectively in a range of conversations and collaborations with diverse partners" (CCSS, 2017, ELA Anchor Standard CCRA.SL.1, see Appendix B). This general sentiment is also supported by a position paper published by the International Reading Association which notes that discourse and interaction with peers is essential, stating "collaboration must occur at every level" (Hakuta, Santos, & Fang, 2013, p. 454).

Similarly, the International Society for Technology in Education's (ISTE) current Standards for Students list the following as a crucial element: "students…enrich their learning by collaborating with others and working effectively in teams locally and globally" (International Society for Technology in Education [ISTE], 2017, Standard 7, see Appendix C). ISTE also defines "communication" as a major component of their society's goals (ISTE, 2017, Standard 5). Research and policy then converge on the idea that students need to be provided with course activities that allow them to engage in meaningful discourse while working collaboratively with others. Setting standards within online settings will require a coordinated effort among course designers, online educators, and policymakers.

Developing 21st century skills. Almost a decade prior to the 2010 California adoption of the Common Core State Standards (CCSS, 2017) there was agreement among United States' educational leaders and policymakers that students would need new skills in order to become successful adults in an increasingly diverse, technical, and global society. In 2001, teachers from the National Educator's Association (NEA) worked with education and business leaders to establish P21, the Partnership for 21st Century Skills (National Educator's Association [NEA], 2017; P21, 2007). As a result, the Framework

for 21st Century Learning was developed (P21, 2007). The framework defines 18 student skills as well as necessary support systems as key factors for best practices. Of the 18 skills, the "four C's" have been the focus of educational reform and are considered the most vital: critical thinking, communication, collaboration, and creativity (P21, 2007).

Beyond recommended state standards, other major policymakers endorse these same "4C" 21st century learning skills, particularly collaboration and communication. The National Research Council, for example, makes a strong case for measuring 21st century skills and competencies. Their text *Knowing What Students Know* encourages a more focused look at how communication among students works in various social situations (The National Research Council, [NRC], 2001). The National Assessment of Educational Progress (NAEP) group similarly explains that much of the future work of our students will demand collaboration. They go on to say that "collaboration is thus a common ingredient to work in society and an integral component of a number of knowledge-building pedagogies" (NAEP, 2012, p. 27).

Indeed, many jobs of the future will require skills in collaboration (P21, 2007; Pink, 2005). A survey of over 1,000 recent college graduates revealed that nearly 40% of participants reported that they had to collaborate online in their career work, but they were never asked to utilize this skill in their final year of courses (Moore, 2016). In fact, Moore's (2016) analysis identifies "online collaboration as one of the most important skills to future employees" (2016, p. 233). As such, online course content providers are beginning to identify collaboration as a critical component of learning often missing in online courses. Florida Virtual School, in its white paper on collaborative learning

challenges, concur that stakeholders are concerned with social isolation and lack of interaction as there are "limited opportunities for active participation" in online courses (Florida Virtual School, *Collaboration in the Online Environment*, n.d.). School leaders, both in Florida and abroad, have therefore actively encouraged teachers to improve teaching strategies in order to enhance 21st century "4C" skills.

Defining educational success. With the intent to develop capable, 21st century-ready students, there is ample evidence that a widely-accepted definition of educational success in online environments must extend beyond academic skill acquisition (Moore, 2016). For example, in Picciano's (2002) landmark study of online learners, it was determined that the students who communicated most effectively (through thoughtful responses to others' comments) within online discussion board posts were significantly better at perspective taking and real life problem solving (as demonstrated on a written exam based on a case study). Although small in scale, with just 23 participants (all of whom were full-time teachers pursuing a post-graduate degree), there was a positive correlation between students' involvement in the class and the perceived course quality. The students who were adept at communicative exchanges were also much more capable when asked to work on a case study. However, there was no significant difference in their scores on tests reviewing course content. This study serves as a reminder that regurgitation of content does not comprehensively define educational success. The goal should be for students to master academic content while also improving real life problem solving abilities and communication skills (Borup, et al., 2012; Hmelo-Silver, et al., 2017)

Researchers agree that if one were to determine course success based on final academic grades (rather than improvement in other skills such as critical thinking and ability to collaborate) the overarching goal of adequately preparing students for the 21st century could not be measured or realized (P21, 2007). For example, in their meta-analysis of online learning over a 10-year span, Cavanaugh et al. (2009) assert that although newer (post 2000) studies are more focused on practice (versus outcomes, such as final grades) than earlier studies, further research is needed to identify specific factors contributing to positive effects. They articulated a desire for further studies to investigate the actual experiences of students in virtual environments (Cavanaugh, et al., 2009).

Studies involving direct observations of K-12 online students, however, are lacking. After studying thousands of online environments, researchers at the agree and add that "some research priorities deserve immediate and expanded attention," prompting the question, "What are examples of best practices for teaching in these settings?" (Miron, et al., 2018, p. 7). Although numerous best practices have already been identified, there is an urgent need to find out if these practices are being implemented in the coursework of online high school students.

To illustrate, researchers noted a significant improvement in positive learning experiences when students were provided with "real-world" experiences and connections between peers (Boling, Hough, Krinsky, Saleem, & Stevens, 2012). This study was conducted at the college level with a relatively small sample size (n=6 course instructors, n=10 students). The authors contend that teachers need additional assistance and professional development to learn how to utilize technology to its fullest in order to

improve student learning experiences. For example, online teachers in the study tended to over utilize text-based lessons which led to a "disconnect" between students and teachers (Boling, et al., 2012). This disconnect can be prevented with a shift in the current mindset of online teachers: Instead of the traditional "lecture" style of teaching, online educators need to "provide students with experiences that challenge their higher order cognitive skills" (Boling, et al., 2012, p. 118).

Similarly, Swan (2001) posited that utilization of an interactive "community of inquiry" teaching practice helped produce an exemplary learning environment. According to Swan (2001), three key variables increase student satisfaction: Clarity of design, interaction with instructors, and active discussion among course participants. Note, however, that many of these studies were conducted with college students, and although providing valuable insight, do not necessarily to transfer to younger participants.

Within K-12th online environments, having a clearly defined policy for student participation levels results in a "positive relationship with academic growth in reading" (CREDO, 2015, p.49). Hossain and Weist (2013) utilized blogging among students to encourage collaboration and reported that students who were involved in online discussions were more interested, motivated, and felt safer to share. They agree with others suggesting that collaborative activities improve subject knowledge as well (Hossain & Weist, 2013; Vogel, et al., 2017). Interaction with others boosts student skills on multiple fronts.

Collaborative activities have the potential to improve academic scores as well as 21st century global skills. Therefore, to meet state standards and improve student success and

motivation, there is an urgent need to provide students with meaningful interactions,

critical discourse, and collaborative activities tailored to each course.

Improving Outcomes Through Interactive Activities

How important are these interactive, social activities? The CASEL group's analysis

of several empirical studies concludes with a statement that students who participate in

the learning process through social interactions with teachers and peers are more

successful both in and out of school (Elbertson, Brackett, & Weissberg, 2009). A separate

study noted a 50% difference in suspension rates when teachers improved relationships

with students (Goodwin, 2016). Numerous other studies indicate that student-teacher

relationships are a significant predictor of student engagement and success (Christle, et

al., 2007; Hattie, 2012; Yuan & Kim, 2014). Enyedy succinctly writes:

> Learning has always been an interactive experience—observation of
> others, questioning and being questioned, dialog, discussion, and debate.
> These are interactions between people. The relationships between people
> that are formed during these interactions help students not only to
> understand new information but to trust it and to value it. (Enyedy, 2014,
> p. 16)

Researchers Bergstrand and Savage (2013) concur. Their large scale study

(comparing 118 online and traditional college sociology courses) found that lack of

interaction is a major reason for deeming online learning as less effective than traditional

face-to-face classrooms. Their review of student evaluations in these courses (which were

recognized as both reliable and valid measures that correlate with student outcomes)

determined that 1) online students learn significantly less (as determined by course grade

point averages), 2) online learners are not as well respected by the teacher, and 3) the

teacher is not as effective. They posit that critical student-teacher interactions are limited

(due to the spatial and temporal separation in online learning environments), and relationships are not fully developed as a result. This becomes a key reason for poor outcomes and evaluations of online environments (Bergstrand & Savage, 2013).

Interaction in many forms. Researchers are beginning to cite lack of interaction and socialization among online learners as a contributor to poor outcomes and attrition among online students (Miron, et al., 2017). Ahn and McEachin (2017) provided one of the top ten American Educational Research Association's [AERA] journal articles of 2017 calling for online virtual charter schools to look at innovative ways to improve social interaction among teachers and peers. In their study of over 1.7 million online students in Ohio, they assert that "learners still need the presence of teachers, mentors, or peers to help them through the learning process" (Ahn & McEachin, 2017, p. 55). They cite the "negative" outcomes of students enrolled in "e-schools" and suggest that different teaching practices, pedagogy, and policy are needed. For example, teachers can contribute to student learning through the use of scaffolding and guidance to help students self-regulate their learning and develop metacognitive skills (Ahn & McEachin, 2017). Miron et al. (2018) support that claim and contend that students need interaction, but most online students appear to be learning in isolation as the corporate model of online courses "do not fully promote student engagement" (p. 41). So then, as asked in Research Question #1, what types of interaction are occurring that support learning?

To answer that question, stakeholders must first be able to define interaction in online learning environments. For example, Bannan-Ritland (2002) reviewed 132 research articles in order to describe computer-mediated communication. Her comprehensive

analysis helped (1) define the term "interactivity"; (2) sort interaction into purpose (i.e.,

organizing, lecturing); (3) consider the examination of quality and depth of interactions

rather than the quantity; and (4) organize interactions by context (social or collaborative)

and interaction type (Learner-Learner versus Learner-Instructor). Finally, her review

provided a list of teaching strategies and activities as well as suggestions for further

research (Bannon-Ritland, 2002). This capturing and organization of themes from her

analysis set a path for others to follow.

A recent study of high school students organized types of student interaction

conducted within online class environments into three distinct categories, namely:

Learner-Learner, or interactions between students and peers; Learner-Instructor, or

interactions between students and instructors; and Learner-Content, or interactions

between students and academic tasks, typically with a one-way flow of information such

as creation of a project for a video presentation (Lin, et al., 2017). Although results

should be interpreted cautiously as they were obtained via self-report and limited to an

optional online high school language course, they show that the most valuable

interactions (as reported by the 466 participants in their study) were Learner-Content

interactions. These included presentations, projects, online chats, and discussion forums.

The authors then surmised that these student-centered activities allow students to be

creators of knowledge rather than passive consumers. Notably, activities such as group

projects and online discussions with peers were categorized as Learner-Content

interactions for this study, whereas others may consider these to be Learner-Learner

interactions. One could argue that these "Learner-Content" activities allow students to

reflect on learning in a social or collaborative way, aligning with Vygotsky's (1987) sociocultural theory. In the end, as noted in the American Psychological Association's (APA) student-centered learning guidelines, students need opportunities to interact with one another and gain support from peers and mentors, as this allows them to take ownership of their learning (APA, 1997). The P21 group would then argue that these activities utilize all four C's: critical thinking, communication, collaboration, and creativity (P21, 2007).

Other researchers have also found positive results when students interact and engage in learning. Hawkins, Barbour, and Graham (2011) for example found that positive Learner-Instructor interactions improved academic course success and completion in an online high school. They report that secondary school students are unable to regulate their own learning and therefore need support, guidance, and opportunities to communicate with others, particularly their teacher. Similarly, Hawkins, Barbour, and Graham (2010) correlated student outcomes (completion of a high school online course) with the number of interactions (as reported by teachers). As would be expected, the most academically successful students (top third) worked with online teachers who reported the highest levels of interaction with students, whereas the least successful students (bottom third) tended to have teachers who did not interact much with students. Note that this study had a low response rate (3.5%), relies on self-report, and included a number of self-motivated students who were successful without such interactions. Also, interaction was generally limited to emails and reminders. Nevertheless, increased communication was seen as advantageous.

Yuan and Kim (2014) regard the lack of interaction as the leading cause of isolation and high drop-out rates for online courses. As a result, their article in the *Journal of Computer Assisted Learning* proposes guidelines that online educators could use to help facilitate a more connected learning community. These guidelines can be summarized thusly (1) Begin building a community right away, as the course begins; (2) Involve both students and teachers in building a community; (3) Use both synchronous and asynchronous communication for teachers and student interaction; (4) Utilize strategies to motivate learners, such as assigning roles, debating topics, working on case studies; (5) Encourage social interactions as well as task-oriented discussions (Yuan & Kim, 2014).

Additional researchers have directed their attention to peer interaction instead. Although studied extensively in traditional school settings (see Mercer, 2000), peer interaction (or Learner-Learner interaction) is understudied in online environments. To demonstrate, drawing from a meta-analysis of interaction types, Cavanaugh et al. (2009) noted that the vast majority of research with regards to online pedagogy focused on Learner-Instructor interactions. Learner-Learner interactions such as peer collaboration, on the other hand, were identified as under researched but important variables. They suggested more research to determine the value of other forms of online interaction (Cavanaugh et al., 2009).

Examining the quality of interactions. Do higher levels of interaction and social presence translate into better outcomes? According to Picciano (2002), studies that attempt to address this question yield mixed and somewhat inconsistent results. The author highlights one of the challenges previously identified, namely that "student

performance is open to many definitions" (p. 22). Picciano's conclusion is that collaborative activities "can support productive learning environments but performance outcomes need to be evaluated to determine overall success of the course" (2002, p. 24). Garrison and Cleveland-Innes (2005) asked a similar question. To determine if the quality of interaction mattered, they conducted a study with 75 online graduate students and found that simple interaction among students was not enough to improve deep learning. The authors concluded that purposeful and meaningful interactions of higher quality (i.e., structured, instructor-directed, critical discourse) improved the quality of higher-order learning. While acknowledging that casual social interactions can enhance online experiences, they advised course designers to create and promote collaborative activities that encourage student-centered participation and progressive discourse (Garrison & Cleveland-Innes, 2005).

This suggestion is echoed by Vogel, et al. (2017) who found that the addition of "transactive" collaborative activities, such as role playing scenarios or peer editing (in which learners build on the contribution of one another through explaining, questioning, extending, and revising) through the use of computer-supported scripts improves collaboration skills and "increases the likelihood of domain-specific learning" (Vogel, et al., 2017, p. 501). Similarly, Bannan-Ritland (2002) noted that higher levels of questioning, such as co-construction of knowledge and application of newly constructed meaning typically lead to deeper student learning, and are therefore more desirable than the simple transmission of information. Information from these organizational studies influenced the communicative exchange categories coded in the current study. Student

engagement was first sorted into Type (Student-Peer or Student-Teacher interactions) and further broken down by purpose (Organizational, Social, or Instructional) and student response (Closed, Explain, Elaborate, or Synthesize).

Numerous researchers have also taken note of the positive effects of face-to-face (F2F) interactions. When comparing online versus F2F credit recovery courses, Heppen et al.'s (2017) study confirmed the positive effects of student engagement in the F2F course. Although similar academically, students who met F2F felt the course was easier, and that the skills learned in the course more transferrable to real life. Moreover, the F2F students felt more engaged and confident in their abilities (Heppen et al., 2017). Reports from other studies followed a similar pattern (e.g., Enyedy, 2014; Picciano, 2002). Overall, these researchers determined that although there was not a consistent or significant improvement in test scores with increased teacher-student interaction, students were more positive about courses requiring participation, collaboration, and discourse.

Clearly, promoting best practices and encouraging dialogue and peer collaboration remains an obstacle within online school environments. While surveying the 59% of schools who offer online learning in New York's Northeast Rural District, Clements, Pazzaglia and Zweig (2015) reported that one of the top three challenges to facilitating a successful school experience is a lack of F2F interaction between teachers and students. Thus the inclusion of meaningful interpersonal interactions through cooperative and collaborative activities is likely to improve online course pedagogy, practice, and student outcomes.

Limited Empirical Studies

This review of literature identifies a number of shortcomings that reveal how little we know about interaction in online environments. For example, it is largely unknown how often online learners work collaboratively with peers. Considering the power of group discussions that expand learning, one must ask, "What does academic discourse look like in an asynchronous environment?" and "Are these activities valued? Are they feasible?" Scholars and educators today remain largely uninformed about current practices within online learning environments and its impact on academic success and essential 21st century skill attainment.

One reason for the lack of information regarding online learning experiences among K-12 students is that most studies are geared toward post-secondary school environments. For example, although 41% of public school districts enrolled students in online or blended courses in 2008, just 8% of theses and dissertations related to online learning studied K-12th grade school environments (Drysdale, et al., 2013). This is true even today as Barbour (2017) reviewed hundreds of empirical articles in online education journals and discovered that less than 10% addressed K-12th grade learning.

Just as research on online learning for K-12 remains scarce, so is information relating learning outcomes and pedagogy in these environments. The relationships between learning outcomes and interaction is a "complex pedagogical phenomenon in need of further study" (Picciano, 2002, p. 33). The "messiness" of attempting to measure so many independent variables is particularly challenging when studying and assessing 21st century skills. However, the challenges of measuring how (and what) students learn in an

online environment should "spur the policy and research communities to deepen their efforts to get rigorous and more conclusive evidence of effectiveness" (NAEP, 2012, p. 25).

Unfortunately, very few of the many landmark studies conducted within college environments are generalizable to the high school level. Those that are informative to elementary and secondary school settings tend to focus on student academic outcomes, particularly test scores and course advancement, rather than 21st century skills as witnessed through improved academic discourse and peer collaboration.

This is particularly problematic given that meaningful interactions, peer collaboration, and critical discourse often stimulate motivation and success within online classrooms (Garrison & Cleveland-Innes, 2005; Hattie, 2012; Heppen, et al., 2017). Although primarily focused on higher education, Drysdale et al. (2013) asserted, "More needs to be done to discover what design features could lead to greater student motivation and engagement" (p. 98). Kosko et al. (2014) add "the last evident area currently in most need of future research is an investigation of social interaction" (p. 172).

Contributing to this problem of practice is the narrow definition of "success" which continues to be based primarily on content mastery and concrete skills rather than 21st century global learner skills (P21, 2007). After all, basic proficiency in math and reading skills will not be sufficient to meet the demands of the future. One must be able to respectfully communicate and collaborate with others. The 21st Century Skills Framework defines essential skills necessary for success in an increasingly global society

as those focused on working effectively with diverse others (P21, 2007). These communicative, interactive skills are also essential for deep learning (Zevallos, 2013).

As Common Core, ISTE, and P21 standards encourage students to engage in critical discourse with others, evaluate diverse points of view, and learn together, the onus is on online course designers and schools to provide opportunities for students to communicate and collaborate with others (CCSS, 2017; ISTE, 2017; Kosko et al., 2014; P21, 2007). The future, with its increase in automation, outsourcing, and globalization, will demand workers who are collaborators and bridge builders. Employees will need to understand diverse perspectives in order to holistically analyze problems and work with others in developing solutions (Gerzon, 2006; Moore, 2016; Pink, 2005). The limitations of current research highlight the value of new research and learning to determine how to assist online students in this monumental task.

Theoretical Framework

The 21st Century Skills Framework. The 21st Century Skills Framework for students (P21, 2007) serves as the key theoretical framework for this particular study. In preparing 21st century students for future success in an increasingly global society "proficiency in reading, writing, and arithmetic is not sufficient if employees are unable to think critically, solve problems, collaborate, or communicate effectively" (NEA, n.d., p. 6). The 21st Century Skills Framework was developed ten years ago with input from business leaders, teachers, and education experts (P21, 2007). The framework describes the "skills, knowledge and expertise students should master to succeed in work and life in the 21st century" (P21, 2007, para. 4). Student outcomes are categorized as such: (1) Life

and career skills; (2) Information, media, and technology skills; and (3) Learning and innovation skills (critical thinking, communication, collaboration, and creativity), otherwise known as the "4 C's" (P21, 2007). In addition to these skills, the framework identifies the following four key interconnected systems to ensure successful student mastery of the 21st century skills:(1) Standards and assessments; (2) Curriculum and instruction; (3) Professional development; and (4) Learning environments (P21, 2007). Although the current study is focused on learning environments, improvement in online learning environments will be dependent on collaboration between policymakers, curricular designers, and professional development of teachers. This 21st century framework provides the shared language, outcomes, and topics related to fostering student online learning.

Sociocultural theory. The 21st century framework aligns well with sociocultural theory (Vygotsky, 1987). Vygotsky (1987) asserts that "what the child is able to do in collaboration today he will be able to do independently tomorrow" (p. 211). Interaction with others should therefore play an integral part in educational design and practice. The National Assessment of Education Progress (NAEP, 2012) group magnifies this notion by stating, "What each individual can accomplish is expanded by the opportunity to work with others" (p. 27). Implications from both 21st century and sociocultural theories indicate that peer and teacher discourse and collaboration are essential components for deep learning. As explained in Vygotsky's Zone of Proximal Development (Vygotsky, 1987) it is the job of educators to design learning environments where students interact with teachers and knowledgeable peers to assist in the creation of knowledge. Beldarrain

(2006) agrees and asserts that interaction between students is the "heart" of learning environments. Likewise, Hawkins et al. (2011) reiterate that social interaction is the center of instruction and go on to assert the need to create a community of engaged and collaborating learners instead of the "faceless" content-based instructional interactions so common within online settings (Hawkins et al., 2011).

Sociocultural theory suggests that students learn best when they are working with others, thereby predicting that students who are learning remotely with limited collaboration with others will receive a less than ideal education (Lin, et.al., 2017; Vygotsky, 1978; Yuan & Kim, 2014). "Transactive" activities in which students work together to build knowledge are critical components for cognitive development as well as improvement in social skills (through teacher-led guidance on how to interact) (Vogel, et al., 2017). These "transactive" back-and-forth activities occur as students actively build on the contributions of a partner through questioning, explaining, refining, arguing, revising, and extending knowledge (Vogel, et al., 2017). Although unregulated social interaction can distract and divert students from academic tasks, the use of CSCL best practices to develop a higher level of learner-instructor/peer interactions may be a solution for enhancing today's online learning environment (Borup, et al., 2012; Stahl, Koschmann, & Suthers, 2006).

Moreover, Dewey said that learning is a social process, and is not just "preparation for life but is life itself" (Dewey, 1893). In the context of online learning, the sociocultural perspective holds that interaction between members of online learning

communities is vital as it enables shared understandings and collaborative knowledge building (Hmelo-Silver, et al, 2017; Lim, 2009; Lin, et al., 2017).

As educational leaders, we must critically assess policies and practices that may constrain student learning. In the case of online learners, these constrictions (such as possible lack of interaction) might impair students' abilities to productively work with others in their future endeavors. Rather than simply observing and detailing online learning environments, the proposed study aims to critique and ultimately inform and change the online learning environment in order to improve student learning and lifelong success. Merriam and Tisdell (2016) promote this type of inquiry as a way to "critique the way things are in the hopes of bringing about a more just society" (p. 60). Through critical analysis and observation of social transactions occurring in online environments we are better able to understand current circumstances and promote better practices. This type of activity can be transformative and emancipatory to students who might feel they don't have a voice in the system of online education (Shor & Freire, 1987).

While there is some empirical support for these theories coming from studies of online learning (e.g., students in online courses agree they are not as "connected" with either the content or others compared to students in a face-to-face learning environment, Enyedy, 2014; Hawkins et al., 2011; Kim & Pekrun, 2014) we have not yet determined how much impact this isolation will have on motivation and life-long student growth and success. Without further study, policymakers are unable to make informed decisions based on current practices in online school environments.

As a result, this study begins with the first step, the direct observation of students, noting the number and type of communicative exchanges offered and utilized. To determine if interactive activities such as academic discourse and peer collaboration are considered valuable and feasible in online settings, this study adds a secondary component seeking input from high school educators working in the field. Their survey responses will expand the discussion through open-ended responses regarding affordances and constraints of communicative exchanges in online settings. Knowing what is currently happening in the field and gaining insight into how it could be improved can assist in the promotion of improved practices and student learning.

Summary

In sum, offering schoolchildren the option to complete coursework online is a controversial topic in today's educational community. Answering basic questions such as "Can students succeed in online courses?" is akin to asking "Which type of fruit is best?" Far too many complex variables exist, such as type of online course (hybrid versus fully online) or teacher expectations (requirement of collaboration with others or not). Most researchers, however, recognize that there is a persistent difference in academic outcomes, with online students engaging in fewer interactions and demonstrating lower academic achievement overall. Of greater concern to many are the lack of opportunities for online students to engage in 21st century skills such as collaborative projects and academic discourse. In a vicious cycle, researchers agree that low academic achievement can be partially blamed on lack of valuable interactions within the online course. This

could therefore be remedied through changes in pedagogy and practice to include purposeful collaboration and discourse with others.

Additionally, as recommended by numerous scholars, more research is needed to understand differences in pedagogy and practice between online and F2F courses (Barbour, 2017; Heppen, et al., 2017). Specifically, further research needs to "increase understanding of the inner workings of online and blended schools, including such factors as the curriculum and nature of student-teacher interactions" (Miron et al., 2017, p. 9). Although interaction in general was mentioned in about one third of the studies reviewed above, Drysdale et al. (2013) concur that there is a "blatant gap" in research regarding Learner-Content and Learner-Learner interaction. They conclude by asserting, "with interaction taking place on so many different levels, we see much need and opportunity for continued research in this area" (p. 96).

This mixed methods study and evaluation of online learning will add value and knowledge to the field by indicating which 21st century skills are most valued, feasible, and actually occurring within online school environments. Observation of students enrolled in online courses will add clarification regarding current practice within online settings and a thorough analysis of survey responses from online teachers and students will provide additional insight on their experience and perceptions. Online teachers and students will then determine the current challenges in implementing meaningful discourse and peer collaboration in online course settings as well as supports which could be put in place to improve these 21st century skills.

In conclusion, researchers make a compelling case that students who engage in meaningful discourse and collaboration with others value the activity and feel more engaged, supported, and positive about online coursework (Garrison & Cleveland-Innes, 2005; Heppen, et al., 2017; Hawkins et al., 2011; Lin, et al., 2017). As a result, grades and persistence in online courses typically improve with increased interaction. Students who are encouraged to engage in discourse and work with others also attain crucial 21st century skills such as perspective taking and empathy. However, timely research is trailing far behind the spike in online learning options. Are online learners engaging in peer collaboration and discourse? This is largely unknown. Through surveys, observations, and discussions with students, information from the present study will ultimately inform recommendations for online course designers, educational leaders, and policy makers. Discernment in further research, funding, and programs could be directed to the type of support and intervention deemed most valuable for the development of the 21st century student, one sufficiently prepared for the future.

Chapter 3: Research Design and Methodology

When online students interact with peers and teachers through academic discourse and peer collaboration, academic grades and critical 21st century skills improve (Ahn & McEachin, 2017; Bergstrand & Savage 2013; Elbertson, et al., 2009). Yet, even with a spike in online course enrollments across the county, there has been little investigation into peer collaboration and academic discourse in online 9th- 12th grade class settings. Therefore, the goal of this study is to obtain an accurate picture of academic interactions between students, peers, and teachers in an online learning environment. This study will determine how often online learners engage in discourse and peer collaboration and will explore how teachers and students perceive and interpret their online interactions and learning experiences. This study will also seek to identify opportunities and challenges for integrating Learner-Learner (student-to-peer) and Learner-Instructor (student-to-teacher) communication and collaboration in online high school courses.

A mixed methods approach was chosen in order to improve the strength of the study; integration of both qualitative and quantitative research data will provide a more nuanced and comprehensive understanding of online learning environments (Creswell, 2009). Understanding the exact ways in which students interact with teachers and peers can help inform the field and assist in bridging the gap between best practices and successful implementation. Student observations will take a close-up look at current practice while online teacher surveys will delineate affordances and constraints to implementation of communicative activities.

The following chapter will describe the study design and research methods utilized to examine communicative exchanges in online course environments. Information regarding participant selection, setting, and scope will be discussed. Ensuing details include comprehensive observation and survey protocols utilized for the collection of data, which were informed by a pilot study completed in the fall of 2017. Strategies for data analysis will be explained in depth. This chapter will also describe measures taken to ensure the reliability and validity of the data collected. Each of these discussions will be supported by a comprehensive design map visually connecting the problem of practice, theoretical frameworks, study methods, and research questions (see Appendix D).

Research Questions

The study sought to answer three research questions. Each question is outlined in detail to provide the reader with information regarding data collection tools, strategies, output goals, short and long-term outcomes, and potential impact for improving online educational environments (see Tables 1-3).

Research Question #1: How often are students engaging in curricular activities that

support peer collaboration and academic discourse in online learning environments?

Table 1

Research Question #1 Operationalized

RQ #1	"How often are students engaging in curricular activities that support peer collaboration and academic discourse in online learning environments?"
Strategies	1) Observe and record instances of online peer collaboration or discourse activities in 9th-12th grade ELA online environments
	2) Analyze recorded and archived synchronous lessons
	3) Ask online teachers how often these activities occur via survey
Outputs	Identify peer collaboration and academic discourse activities (both **number of** activities and **types of** activities) students are actually engaging in
Outcome	**Short-term:** Informed knowledge of what is actually occurring
	Long-term: Stakeholder perceptions will change to align with the reality of what is actually happening in online environments
	Recommendations for improved 21st century learning practices widely implemented
Potential Impact	Increased awareness of gaps in online students' learning; requirement of additional support for activities aligned with 21st century best practices

Research Question #2: To what extent do online teachers perceive these curricular

activities to be valuable and feasible?

Table 2

Research Question #2 Operationalized

RQ #2	"To what extent do online teachers perceive these curricular activities to be valuable and feasible?"
Strategies	1) Survey online high school teachers and advisors in 9-12th grade online course settings
Outputs	Responses from surveys and comments will determine the extent that teachers value interactive activities, as well as provide insight into feasibility within online learning environments
Outcome	**Short-term** Improved understanding about online learning environments (perceptions of what is valued, feasible, or lacking) **Long-term** Increased value and buy-in for more effort in promoting 21st century skills such as peer collaboration and discourse in online settings
Potential Impact	An increase in utilization of feasible and highly valued peer collaboration and academic discourse activities in online environments

Research Question #3: What do teachers and students cite as specific affordances or constraints of implementing these curricular activities in online learning environments?

Table 3

Research Question #3 Operationalized

RQ #3	"What do teachers and students cite as specific affordances or constraints of implementing these curricular activities in online learning environments?"
Strategies	1) Survey online high school teachers and advisors in 9-12th grade online course settings
	2) Jot down comments students make in reference to challenges or affordances
Outputs	Responses from surveys and comments will identify the challenges and benefits of implementing best practices (dialogue and collaborative activities) in online environments
Outcome	**Short-term:** 1) Improved understanding of barriers to implementing best practices (collaboration and discourse) 2) Suggestions for replicating and enhancing what works **Long-term:** Further investigation and an intervention study (i.e., add a support or activity not already in place, such as face-to-face (F2F) peer collaboration activities or online discussion posts/projects)
Potential Impact	An increase in 21st century skills (i.e., peer collaboration and academic discourse) practiced and widely implemented in online environments

Research Methodology and Rationale

As can be seen in the logic models above, research questions were addressed through a combination of structured observations, surveys, and discussion with students. This data was not passively collected, but instead constructed with forethought and strategic decision-making (Merriam and Tisdell, 2016). For example, in this study, 1) crucial pieces of data were obtained from a comprehensive review of literature, informed and guided by relevant theoretical frameworks; 2) data from early phases of the study, as well as a pilot study, informed the development of measures implemented in later phases; and 3) follow-up "member check" conversations with student participants ensured descriptive narratives were valid. Additional archival data, such as recorded synchronous lessons, and teacher feedback on homework assignments were analyzed as well in order to create a more accurate and holistic picture of online course environments.

The observation protocol and survey questions were vetted by a colleague, course instructor, and dissertation committee (see Appendices E-G). This cooperative endeavor help strengthen validity of these instruments. Meeting with student participants after the observations to review early analyses of their experience before engaging in a more rigorous and constrained coding process further helped to validate and clarify responses

The study approach assumes an interpretive/qualitative humanistic perspective with ongoing attempts to work cooperatively with teachers and students to better understand online course environments. This descriptive type of research allows for exploration and contextual analysis within particular online learning environments. These methods are used in the current study to uncover the perceptions of stakeholders and how they may

present affordances and constraints to adopting research-based practices in online learning. This descriptive research also can be beneficial for the development of current or new educational practices or theories. For example, if a participant has knowledge of an effective online collaborative activity or specific interactive tool, this could be further developed or shared.

A mixed methods design was strategically employed in order to extend knowledge of interactions within online learning environments. The decision to conduct observations of online students participating in online lessons was chosen as a strategy for "understanding ill-defined phenomena"; to substantiate survey responses, and to see first-hand what is happening (Merriam & Tisdell, 2016, pg. 139). Observing students conducting daily work in their natural environment add meaningful context, as few studies have set out to observe students completing their regular online lessons.

Quantitative measures were used to tabulate and compare the number and type of interactive occurrences observed. These communicative episodes included class discussions, conferences with teachers, and peer collaborations. Likert-style survey questions posed to online teachers were used to determine the degree to which curricular activities are perceived as valuable and feasible by online teachers. Closed-ended questions were also used to determine how often peer interaction and academic discourse occurred from the teachers' perspective.

Qualitative data added an essential component to the study. Throughout the observational sessions, and in post-observation discussions, the researcher was able to capture numerous comments and observational data from student participants. Students

pointed to their computer screen to highlight specific text, and read aloud comments received from teachers. The researcher noted when students took written notes or typed responses to online questions. Although the researcher remained silent during each 30-minute observation, "in the moment" student expansion and clarification of ideas occurred spontaneously during most observations. Researcher-led questioning directly following each observation provided additional insight into students' thoughts and experiences regarding their online learning. Open-ended qualitative survey questions posed to online teachers were aimed at delineating specific affordances and constraints that they believe positively or negatively impact online interactive activities. Asking teachers how often these activities occurred before asking the value of academic discourse forced participants to think about the quantity before considering if this activity held value or not. For more detailed explanation regarding specific benefits and challenges to online communication, individual teacher and student comments and quotes were coded and analyzed.

Participant Selection, Setting, and Scope

Participants were recruited by means of purposeful selection (Maxwell, 2013) as the study focused on a particular class environment. Therefore, only students and teachers directly involved in online high school courses were eligible to participate. High school students were eligible to participate if they were currently enrolled in a fully online 9-12th grade English Language Arts class.

The online high school selected for the study is smaller in size than a typical online district school, with 79 students enrolled in the high school compared to the average

enrollment of 319 in district virtual schools around the country (Miron, et al., 2018).

However, the course content and instruction is provided by a large for-profit Education

Management Organization (EMO) (e.g., similar to Connections Academy, Florida Virtual

School, or K12 Inc.). Curriculum and instruction are similar to that offered by many other

fully online high schools. Moreover, the student experiences in the current study align

closely with those of student participants in a similar pilot study conducted in the fall of

2017 which evaluated high school English courses that were provided by a different (but

similarly large) EMO.

This particular school was selected for this study because it offers Western

Association of Schools and Colleges (WASC) accredited, fully online 9th, 10th, 11th, and

12th grade English Language Arts (ELA) courses. This specific academic subject was

selected purposefully as many state standards clearly define communication and peer

collaboration as key standards for English course content (Common Core State Standards

Initiative [CCSS], 2017).

Student participants. This study's observational component (Phase I) included

participants from a school located in the Central Valley of California. This fully online

high school is a district-supported public school. Therefore, students from the local (or

any adjacent) county are welcome to attend. In fact, less than 5% of current students

actually live within the school district boundaries. The student population is similar

demographically to other US virtual schools in the following ways: Less than 1% English

language learners (0.8% this study versus 0.7% average in virtual schools), 4% special

education (versus 13% average in virtual schools), 41% socioeconomically disadvantaged

(versus 33% average in district virtual schools), 58% White-non-Hispanic (versus 66% average in virtual schools), and both averaging 50% male/female (Miron, et al., 2018).

Students at this school mostly work from home as they complete their online coursework and are not required to be present on campus (a modular building). Although this is a virtual school, an optional on-site study hall room is available two days per week, with oversight from two site-based credentialed high school advisory teachers. To clarify, there are three types of teachers involved in the education of the online student participants: 1) The *online course teacher* of record who provides the asynchronous online curriculum, instruction, and assessments, 2) The *synchronous lesson teacher* who provides optional weekly 30-minute synchronous group lessons (although these lessons are available through the online vendor, the instructor may not be the same as the online teacher of record), and 3) The local on-site *advisory teachers* who oversee student progress, onsite study hall, and adherence to regulations and accountability.

An email was sent to all 79 enrolled students and their parents/guardians asking if students would be interested in participating in three observations. This letter indicated that both the parent (or legal guardian) and student would need to review and sign the attached consent/assent prior to the study (Appendix F). The families of nine students showed interest. Four of those students did not qualify as they were not currently enrolled in a high school level online English course (three were taking English at the local junior college and one was waiting for spring semester to enroll in English). In the end, five student participants qualified and were able to complete the study.

The online English courses are provided to the school through a corporate vendor and made digitally available on the student's computer utilizing a course management system (similar to Canvas or Blackboard). Each student is assigned to one remote (online) course and instructor, with one additional local site-based advisory teacher who generally oversees all subjects and assists in planning, pacing, and monitoring of the on-site study hall. If students desire, they are also given the opportunity to participate in weekly interactive, synchronous lessons with other students (and possibly another teacher). In addition, as students primarily work from home, parents or siblings could be a potential source of assistance. As a result, other family members were considered and factored into in the study as possible course support as well.

High school participants chose to conduct each in-person one-on-one "over the shoulder" observation in a quiet study room at their school. As most students work from home, their home environment was offered as an option (with parents present), but not selected by any of the participants. This did not affect the course delivery as the English course is presented 100% online with the student completing work and accessing content asynchronously on a personal laptop computer.

As part of their regular curriculum, students are offered an opportunity (1-3 times per week) to participate in an interactive synchronous lesson with other online students via livestreaming. These synchronous lessons are often cited by online course providers as the best way for online students to interact with others, thus a component of online learning worth investigating. While none of the participants chose to participate in these lessons within the month-long observation window, the researcher was able to obtain a

number of 30-minute prerecorded and archived English synchronous lesson sessions. Five of these sessions, randomly selected from a different large corporate online course provider, were viewed and analyzed. Based on student feedback and comparisons from a pilot study, the observed lessons are similar to the interactive synchronous courses offered to the current student participants. This analysis therefore provided insight into the communicative exchanges occurring in these types of course enrichment lessons.

Teachers and advisor participants. For Phase II of the study (surveys), online teachers (or advisors to online high school students) were eligible to participate if they were currently teaching or advising any online 9-12th grade class within the United States.

A brief request for participation (along with a link to the survey) was posted in numerous discussion forums such as the International Society of Technology in Education's (ISTE) Online Learning Network with 3,100 members and ISTE's Teacher Education Network with 4,600 members. The researcher also utilized a professional network via LinkedIn by searching for people who indicated (in their profile) they worked for virtual schools or online learning corporate providers. Over 80 people were directly messaged in LinkedIn and asked to participate. These messages were received and confirmed by educators representing numerous state-specific virtual schools as well as large corporations such as Connections Academy, Florida Virtual Learning, and K12 Inc. These educators were asked to forward the survey to others within their professional communities.

As a result, a large number of online high school educators from across the United States (and among varied online educational institutions, schools, and online content providers) are presumed to be represented in the sample. After consenting to participate in this study, respondents were asked a mandatory gatekeeping question to ensure they fit the target audience of online high school educators in the United States: Unbeknownst to respondents, the first (and only mandatory) survey question ensured the participants were qualified thusly: If a participant selected the response, "Online teacher (high school level, United States)" or "Advisor/Coach (to online high school students in the United States)" as their primary role, the rest of the survey unlocked and became available. Participants who selected, "Does not work with online high school students in the United States" were thanked for their time and were not provided access to the remaining survey questions. The remaining survey questions were all optional, and participants were free to stop at any time.

In all, 77 respondents consented to participate in the online teacher survey, with 49 qualifying as online high school teachers or advisors in an online learning environment in the United States. Other factors such as gender, socioeconomic status, and ethnicity of participants were not a consideration in selection. Participants were presumed to be representative of the general population of online teachers and students.

Consent and confidentiality. The student participants (and parents of students) signed informed letters of consent/assent (see Appendix F). Copies were thoroughly explained and handed to each participant and parent prior to the first observation. Adult survey respondents were asked to read the letter of consent and select the response, "I

agree to participate in the study." In addition, school staff/administration, the dissertation committee, and San José State University's IRB board provided written approval for both phases of the study. Confidentiality was maintained in the following manner: 1) identifiable information coded; 2) pseudonyms utilized; 3) data stored in a locked and secure location (in the home of the researcher and on a password-protected laptop).

During the study's Phase I (observations), personally identifiable information (such as online teacher names), both within the daily coursework and in the prerecorded and archived synchronous lessons were blocked off and not made visible to the researcher. Site-based (advisory) teachers were not asked to adjust or modify their interaction or daily routines, and were only asked logistical questions by the researcher. For Phase II, the Qualtrics survey platform used for the study did not track identifiable information from survey respondents (e.g., email addresses). Other than choosing from a selection of courses and grade levels taught, years of experience, and role (teacher or advisor), survey participants were never asked to provide any specific identifiable information, thus remained anonymous.

Ethical considerations. Trust, rapport, consent, and conflicts of interest were considered proactively, considering that "both parties bring biases, predispositions, attitudes…that affect the interaction and the data elicited" (Merriam & Tisdell, 2016, p. 130.) Although the researcher is not in a direct position of authority over the participants, precautions to be objective, honest, fair, and respectful were made. For example, the researcher built trust by 1) attempting to listen more, talk less, and avoid interrupting, 2) being fully present and engaged with the person, and 3) encouraging clarification and

expansion of ideas (Gerzon, 2006). Each observation began by reiterating participants' rights (i.e., to not answer or to opt out anytime). Adult survey participants were presented with a comprehensive letter of consent which listed their rights as well as contact information for university administrators if they had any questions or complaints.

Maxwell (2013) makes it clear that all stakeholders will influence all aspects of the study. The researcher holds herself accountable to the people affected by this study and was fair and conscientious in the choices made. For example, she remained available to address follow-up concerns participants may have had. The goal was to maintain a positive, professional, and ethical working relationship with all stakeholders. As an outsider observing the online environment, the researcher did not have any influence over course evaluations or grades. Therefore, it was made clear to stakeholders that student performance, teacher effectiveness, and school achievement were not being evaluated (see letters of consent, Appendix F).

Insight from Pilot Study

The researcher conducted a pilot study in the fall of 2017. Although small in size, with just two formal interviews and three observations, it served to inform the development of the instruments and study protocol. Interviews were a component taken out of this study for numerous reasons: 1) Students were able to casually speak with the researcher each week following the observation session, making interviews redundant; 2) A number of interview questions originally directed to teachers were easily adjusted and turned into open-ended survey questions. A separate interview component would have been limited to five participants, whereas allowing more participants to answer via

electronic surveys allowed for much larger number of responses and rich data; 3) After interviewing a parent for the pilot study, the researcher made the decision to eliminate that stakeholder group for the actual study since the parent indicated that she was not familiar with how her child interacted with others in the online English course.

The pilot study also included observations of a student participating in interactive synchronous lessons. As mentioned in the literature review, there have been relatively few studies looking at interactions in online learning environments, and none that the researcher could find analyzing dynamic online synchronous lessons. Attempting to keep up with the teacher talk, the student chat box, and the participant's engagement was a challenge as the pace was fast, and the font too small for the researcher to read in real time. Yet, observing these synchronous lessons assisted in the development of codes, matrices, and networks with interrelated components describing student interaction. All these pieces helped tremendously with organization, pattern finding, and the development of the observation instrument (see Appendices E and H for examples). As a result, the decision was made to view five archived lessons for the current study, each of which had been pre-recorded during the spring of 2018. This allowed the researcher time to review the lesson, pause the video as needed, read the discussion posts, and record each type of teacher question. Although time consuming, observations of this online learning component provided invaluable insight about practices in these types of learning environments.

For the pilot study, one surprising limitation was obtaining access to online teachers within the school district's vendor provider list. Most large for-profit corporations

providing online lessons do not wish to have their employees speak with those outside the

company. As a result, for the current study, the researcher had to build a personal

network of professional connections from other educational organizations to recruit

survey participants. This included membership in numerous professional learning

communities (i.e., ISTE's Online Teacher Network). Links to the survey were posted

within these network forums, providing a larger population sample.

Data Collection

In order to provide a comprehensive picture of peer collaboration and academic

discourse in online courses, various types of data were collected through student

observations/post-observational discussions, analysis of archived synchronous lessons,

and online teacher surveys.

Phase I: Student observations. The study commenced with one-on-one observations

of participants engaging (via computer) in their online English Language Arts fall

semester coursework. Student participants were enrolled in grades 9-11, and were taking

an online English course as part of their high school graduation requirements. These

courses were purchased by their public school, provided by a large corporate vendor,

accessed through the internet and web-based technology, and available to the student

asynchronously 24/7. in a quiet study room at their school.

Over the course of one month, each student participant met individually with the

researcher to conduct three (separate) 30-minute "over the shoulder" observations in a

quiet study room at their school. Taken together, there were fifteen (30 minute)

observations conducted. Students were asked to log in and complete their daily

assignment as they would at home on any given day. Most of the observations centered

around student reading of the daily (static) online lesson slides or work on written

homework assignments (which they submitted to the online course instructor in a

separate document). Each student's daily lessons appeared as a page of (mostly) text as

illustrated in Figure 1 (author rendition).
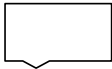
Figure 1. Visual illustration of an online classroom environment.

As students read through the daily lesson slides, or completed other work for their

English course, the researcher took written notes on an observation instrument form (see

Appendix E). If a student was working diligently and wanted to finish a lesson or assignment beyond the 30-minute time frame, only activities observed during the first 30 minutes were coded. The researcher did not engage with the student during the timed session. At times the students would make verbal comments throughout the 30-minute session to clarify the assignment, provide their opinion, or ask a question. While the researcher did not respond to these queries, they were recorded. When asked a question, the response from the researcher was, "I'm just watching to observe what you typically do each day. Pretend I'm invisible." Upon completion of 30 minutes (or up to 45 minutes, as soon as the student was in a good position to stop the lesson), the researcher asked about other communication related to the observed English course that the student may have had with teachers, peers, or family.

Students were asked about assignments and interactions completed asynchronously by the student in their home or other work environments. Records of these interactions (such as email communications or feedback on homework) were noted by the researcher. Although this data is archived and accessible within the student's learning platform throughout the semester, the researcher did not look into the student's portal, instead relying on students' self-reports. This served as one way to maintain the anonymity of the online teachers.

Engagement was first sorted into Type; Student-Peer or Student-Teacher interaction. Interactions were further broken down by Purpose (Organizational, Social, or Instructional) and student Response (Closed, Explain, Elaborate, or Synthesize). In addition, field notes such as quotes, comments, and researcher thoughts were jotted down

on a separate piece of paper during the observation. Post-observation dialogue, notetaking, and analysis further aided in the categorization of new or unexpected types of interactions, along with mention of challenges and successful strategies utilized.

Additional interactive options. Students were provided (optional) weekly 30-minute interactive, synchronous lesson sessions for which they could use a computer (typically a laptop from home) to log in to listen to the teacher present a supplementary lesson in real time. Other students enrolled in the same course are offered an opportunity to join in as well. For the current study, participants did not engage in any of the optional synchronous lessons, Therefore, the researcher viewed and analyzed five archived 30-minute synchronous lessons from a similar online educational provider. These were previously recorded by a third party (with teacher names blocked) in the spring of 2018 and utilized for additional secondary data. A typical synchronous interactive lesson screen format (author's rendition) is illustrated in Figure 2.

View of student screen during synchronous lessons
(author's rendition, composite image)

Display of the lesson's PowerPoint-type slide show

Quick survey or poll

List of other students in attendance for this
synchronous lesson
(archived lessons have no names, shown as User 1, 2)

Chat box area for attendees
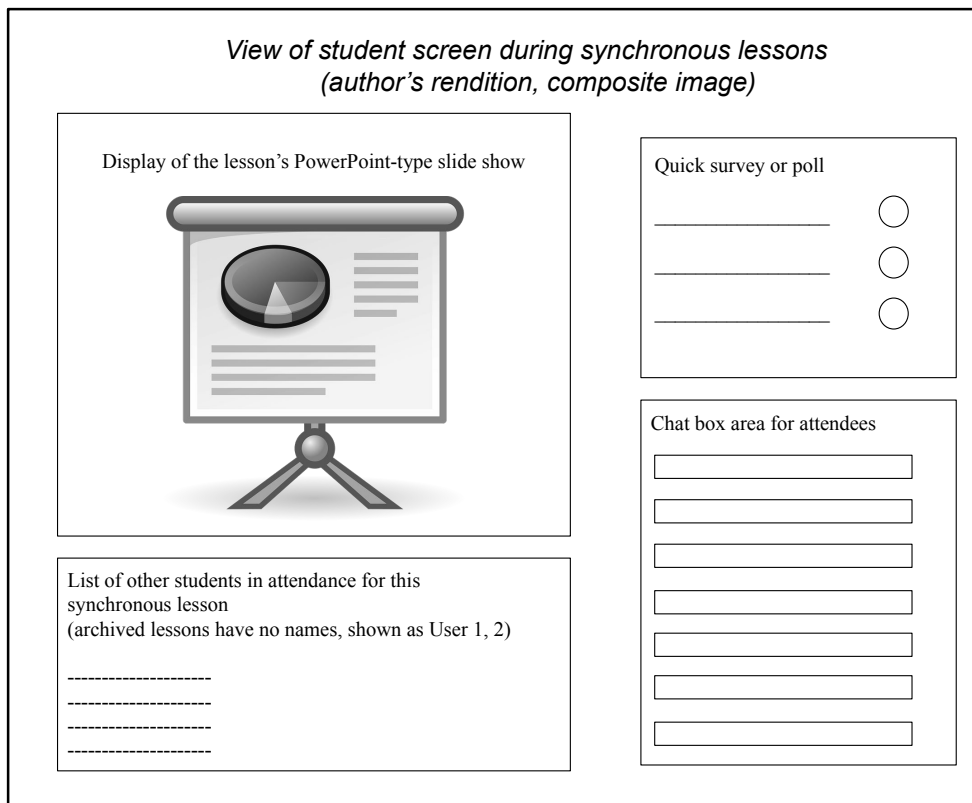
Figure 2. An image of the student's computer screen when participating in a typical synchronous interactive lesson.

A number of images appeared simultaneously on the student's screen, such as Power-Point type slides with written content and images that the teacher utilizes for the daily content (with audio narration). There were also group polls and surveys, and chat or discussion boxes. Students were asked to type their responses to the teacher's verbal questions in group discussion posts (as the students' audio mic is usually disabled during synchronous lessons). For student (participant) observations as well as observation of synchronous lessons, tallies were taken of observed interactions throughout the lesson (see observation instrument in Appendix E).

As mentioned previously, the participants' school offers an opportunity for students to meet with advisory teachers (and potential peers) though twice weekly on-site study hall sessions. Students who choose to participate typically sit at tables, open up a laptop (either their personal laptop or a school Chromebook), and begin their daily online work. Since it was possible that participants interacted with others in a way that furthered learning in their online English course, students were asked about study hall attendance and engagement. Student reports of attendance were verified by the two on site advisory teachers who oversee the study hall. Within some online learning programs, parents are asked to assist students as needed. With that in mind, student participants were also asked about interaction with parents while working on English coursework. Follow-up conversations with many of the parents (as they picked up their child from the observation sessions) confirmed the student reports.

These activities (observations and follow up questions) helped determine how often students engage in discourse and peer collaboration in their online coursework (RQ #1). Data from student comments and researcher's observational notes also shed light on student perceptions of the value and feasibility, challenges, and affordances of interactive communicative exchanges in online learning environments (RQ #2 and RQ #3).

Phase II: Teacher surveys. The aforementioned observations influenced the development of specific survey questions. To obtain this data from a different group of key stakeholders, surveys were provided to online teachers and advisors utilizing the Qualtrics web survey software. A hyperlink to the survey was provided in the recruitment message, and the survey could be completed on any computer or mobile device with

internet service. The survey contained 14 questions, including Likert scale, multiple choice, and open-ended questions (see survey instrument in Appendix G). To ensure alignment, the following definitions of peer collaboration and discourse were provided within the survey.

Academic Discourse: a formal, reciprocal (back and forth) discussion, conversation, or chat (written or spoken) with another student or teacher that is related to academic content in a way that expands learning.

Peer Collaboration: Cooperatively interacting with another student (working together) in order to solve problems, create a product, or learn and master course content.

These definitions appeared in the survey directly above each section for easy reference.

The purpose of the survey was to 1) determine the experience and diversity of the participants (e.g., professional position or role, courses and subjects taught, grade level (9-12th), and years of online teaching or advising experience (so as to provide insight into the overall diversity of respondents); 2) determine whether stakeholders believe peer collaboration and academic discourse activities are occurring in online coursework; 3) measure the perceived value and feasibility of these interactive activities in online learning environments; 4) obtain information regarding benefits and challenges of interactive activities in online environments; and 5) seek input for ideas to improve the quality and quantity of interactions.

To find out if teacher perceptions aligned with the findings from student observations, the survey asked online educators to rate (separately, on a 1-5 scale) how

often students participated in these two activities. Responses ranged from "never" to "a great deal." Survey questions also allowed opportunities for participants to provide information relevant to the second research question: "To what extent do teachers perceive these curricular activities to be valuable and feasible?" Four separate survey questions asked online educators to rate these activities on a scale of 1 (not valuable/not feasible) to 5 (extremely valuable/extremely feasible).

Finally, open-ended survey questions provided opportunities for participants to inform the researcher of specific types of interactive activities as well as challenges and benefits of implementing online interactive activities such as academic discourse and peer collaboration in online coursework (RQ #3). This two-fold approach allowed participants to share their knowledge and experience in the field. Although student participants were not asked these specific questions, some of their comments during (and directly after) observational sessions were noted as well.

All survey responses were electronically aggregated within the Qualtrics data platform for ease in data reporting and analysis. The survey was open and available for approximately one month. Various matrices and networks were utilized for organization, coding, collecting, and analyzing observational and survey data (see Appendix H).

Data Analysis

Data was analyzed both in the moment and very soon after collection. To ensure conclusions are considered valid, a clear trail of evidence is presented throughout the study in order to demonstrate adequate interpretation (Pratt, 2009). This evidence trail includes detailed reports of thoughts, interpretation, and analysis (informed by a literature

review, theoretical frameworks, positionality statement, colleague checks, and member checks).

Numerous tactics were utilized to organize and analyze data, such as memos; coding of lists, themes, and categories; and visual matrices (Appendix H). First, a memo notebook was used for reflection and reminders of decision-making rationale, which greatly assisted a timely, well organized analysis. Categorization of data was inductive, meaning older and newer data were constantly compared to one another in order to make meaning. Themes and categories emerged, shifted, and were subject to change along with new findings (Merriam & Tisdell, 2016; Pratt, 2009).

Organization. Findings were relatable through the discovery (and labeling) of patterns. This process began by noting patterns observed based on broad themes. Organizational categories were based for broad areas or topics such as 1) Academic peer discourse versus Non-academic peer communication; 2) Student-Peer or Student-Teacher interaction, 3) Online daily coursework versus Written homework assignments. Various coding schemes based on online and traditional school academic discourse studies were adapted to help inform decisions while discovering and analyzing themes and trends (e.g., Alexander, 2006; Bannan-Ritland, 2002; Borup, et al., 2012; Boyd & Markarian, 2011).

Next, larger ideas were broken into sub-categories. For example, variables were broken into sub-variables. Instead of looking at "peer interaction opportunities" as one unit, it was broken down into (e.g.) "interactive synchronous lesson"; "on-site study hall"; or "peer collaboration course assignment." Similarly, interaction with teachers was

broken down into (e.g.) "teacher feedback on assignments," "teacher phone call," or "teacher email." Factoring, or making patterns from patterns helped break the data down even further. One example of this is the delineation between generic teacher feedback versus teacher feedback that was specific to the assignment.

For deeper analysis, substantive categories were created to organize data regarding participant's thoughts, words, descriptions and ideas. This created new groups of important patterns and themes. For example, trends were found in teacher participants' quotes and ideas and were highlighted with various colors (e.g., challenges involving time constraints were underlined in red, challenges with student participation rates were underlined in blue, etc.)

Coding and matrices. Following the lead of Miles, Huberman, and Saldaña (2014), a code list with acronyms and a coding guidebook were utilized for data collection and analysis. Researcher side notes were written to keep track of how coding decisions and categories were developed. Adjustment of codes along the way served to help reorganize, clarify and refine the data analysis. Additionally, utilization of matrices with data tied to certain themes and categories helped formally analyze, triangulate, and display data collected via surveys, field notes, and observational checklists (see Appendix H). Sample (general) matrices provided by Miles, Huberman, and Saldaña (2014) helped inform the development of these organizational tools.

Validity and reliability. Validity threats are made implausible "by *evidence*, not methods" (Maxwell, 2013, p. 128). Therefore, when presenting results, an audit trail for this study is provided. Stakeholders are able to view artifacts such as codebooks, memos,

and raw data as well as matrices developed as an analysis tool. In order to ensure transparency and limit the chance of getting stuck in a mindset (or creation of cause-effect relationships that don't exist) the researcher remained a vigilant skeptic.

Similar to the aforementioned coding task, the utilization of an analysis table helped the researcher remember decisions, as well as identify pattern-breakers and outliers. This template, similar to Miles, et al.'s Qualitative Analysis Documentation Form (2014, p. 318) provided a place for the researcher to jot down procedural steps taken and decisions made (i.e., which data to highlight and why). Any negative evidence, confusing evidence, outliers, surprises, and extreme cases were noted.

Reliability and validity checks occurred in a number of ways: 1) member checks were conducted on a weekly basis, with student participants individually reviewing the researcher's preliminary findings, and confirming data through discussions following each observational session; 2) numerous San José State University (SJSU) professors, a doctoral advisor working in the field of education, and a dissertation committee previewed methods, giving additional feedback on study design, preliminary data, and findings; 3) the researcher's positionality statement was presented to stakeholders in written form, keeping note of bias, and adhering to stated theoretical frameworks; 4) data was analyzed in a timely manner (within hours of each observation, and within one week of survey responses) with the presentation of an audit trail; 5) enough data was obtained to reach saturation (where a large number of similar responses were received), and finally; 6) the researcher attempted to ensure that the data is full of factual, "rich, thick

descriptions" (Merriam & Tisdell, 2016, p. 257), clear enough so others understand the transferability and generalizability.

Potential bias and blind spots have been addressed throughout the study protocol and methods. First, incorporation of a positionality statement allows others to have a sense of the researcher's background, role, and decisions regarding study design. The theoretical frameworks identified in Chapter 2 were used as guideposts to ensure that each decision and approach was given context for understanding the study's approach. Any potential biases, assumptions, and concerns were noted and brought forward to "colleague critique" sessions (with SJSU cohort peers, dissertation advisor and committee members, SJSU Research Award seminar participants, and qualitative and pro-seminar course professors). The researcher acknowledges the fact that her presence could affect the observation and made allowances for that when interpreting and reporting findings. Member check "respondent validation" occurred during follow-up sessions with students and throughout brief chats with on-site advisory teachers and parents (Merriam & Tisdell, 2016).

To improve generalizability and expand the sample size, perspective, and participation rate, the researcher deliberately recruited online high school teachers from a number of different types of online school environments across the United States. Finally, the study employs a triangulation technique whereby multiple sources of data, multiple participants (students and teachers), and multiple frameworks (sociocultural, critical perspective, 21st Century Skills) were used.

Background and Positionality of Researcher

The researcher has taught in diverse traditional K-6th grade public school classrooms for 15 years followed by service as a TK-8th grade teacher (specializing in curriculum, assessment, and literacy) at a public charter school for the past 17 years. In addition to advising, the researcher currently teaches supplemental 1st, 3rd, and 6th-8th grade extracurricular courses at a K-8th grade charter school (e.g., art, math, Spanish, and technology). She holds a California multiple subject teaching credential, a credential for teaching English as a second language, and a master's degree in instructional technology.

The researcher positions herself as someone who is curious about the goings-on of online coursework and student learning. She is concerned about studies indicating that students in online courses are isolated, disengaged, and failing at a much higher rate than their seat-based (traditional school) peers (Drysdale, et al., 2013; Miron, et al., 2018). She is interested in learning more about online educators' thoughts regarding perceived value and feasibility of communicative activities, and wishes to engage in a critical discussion of ongoing constraints and affordances of academic discourse and peer collaboration activities. Through the conglomeration and interpretation of student and teacher voices, the researcher would like to strengthen the field of education through new findings from the current study. Nevertheless, she is excited about the promise of technological advances and the incorporation of 21st century learning activities to improve online learning environments.

Conclusion

This study is based on well-established theories asserting that learning is enhanced in an interactive, collaborative environment (P21, 2007; Vygotsky, 1978). Curricular activities that support this type of social environment include class discussions, group projects, and peer tutoring. Online course options are growing in number, therefore it is essential that stakeholders find out if there is evidence that students are provided with adequate opportunities to develop 21st century skills such as peer interaction, collaboration, and meaningful discourse. If so, how? If not, why not?

This mixed-methods study provides comprehensive answers to research questions targeting these interactive activities. Each of the three research questions are addressed in the most direct way possible. For example, actual counts of interaction through naturalistic observations will help determine how often students are engaging in curricular activities that support peer collaboration and discourse in online learning environments (RQ#1). Responses to survey questions will help determine *to what extent* teachers perceive these activities to be valuable and feasible (RQ#2). This point matters greatly; if teachers do not find the activities valuable (or feasible) they are much less likely to assign or teach them. Finally, open-ended survey questions and field notes from observational sessions will assist in delineating the specific challenges and benefits of implementing these curricular activities in online learning environments (RQ#3). This question is rarely asked, particularly to a large number of online teachers from diverse schools across the US. Thematic aggregation of data can help determine trends (e.g., if a

particular challenge is mentioned repeatedly by numerous educators, it would be worthwhile to follow up with suggestions for further study in order to develop solutions).

The study design is influenced by a critical perspective. Therefore, the researcher attempts to critically assess policies and practices that may constrain student learning. Although best practices in teaching include ample use of academic discourse and peer collaboration activities, there is general agreement amongst scholars that these activities are more challenging to incorporate successfully in online learning environments (Miron et al., 2018; Paloff & Pratt, 2005). Moreover, the lack of development of essential 21st century skills such as collaboration and communication may negatively impact online learners as they enter the workforce and are required to interact with others (Allen et al., 2016; NAEP, 2012; P21, 2007). In this study, critical inquiry through the observation and surveying of participants (along with a thorough analyses of themes based on aggregated and subcategorized responses) help identify forces which benefit (or limit) activities that promote interaction and 21st century skills in online course environments. In the end, this mixed-method approach provides a more comprehensive analysis of social learning (by means of peer collaboration and discourse) in online environments, consistent with a sociocultural philosophical perspective (Vygotsky, 1987).

In sum, numerous tactics and organizational strategies were used to design the study, collect data, analyze responses, categorize themes, and interpret findings. Along with written descriptive text, formal tables, diagrams, and matrices provide a visual display of thinking and analysis. A trail of evidence, along with triangulation, member checks, acknowledgement of bias, researcher positionality, and study limitations

(comprehensively reviewed in Ch. 5) will preemptively mitigate validity threats. This will assure all stakeholders that the analysis is plausible, reasonable, and ethical, yielding valid methods and trustworthy conclusions.

Chapter 4: Findings

In seeking to determine if (and how) students are engaging in curricular activities that support peer collaboration and academic discourse in online learning environments, a mixed-methods approach was utilized. Over the span of 5 weeks, multiple naturalistic observations as well as follow up questioning of student participants completing daily online lessons were completed. Directly following the observations, surveys of online teachers and advisors assisted in determining to what extent these collaborative activities are deemed to be valuable and feasible in online 9-12th grade learning environments. Specific affordances and constraints were identified as well by teachers and student participants. Analysis of this data will help to expand understanding of communicative practices in online learning environments.

To foreshadow results, findings from direct observation of five high school students engaging in online coursework indicate that they rarely, if ever, engage in peer collaboration and academic discourse activities. Teacher perspectives (n = 49), shared through an online questionnaire, show that academic discourse and peer collaboration activities are considered valuable and feasible, but there are numerous challenges to successful implementation in online learning environments (such as scheduling and timing issues). Taken together, findings reveal a troubling contradiction: Whereas many online educators report facilitating activities promoting meaningful discourse, naturalistic observations of at least one such school show that students seldom encounter such opportunities, and when they are offered, they choose to opt out. Further exploration

sheds light on several limiting constraints as well as possible affordances of interactive activities in online learning environments.

Observation Type A: Student Participants

Over the span of approximately one month, five students were observed (each on three separate occasions) completing their regular Fall semester English online coursework. In all, there were fifteen (30 minute) observations conducted. Student participants varied demographically (Table 4).

Table 4

Student Participant Demographic

Participant	Description	Course	Observation Dates
1. Grade10 student	M, Asian-American	English 10 Honors	10/18, 10/23, 11/1
2. Grade 9 student	M, Hispanic	English 9 General Ed	10/4, 10/11, 10/25
3. Grade 10 student	M, White	English 10 General Ed	10/9, 10/18, 10/30
4. Grade 9 student	M, White	English 9 General Ed	10/11, 10/18, 10/25
5. Grade 11 student	F, Hispanic	English 11 General Ed	10/11, 10/18, 11/8

Note. All observations occurred at the student's school campus in a quiet meeting room.

There were five student participants, two males in Grade 9, two males in Grade 10, and one female in Grade 11. Ethnicity varied with students who identified as Hispanic (n=2), White, (n=2), and Asian-American (n=1). All students were enrolled in a grade appropriate online English course, with four enrolled in general education courses and

one in an honors level course.

Each participant brought in their laptop and began coursework as they would on a typical day. Each observation of online coursework lasted approximately 30 minutes, with the researcher sitting at a table adjacent to the participant viewing the student's laptop screen (see Figure 1).

The English course content was presented with a series of PowerPoint type slides. Students clicked through the slides to complete the lesson. The first slide presented the lesson topic and objectives. The next few slides (typically from 3-6) presented the topical content. Most of the content was provided via written text, in paragraph or bulleted style. Interspersed with the text were some multiple choice "Guess and Check" type questions along with various tabs to click and view additional content. Outside links and video snippets, if present, were included within the text. The last slide contained the lesson's assignment. This assignment was typically completed by the student on a separate document and submitted online. Although there were suggested timelines for course progression, there were no due dates for assignments.

The researcher tallied occurrences of interactive episodes (see Appendix E for the Observation Protocol). The observation instrument noted type of interaction, purpose for interaction, response expected from interaction, and commentary notes (Figure 3). In addition, detailed field notes of observed behavior and extended responses were jotted down on lined paper.

Date/ Time		Location		Student ID		Reporter		Course Title		
	Type	Type	Purpose	Purpose	Purpose	Response	Response	Response	Response	Commentary
	Student-Peer	Student-Teacher	Organizational/ procedural	Social or motivational	Instructional	Closed	Explain/ justify	Elaborate/ reason	Synthesize/ create	

Figure 3. Observation instrument for tallying interaction types, purpose, and response.

Students were asked to work on their regular English course assignment as they would at home. As they progressed though the lecture slides (or completed written homework assignments) the researcher tallied interactions and took copious field notes. Immediately after each 30-minute observation the students were questioned about interactive opportunities and activities that may have occurred during the week prior, or in the time between observations. This gave additional insight into interactive online and face-to-face (F2F) opportunities offered and accepted within the study's timeframe. Thus, a comprehensive picture of interactive opportunities within the entire month was provided. The opportunities for students to participate in interactive communicative activities related to their English course were varied and are illustrated in Figure 4.
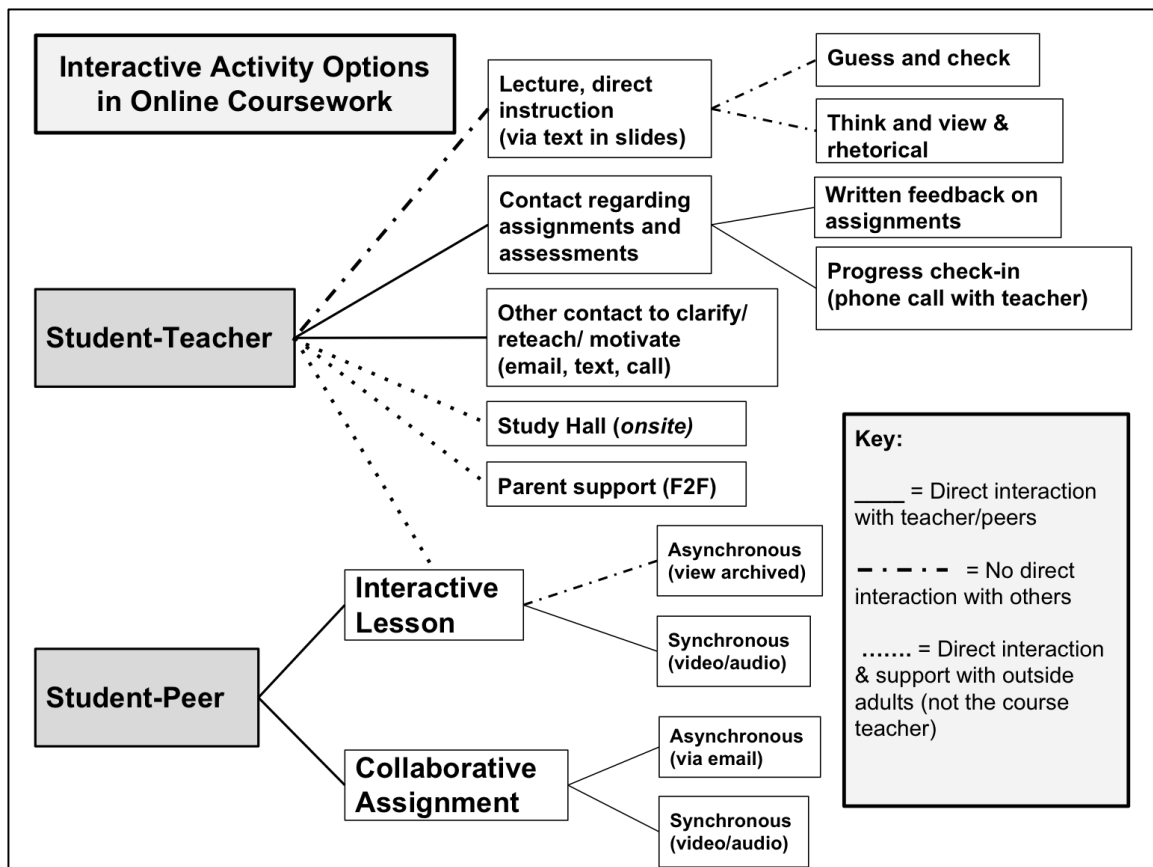
Figure 4. Flowchart illustrating the interactive activity options afforded to high school student participants in their online English course.

While observing opportunities for academic discourse, there are two key groups students might choose to interact with: teachers (or other adults available to assist with English coursework) and peers. As illustrated in Figure 4, students were offered multiple opportunities to engage with the teacher (or other supportive adults), and fewer opportunities to engage with peers. Each opportunity will be explained in detail in subsequent sections of Chapter 4.

Direct instruction via text in slides. The vast majority of student activity centered around reading the information presented via PowerPoint-type slides decks. There was no

direct student-teacher interaction during these lessons. However, there were questions embedded within many of the slides. Students were expected to think about the question or were offered an opportunity to select and click a boxed choice from a few options to see if their mental response matched the correct response. Although these would not be considered either academic discourse or peer interaction, the researcher coded the type of questions into four progressive categories: 1) Closed; 2) Explain or justify; 3) Elaborate or reason; and 4) Synthesize or create. Each level requires more sophisticated reasoning, thus a more valuable learning experience (Bannan-Ritland, 2002). For example, selecting responses from four prefabricated multiple choice options would be less cognitively challenging and valuable than having to synthesize information from multiple sources and perspectives.

There were numerous "guess and check" type questions, such as, "Match the image with the text." After each question was asked, then answered, a pop-up response initiated, typically with the words "correct" or "incorrect" and subsequent explanation. Examples of each question type can be seen in Table 5.

Table 5

Question Types with Examples

Type	Example 1	Example 2	Example 3
Closed	multiple choice and yes/no	personal opinion in survey/poll (does not extend)	recall
Explain, Justify	define	provide example	paraphrase
Elaborate, Reason	build on	challenge	clarify
Synthesize, Create	pull ideas together	create (original)	

A "Closed" type of question either did not allow for a unique response or ended with the student response, disallowing further elaboration. Provision of an example or defining a term were questions sorted under the "Explain/Justify" category. Clarifying one's reasoning or challenging another's view are examples of "Elaborate/Reason" question categories, and the most advanced type of questioning expected students to synthesize material or create an original product. Researcher analysis of question types within the observed (static, asynchronous) online lessons were categorically organized and tallied.

Table 6

Observation Type A: Question Types in Online Lesson

Student	Closed	Explain/Justify	Elaborate/Reason	Synthesize/Create
Student 1	11	2	0	0
Student 2	18	1	0	0
Student 3	25	7	0	0
Student 4	24	4	0	0
Student 5	0	3	0	0
Total	**78**	**17**	**0**	**0**

As noted in Table 1, the vast majority of questions asked within the static online daily lessons were of the "Closed" variety (n=78; 82%), such as multiple choice questions with a recall component. Questions were asked such as, "Identify the figure of speech" and "Organize the phrase into the correct category." Questions that asked the student to explain (n=17; 18%) were the next common type of question. One example was, "What type of obstacle does the character face?" Once again, the correct answer was shown either immediately (when the student clicked the answer) or in a drop down "View" or

"Check Answer" box. Students were not asked to elaborate, synthesize, or create in any of the observed online lessons. Students 2-4 had the largest amount of questions asked as they primarily read lessons during each observation, whereas Student 5 spent a significant amount of observation time reading and re-reading full text slides (without many "guess and check" questions) and completing written homework assignments.

To recap, although there were numerous "guess and check" textual questions within the online lessons, there was no discursive interaction or communication with the teacher or peers while students viewed these asynchronous lessons.

Student communication with course instructor. Student participants were offered numerous opportunities to interact with teachers. However, as mentioned previously, direct interactions with teachers are not possible during the asynchronous lectures (i.e., online daily lessons) and therefore did not occur during the observation period. Instead, actual back and forth interactions with the course teacher were observed under three circumstances: 1) written feedback on students' submitted assignments; 2) verbal phone calls validating student knowledge of assignments (AKA progress "check-ins"); and 3) other communication, such as texts or emails sent from the teacher to encourage students to complete coursework. On rare occasions students initiated contact with teachers, either to schedule the phone call "check-in," or to ask for clarification or help on a lesson or assignment. Results from these interactions are separated and presented individually for each category below.

Student-teacher contact regarding assignments. Although most of the student's time centered around reading daily lessons, some students also spent time completing written

assignments related to the slide content and lesson objectives. Students also referred to these as assessments. These assignments were typically completed using separate word processing software (e.g., Microsoft Word) and submitted within the provider's course management system. The researcher coded the types of questions asked within each observational session's "homework" assignment. These assignments were considered useful for promoting academic discourse or peer interaction if they involved reciprocal conversations resulting in further learning or shared knowledge building.

Table 7

Observation Type A: Question Response Types in Assignments

	Closed	Explain/Justify	Elaborate/Reason	Synthesize/Create
Student 1	4	4	2	0
Student 2	9	3	3	1
Student 3	2	3	2	1
Student 4	9	0	2	0
Student 5	3	2	1	1
Total	**27**	**12**	**10**	**3**

The types of questioning within assignments tended to be more diverse and of a higher level compared to the "guess and check" questions on the fixed asynchronous lessons. The majority of the homework questions took the form of closed questions (n=27, 52%) similar to, "What is the title of the text?"; "Describe the physical characteristics of ..."; and "Correctly cite this book." Fewer (n= 12, 23%) noted instances of explanatory questions such as, "Explain which plot you chose" and "Analyze what the

author is trying to say." Even fewer (n=10, 19%) contained questions asking students to elaborate or justify their reasoning, such as, "What are three questions you can ask yourself regarding..." and "Why do you plan to study that character?" Among the observations, there were three assignment tasks (6%) asking students to synthesize information or create, such as, "Rewrite a fairy tale" and "Write a thesis statement."

These course assignments did not involve interactive communication for completion, but did allow for some student-teacher discourse. Instances of teacher feedback related to assignments were presented to the student in the form of written teacher feedback. Each week, the researcher asked students if they had received feedback on their assignment observed the week prior. The students who said they received a grade or feedback then opened up their Gradebook web page and read the feedback aloud. Feedback on observed lesson assignments, if provided by the instructor, were noted by the researcher. To protect the students' privacy, specific grades (as indicated with scored points, rubrics, or percentages) were not recorded by the researcher. Three of the five student participants received feedback from their teachers on many (but not all) of their submitted assignments (see Table 8).

Table 8

Written Feedback from Instructor

Student	Observed Occurrence	Teacher Feedback Quotes	Assignment Type
Student 1	3	a) "Well done, (s. name)" b) "Keep up the good work" c) "Knowing what happened, do you think that resolved the issue? Let me know if I can help, (s. name)."	a) quiz b) essay c) character analysis rubric
Student 2	2	a) "Be more specific, keep working on figurative lang." b) "Fabulous work on your thesis"	a) quiz b) written thesis statement
Student 3	0	n/a	Student reported no feedback received on submitted assignments.
Student 4	1	"Thank you for your effort, (s. name). I love the peaceful ending. Proofread for proper grammar for top score. Keep in touch w/ questions"	partial paragraph section of longer essay
Student 5	0	n/a	No assignment submitted by student during observation window.

Note. These feedback comments from the online course instructor were received by students after submission of assignments.

There were many occasions when students did not receive any feedback on assignments, and times when students simply received numerical scores without additional comment. As illustrated in Table 8, when written feedback was provided,

comments were fairly generic (e.g., "Fabulous work" and "Well done"). Oftentimes there was encouragement to seek help if needed (e.g., "Keep in touch with questions" and "Let me know if I can help"). There were two instances of the teacher using the student's name. On both of these occasions, the students mentioned that it felt "personal" and more meaningful.

One student reported that since assignments can be re-submitted for a higher grade so the teacher provides written feedback in the form of hints to encourage students to revisit their work, improve answers, and resubmit. This could be the reason for the observed feedback stating, "Proofread for proper grammar for top score" and "Keep working on figurative language."

One student did not complete any assignments during the observation window, thus had no feedback. Another student reported that he had not received any feedback yet. Three students were awaiting feedback on at least one assignment submitted prior. None of the students responded back to the teacher regarding the feedback received, thus limiting this academic discourse opportunity. Likewise, all students had been pleased with their scores on assignments and did not choose to improve and resubmit.

In sum, keeping in mind that academic discourse is defined as a reciprocal back-and-forth communication that expands learning, the researcher found that no examples throughout the daily lessons and homework assignments. Instead, most communication was unidirectional as students were not expected to respond. There were several examples of interaction as demonstrated by teacher feedback on assignments with the provision of formative feedback in a summative context. However, this did not tend to

refine the product or the skill behind the product as students did not respond back to teacher questioning or offers to resubmit the assignment. In the end, instances of academic discourse and peer collaboration were not observed within the 15 observations.

Student-teacher interaction as a progress check-in. Arguably, the best opportunity for student-teacher interaction occurs during course-mandated phone call "check ins" with the instructor. At the end of each learning unit (approximately once per month), students are asked to schedule a time to speak with the teacher by phone. Students set up a time (via text, email or call) and chat with the teacher about that unit's content. Once the conversation ends, and the teacher has verified that the student is well-prepared for the exam (with sufficient content acquisition), the student receives a specific code to unlock the unit exam.

According to student participants, these calls are designed for various purposes. One participant stated the purpose was for the teacher to know that students are "comfortable with the information" or if they are struggling. He added that it was with the "basic understanding that you won't fail the exam." Another student reported its purpose was for "academic integrity" to make sure "students are the ones doing the work online." A third participant reported that the call typically lasts 15 minutes and the teacher quizzes them about previous lessons. The fourth participant stated, "It's to review concepts; know what we are talking about and not just guessing on tests." The last participant stated that the teacher usually asks, "What's the trickiest part of the lesson?"; "What are student's thoughts on the lesson?"

Within this one-month window, only one of the five students had participated in the teacher phone call "check-in." At the third observation, the student reported that the call (during the week prior) lasted about "10-11 minutes." He said the teacher asked some closed-type questions, such as, "Who was ...?" and "Where did ...occur?" The student was then prompted to give examples of literary devices. The student reported that the call was brief because he "didn't have any questions for the teacher." The student stated that he would be receiving the code to unlock the unit exam after he completed one more lesson.

The other participants were asked (by the researcher) why they hadn't initiated a check-in call within the observed timeframe of the study. One student stated he would schedule a call after four more assignments; Another student said "It's coming up soon maybe"; A third participant reported uncertainty regarding how to contact the substitute teacher, as the regular teacher usually schedules it. This student reportedly tried calling without having the meeting scheduled the month prior, but the teacher said it had to be scheduled. This participant added that there should be one coming up in a "couple more lessons."

It is important to note that students are able to move on to the next unit without taking the prior unit's exam. The onsite advisory teachers have reported that students will put off the phone calls, move ahead without mastering prior content, thus limiting their success in the course. In sum, there was just one reported instance of interaction with the teacher coded as a "Progress Check in." The purpose was instructional, and included 6 closed questions and 7 questions coded as "explanatory."

Other student-teacher interaction. Observed within the online English courses were ample opportunities for students and English teachers to connect at any time via email, texts, and phone calls. These "extra" interactions were coded under "Other Contact" and included motivational reminders and clarification of assignments.

Teachers were often the ones to initiate contact with students. Many of these teacher-initiated "other" interactive activities included teacher motivational messages to stay on track. An example of this type was the following email, "Who wants to do turkey challenge?" (complete Fall semester work by Thanksgiving). Please reply back if you want to." The observed student reported that he didn't respond, but told the researcher he "might do it."

Teachers also initiated contact with students to follow up with those who haven't submitted any assignments for a while, such as this email from a participant's teacher: "Did you carve pumpkins? Tell me how things are going." Another student received a text message from the teacher asking, "Is everything OK?" after the student only completed one assignment in a week. The student replied to the teacher that he "was working on other things (courses)." The student reported to the researcher that he could easily catch up in one day in this English course. Another student reported that the "Teacher has texted me once or twice" in the past (but not during the observation window). In all, there were three reported instances of "other" teacher initiated communication during the observation window.

Sometimes students were the ones to initiate contact with the course instructor. These "other" type of interactions with the teacher fell into these categories: 1) Asking for

clarification on an assignment (none reported during the observation window); 2)

Scheduling the "check in" call to unlock the unit exam (one occurrence reported); and 3)

Asking the teacher for help (reteach). There was one noted instance of this "re-teaching"

as a student reported a 5-minute phone call chat with the teacher regarding an

assignment. The student asked, "What does social status mean?" The teacher gave a

definition and clarified the assignment task.

In sum, there were a total of five "other" interactive episodes within the observed

time frame as reported by the student participants, with just one (the phone call "check

in") considered authentic academic discourse.

Study hall interactions. All high school students enrolled with the school where the

observations occurred are offered a twice-weekly on-site face-to-face (F2F) study hall

(Tuesdays and Thursdays, 8:30am-2:30pm, 3 out of 4 weeks per month). One or two

credentialed high school teachers offer general assistance, motivation, and opportunities

to engage with peers. Students typically bring in their laptops and headphones but have

the option to utilize school equipment. Students may choose to sit at a table with others

(up to 4 per table) or at a table by themselves. Although there are 76 students enrolled in

the high school, the onsite advisory teachers reported that most study hall sessions

typically have between 2-6 students in attendance. During the observation window, the

five student participants were offered 172 hours of study hall hours. Nevertheless, only

two of the five participants chose to attend study hall (irregularly and minimally, see

Table 9.)

Table 9

Study Hall Participation

Student	Observation Window (Timeframe)	Total Number of Hours Offered	Number of Hours Attended
Student 1	10/18-11/1	18	0
Student 2	10/4-10/25	36	0
Student 3	10/9-10/30	36	8
Student 4	10/11-10/25	30	0
Student 5	10/11-11/8	42	3
Total		**172**	**11 (6%)**

Note. Study Hall, onsite face to face support with local credentialed teachers, is available Tuesdays and Thursdays, 8:30am-2:30pm, three out of four weeks per month.

Although the study hall sessions provided an opportunity for student engagement with teachers and other students, three of the five participants (Students 1, 2, and 4) did not attend at all. Students 3 and 5 chose to attend study hall three and two times, respectively, for a total of 11 hours (out of 78 hours available during their observation window). There was no assumption that these students would encounter a peer from their online course during the study hall session due to the low turn-out among the high school students, and the two students confirmed that they didn't think anyone else in study hall was enrolled in the same online English course.

The two student attendees stated that they usually showed up for part of the day, logged in to their online course, and began completing the lessons. Neither student reported any academic discourse or peer collaboration during any of their study hall

sessions throughout the study. The on-site advisory teachers confirmed this with the researcher, stating that they had not provided specific academic help or tutoring in English. Instead, the advisory teachers reported that they monitor student behavior and generally encourage students to stay on track. In the end, just 6% of the 172 hours offered to students was utilized. Within those 11 hours, there were no reported instances of peer interaction or academic discourse related to their online English course.

Academic interaction with parents. Although the online content providers do not expect parents to teach the content provided in these lessons, it is possible that parents may choose to engage in academic discussions with their children. As a result, the students were questioned about academic discourse activities with parents and siblings. Two of the five students mentioned parent interaction regarding course content during the semester. One student reported one parent interaction during the observation window; she was unsure of the meaning of a word and asked her mom what it meant. Her mother reported that she wasn't sure and encouraged the student to contact the teacher (which she did). A different student reported that at times (in the past) he asked his mother or younger sister to read his written essays prior to submission to make sure they were legible. However, this had not occurred during the month-long observation window. In all, there were no instances of reciprocal academic communication regarding the online English course with family members.

Interactive synchronous lessons. In each English course observed, there were opportunities for students to participate in weekly thematic, web-based synchronous, or synchronous, lessons with peers and a teacher. These interactive lessons are considered

optional and supplemental. These real-time lessons are posted on a calendar within the student's course-specific web portal and are shown by theme. For example, students might have been offered a synchronous lesson about Literary Devices on October 18th at 9:00 am. Students who opt to participate click on the link and join in. (Although the teacher's voice can be heard, students typically 'speak' through type-to-chat features rather than audio.) The teacher of the synchronous lesson is not usually the same as the course teacher. None of the five participants participated in an interactive synchronous lesson or viewed an archived lesson, not even in the months prior to the October observations.

When queried about these interactive lessons, two students provided the following responses: "I'm too busy"; "It's optional." A third student responded by saying, "I never saw them in this course" then proceeded to look for them. Upon successfully finding the list, said with excitement, "I found it!"; further explaining that it still would not be utilized. A fourth student found them to be useful in other courses, such as math and foreign language, but saw no need for them in English. None of the five participants planned to watch or participate in the interactive synchronous lessons in the future.

As online course providers consider these synchronous lessons a key component for student engagement, it is essential to understand what occurs during these lessons. The researcher therefore analyzed five (archived) 30 minute synchronous lessons from a similar corporate course provider she explored in a pilot study. Results will be discussed later in this chapter.

Student-peer interactions. There were two different types of opportunities for Student-Peer interaction, either participation in the aforementioned thrice weekly, 30 minute, synchronous interactive lesson, or a collaborative assignment with another student (offered once per semester), via email discussion (asynchronous), or video chat (synchronous).

Communication with peers in interactive lesson. As stated earlier, students were offered opportunities to participate in the weekly synchronous lessons. These interactive lessons would provide opportunities for academic discourse and possible peer collaboration. As these were considered optional, all five chose not to participate in them throughout the semester. A separate investigation into these lessons is described in the section titled **"**Observation Type B: Interactive Synchronous Lessons."

Peer collaboration assignment. Within the online coursework, there was one opportunity for students to engage with classmates in a peer-collaboration activity. The assignment, shown on the syllabus, asks students to work with a classmate in discussing a specific thematic prompt. The assignment could be completed anytime and is due by the end of the semester. Students are required to fill out a template with the answer to the discussion question as well as show documentation of interaction (such as an email transcript trail of evidence or a notation of the time/date of their video chat). Students have the option to ask the teacher for help finding a partner for a video conference (synchronous discussion) or are able to directly email another classmate to ask if they would be interested in working on the assignment together (via email, asynchronously).

None of the five participants completed the collaborative assignment and four of the five said they did not plan to complete it in the future. One said he "might do it later." Although the assignment (with point value) was shown on four of the five students' syllabus (with the English Honors student's showing "Ex" for exempt), all five believed the assignment was optional. This was verified by the onsite advisory teachers as some of the students are unable to access the technology needed for web-based conferencing on their Chromebook laptops. Within the observed timeframe, two students were approached by three different peers who wanted to work on the assignment together. The participants did not respond to the email requests. In sum, as this assignment was deemed "optional" or "exempt" it is unlikely the students will participate.

Summary of observation Type A findings. In conclusion, while reviewing results of overall communicative interactions with teachers and peers, the following summary of student observations can be reported (Table 10).

Table 10

Observation Type A: Summary of Student Participation

Participant	Instances of "Academic Discourse" Observed with Course Instructor	Instances of "Academic Discourse" Observed with Peers or Others	Instances of "Peer Collaboration" Observed	Observation Window (Timeframe)
Grade 10 student	0	0	0	10/18- 11/1
Grade 9 student	1	0	0	10/4-10/25
Grade 10 student	0	0	0	10/9-10/30
Grade 9 student	0	0	0	10/11-10/25
Grade 11 student	1	0	0	10/11-11/8

Note. Only reciprocal discussions or conversations related to the English course which expanded learning were coded as "academic discourse." Peer collaboration was identified as cooperative interactions among students.

In all, although there are several different options for students to participate in academic discourse and peer collaboration activities, few were chosen. Some of the best opportunities were seen as optional or enrichment activities. In the case of interactive lessons and the peer collaboration assignment, computer technology platforms that did not support synchronous web activity were to blame. Additionally, calls to the teacher, a key form of communication and potential discourse, did not serve as a gatekeeper for students to move along in their studies. As a result, students waited to contact the teacher. Only one assignment per semester involved peer discussion, and it was optional as well, resulting in no participants opting in.

Observation Type B: Interactive Synchronous Lessons

The second type of observation captured the goings-on of a typical interactive (synchronous) lesson. This is an essential component to analyze as it is often mentioned as a draw to promote interaction in online learning environments, and integral to the English course design. Utilizing Web 2.0 Video Chat technologies, course providers offer the option of synchronous, virtual class sessions. These are thematic, related to the course content, and occur from 1-3 times per week. A course syllabus and/or calendar (depending on vendor web platform) lists the topic and includes a live link to join.

Students typically view the lesson on a personal computer, and are able to listen to the teacher speak in real time while reading typed responses from peers. (Students respond with typed responses in a chat box area.) Students are also able to interact by selecting multiple choice options on a teacher created poll, or type text into a frame or graph. Students' microphones are typically "muted" as numerous stakeholders report that it creates distracting background noise (dogs barking, etc.). A large part of the screen shows the teacher's PowerPoint-type lesson slides (see Figure 2). All teacher audio, ongoing slide changes, and typed responses are archived, which provides a clear record for interactional analysis. Five separate synchronous lessons were analyzed (Table 11).

Table 11

Observation Type B: Archived Synchronous Lesson

Lesson	Course	Lesson participants*	Recorded and observed time
1	English 11	3 students & 1 teacher	30:10
2	English 11	3 students & 1 teacher	29:02
3	English 10	2 students & 1 teacher	27:26
4	English 11	3 students & 1 teacher	33:14
5	English 11	2 students & 1 teacher	27:30

Note. *All participants' identifying information removed from researcher view prior to observation (seen as "User 1, 2," etc.)

As noted in Table 11, four of the five lessons were from English 11 (grade 11), and one was from grade 10. The average number of student participants in each lesson was 3, with one teacher presenting the information. The lessons averaged 30 minutes in length.

The researcher coded different types of interactive activities and tallied occurrences on the observation instrument (see Appendix E). This observation instrument tool was utilized for tallying interaction types, purpose, response, in addition to commentary.

Purpose of interactive activity. The purpose of the observed synchronous lesson interactions could be coded into three main categories: 1) Organizational or Procedural; 2) Social or Motivational; and 3) Instructional. Examples of each are shown on Table 12.

Table 12

Purpose of Interactions with Examples

Type	Example	Example	Example
Organizational/ Procedural	reminder	rule	scheduling
Social/Motivational	personal stories, anecdotes	encouragement	casual conversation
Instructional	direct teaching, lecture	clarify, reteach	question

Organizational interactions tended to be reminders of rules or upcoming events. Social/motivational interactions were intended to engage the student, but did not necessarily expand learning. Instructional interactions were communicative exchanges directly focused on helping students learn or master content. Each synchronous lesson session was analyzed for these types of interactions (Table 13).

Table 13

Observation Type B: Interaction Purpose

Lesson	Course	Organizational or Procedural	Social or Motivational	Instructional
1	English 11	3	10	3
2	English 11	1	3	23
3	English 10	1	6	11
4	English 11	3	1	11
5	English 11	4	1	17
Total		**12 (12%)**	**21 (21%)**	**65 (66%)**

The purpose of most interactive activity was "Instructional" as the goal was to teach, clarify, or review content (n=65, 66%). Examples of these interactions include, "Give an example of symbolism" and "How do you pronounce ---?" Quite a few interactions (n=21) were meant to engage or motivate the student participants. These interactions included prompts such as, "Feel free to comment" and "Have you ever been to ---?" The least common form of interaction served the purpose of procedural or organizational conversations, such as, "Is your audio working?" and "You can look at your message board."

Within the synchronous lessons, there were multiple opportunities for student engagement through academic discourse and discussion with peers. Compared to the relatively small number of interactions within the participant's daily online school experience, those who joined in these extra asynchronous lessons were able to speak directly with a teacher or classmate in real time. This "in the moment" give-and-take conversational dialogue is an essential 21st century learning skill which appeared to be lacking in the online learning environment of the students observed in the Observation Type A part of the study. Within a matter of 30 minutes, an average of 13 instructional queries were asked of these synchronous lesson participants, all with an expectation that they would answer. This is in sharp contrast to the minimal amount of engagement observed in the asynchronous lessons.

Types of questioning. Interactions, overwhelmingly initiated by the instructor, primarily took the form of question and answer. The teacher would ask a question (audio), with students directed to type responses in a text or "chat" box. Further analysis

of the types of interactions (primarily questions) were coded into four progressive

categories: 1) Closed; 2) Explain, justify; 3) Elaborate, reason; and 4) Synthesize, create.

Examples of each can be reviewed in Table 5, with results shown in Table 14.

Table 14

Observation Type B: Question Response Types

Lesson	Course	Closed	Explain/ Justify	Elaborate/ Reason	Synthesize/ Create
1	English 11	15	1	0	0
2	English 11	6	22	2	0
3	English 10	15	4	0	0
4	English 11	9	6	0	0
5	English 11	8	9	5	0
Total		**53 (52%)**	**42 (41%)**	**7 (7%)**	**0 (0%)**

Note. Although there were 98 coded "Interactions" within the five lessons, there were 102 coded "Question Response" types. This discrepancy is due to the fact that some questions were unanswered by participants.

Within these five synchronous lesson observations, there were 53 closed-type

interactions (52%), primarily yes/no. These are not deemed as valuable in expanding

student learning. There were multiple opportunities (n=42, 41%) for students to explain

themselves, however, with such questions as, "Why did you choose that argument?";

"How does... differ from...?"; "What does ...represent?" Less often, students were asked

to elaborate, with (n=7, 7%) questions such as, "Why would authors use...?"; "How do

you picture..." There were no opportunities for students to synthesize or create new

content.

Summary of observation Type B findings. To recap, within the online course environment, opportunities to engage in academic discourse with teachers and peers are available during the synchronous lesson sessions. Archived lessons allow for a closer inspection and observation of actual student engagement as seen in Table 15.

Table 15

Observation Type B: Summary of Student Participation

Lesson	Course	Instances of Interaction* with Instructor	Instances of Interaction* with Peers	Instances of *Peer Collaboration* Observed
1	English 11	16	0	0
2	English 11	24	3	0
3	English 10	16	2	0
4	English 11	15	0	0
5	English 11	22	0	0
Total		**93**	**5**	**0**

Note. *Not all interactions would be coded as "Academic Discourse" as many were procedural or motivational.

Even with just 2-3 student participants per session, there were far greater opportunities for students to interact with both peers and the teacher in synchronous lessons compared to typical daily asynchronous lessons. Within the five observed (archived) lessons, there were 93 total instances of student-teacher interactions. The vast majority, 87, were initiated by the teacher. These primarily took the form of question-answer (Initiation-Response-Evaluation).

In sum, opportunities for "real-time" synchronous lessons appear to be an ideal

opportunity for student and teacher or peer interaction. Nevertheless, while there were numerous opportunities for back and forth academic discourse within the synchronous lessons, there were no observed opportunities for peer collaboration.

Teacher Surveys

Beyond observation of interactive student learning opportunities, answers to the study's research questions require an evaluation of different stakeholder group; teachers and advisors of online students. Do they believe students are participating in academic discourse and peer collaboration (RQ #1)? Do online educators find academic discourse and peer collaboration activities valuable and feasible (RQ #2)? Finally, what are the affordances and constraints to academic discourse and peer collaboration activities in online learning environments (RQ#3)?

As mentioned previously, an invitation to participate and the survey link were posted to groups within the researcher's network and forwarded to other online teachers within participant networks. As a result, a large number of online high school educators from across the United States (and among varied online educational institutions, schools, and online content providers) were represented in the sample. After consenting to participate in this study, respondents were asked a mandatory gatekeeping question; "What is your primary role?" Although 77 responded to the survey, 28 did not qualify by indicating they did not work with online high schoolers in the United States, leaving 49 in the sample. Of those, 39 were online teachers and ten were advisors to online high school students in the United States. These respondents represented numerous grade levels and academic subjects, with years of collective experience (Figure 5).

Grade Level	Number	Percent of Total Responses	
9th	43	88%	
10th	40	82%	
11th	39	80%	
12th	37	76%	

Subject	Number	Percent of Total Responses	
ELA	28	57%	
Foreign Language	14	29%	
Math	29	59%	
Science	23	47%	
Social Studies	22	45%	
Visual/Performing Arts	19	39%	
Other	17	35%	

Experience	Number	Percent of Total Responses	
0-2 yrs	8	23%	
3-5 yrs	9	20%	
6-10 yrs	10	26%	
10+ yrs	12	31%	
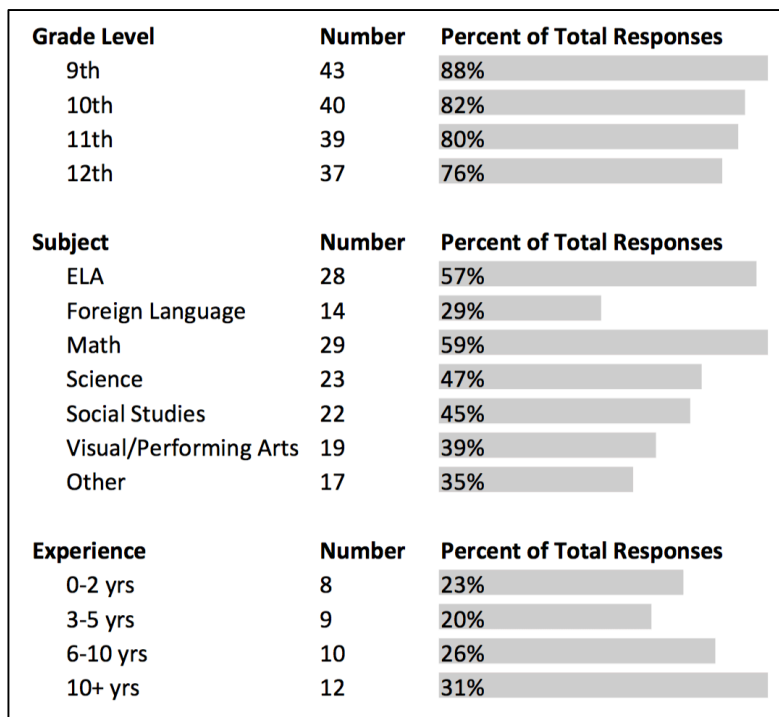
Figure 5. Demographic information from survey respondents.

Participants were fairly evenly distributed among grades 9-12. Although participants represented multiple grade levels, it is helpful to note that the survey participants are familiar with each grade level observed. Many surveyed educators have the added benefit of working with students in multiple grade levels. This aids in understanding the progression of grade level standards as they work across grade spans.

Math (n=29) and English/ Language Arts (n=28) were the most common subjects taught by respondents, with ancillary subjects rounding out the responses. Phase I of the study included observations of students in an online English course, so it is meaningful to note that 28 survey respondents said they teach or advise online high school English courses. Additionally, surveyed teachers/advisors come from diverse online educational

environments.

The final demographic survey question queried, "How many years have you been teaching/advising online students?" Responses revealed that survey respondents have had many years of teaching/advising experience. Although virtual courses are fairly new, many survey respondents are veteran teachers with 6 or more years of experience (n=22). Just nine teachers would be considered novice at under 2 years, and eight have taught 3-5 years. If one were to count the minimum number of years taught by the 39 online teachers, it would add up to over 200 years! (For example, the ten respondents who indicated 6-10 years of experience would earn 60 years overall.) It is important to note that while 200 years is the minimum number of years these respondents (n=39) have taught, an additional 10 respondents did not answer this final survey question (and would have added more time). In all, it can be authoritatively stated that the survey responses do not come from a small, select group of online teachers, but a diverse and large group of fairly experienced educators representing multiple grade levels and subjects.

The body of the survey contained ten questions pertaining to academic discourse and peer collaboration. Six questions utilized a 1-5 Likert scale and four questions were open-ended. Comments received in response to the open questions tended toward brief phrases.

After being provided with a written definition of academic discourse (and later, in section 2, peer collaboration), online teachers and advisors of online high school students were first asked, "How often do students participate in Academic Discourse [peer collaboration] activities?" Survey participants proceeded to respond to further questioning about the value and feasibility of academic discourse or peer collaboration

via Likert scale-type questions, with a scale of 1 (not valuable/feasible) to 5 (extremely valuable/feasible).

Written responses for questions #4-5 (academic discourse) and #9-10 (peer collaboration) provided additional insight into challenges, types, and value of these interactive activities. Table 16 provides a summary of survey question types, number of survey responses per question, mean values for Likert style questions, and number of unique/distinct comments received regarding academic discourse and peer collaboration activities in online learning environments.

Table 16

Survey Response Findings

Specific Question (Q)	Academic Discourse	Peer Collaboration
How often do students participate in these activities in online courses?	Question #1 n=41 M=3.54	Question #6 n=39 M=2.31
How valuable are these activities in online courses?	Question #2 n=41 M=4.15	Question #7 n=37 M=3.30
How feasible are these activities in online courses?	Question #3 n=41 M=3.88	Question #8 n=39 M=3.03
What are the primary challenges associated with these activities in online courses?	Question #4 n=38 53 distinct comments	Question #9 n=34 51 distinct comments
Further comments regarding types (and value of) these activities in online courses?	Question #5 n=24 37 distinct comments	Question #10 n=17 27 distinct comments

Note. The "n" indicates the number of responses, whereas the "M" indicates the mean value within a 1-5 point Likert scale rating.

Academic discourse. The survey began with a focus on academic discourse, defined as a "formal, reciprocal (back and forth) discussion, conversation, or chat (written or spoken) with another student or teacher that is related to academic content in a way that expands learning." The first three questions asked participants to select a choice among a five-point Likert scale, with the lowest choice (1 on a 1-5 scale) indicating "never" (Q#1), "not valuable" (Q#2), and "not feasible" (Q#3). The highest value (5 on a 1-5 scale) denoted "a great deal" (Q#1), "extremely valuable" (Q#2), and "extremely

feasible" (Q#3).

Survey questions #1-3 each received 41 responses (Table 16). Participants gave a strong rating to the value of academic discourse activities in online courses (M= 4.15). Educators felt that these activities were fairly feasible (M=3.88). Survey responses indicated that teachers believe students (at times, but not frequently) participate in academic discourse (M=3.54). A more thorough breakdown of results is described in subsequent paragraphs.

Frequency of academic discourse. To begin, surveyed adults were prompted to state how often they believed students participated in academic discourse activities in online learning environments (Figure 6).
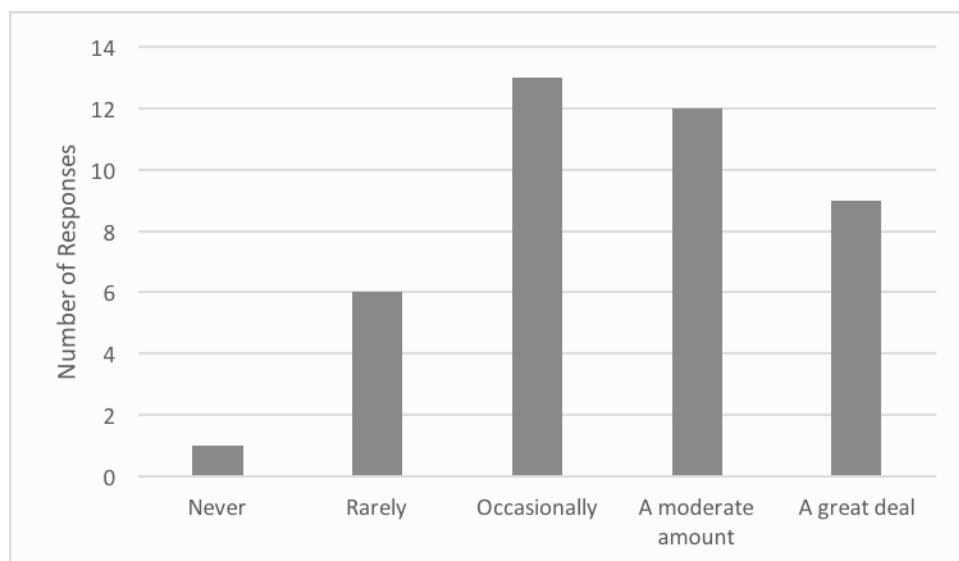
Figure 6. Number of survey responses stating how often students participate in academic discourse in online courses.

When asked, "How often do students participate in academic discourse activities in online courses?" the majority of respondents (n=21) chose "a moderate amount" or "a great deal." Only one respondent said "never," six chose "rarely," while 13 selected

"occasionally." Overall, it would be fair to report that most online educators and advisors believe academic discourse is happening in online learning courses. The difference between educators' perceptions regarding the amount of interaction and the reality observed in Phase I of the study is discussed in the Chapter 4 summary.

   Value of academic discourse. After responding to the question regarding frequency of discourse activities in online coursework, participants were asked, "How valuable are interactive academic discourse activities in online courses?" (Figure 7).
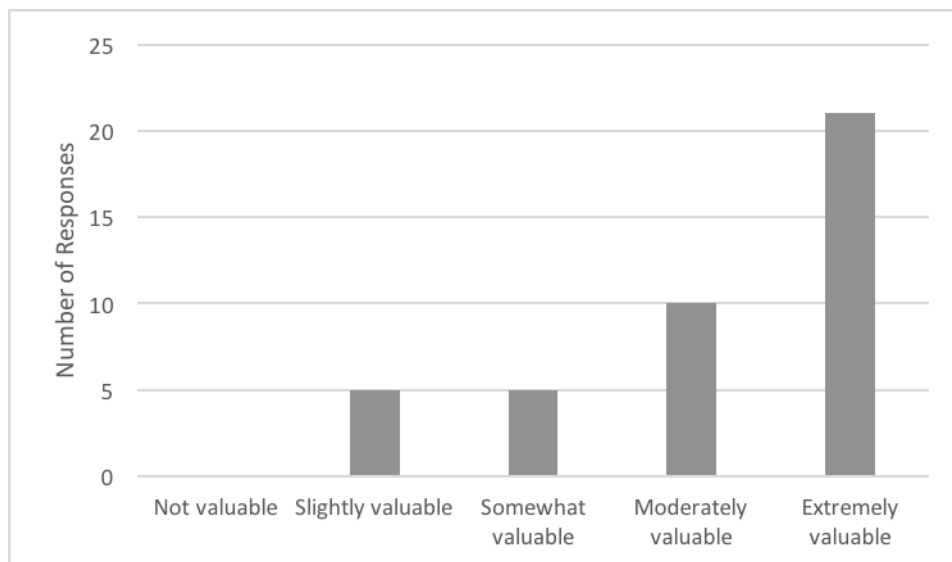
Figure 7. Number of survey responses determining how valuable academic discourse activities are within online courses.

   In response to the question regarding the perceived value of academic discourse in online courses, over 51% of educators chose the 5th and highest level of value, "extremely valuable," and another 24% selected the 4th highest level, or "moderately valuable." Overall, this question rated the highest overall mean average of all the Likert scale questions (M=4.15 on a 5-point scale). In fact, all agreed that academic discourse is a valuable activity to pursue in online learning environments. But is it manageable and

feasible?

Feasibility of academic discourse. The third question asked, "How feasible are academic discourse activities in online courses?" Most online educators indicate that discourse is achievable (Figure 8).
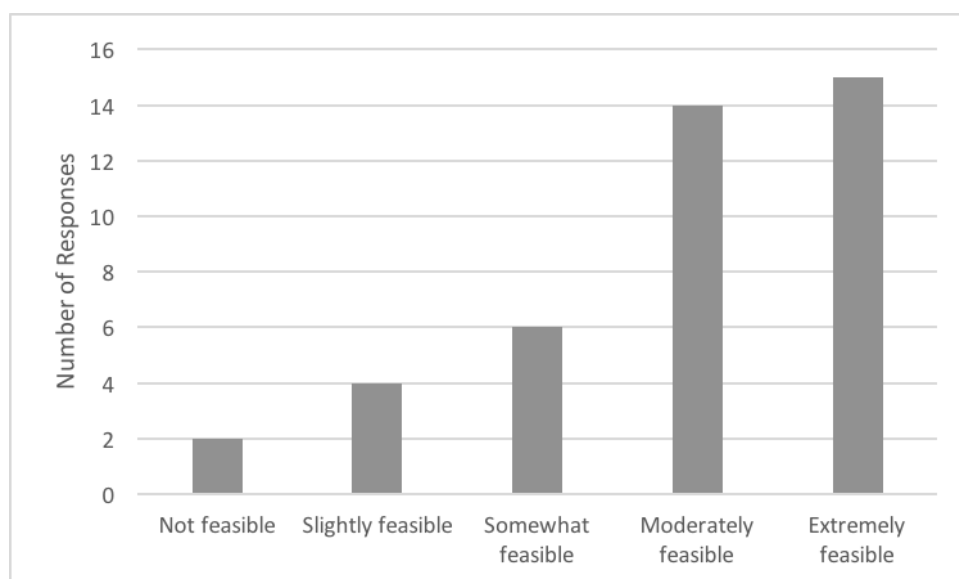
Figure 8. Number of survey responses determining how feasible academic discourse activities are within online courses.

A review of findings indicates that 71% of respondents believe it is more than somewhat feasible to incorporate academic discourse activities in online learning. Just two teachers indicated that it is not feasible, and 10 others (24%) felt that academic discourse was "slightly" to "somewhat" feasible to incorporate into online courses.

Survey questions #4 and #5 provided an opportunity for educators to respond via written response. In alignment with the study's second and third research questions, these questions asked participants to explain the challenges, affordances, and types of academic discourse activities in online courses. They were also queried about the perceived value of these interactive activities. Survey question #5 (asking for further comments) received

24 responses with 37 unique statements.

Challenges of academic discourse. Analysis of responses to the fourth question,

"What are the primary challenges associated with academic discourse activities in online

courses?" was straightforward. A total of 38 respondents answered the fourth question,

with 53 varied comments regarding challenges of academic discourse activities (Table

17). Most comments easily fell into one of the following 4 categories: Student

participation (n=25); Timing (n=16); Curriculum (n=5); and Technology (n=4). There

were just three responses out of 53 overall that did not fit the aforementioned categories.

Table 17

Challenges of Academic Discourse

Category	Theme
Student participation (n=25)	Student comfort level low Student too busy Student not motivated Student lacks knowledge Student etiquette issues
Timing (n=16)	Finding available times/scheduling appointments Different pacing and course progress Time needed to manage discussions
Curriculum (n=5)	Lessons too structured Need to create prompts Assessment of participation
Technological issues (n=4)	Incompatible equipment Nonfunctional or missing equipment
Other (n=3)	Student isolation Family "buy-in"

The number one challenge associated with academic discourse in online courses cited by educators (n=25) was the lack of engagement and participation by students. This category was so large that five sub categorical themes emerged. Teachers reported that (1) Students do not feel comfortable interacting as some "students are shy," or "others can judge them"; (2) Students are "already busy," or "they feel overwhelemd [sic]"; (3) Students are not motivated, with teachers citing challenges in "getting students to commit," as "students [are] unwilling to interact." Many stated they had trouble "getting students to complete the work." Many "students resist this sort of activity" or are simply "not motivated." Some students "are limited in their responses" or "unwilling to interact"; (4) Students may have a "lack of knowledge" and; (5) Student etiquette can cause challenges, with teachers saying they have had issues with, "student civility online" and "proper online etiquette." One outlier response noted that some students are hyper-communicators, and relentlessly contact the teacher 24/7 for "non-essential reasons." This was a rare response. In contrast, most teachers simply stated that (for whatever reason) students simply did not respond to the opportunities to engage in academic discourse.

The next greatest challenge mentioned by teachers (n=16) is timing. The largest timing issue (repeated by 6 participants) is the difficulty of "scheduling mutually convenient meeting times." Teachers commented that there was limited availability in their (and in the students') schedules. Different time zones present a unique challenge, particularly in attempting to conduct a "real-time" or synchronous discussion. Further comments were centered around the timing of course progress. Educators indicated the

frustration that their students, often "working different paces," and are typically not all on the "same page." The timing of a meaningful course content discussion is quite a feat. Some students "may be responding to a post from weeks or even months ago." Start dates for students vary as well, adding another challenge. In all, four teachers mentioned the challenge of delayed discussions. One educator said it clearly, "It is challenging to make sure that all students receive an answer from me in a timely fashion and a response that promotes stimulated dialogue." Two teachers indicated that it simply takes a lot of "time to manage all of the discussions."

Surprisingly, there were far fewer challenges related to curriculum or technological issues when incorporating academic discourse into the online environment. Several teachers mentioned that the curriculum limited the opportunities for academic discourse. A comment was made that "the online courses that I supervise are highly structured and seldom allow for discourse." Another felt it was a challenge "creating the right prompts." One teacher felt challenged with the "subjective assessment of participation value." Technological issues were indicated by just four survey respondents. One mentioned the lack of necessary online tools, such as a "mic or camera." Although another uses Zoom conferencing software (and has a "tech desk"), at times the students will have technical issues. Another teacher echoed the "technical issues" concern in non-specific terms. A fourth teacher stated that the student Chromebooks "are not compatible with the collaborative component to our online courses."

Finally, there was a brief mention by two teachers that students are completely "isolated" and working independently with "no contact with others." One reason for

isolation referred to a student who was incarcerated, whereas another teacher said that students "are not in a class with another student." One comment not placed into a categorical theme stated, "family buy-in" as a challenge; it is unclear what that means.

Further comments regarding academic discourse. Survey participants were then given an opportunity to expand their thoughts in question #5 while providing "Further comments regarding types (and value of) academic discourse activities in online courses." A total of 24 participants typed a response to this prompt (Table 18). The responses were coded into 3 main categories: (1) The value (and positive outcomes) of academic discourse activities; (2) The needs of stakeholders, and; (3) The types of activities.

Table 18

Additional Comments Regarding Academic Discourse

Category	Theme
Value (Positive outcomes)	Integral/essential
	Better relationships
	Improved learning
	Active participation
Needs	Time to develop/monitor
	Etiquette
	Participation
Types of activities	Discussion boards/threads
	Verbal/oral discussions or assessments
	Shared online space

These responses regarding academic discourse provided much insight. There were 37 unique comments in all, with 15 comments centered around the value of pursuing

academic discourse in learning. One educator emphatically said, "Collaborative discussions between students and a teacher will always outweigh any negative effects. When students take on a part of the onus of discussion, they are becoming active members of their own learning." Others mentioned that beneficial discussions improve learning and helpful sharing of ideas among students. It was mentioned that discussions can help provide a better understanding of course material.

The benefit of improved relationships between teachers and students through discourse was a point made by several teachers. One teacher stated, "When I take the time to build a stronger relationship with the student, their response is much more likely, improves their participation and often times results in better understanding of the material." Many responders agreed that intellectual engagement is much more robust in courses that have academic discussions. One response suggested that these discursive activities promote 21st century learning (communication, collaboration, critical thinking, and creativity). An online educator summed up the tone of many responses with, "I believe that discourse is vital to education. It allows sharing of ideas and broadens the mind."

And yet, according to 12 survey participants, there are many needs. First, as one responder noted, there must be a "Qualified teacher trained to effectively facilitate online discussions" in this type of school environment. Next, there must be frequent monitoring of student behavior, etiquette, and participation. Another educator said, "Maintaining citizenship (online decorum) can be challenging and itself becomes a part of the academic discourse effort." Additionally, much time is needed for teachers (and students)

to prepare for discussions, as one educator said, "It can be difficult to moderate/curate." Other insights provided by the teachers demonstrate the frustration they feel regarding the disconnect between the value of these activities and the actual student participation rate. The challenge of getting students to participate was a frustration shared by many. One teacher mentioned that some students refuse help, whereas another said that some students are anxious (socially) and prefer not to interact. Indeed, interaction between teachers and students through academic discourse is problematic when, as three teachers noted, "it is hard to get students to agree to it"; "some students have issues like anxiety and prefer to NOT interact"; or "very few of my students participate."

Fewer comments (just 10 of 37) mentioned specific types or forms of academic discourse in online environments. Discussion boards or threads, collaborative editors on student essays, teacher tutoring, online whiteboards, webinars, discussion-based assessments, and more were all mentioned. However, all were mentioned briefly and without much detail. Interestingly, there was only one response specifying a particular technological tool (Google Docs), whereas most comments simply provided generic uses of technology such as "online discussions" or shared "project space online."

To summarize, a review of findings indicates that although teachers/advisors find academic discourse to be "moderately valuable" overall (M= 4.15 on a 5-point scale), they state that online students are engaging in these activities only "occasionally" to "a moderate amount" (3.54). Moreover, most believed that academic discourse activities were feasible (3.88) in online learning environments. If these activities are feasible, why aren't they more widely utilized? The specific challenges cited varied, but centered

around lack of student participation and time management. In further comments, a fair amount of teachers listed numerous positive outcomes of academic discourse and group discussions, but agreed that it requires time, effort, and multiple stakeholder buy-in.

Peer collaboration. Respondents were asked to refer to the following definition of Peer Collaboration as they answered survey questions #6-10: "Cooperatively interacting with another student (working together) in order to solve problems, create a product, or learn and master course content." Following section 1 of the survey (focusing on academic discourse) were five similar questions regarding peer collaboration in online high school learning environments. The first three questions asked participants to select a choice among a five-point Likert scale. The lowest choice (1 on a 1-5 scale) indicated that the activity in question "never occurs" (Q#6), the activity is "not valuable" (Q#7), and the activity is "not feasible" (Q#8). The highest value (5 on a 1-5 scale) denoted the activity "occurs a great deal" (Q#6), the activity is "extremely valuable" (Q#7), and the activity is "extremely feasible" (Q#8). Each of these questions received at least 37 responses.

Frequency of peer collaboration. Section 2 of the survey began with the question, "How often do students participate in peer collaboration in online courses?" (Figure 9).
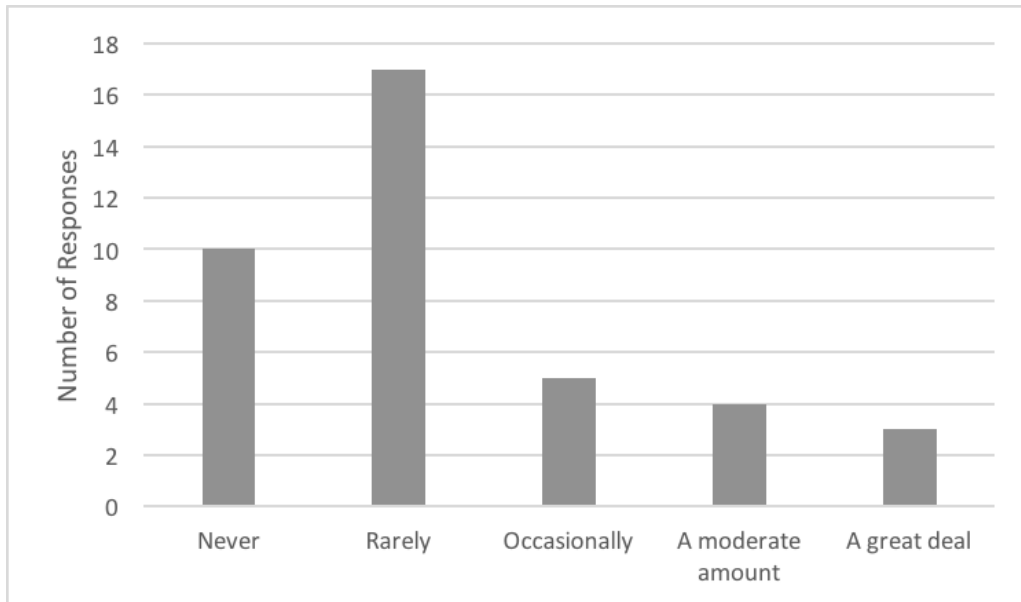
Figure 9. Number of survey responses stating how often students participate in peer collaboration in online courses.

According to most online teachers surveyed, students rarely participate in peer collaboration in online learning environments. In fact, 69% of educators (n=27 of 39) said that students "never" or "rarely" engage in peer collaboration activities. Just 18% of participants (n=7) felt that students engaged in peer activities "a moderate amount" to "a great deal."

Value of peer collaboration. Perhaps the lack of peer collaboration among online learners cited by teachers could be justified if educators didn't find it valuable. The question, "How valuable are interactive peer collaboration activities in online courses?" seeks to determine the answer (Figure 10).
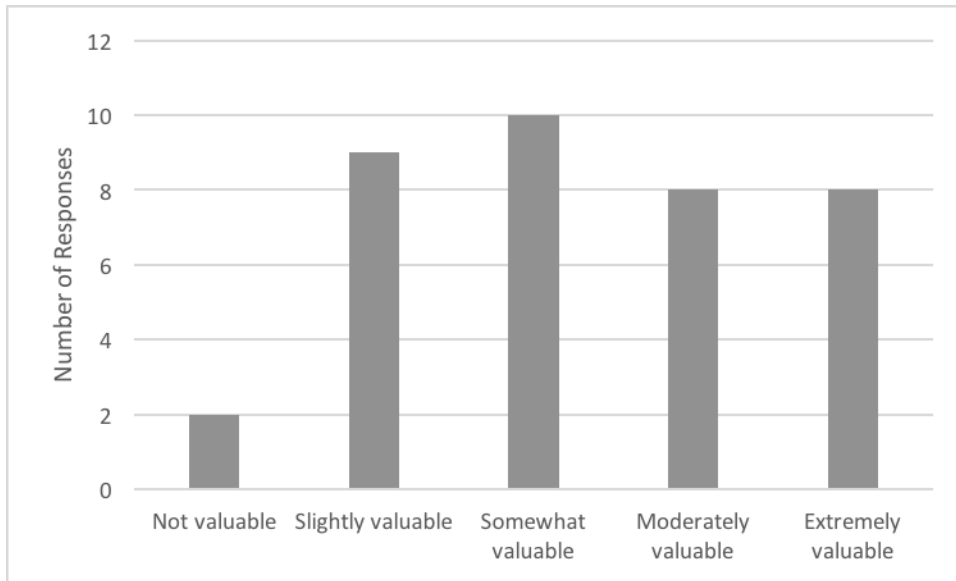
Figure 10. Number of survey responses determining how valuable peer collaboration activities are within online courses.

Indeed, 57% (21 of 37) respondents determined that peer collaboration activities were not highly esteemed, instead claiming they are "somewhat valuable" (n=10), "slightly valuable" (n=9) or "not valuable" (n=2). Just 16 educators (out of 37) found peer collaboration activities to be "moderately" to "extremely" valuable.

Feasibility of peer collaboration. The final Likert scale survey question (#8) asked if peer collaboration activities were feasible in online courses (Figure 11). Would surveyed educators find peer collaboration easily manageable in their online learning environments?
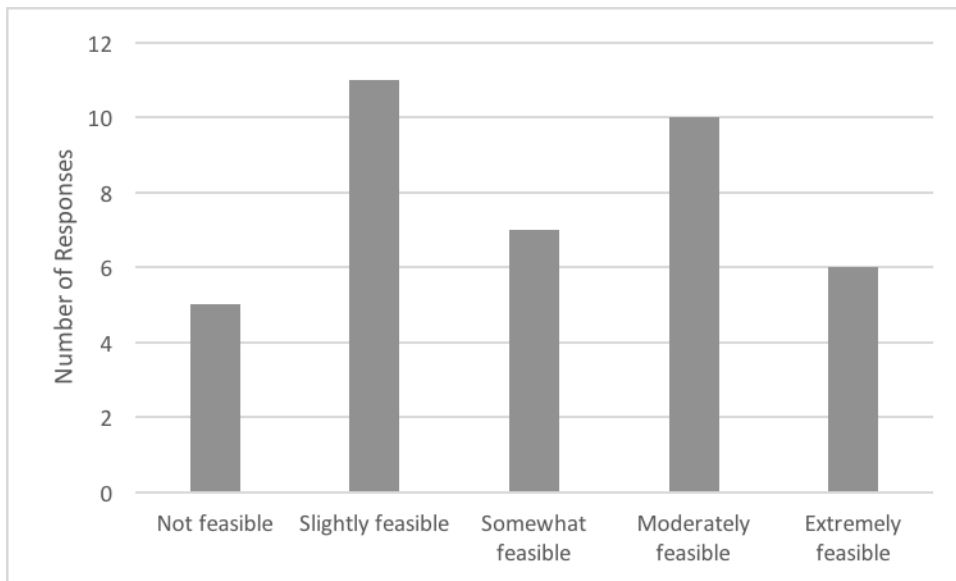
Figure 11. Number of survey responses determining how feasible peer collaboration activities are within online courses.

Respondents (n=39) were divided on the answer to this question. When queried, 41% of survey respondents (16 of 39) positively stated that peer collaborative endeavors were "moderately" to "extremely" feasible in online courses. Fifteen, or 38%, were less optimistic, stating that peer collaboration is "slightly feasible" (n=11), or "not feasible" (n=5). The remaining 18% found these activities to be "somewhat feasible" (n=7). Upon completion of questions #6-8, surveyed educators were asked to describe the challenges, types, and value of peer collaboration via written statement responses.

Challenges of peer collaboration. Question #9 was answered by 34 online educators, creating an ample repository of data. When asked, "What are the primary challenges associated with peer collaboration activities in online courses?" clear themes arose in the respondents' replies. Some educators listed numerous challenges, thus, there were a total of 51 distinct challenges noted with regard to integration of peer collaboration activities in online school settings. Themes emerged as the respondents' ideas fell along 5 main

categories: Student participation (n=21); Timing (n=12); Student isolation (n=8); Curriculum (n=4); and Technological issues (n=4). There were only two responses that did not fit the aforementioned categories (Table 19).

Table 19

Challenges of Peer Collaboration

Category	Theme
Student participation (n=21)	Student effort and equal work Student lack of response or participation Student too busy Student comfort level Other
Timing (n=12)	Scheduling/availability Course pacing/progress
Student isolation (n=8)	No classmates No contact with others
Curriculum (n=4)	Teacher content creation Availability
Technological issues (n=4)	Incompatible equipment Nonfunctional equipment
Other (n=2)	Confidentiality Family

Similar to the difficulties educators cited in practicing academic discourse in online environments, educators (n=34) responding to the question regarding challenges associated with peer collaboration activities cited student participation issues as the primary challenge. In fact, 21 of the 51 unique comment statements centered around student effort or participation factors. These were sorted, in order of frequency, according

to the following themes: (1) Student effort and equal work; (2) Student lack of response or participation; (3) Student too busy; (4) Student comfort level, and; (5) Other.

The number one challenge in this category, noted in 7 separate comments, described student effort or work habits as less than ideal. Educators made statements such as, "Some students are more active than others." Others mentioned the problem of "everyone contributing equally"; "equitable quality of work"; "flak(ing) out"; and "work ethic." One teacher summed up the problem by writing, "Online collaboration can be difficult if all students involved don't commit equally to the work." One respondent mentioned that these types of challenges in online peer learning echo the same challenges in traditional school environments.

The next group of comments under the student participation category revolved around lack of participation. "Getting students to participate" was a common theme, as was "getting students to commit." An equally popular theme was the theme of "busy students." One commenter mentioned that students in online programs often have outside jobs. Another said that students simply "don't have time." Other comments in this category stated that students are not comfortable; instead they are "reluctant" and of "varying temperaments" (possibly meaning they aren't comfortable working with unfamiliar peers). Some educators noted a "lack of authenticity" or an "apprehension of working with other students/teachers when they cannot physically 'see' them."

Even if time and comfort levels weren't an issue, the challenge of timing and scheduling collaborative activities among all participants was repeatedly mentioned (in 12 separate comments) as a real obstacle. One concern revolves around course pacing as

"students work at different paces"; "outpace each other" or "are not on the same assignment." Also, as with academic discourse, the logistical challenge of scheduling collaborative activities among various time zones and work schedules weighs heavy on educator's minds. Reasons for this vary, but a compilation of four separate educators' comments paint a clear picture: "coordination," and "scheduling" while "finding the best times" when "students are available" is problematic. A teacher articulated it thusly, "It is extremely hard to get students to call in at the same time."

The third category, student isolation, was referenced in 8 different comments. Some online students apparently have zero communication with peers. According to educators, this isolation is a result of students being in "classes without classmates"; "working in their own classes" or "remotely." One survey respondent said, "For online, there is no 'contact' with each other." Another lamented, "I only have one student enrolled in a subject at a given time." One must wonder, then, if some students are simply completing static lessons (similar to online workbooks) in order to pass online high school courses?

As with academic discourse activities, the limiting factors of curriculum or technological issues do not appear to play a large part in the difficulty of conducting peer collaboration activities. Both categories were mentioned just four times each. Apparently, at times, the online teacher must take time to develop the activity, which "requires specific goals and academic quidelines [sic] created by a supervising teacher." Then "teachers need to assign it." Other times, peer collaboration activities simply are "not available" within the course. Availability can be limited by technological issues as well. Sometimes, there is no "compatibility of the [student] devices with the online

collaboration tools." Other times, "Online platforms used had chat features turned off."

Technological issues mentioned by a small number of respondents indicate that better

technology would not necessarily improve access to peer collaboration activities for the

majority of online students. Other unrelated comments (outside the five main categories)

cited lack of "family participation" and "confidentiality laws."

In sum, according to the survey responses, the largest challenge of online peer

collaboration is "getting students to participate, and to participate equally." This appears

to be a slippery slope; Students are not comfortable or are too busy, so they don't want to

participate. Even if students desire peer collaboration activities, scheduling is a real

problem. (It would appear that most educators felt that it was preferable for collaborative

activities to be done "in real time," or synchronously.) Therefore, finding availability

amongst students looms large. Technological or curricular limitations may arise,

disabling connections with peers. In the end, if children do participate, effort among

students varies, which causes frustration among all stakeholders.

Further comments regarding peer collaboration. The final survey question (#10)

simply asked if participants had "Further comments regarding types (and value of) peer

collaboration activities in online courses." As this was the last open-ended question, there

were just 17 respondents. The responses were coded into three main categories: (1) The

value (and positive outcomes) of peer collaboration activities; (2) The needs of

stakeholders, and; (3) The types of activities (Table 20).

Table 20

Additional Comments Regarding Peer Collaboration

Category	Theme
Value (Positive outcomes)	"Essential" Improved student learning Learn from others Motivation
Needs	Quality teachers Time to prepare and monitor activities Student participation
Types of activities	Online synchronous meetings/sessions Collaborative document editing

Although just 17 educators responded to this optional open-ended question, they provided 27 unique insights. The greatest number of comments focused on the value of peer collaborations in online learning environments (n=13). Several online educators mentioned the benefit of improved student learning. Two comments noted that "students can learn a lot from each other" and "students learn best when they learn with and from their peers." Many expressed sentiments that it was an "essential part" of learning, or stating it was, "extremely valuable." One specific comment summed up the thoughts of a few others, "Peer collaboration activities are critical to student academic and social development as well as self-awareness and the student's place in the world."

Apparently, some students have indicated to their teachers that they value peer collaboration activities. One teacher said that once students work together with others, the children "see the true benefits and advantages of working together in an online

environment"; They "love it" according to another. They "get excited for the opportunity to connect with other students all over the country and know they have a support system besides their online instructor!"

This collaborative peer engagement is not an easy feat, however. With 11 distinct comments within this sub-category, educators expressed a large number of needs and issues regarding online peer collaboration activities. Words such as "difficult" or "challenge" were repeated numerous times. As with academic discourse, two respondents mentioned the need for quality instructors to develop, "administer" and monitor the peer activity. Specifically, teachers must work "structuring the assignment so incentives are right, timeline is workable, and there are appropriate milestones or check-ins." This is especially challenging as students may not be "on the same assignment" as others in the online course.

Based on number of comments, these challenging teacher tasks were so great that it overshadowed the concern for lack of student participation (the greatest challenge cited with academic discourse). The mention of reluctant students was listed as a secondary problem in relation to the amount of work and time teachers need to commit to develop activities. However, lack of student participation was a concern echoed by a few respondents. "Getting them to commit and keep the commitment is our challenge" wrote one teacher. Another said, "We have many students that are coming from bullying and other issues that will not participate in peer collaboration." There were just three comments mentioning the different types of peer collaborations: (1) "Students attend live online session"; (2) "We use Zoom.us to coordinate online meetings," and; (3) use of

"Simultaneous document editing" (unspecified). As a reminder, the synchronous online session was one of the opportunities for interaction for the five students observed in Phase I of the study.

To recap the final half (section 2) of the survey, peer collaboration activities, although occurring "rarely" (with a value of 2.31 out of 5) are deemed "somewhat" valuable (with an average of 3.3 out of 5), and "somewhat" feasible (3.03 out of 5) by educators in online course environments. Most of the additional comments regarding peer collaboration centered around the complexity of scheduling, monitoring, and managing these activities in an online educational setting.

Summary of survey findings. An overall summary of survey findings indicate that teachers place a fairly large value on academic discourse activities. However, numerous challenges to implementation of academic discourse activities within online learning environments were cited. Most challenges centered around student's lack of motivation, engagement, and participation. Other factors pointed to the difficult feat of scheduling and timing simultaneous discussions in the asynchronous environment. And yet, based on survey responses, educators believed that students participate a fair amount in academic discourse discussions in their online classes (Figure 12).
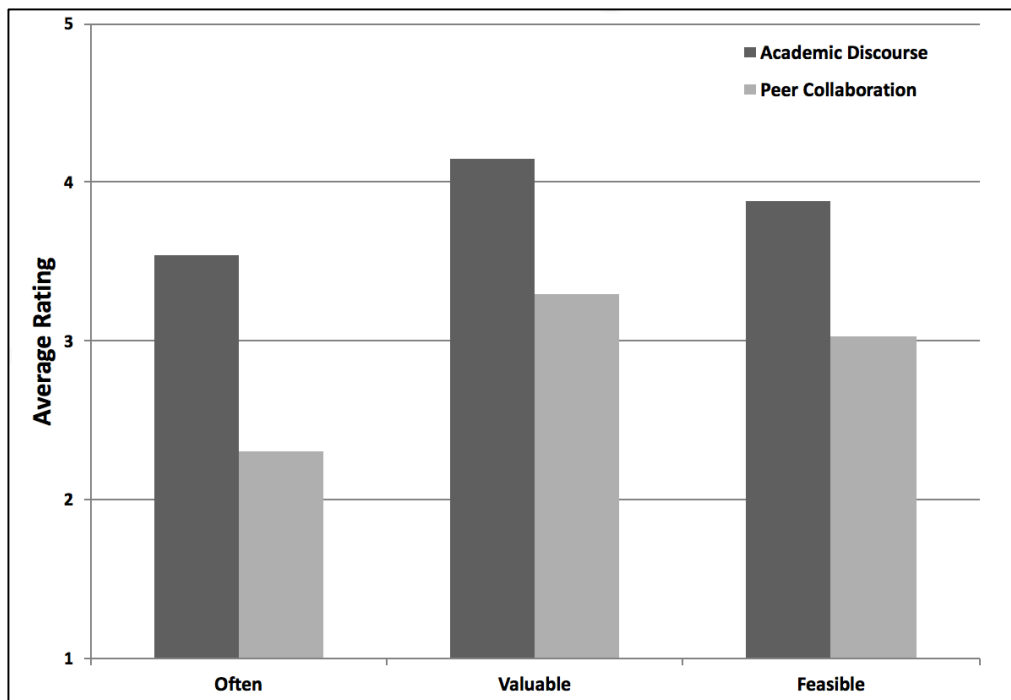
Figure 12. Summary of survey response mean scores (from 1-5 on a Likert scale) regarding the frequency, value, and feasibility of academic discourse and peer collaboration in online courses.

When juxtaposing survey responses regarding academic discourse against responses about peer collaboration, clear differences emerge. Surveyed educators were far less likely to deem peer collaboration valuable or feasible. Most admitted it happened rarely in online coursework, mostly due to feasibility issues. Challenges were abundant, including the fact that many students are "isolated" and working independently at their own pace. Creating and monitoring meaningful peer collaboration activities seem both unlikely and unfeasible for most online teachers. There were a few outliers, however, who believe peer collaboration is both essential and possible in online coursework.

In summary, findings from direct observation of five high school students engaging in online coursework indicate that they rarely, if ever, engage in peer collaboration and

academic discourse activities. Teacher perspectives (n=49), shared through an online

questionnaire, show that although these interactive activities are considered valuable and

feasible, there are numerous challenges to successful implementation in online learning

environments. A discussion in Chapter 5 will further develop the relationship between

observed interaction and surveyed teachers' perception of occurrence.

Chapter 5: Conclusions and Recommendations for the Field

Meaningful and purposeful interactions that occur through academic discourse and peer collaboration are often the key to students' successful understanding of course content. Moreover, well thought-out interactive activities encourage students to confront and listen to diverse viewpoints and improve their perspective taking, two essential 21st century skills. As online learning opportunities for K-12 students expand, one must question if these communicative exchanges (and state standards) are being addressed and met. This study targets these precise concerns in a threefold manner.

First, to determine how often students are engaging in curricular activities that support peer collaboration and academic discourse in online learning environments (RQ #1), five high school students were observed as they completed their typical online English coursework. Students were also queried about their participation in interactive activities between scheduled observations. The number of opportunities (both offered and utilized) for discourse or peer collaboration were tallied and categorized along multiple dimensions (participants, purpose of interaction, question/response type). Five separate synchronous lessons were observed and analyzed as well.

Secondly, to find out the extent to which online teachers perceive these activities to be valuable and feasible in online course environments (RQ # 2), Phase II of the study surveyed a sample of 49 online high school teachers and advisors from diverse online learning environments across the United States. These participants were asked to share their insight with regard to the value and feasibility of peer collaboration and academic discourse in online learning environments. Responses were tallied, with averages and

trends noted and analyzed.

Thirdly, to examine what online teachers and students cite as the specific affordances and constraints of implementing these curricular activities in online learning environments (RQ #3), the teacher survey included four open-ended questions, allowing for further explanation and insight into different types of interactive activities, the challenges, and the benefits. Student comments from the observation sessions, whereby they too shared their perspectives on the affordances and constraints of communicative endeavors, were added to this analyses. Qualitative descriptions were coded and themes were identified for further analysis.

Summary of Findings

Findings from this comprehensive study indicate that online educators *believe* academic discourse (and to a lesser extent peer collaborations) occur in high school online learning environments, but the reality is much different for students. In fact, students have little to no academic interaction whatsoever with their teachers and peers, instead simply reading their daily (static) online lessons and independently completing written homework assignments. Although one could foreseeably have an opportunity to engage with others through the discussion of work submitted, teacher feedback (if present at all) was rarely meaningful or personal. Overall, the cognitive complexity of prompts and interactions was low. For example, most questions were unidirectional (teacher to student) and of the closed response type (i.e., brief correct/incorrect responses) rather than asking students to reason, elaborate, or synthesize information.

Other options for engagement, such as conversing with others (via calls, texts, emails, or synchronous lessons, and group projects) simply did not occur for the majority of students. Overall, after 15 separate observations, just one student engaged in a dialogic conversation with his teacher (via phone call), while one other contacted the teacher for the answer to a brief question. Other than the few written feedback comments on various assignments over the course of the month-long observational period, three of the five participants never interacted with their online English teacher. None of the students engaged in any discourse with peers.

Alternative opportunities were afforded to students for interaction with others via different channels. One option for interacting with other online English teachers and peers included the opportunity to participate in weekly synchronous video chat lessons. None of the five students opted to take part in this activity. To note, this decision was not limited to the study's timeframe; None of the participants had joined in the course's synchronous lessons prior to the study, and all stated they would not participate in the future. Since these students primarily worked from home, perhaps they discussed academic content with their parents or siblings? When queried, all responded that they had not.

A final opportunity for academic discourse or peer collaboration included face-to-face interaction with on-site general advisory teachers and peers during study hall sessions at the participants' school. This mechanism for collaboration and discourse was also underutilized. Of the 172 hours of support offered to these online students within the observational time frame, just two participants attended for a total of 11 hours. Within

these 11 hours, students reported that they did not engage in academic discourse with the monitoring teachers or peers (instead utilizing personal laptops to complete online lessons independently). To compound the problem, these opportunities for face-to-face interaction were optional, allowing disengaged, reluctant, or busy students an easy out.

Responses from online educators via surveys presented a different picture. When teachers were asked about the occurrence of academic discourse in online environments, answers typically fell between "a moderate amount" to "a great deal." Just 17% of teachers reported that students "never" or "rarely" engaged in academic discourse. Thus there appears to be a clear disconnect between how often these teachers believe academic discourse occurs and how often it actually does.

Peer collaboration fared even worse. Over the course of one month, student participants had no interaction with peers. When queried, online educators agreed that engagement with peers does not occur often, with almost 70% answering that online student peer collaboration "never" or "rarely" happened. And yet, the remaining 30% of surveyed teachers thought that online students participated in peer collaboration at least "occasionally" or even "a great deal." Again, the survey results do not align with reality as witnessed by observing student behavior. Given that there was not one instance of peer collaboration among (or in the time between) the 15 observed lessons. Furthermore, all students reported that they did not participate in any collaborative endeavors in the months prior to the study. Most stated they were not interested in participating in the one collaborative (and optional) course assignment that included opportunities to interact with peers. The next logical question becomes, "Are these activities considered important?"

Can they be easily managed in an asynchronous environment?

Within online learning environments, educators believe that academic discourse is of greater value and more feasible than peer collaboration activities. To illustrate, on a scale of 1-5, with 1 indicating "not valuable/feasible" and 5 indicating "extremely valuable/feasible," surveyed teachers seem to value discursive activities (M=4.15) more so than peer collaboration (M=3.30). Similarly, educators determined that academic discourse was much more feasible (M=3.88) than peer collaboration (M=3.03) in online school courses. Although students were not formally asked these exact questions, their post-observation commentary reflected similar (albeit more dramatic) findings. All mentioned that they did not see any value in communicating with peers. None were able to articulate why it would be needed or desired for their coursework or education. Most of the students felt that the feedback on assignments was sufficient interaction with teachers. When discussing what they did when they needed help, responses varied from asking the teacher to looking online for help. None indicated that they valued academic discourse. All five students mentioned that any sort of interactive activity was an added inconvenience and thus not feasible.

Finally, to obtain additional insight into online course environments, participants were asked to describe specific affordances or constraints for implementing these curricular activities in online learning environments. Online teachers repeatedly mentioned that there are specific challenges to overcome for successful integration of meaningful interactive activities within remote and asynchronous online learning environments. The largest challenge cited by teachers regarding academic discourse

discussions and peer collaboration activities (cited in over 50% of the comments) was the lack of student participation. Observed student behavior offers support to this assumption – none of the students chose to interact with peers, and few took the time to contact or converse with teachers. Students claimed they were "too busy" or "didn't have to do" the interactive activities. The one mandatory discussion with the online teacher (approximately once per month) was put off or delayed by four of the five students.

The next largest challenge for teachers (which students appear to agree with) is the obstacle of timing and scheduling interactive activities. Both parties (students and teachers) agreed that various time zones, availability, individual student course pacing and progress made both synchronous and asynchronous communicative exchanges difficult. Teachers added that it took a lot of time to plan and conduct interactive activities.

Very few teachers commented on technical issues, but each student at one time or another reported that they weren't sure if their equipment was compatible with some of the interactive features of their online program. As a result, they opted out of some of the ideal opportunities to interact with teachers and peers. Finally, curricular issues arose as a problem for a handful of online teachers, with some mentioning that interactions would need to be listed as an academic goal on the course syllabus, which in turn would require explicitly stated guidelines and scoring rubrics.

A large number of online teachers took the time to confirm the value of communicative exchanges through extensive comments in the survey. Online educators mentioned that "connected" students were more motivated, more engaged, and more

successful academically. Several mentioned that it was beneficial for students to learn from others, supporting a sociocultural perspective on learning (Vygotsky, 1978). Student participants, however, were much less likely to mention the benefit of working with others – all but one mentioned that they prefer working alone.

Many educators further described the various affordances of interactive activity options and tools, such as Zoom conferencing, shared Google Documents, and synchronous lessons. Students showed the researcher various options for interaction within their online coursework (i.e., a peer collaboration assignment in the syllabus, a calendared schedule of the synchronous lessons, their online teacher contact information, and the location of homework feedback). Yet participation in the aforementioned activities (as well as on-site study hall sessions) was exceptionally low. The fact that students chose not to engage with others implies that it simply isn't valued.

Study Limitations

While findings reveal a troubling disconnect between best practices in education and reality as witnessed through direct observation of students in online learning environments, this study has several limitations. First, this study focuses on communicative interactions within online high school courses, and zeroes in on just two specific communicative activities: peer interaction and academic discourse. In addition, the study was somewhat limited in scope, with a relatively small student sample size. Students' academic grade point averages and socioeconomic status were not considered, and female students were underrepresented in the sample. Student observations were limited to grades 9-11, one content area (English), and do not include remedial or credit

recovery courses. Limitations are mitigated in part due to the fact that the student participants were enrolled in courses provided by a large corporate vendor. Their experiences are therefore assumed to be similar in structure, content, and instruction to other virtual schools utilizing similar courses. However, the experiences of these students (all enrolled at the same school) may differ from other online learners in differently-structured online environments (such as hybrid schools, or courses within districts that mandate specific requirements regarding interaction). For example, attendance for the on-site study hall was not mandatory for the participants, but may be required elsewhere.

Additionally, the student observations were limited to 15 one-on-one sessions combined with data from students' self-reported interactions between observational sessions. The students' fully online English course content, although varied according to grade level (and different instructors) was delivered by the same large corporate provider vendor. This vendor offers hundreds of courses to tens of thousands of students across the United States but may differ from other online vendor courses in content and/or requirements for interaction and discourse. Although vendor-provided courses vary, the observed sessions appeared very similar to other large corporate vendor courses: Observations that occurred as part of the pilot study and the interactive synchronous lessons were of courses offered through a different (but similarly large sized corporate) online course vendor/provider. Nevertheless, general findings and themes from both observational contexts were very similar. Therefore, it is reasonable to expect that the experience of these student participants is somewhat generalizable within similar online course environments.

Generalizability is also strengthened with the input from nearly 50 online educators and advisors to online high school students. Based on demographic survey questions and specific individual comments identifying their type of school (i.e., fully online, hybrid, state-sponsored, charter, corporate provider), these survey respondents represent diverse backgrounds and educational environments. Although the diversity of the sample helps to strengthen the validity of these findings, responses were limited to self-reports from educators working within online high school environments in the United States.

Implications

To recap, findings from the observational phase of the study indicate that students spend little to no time engaging in reciprocal academic discussions with teachers. Furthermore, students did not interact with peers and did not participate in activities involving peer collaboration. Instead, student participants primarily logged into their laptops and completed the static lessons or written homework assignments on their own, without reciprocal discussions with others. This type of isolated environment is of concern to many stakeholders, including online educators.

Findings from the online educator survey show that academic interactions are valued, but there are numerous hindrances to successful implementation in online learning environments. Still, teachers who successfully implemented these communicative activities were quick to write about the benefits, including improved student motivation, engagement, and academic prowess. As a result, many online teachers expressed frustration with the fact that students do not want to interact with others. One surveyed teacher said, "We have many students that are coming from bullying and other issues that

will not participate in peer collaboration. This is why they chose our online school." This response brings up some vital questions: Are online students inherently more likely to be disengaged than the traditional (seat-based, brick and mortar school) student? Are they selecting online courses so that they don't have to interact with others? If so, this obstacle of student isolation and disengagement is perhaps a larger hurdle to overcome than at first glance. This could be the reason why there were very few positive instances of peer collaboration activities mentioned by teachers on the survey.

Based on this study, one must ask whether it is possible for hundreds of thousands of online students to potentially graduate from high school with little to no interaction with others. If that is the case, how will that loss of interaction impact their future lives and the greater society? There can be no doubt amongst educational leaders that a key component of success in life is the ability to successfully interact with others. This is precisely why "communication" and "collaboration" are standards for Common Core English Language Arts (CCSS, 2017; see Appendix B), International Society of Technology in Education (ISTE, 2017, see Appendix C), and Partnership for 21st Century Learning (P21, 2007; see Appendix A). This uniquely human trait will grow in importance even as technology advances. The irony of the situation is this: As the increase in automated and purported "personalized" educational environments unfolds, the potential for a shortage of human interaction within those online learning platforms grows. For example, if a student clicks a wrong answer on a multiple choice online questionnaire, a personalized e-lesson can be "pushed" out to them to assist in understanding the concept. But does that form of instruction truly motivate, inspire, and engage the learner? As noted in Chapter 2, studies

indicate that a human presence to help guide and support students remains the gold standard.

To be certain, in the current study, there were a handful of opportunities for human communicative exchanges offered to participants within their online environment. Yet they weren't being sufficiently utilized. Teachers and students both reported that it was hard to connect with others in asynchronous courses. Students are often ascribed blame for the lack of interaction within online environments as many are clearly hesitant to participate. To illustrate, teachers cite "student lack of response" as their largest challenge. Post-observational discussions verified this, with numerous students admitting they do not want to interact with teachers or peers.

When there is an interest, or when circumstances demand interaction, the timing (scheduling, pacing) and effort to create interactive activities appears insurmountable. This "time constraints" obstacle was mentioned by online educators as the second greatest challenge. Once again, students agreed with teachers in declaring that it is hard to connect with others as pacing is different for each student, diverse time zones cause a hardship, and busy lives all make scheduling problematic. Teachers added that it requires a lot of effort for educators to find time to develop, schedule, and monitor interactive activities. In the end, it just doesn't happen as evidenced in the daily lesson plans and course requirements (or observed and reported reality). This mentality demonstrates the apathy and lack of cohesion surrounding requirements for communicative exchanges across numerous stakeholder groups; the teachers, course designers, district administration, and students.

Compounding the problem is the lack of importance online educators place on discursive or collaborative endeavors, particularly among student peer groups. As long as peer collaboration is undervalued, little effort will go into requiring it in online learning environments. How, then, will students learn to interact with others? How will they handle diverse viewpoints? How will they defend their position or successfully and empathetically challenge others? Based on this study, even academic discourse, deemed highly valuable among teachers, fails to occur regularly in online learning environments. All can agree that this specific pedagogical tool dramatically increases student knowledge, skills, engagement, and motivation. Yet it simply is not happening sufficiently in online high school environments. Nevertheless, it is largely unknown how this will affect students later in life as they transition to college or careers and are required to successfully collaborate with diverse others.

Practical Applications

Practical applications from this study's findings demonstrate the need for engagement from all stakeholders. First, it must be generally recognized that there is a problem of practice: Although best practices indicate that meaningful and purposeful interactions (such as academic discourse and collaboration with peers) improve educational outcomes, for the most part these practices are not observed or effectively integrated in online learning environments. Each semester, more and more students complete fully online coursework without academic interaction with others. There is an urgency for stakeholders to identify and address the problem.

Online content providers and schools, online educators, parents, and students must come to understand that participation in communicative exchanges with others must be a mandatory and critical piece of online learning. Instead of a small number of optional activities, it would be more preferable to promote students' appreciation for these activities by developing and implementing computer supported collaborative learning (CSCL) best practices to facilitate a shared learning environment. Engaging in academic discourse and peer collaboration should be a key part of learning, particularly in online environments, as this may be the only opportunity for students to discuss content, problem solve, interact, communicate face-to-face (F2F) in real time, socialize, and view diverse perspectives. Moreover, accountability measures can ensure implementation and a robust environment that motivates and encourages students to participate.

Next, participation must be structured in such a way that it is easy for students to participate. Ackoff (2008) raises a valid point that we cannot ask the "customer" (or student) to say what they want when they do not have the information and/or wisdom to know what they want and need. Online course providers must work to target state standards to the best of their ability. If collaboration is a standard, the impetus is on the course provider and teacher to demonstrate that students are collaborating. "Opting out" of communicative activities simply cannot be an option for any stakeholder. Interaction with teachers and peers must occur within the bounds of the course, utilizing proven academic discourse strategies instead of a series of simple open-ended questions, multiple choice clicks in static lessons, or homework worksheets. Online providers, course developers, schools, teachers, and students must band together and develop an agreed

upon standard of practice to improve academic student interaction, engagement, motivation, communication, and 21st century skills. Instead, far too often, online course providers are competing with one another to enroll more students while attempting to keep costs down (while subsequently earning millions of dollars in profit).

Students, in any online course, should be required to stretch out of their comfort zone and interact with others to pass a course. Being isolated from teachers and peers does not assist in the development of 21st century skills and the overarching goal of preparing students for success in life. Human interaction is a critical component of learning, and student-teacher/peer interaction often motivates students by giving them a voice and an opportunity to hear other perspectives. Teachers, as well, need to find a way to successfully navigate the obstacles such as time, scheduling, and apathy from students. Fortunately, there are ways to help in this endeavor. First, and most importantly, the student-teacher ratios must be lowered for online teachers as they are currently at least twice as high as traditional school student-teacher ratios (Miron, et al., 2018). Fewer students would allow more time for teachers to prepare activities, connect with students, develop relationships, and truly engage online learners. For example, teachers could create a small group of students who begin their studies together in a cohort model, where they get to know a few of their peers and work on academic projects together. There are several technological tools to assist in this endeavor, such as interactive (multimedia, collaborative) applications Flipgrid, Padlet, SeeSaw, or Voicethread.

Another recommended change would require all schools offering virtual courses to provide and mandate real-time course discussion and peer collaboration sessions. If a

student were unable to attend on site for these structured academic interactions, other options (preferably through Skype, Zoom, or a similar "real time" synchronous video feed) could be required. The use of video conferencing appears to be underutilized as a way to interact. Scheduling a brief 10-minute Google Hangouts, Skype, or Zoom conference with a small group of students would greatly expand opportunities for academic discourse. If technology does not support this F2F meeting in real time (i.e. limited access to Chromebooks), then the onus would be on the school or course vendor to provide technology that does work. At the very least, a 3-way phone conference with the teacher and another student would be extremely beneficial. In many ways, the failure of a student to participate could be viewed as an issue of attendance.

Instead of focusing on school growth or simply "passing the course" through content exams and homework, schools (particularly fully online schools) must shift their attention to the holistic development of students. The goal should be to increase competence and learning in order to succeed with sufficient 21st century skills. As mentioned previously, a paradigm shift is needed; All stakeholders are responsible for the current disengagement and isolation of online learners. Based on a preponderance of data and evidence, students need interaction with peers and teachers, particularly when they are not succeeding academically.

To ensure continuous improvement, one would be wise to follow the advice of Donella Meadows, "Stay wide awake, pay close attention, participate flat out, and respond to feedback" (Meadows, 2008, p. 170). This study's critical analysis of the online course environment system allows one to target specific areas of need: With the

addition of competent leadership strategies, positive changes can occur. Change is most likely to take hold through a strong network of partnerships, ironically often created and sustained through technology. Online coursework has the potential to accommodate a variety of needs while providing a flexible, robust, and engaging learning environment. Generating and developing partnerships with online students and families, the online course vendor/provider, the larger school system, outside leaders, and interested researchers will be critical to ongoing success.

Recommendations for Future Research

There is a large gap in educational studies targeting K-12th grade online learning environments (Barbour, 2017; Drysdale, et al., 2013; Kim & Pekrun, 2014). Therefore, there are an astoundingly large number of directions future research could take. For example, few researchers have taken time to directly observe online students conducting daily assignments, and the reality (as seen in this study) indicates that they are isolated and disengaged with teachers and peers. Therefore, structured observations should take place with larger populations and among various course subjects. Future studies could also look at specific subgroups to determine if there are substantial differences in the number and quality of online learning interactions. For example, ethnicity, gender, grade level, academic success, and socioeconomic factors all may play a part in the frequency of student communicative exchanges and could be fleshed out.

The same argument for isolating variables in future studies is true of online teachers as well: Are certain types of teachers more likely to engage with students? Years of teaching, educational attainment, mindset, student-teacher ratios, technological

capabilities, and location all may play a part in opportunities afforded to an educator's online students, but to what degree? Similarly, curriculum course content, the course designers/developers, and course providers are all factors worth considering. Do the course standards require interaction? How? Are some online providers more successful with implementation of academic discourse and peer collaboration activities?

More and more schools are opting for a hybrid-type program for online learners (Miron, et.al., 2018). In these environments, students are required to physically meet with others anywhere from 1-3 times per week. This type of environment forces students to engage with others, but does it increase higher-level interactions among teachers and peers (i.e., academic discourse and peer collaborations)? Moreover, an intervention study can measure the extent to which specific, purposeful, and meaningful opportunities to engage in discourse and collaboration increase student understanding and success. Furthermore, a multi-year longitudinal study of current online high school students would help determine if there is a connection between participation in meaningful interactive activities and improved success in college and career pursuits.

Conclusion

This particular study focuses on the interactive communicative exchanges in online learning environments. Prior research has shown, time and time again, that taking part in academic discourse and peer collaboration activities has a direct relationship to student success and the development of critical 21st century skills (Dietrichson, et al., 2017; Hattie, 2012; P21, 2017). This is not happening in online learning environments and changes are needed. But for any systematic change to take hold, a comprehensive

analysis of the system must be viewed. Connections between stakeholders and elements should be included, addressed, understood, and valued (Groff, 2013). This study's identification of malfunctions in the current online course environment system include lack of student participation; time constraints; technology glitches limiting or restricting access to interactive lessons; and course policy or practice (i.e., no requirements of interaction such as class discussions, F2F meetings, or peer collaborative activities).

In the end, those participating in online course environments must work harder to increase interaction among teachers and peers. This is a critical "Error of Omission" (Ackoff, 2008). Instead of the current situation (offering students a minimal number of optional opportunities to engage and communicate with others), there is an urgent need for stakeholders to understand the value of these skills. Solid principles of systems thinking and educational leadership, along with resources and tools, can help us better understand both school/environmental structure and behavior (Ackoff, 2008; Gerzon, 2006; Groff, 2013). There is hope for systematic improvement and long-term student success through shared ethical leadership, concern for student well-being, and improved course design and accountability measures. This depends on the courage to admit shortcomings, the courage to confront stakeholders, and the courage to change.

In conclusion, the current growth of online learning environments in secondary and elementary grade levels demand that we investigate the programs, the outcomes, the successes, and the failures. All stakeholders need to come to the table and acknowledge that we have a problem and begin the collective work of finding solutions. Currently, although technology affords numerous opportunities to connect with others, there is a

failure to see it fully utilized in online course environments. Academic discourse and peer collaboration should occur at a much higher level than currently observed in this study (and cited by online teachers). Online students desperately need "ample opportunities to take part in a variety of rich, structured conversations" (CCSS, 2017).

These interactive activities are critical and beneficial parts of student learning, yet undervalued and underutilized in online learning environments. We should all care that our students may not be sufficiently prepared for the 21st century, and we should take immediate action. As Goodwin exhorts, "Today's 'cyber youth' need, perhaps as never before, for us to show (and model) empathy, giving them something that's in increasingly short supply in their lives-a real human connection" (Goodwin, 2016, p. 83). As we look into the black box, we discover the inner workings of online learning environments. We find a reason and a means to create a vibrant online community of learners and it is within our grasp to design an environment that teaches, motivates, and inspires. Working together, we can provide every student a successful today to ensure a bright future for tomorrow.

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Appendix A. Framework for 21st Century Learning

Framework for 21st Century Learning

"Communication and Collaboration"

Communicate Clearly
- Articulate thoughts and ideas effectively using oral, written and nonverbal communication skills in a variety of forms and contexts
- Listen effectively to decipher meaning, including knowledge, values, attitudes and intentions
- Use communication for a range of purposes (e.g. to inform, instruct, motivate and persuade)
- Utilize multiple media and technologies, and know how to judge their effectiveness a priori as well as assess their impact
- Communicate effectively in diverse environments (including multi-lingual)

Collaborate with Others
- Demonstrate ability to work effectively and respectfully with diverse teams
- Exercise flexibility and willingness to be helpful in making necessary compromises to accomplish a common goal
- Assume shared responsibility for collaborative work, and value the individual contributions made by each team member

Partnership for 21st Century Learning. (2007). *Framework for 21st century learning.* Washington, DC. Retrieved from http://www.p21.org/our-work/p21-framework

Appendix B. Common Core State Standards

Common Core State Standards, 2017

English Language Arts Standards » Anchor Standards » College and Career Readiness Anchor Standards for Speaking and Listening

To build a foundation for college and career readiness, students must have ample opportunities to take part in a variety of rich, structured conversations—as part of a whole class, in small groups, and with a partner. Being productive members of these conversations requires that students contribute accurate, relevant information; respond to and develop what others have said; make comparisons and contrasts; and analyze and synthesize a multitude of ideas in various domains.

Comprehension and Collaboration:
CCSS.ELA-LITERACY.CCRA.SL.1
Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

Common Core State Standards Initiative. (2017). *English language-arts standards*. National Governors Association Center for Best Practices: Washington, DC. Retrieved from http://www.corestandards.org/ELA-Literacy/CCRA/SL/

Appendix C. ISTE Standards for Students

International Society of Technology in Education
Standards for Students

Standard 7. Global Collaborator

Students use digital tools to braoden their perspectives and enrich their learning by collaborating with others and working effectively in teams locally and globally.

Students:

a. use digital tools to connect with learners from a variety of backgrounds and cultures, engaging with them in ways that broaden mutual understanding and learning.

b. use collabortive technologies to work with others, including peers, experts, or community members, to examine issues and problems from multiple viewpoints.

c. contribute constructively to project teams, assuming various roles and responsibiliites to work effectively toward a common goal.

d. explore local and global issues and use collaborative technologies to work with others to investigate solutions.

International Society of Technology in Education. (2017). *Standards for students.* Retrieved from International Society of Technology in Education website: https://www.iste.org/standards/standards/for-students

Appendix D. Study Design Map

Title
"A Look Inside the Black Box: Understanding Communicative Exchanges in Online Learning Environments"

Problem of Practice: Online school environments are growing with little evidence that they teach key 21st century skills to all students. While best practices indicate that meaningful and purposeful interactions (such as discourse and collaboration with peers) improve educational outcomes, there are significant gaps in the literature to determine if these practices are observed and effectively integrated into online learning environments.

Purpose: Determine if 9th - 12th grade online learners are engaging in academic discourse and peer collaboration, two crucial 21st century skills. Find out *How and/or Why not?*

Goals

Spotlight 21st Century Learning Skills: (Communication & Collaboration)

Course design & pedagogical **changes** will positively impact and **improve** online learning and outcomes

Methods

Mixed methods:
*RQ1) Observations-*Qualitative + *Quantitative*
RQ2) Surveys Qualitative + *Quantitative*
RQ3) Surveys + observation *Qualitative*

Participants:
RQ1) 5 students (gr. 9-11 online English course)
RQ2) >45 online course teachers and advisors
RQ3) 5 students & > 45 teachers (online settings)

Research Questions

RQ 1-How often are students engaging in curricular activities that support peer collaboration and academic discourse in online learning environments?
RQ 2-To what extent do online teachers perceive these curricular activities to be valuable and feasible?
RQ 3-What do teachers and students cite as specific affordances or constraints of implementing these curricular activities in online learning environments?

Experimental data:
*Researcher's knowledge, background
*Experiences
*Pilot study

Conceptual Framework

Theoretical framework:
*Sociocultural Theory
*21st Century Skills Framework

Lit. Review:
*History/growth of online edu.
*Best practices
*Improving outcomes

Need for study: Fill a gap in research

Validity

Validity:
*Provide audit trail & evidence
*Address limitations/generalizability
*Member checks, triangulation

Appendix E. Observation Protocol and Instrument

Observation Protocol for Student Participants

Participants: Students (n=5) enrolled in a fully online grade 9-12 English course. Individual students will be observed completing online coursework for 30 minutes.

Physical Setting: Quiet location at the student's school to observe online student. Three individual 30-minute observations per student, 1 per week over a 1-month span. The researcher will sit adjacent to the student at a shared desk with the student's laptop in front of the child, visible to both.

Steps: Researcher will *establish rapport* by showing interest, and mentioning common ground. She will review consent/assent, with particular attention to rights to stop at any time. She will ask the student to work on their daily online English lesson as they would at home. At the end of 30 minutes, the researcher will ask if there were any interactions with others in the time between observations (or the week prior).

Data recording: Utilization of Observation Instrument (paper copies on clipboards) for all observation sessions. Researcher will also take field notes while on site using tally marks and written notes on binder paper. All instructional activities, questions, and interactions with teachers and peers will be noted, as will direct quotes from students.

Interactions to observe are shown in the observation instrument below.

Observation Instrument

Date/ Time		Location		Student ID		Reporter		Course Title		
	Type	**Type**	**Purpose**	**Purpose**	**Purpose**	**Response**	**Response**	**Response**	**Response**	**Commentary**
	Student-Peer	Student-Teacher	Organizational/ procedural	Social or motivational	Instructional	Closed	Explain/ justify	Elaborate/ reason	Synthesize/ create	

Appendix F. Consent and Assent

Agreement to Participate in Research

Parent Consent for Student Observation

Title of the study: Understanding Communicative Exchanges in Online Learning Environments

Researcher: Sara Douglas is a doctoral student under the direction of Dr. Slusser in the Educational Leadership (EDD) program at San José State University (SJSU). As part of her dissertation research she is conducting a study entitled, "*Understanding Communicative Exchanges in Online Learning Environments.*"

Purpose: The purpose of this study is to identify best practices within online high school education courses. This study is **not** designed to directly evaluate student performance, teacher effectiveness, or school achievement.

Procedures: If enrolled in this study, your child's participation in his/her regular online coursework will be observed over the course of three 30-minute sessions scheduled across three weeks. The researcher will observe your child completing online assignments, either at the student's home (with a parent present) or at school. Field notes will be taken during the observation and your child may be asked a series of follow up questions just after the observation session. Observations will not be audio or video recorded.

Potential risks: There are no foreseeable risks associated with participation in this study.

Potential benefits: Although there may be no direct benefit to you or your child, the possible benefits of participation include the opportunity to share their knowledge, opinions and experiences regarding online learning.

Compensation: Your child will receive a $20 gift card for their participation.

Confidentiality: Although results of this study may be published**,** no information that could identify participants, their families, or school will be included. All data will be kept secure in a locked file cabinet or password-encrypted computer accessible only by the researchers. Note, however, that the researchers are considered mandated reporters and must report evidence of any child experiencing abuse, neglect, or who intends to self-harm to appropriate authorities.

Participant rights: Participation in this effort is voluntary. Your child's time commitment will not exceed 3 hours over the course of 3 weeks.

Student participants and/or their parents can refuse to participate in the entire study or any part of the study without any negative effect on your relations with San José State University or your child's school. This consent form is not a contract. It is a written explanation of what will happen during the study if you decide to participate. Participants will not waive any rights if they choose not to participate, and there is no penalty for stopping participation in the study.

Questions or problems:
You are encouraged to ask questions at any time during this study.

- For further information about the study, please contact Sara Douglas at (cell #).
- Complaints about the research may be presented to Dr. Arnold Danzig, Ed.D. Department Chair, San Jose State University, One Washington Square, San Jose, CA 95192, phone (408) 924-3605.
- For questions about participants' rights or if you feel you have been harmed in any way by your participation in this study, please contact Dr. Pamela Stacks, Associate Vice President of the Office of Research, San Jose State University, at 408-924-2479

Parent/Guardian Signature
Your signature indicates that you voluntarily agree to allow your child to be part of the study, that the details of the study have been explained to you and your child, that you have been given time to read this document, and that your questions have been answered. You will be given a copy of this consent form, signed and dated by the researcher, to keep for your records.

_____   _____
   Name of Child or Minor   Parent or Guardian Name (Printed)

_____   _____   _____
Relationship to Child or Minor   Parent or Guardian Signature   Date

Researcher Statement
I certify that the participant has been given adequate time to learn about the study and ask questions. It is my opinion that the participant understands his/her rights and the purpose, risks, benefits, and procedures of the research and has voluntarily agreed to participate.

_____   _____
   Signature of Person Obtaining Informed Consent   Date

Title of the study: Understanding Communicative Exchanges in Online Learning Environments

Researcher: Sara Douglas is a doctoral student under the direction of Dr. Slusser in the Educational Leadership (EDD) program at San José State University (SJSU). As part of her dissertation research she is conducting a study entitled, "*Understanding Communicative Exchanges in Online Learning Environments.*"

Purpose: The purpose of this study is to identify best practices within online high school education courses. This study is **not** designed to directly evaluate student performance, teacher effectiveness, or school achievement.

Procedures: If enrolled in this study, your participation in your regular online coursework will be observed over the course of three 30-minute sessions scheduled across three weeks. The researcher will observe you completing online assignments, either at your home (with a parent present) or at school. Field notes will be taken during the observation and you may be asked a series of follow up questions just after the observation session. Observations will not be audio or video recorded.

Potential risks: There are no foreseeable risks associated with participation in this study.

Potential benefits: Although there may be no direct benefit to you, the possible benefits of participation include the opportunity to share your knowledge, opinions and experiences regarding online learning.

Compensation: You will receive a $20 gift card for your participation.

Confidentiality: Although results of this study may be published**,** no information that could identify participants, their families, or school will be included. All data will be kept secure in a locked file cabinet or password-encrypted computer accessible only by the researchers. Note, however, that the researchers are considered mandated reporters and must report evidence of any child experiencing abuse, neglect, or who intends to self-harm to appropriate authorities.

Participant rights: Participation in this effort is voluntary. Your time commitment will not exceed 3 hours over the course of 3 weeks.
Student participants and/or their parents can refuse to participate in the entire study or any part of the study without any negative effect on your relations with San José State University or your school. This consent form is not a contract. It is a written explanation of what will happen during the study if you decide to participate. Participants will not

waive any rights if they choose not to participate, and there is no penalty for stopping participation in the study.

Questions or problems:
You are encouraged to ask questions at any time during this study.
- For further information about the study, please contact Sara Douglas at (cell #).
- Complaints about the research may be presented to Dr. Arnold Danzig, Ed.D. Department Chair, San Jose State University, One Washington Square, San Jose, CA 95192, phone (408) 924-3605.
- For questions about participants' rights or if you feel you have been harmed in any way by your participation in this study, please contact Dr. Pamela Stacks, Associate Vice President of the Office of Research, San Jose State University, at 408-924-2479

Signature
Your signature indicates that you voluntarily agree to be part of the study, that the details of the study have been explained to you and your parent, that you have been given time to read this document, and that your questions have been answered. You will be given a copy of this consent form, signed and dated by the researcher, to keep for your records.

_____   _____   _____
       Participant 's Name   Participant's Signature   Date

Researcher Statement
I certify that the participant has been given adequate time to learn about the study and ask questions. It is my opinion that the participant understands his/her rights and the purpose, risks, benefits, and procedures of the research and has voluntarily agreed to participate.

_____   _____
      Signature of Person Obtaining Informed Consent   Date

Appendix G. Survey Instrument

◯ I agree to participate in the study. Continue to survey.

What is your primary role? *(check one)*

◯ Online Teacher (high school level, United States)

◯ Advisor/Coach (to online high school students in the United States)

◯ I do not work with online high school students in the United States*
   *If this selection is chosen, participants are thanked for their time and the survey ends.

What grade level(s) do you teach/advise? (*check all that apply*)

☐ 9th grade

☐ 10th grade

☐ 11th grade

☐ 12th grade

Which subjects do you currently teach or oversee online? (*check all that apply*)

☐ English /Language Arts

☐ Foreign Language

☐ Math

☐ Science

☐ Social Studies

☐ Visual/Performing Arts

☐ Other

Communication Focused on *Academics*

Please refer to the following definition of "academic discourse" as you consider the following questions.

Academic Discourse: A formal, reciprocal (back and forth) **discussion**, **conversation**, or **chat** (written or spoken) with another student or teacher that is **related to academic content** in a way that expands learning.

1. ***How often*** do students participate in academic discourse <u>in online courses</u>?

	never	rarely	occasionally	a moderate amount	a great deal
	○	○	○	○	

2. How ***valuable*** are interactive academic discourse activities <u>in online courses</u>?

	not valuable	slightly valuable	somewhat valuable	moderately valuable	extremely valuable
	○	○	○	○	○

3. How ***feasible*** are academic discourse activities <u>in online courses</u>?

	not feasible	slightly feasible	somewhat feasible	moderately feasible	extremely feasible
	○	○	○	○	○

4. What are the primary **challenges** associated *academic discourse activities* <u>in online courses</u>? _____

5. Further comments regarding types (and value of) *academic discourse activities* <u>in online courses</u>? _____

- -

Peer Collaboration

Please refer to the following definition of "peer collaboration" as you consider the following questions.

Peer Collaboration: Cooperatively interacting with another student (**working together**) in order to solve problems, **create** a product, or **learn** and master course content.

6. How *often* do students participate in peer collaboration <u>in online courses</u>?

	never	rarely	occasionally	a moderate amount	a great deal
	○	○	○	○	○

7. How *valuable* are interactive peer collaboration activities <u>in online courses</u>?

	not valuable	slightly valuable	somewhat valuable	moderately valuable	extremely valuable
	○	○	○	○	○

8. How *feasible* are peer collaboration activities <u>in online courses</u>?

	not feasible	slightly feasible	somewhat feasible	moderately feasible	extremely feasible
	○	○	○	○	○

9. What are the primary **challenges** associated with *peer collaboration activities* <u>in online courses</u>? _____

10. Further comments regarding types (and value of) *peer collaboration activities* <u>in online courses</u>? _____

- -

How many years have you been teaching/advising online students?

○ 0-2 years

○ 3-5 years

○ 6-10 years

○ 10+ years

Thank you for your valuable time and input!

Appendix H. Data Analysis Matrices

Matrix for notating responses to survey questions and student comments

	How often do students participate?	How valuable are activities in online courses?	How feasible are activities in online courses?	Comments
Academic Discourse Teacher responses				
Student responses				
Peer Collaboration Teacher responses				
Student responses				

Note: Used for data collection and analysis chart for frequency, value, and feasibility of academic discourse and peer collaboration in online learning environments

Matrix for notating researcher decisions (influenced by Miles, et al.)

Specific Data	Procedural Steps *What was done/why	Decision Rules *How data was sorted	Analysis *Data drawn	Conclusion confirmation	Researcher Comments (outliers, etc.)