

UNIVERSITY OF OKLAHOMA
GRADUATE COLLEGE

HOW TEACHERS AT OKLAHOMA VIRTUAL CHARTER ACADEMY ADDRESS
THE FIVE ELEMENTS OF COGNITIVE ENGAGEMENT:
AN INTERPRETIVIST CASE STUDY

A DISSERTATION
SUBMITTED TO THE GRADUATE FACULTY
in partial fulfillment of the requirements for the
Degree of
DOCTOR OF PHILOSOPHY

By

JOHN DALTRY MORRISON
Norman, Oklahoma
2017

HOW TEACHERS AT OKLAHOMA VIRTUAL CHARTER ACADEMY ADDRESS
THE FIVE ELEMENTS OF COGNITIVE ENGAGEMENT:
AN INTERPTRETIVIST CASE STUDY

A DISSERTATION APPROVED FOR THE
DEPARTMENT OF EDUCATIONAL LEADERSHIP AND POLICY STUDIES

BY

Dr. Hollie Mackey

Dr. Neil Houser

Dr. Angela Urick

Dr. Kathrine Gutierrez

Dr. Jeffrey Maiden

© Copyright by JOHN DALTRY MORRISON 2017
All Rights Reserved

Dedication

This dissertation is dedicated to my grandmother, Naomi Morrison, who passed away this year. I am eternally grateful for her willingness to take me in at a young age and raise me as her own.

Acknowledgments

This doctoral study would not have been possible without the assistance, guidance, and support of others.

- To my wife Heather, thank you for your belief in me and the incredible patience over the last several years.
- To my daughters Avery and Ally, thank you for your love and willingness to let me write on so many weekends.
- To my committee chair Dr. Hollie Mackey, thank you for not giving up on me when I turned in draft after draft over the years. Your suggestions, guidance, and red pen directly made this possible.
- To my committee members, thank you for your encouragement and patience.

Table of Contents

Acknowledgements.....	iv
Abstract.....	xi
Chapter 1: INTRODUCTION.....	1
Background.....	1
Statement of the Problem.....	3
Theoretical Framework.....	6
Research Question.....	8
Significance of the Study.....	9
Research Purpose.....	9
Chapter 2: LITERATURE SITUATING THE STUDY.....	11
Academic Engagement.....	11
Cognitive Engagement.....	13
Practice.....	14
Study.....	15
Solving Problems.....	16
Analyze.....	17
Feedback.....	18
Intentional Instructional Strategies.....	19

Full-Time Virtual Schools.....	23
Virtual School Classrooms.....	24
Community of Inquiry Model (CoI).....	25
Similar Studies.....	28
Chapter 3: METHODOLOGY.....	33
Case Study.....	33
Participants.....	33
Methods.....	35
Data Collection.....	37
Audio-Visual Observations.....	37
Interviews.....	38
Limitations.....	40
Potential Threats to Internal and External Validity.....	41
Trustworthiness.....	41
Chapter 4: FINDINGS.....	44
Defining Cognitive Engagement.....	44
Student-Centered Responses vs. Teacher-Centered Responses.....	45
Teacher Perceptions vs. Teacher Actions.....	46

Feedback.....	47
Teacher Perceptions of Facilitating Feedback.....	47
Observations of Teachers Facilitating Feedback.....	51
Solve Problems.....	54
Teacher Perceptions of Facilitating Problem Solving.....	54
Observations of Teachers Facilitating Problem Solving.....	58
Analyze.....	61
Teacher Perceptions of Facilitating Analyzation.....	61
Observations of Teachers Facilitating Analyzation.....	64
Study.....	66
Teacher Perceptions of Facilitating Study.....	66
Observations of Teachers Facilitating Study.....	71
Practice.....	72
Teacher Perceptions of Facilitating Practice.....	72
Observations of Teachers Facilitating Practice.....	75
Chapter 5: DISCUSSION.....	77
Concerns and Questions.....	78
Differences in Class Purpose.....	79

Improving Use of Instructional Minutes.....	79
Definitions of Participation.....	80
Perceived Lack of Social Engagement.....	80
Face-to-Face.....	81
Fear of Failure.....	81
Perceptions of State Standard Rigor.....	82
Response Time.....	84
Student Autonomy.....	85
Teacher Confidence.....	86
Unclear Lesson Goals.....	87
Simplifying Content.....	87
Teacher Perceptions of Existing Study Habits.....	89
Student Engagement Important to OVCA.....	89
Teaching Presence.....	91
College Preparation.....	92
Excuses.....	93
OVCA vs. Other Oklahoma Online Schools.....	94
References.....	99

APPENDICES

A. Interview Questions.....	123
B. Depth of Knowledge (DOK) Levels.....	125
C. Example of a Lesson Slide.....	126
D. Blackboard Collaborate Participants Tab.....	127
E. Example of Discussion Slide.....	128
F. Example of a Multiple Choice Question Slide.....	129
G. Levels of Mastery Verbs Chart.....	130
H. Flip Chart.....	131
I. Critical Thinking Skills Resource.....	132
J. Example of Lesson Goals Slide.....	133

List of Figures

Figure 1. Academic Engagement.....	12
Figure 2. Five Elements of Cognitive Engagement.....	14
Figure 3. Elements of an Educational Experience.....	25
Figure 4. Where Feedback Happens Based on Subject Area.....	52

Abstract

This qualitative case study examines teacher perceptions of how they cognitively engage their students in live online classes to determine the perceptions and practices of ten teachers at Oklahoma Virtual Charter Academy. Data was collected from teacher interviews and observation notes of live classes. Findings of this study revealed that teachers at Oklahoma Virtual Charter Academy value student engagement, but struggle when implementing strategies that prompt students to cognitively engage with material. Recommendations include addressing teacher assumptions about students' learning preferences and assessing students' perceptions about student engagement.

Chapter 1: Introduction

Background

A recent report revealed that more than half of all U.S. secondary schools have adopted an online learning model to service their students (Watson & Gemin, 2008). The International Association for K-12 Online Learning (iNACOL) estimates there were 1,816,400 enrollments in distance-education courses in K-12 school districts in 2009-2010, and 74% of those enrollments were in high schools. Online courses with the highest level of enrollment fall under the categories of credit recovery (62%), dual enrollment (47%), and advanced placement (29%), and as of 2012-2013 the number of students enrolled solely in an online curriculum has grown to 310,000. The International Association for K-12 Online Learning (iNACOL) suggests that the top reasons school districts make online learning opportunities available to their students are to offer courses not otherwise available and provide opportunities for students to recover course credits. Credit recovery is especially important in urban environments where 81% of schools indicate this is an issue. Credit recovery, dual enrollment, and advanced placement are typically what we think of when we hear the words virtual or online education.

Despite the increasing number of enrollments in online courses, these courses may not successfully meet students' needs. Research suggests that students drop out of online courses primarily because of either technological problems or feelings of isolation and disconnectedness (Bocchi, Eastman, & Swift, 2004; Frankola, 2001; Santovec, 2004; Willging & Johnson, 2004). Bernard (2004) completed a meta-analysis of 232 studies looking at retention and found that students typically prefer classroom

instruction over distance education. The implication is that students were more prone to dropping out of online classes over brick and mortar classes. Both the Bocchi et al. (2004) and Bernard (2004) findings address the issues of isolation and disconnectedness and suggest that online schools develop policies that encourage building community among students. Additionally, they suggest that teachers and school leaders be aware of the types of students they serve. K12, Inc., one of the largest virtual school networks in America, recognized this and e posted an abstract of the common characteristics of online learners on their website. It identified four characteristics socially healthy students possess: responsibility, self-control, assertion, and cooperation (Sivin-Kachala, 2009). Each characteristic consisted of behaviors a student would need to adopt to succeed in an online environment. Examples include communicating with adults, compromising, asking others for assistance, and sharing materials (Sivin-Kachala, 2009).

Full-time virtual schools like Oklahoma Virtual Charter Academy (a K12, Inc. school) have become appealing to more than just one or two demographics regardless of what the NEPC study found. However, interest and actual enrollment are not the same thing. Students who desire a self-paced approach fit nicely in online courses and advanced students are provided an opportunity to accelerate their education to suit their own goals (Blazer, 2009). However, the typical enrolled virtual school student generally falls into the following categories; needing remediation, late enrollee, transient, needing to repeat a class, summer school, needing one-on-one support, or a student who has fallen behind for any reason (Bonner, 2008; Tucker, 2007; Wisconsin Virtual School, 2008).

Statement of the Problem

Student disengagement is a problem at Oklahoma Virtual Charter Academy. Studying teachers' perceptions of student engagement may provide school leaders insight into ways in which teachers conceptualize student engagement and provide opportunities for professional development supporting strategies. Student engagement is necessary if schools want to address issues associated with isolation and disconnectedness in the online learning environment. Engagement literature may have found its roots in the burnout literature of the 1970's (Freudenberger, 1974; Maslach 1976). Maslach's original studies centered on staff burnout and he later adapted it to involve students (Maslach, Schaufeli, & Leiter, 2001). His definition of burnout shares similarities with that of disengagement when it mentions a student's reluctance to study (Schaufeli, Martinez, Marques-Pinto, Salanova, & Bakker, 2002). The problem of student cognitive disengagement in school first appeared in the 1980's when researchers studied the internal organization and culture of hundreds of high schools (Cusick, 1983; Goodlad, 1984; Oakes, 1985; Powell, Farrar, & Cohen, 1985; Sedlak, Wheeler, Pullin, & Cusick, 1986; Sizer, 1984). Academic engagement is often cited as the most important component in student achievement in both traditional schools (brick and mortar) and online schools (Claxton, 2007; Gilbert, 2007; Prensky, 2001; Tapscott, 1998; Willms, 2003). The engagement premise supposes that if a student studies a subject more they will learn more (Wong, 2015). Though it may seem obvious, it is important to note that the opposite is also true – students who study less tend to learn less.

Simply stated, student academic engagement leads to higher achievement (Hughes & Chen, 2011; Roorda et al., 2011; Spilt, Koomen & Thijs, 2011). Therefore, lack of student engagement leads to lower achievement. However, this does not suggest that student disengagement is the direct opposite of student engagement. Student engagement is multi-faceted and cannot be narrowed down to one specific reason a student appears to be disengaged. Angela Duckworth's (2007) research on grit suggests that students need to develop long-term goals and stick with them to the end, regardless of how uninteresting the process may be. Carol Dweck (2006) argues engagement is a mindset issue that students have developed over the course of their lives that determines interest based on past outcomes. Daniel Pink (2009) posits the students are not given the opportunity to demonstrate autonomy or mastery in the classroom and therefore lose interest. All three of these need to be examined in order to gain knowledge pertaining to students' disengagement.

The problem of disengagement is one that teachers and administrators at Oklahoma Virtual Charter Academy are desperately trying to solve as they implement various policies and programs to increase interaction activities within their live-streamed classes. Professional development on instructional coaching, grit, and motivation have shown some positive results as teachers experiment with differentiated instruction at a higher rate than previously assumed. Based on Kuh's (2003) definition, the disengaged student in this setting will be one who 1) fails to attend live-streamed classes regularly, 2) fails to consistently complete coursework, and 3) fails to respond to communication from their instructors. A recent, unofficial, poll of teachers at OVCA revealed that they feel over 50% of their students meet each of the above criteria.

This same unofficial poll revealed that teachers have heard students say they missed the social situations of traditional school. The lack of social interaction is a disadvantage to online learning (Cook, 2007) and looking at online students with that in mind may cause teachers to care more about how the students are doing personally than how they are doing academically (Galla, 2014). This regulation is important, however, as online learners have immediate access to a host of distracting websites during a live instructional session. Live-streamed classes often provide the only opportunity for social interaction a student may have during the school day. This suggests that the teacher-student relationship is crucial to a student's success in virtual school.

The common perception of a student enrolled in an online secondary school typically suggests the student is older than his peers, has a full-time job, may have started a family, and/or has a history of struggling as a learner (Colorado, 2010). This perception is so common that many teachers who apply for positions at OVCA mention it during their interviews. The student demographic of OVCA was not observed or analyzed for this study, but it was noted indirectly during many of my interviews with teachers. This perception is problematic in that many teachers have predetermined how they will address students before they have an initial interaction with them. This can obviously affect the teacher-student relationship in a number of ways.

The teacher-student relationship is universally understood to be a meaningful component of the learning environment. The effects of this relationship are broad, but student engagement is undeniably affected either positively or negatively (Hughes & Chen, 2011; Roorda et al., 2011; Spilt, Koomen & Thijs, 2011). When teachers are positive and supportive, students feel a sense of school belonging and tend to participate

more in student-driven activities (Hughes & Chen, 2011). Every good teacher, conscientiously or non-conscientiously, strives to develop and maintain a quality learning environment where high levels of support for learning are present (NSW DET, 2003).

This study examined student cognitive engagement and teachers' perceptions of effective online teaching. Cognitive engagement is one of three characteristics of academic engagement according to the Community of Inquiry Model (CoI), the conceptual framework used for this study. Each characteristic – cognitive, behavioral, and social – is important, but cognitive is most closely associated with a teacher's instructional approach. This characteristic of academic engagement suggests that students should demonstrate willingness to study a subject, practice, obtain feedback, analyze, and solve problems (Bigatel & Williams, 2015). Teachers were asked how they prompt this willingness at Oklahoma Virtual Charter Academy in an effort to identify what virtual school teachers do to address the problem of low student cognitive engagement.

While this study is limited to this space, the discussion is broad as credit recovery and online education has expanded exponentially across the nation. Cognitive engagement is critical for successful completion and school leaders are facing more pressure now than ever when it comes to passing rates and student retention.

Theoretical Framework

Symbolic interactionism suited this study. This perspective can be seen in the works of George Herbert Mead (1908/1909; 1913; 1967). There are three primary tenets to this perspective. First, humans act toward things in a way that is determined

by their created meanings of those things. Second, their created meaning of those things is developed by the social interactions they have had with their peers. Last, those things are modified through an interpretive process by the person doing the original creation of meaning. Symbolic interactionism was appropriate to my study because I wanted to observe the process of teachers' perceptions of how they cognitively engage their students.

Denzin and Lincoln (1994) suggest that there are seven epistemological characteristics that make up symbolic interaction theory: general theories are not useful, local understanding is important, objectivity and quantification are not desirable, imported theories from the natural sciences are not desirable, ahistorical theories are inadequate, theories that ignore individuals miss much, and an emphasis on asking "how" questions instead of "why" questions.

There are two epistemological characteristics of symbolic interaction theory that served this study most appropriately: "how" versus "why" questions and that local understanding is important. While conducting observations, I was mindful of how the teacher was interacting with the student. As I interviewed, I asked the teacher how questions about perceptions pertaining to her interaction with students. Local understanding suggests that teachers at Oklahoma Virtual Academy, especially experienced ones, recognize tendencies and trends at their school better than someone not a part of their community.

The Community of Inquiry (CoI) Model is used most frequently in online education research (Lee, 2013). There are three indicators that, when all present, create this community: readiness to reason, mutual respect, and an absence of indoctrination

(Lipman, Sharp, & Oscanyan, 1980). Each of these play a part in the three elements of an educational experience. However, one of those elements (cognitive presence) is more relevant to this study as it is where the majority of learning occurs (Garrison, 2000). Being mindful of both the CoI model and the seven epistemological characteristics of symbolic interaction theory not only framed this study but kept it grounded as well. It should be noted the Community of Inquiry Model is just one of many models and frameworks used when researching cognitive engagement. It was chosen for this study because it seemed to be most relevant to online education.

The three assumptions - readiness to reason, mutual respect, and an absence of indoctrination – observed by Lipman, Sharp, and Oscanyan (1980) provided a lens for the methods section of this study. It was important to determine if the teachers perceived their students as *ready to reason*. Readiness to reason is most closely associated with a student's willingness to engage in all five elements of cognitive engagement (practice, study, analyze, solving problems, and feedback) identified by Corno and Mandinach (1983). I also looked for evidence of mutual respect between teacher and student as it affects one of the elements of cognitive engagement (feedback).

Research Question

This study was comprised of observations of the five elements of cognitive engagement and examined how teachers in an online school in Oklahoma address each. The case study approach focused on secondary school as there is an urgency to discover the causes of dropout at that level in that setting. Thus, the following research question was developed:

How are teachers at Oklahoma Virtual Charter Academy High School addressing the five elements of cognitive engagement?

This question was answered primarily through interviews, observations, and audio-visual materials.

Significance of the Study

To date, there are very few studies that address academic engagement in virtual schools. This study will add to the literature and prompt a discussion about the importance of cognitive engagement in an online setting. By keeping the focus concise, instructional strategies that address all five elements of cognitive engagement can be identified. Additionally, the findings can be utilized by educational leaders as they determine how their teachers define and perceive their own instructional strategies. Professional development, webinars, workshops, and PLC's can be built around the results of this study.

Research Purpose

The purpose of this study is to identify how teachers at Oklahoma Virtual Charter Academy High School believe they cognitively engage their students. This contributes to the field of educational leadership and policy studies by 1) examining virtual school teacher instructional practices and perceptions to strengthen instructional leadership, 2) prompting a research-based discussion about the problem of academic disengagement in both traditional (brick and mortar) and virtual schools, and 3) adding to the literature surrounding the Community of Inquiry (CoI) Model. Further, it fills a gap in the scant literature about cognitive engagement in virtual schools.

Conclusion

This study seeks to understand teachers' perceptions of academic engagement and how they cognitively engage students in their live classes. This chapter introduced the exponential growth in online education in recent years and the issues virtual schools face when it comes to student disengagement. This chapter also argued how symbolic interactionism is the most relevant theoretical framework for this study. In the following literature review, topics related to student engagement including academic engagement, intentional instructional strategies, cognitive skills, active learning, self-control and motivation, and the Community of Inquiry Model are discussed in greater detail.

Chapter 2: Literature Situating the Study

Academic Engagement

There is disagreement about what comprises engagement (Harris, 2008) and the lack of a concise definition complicates its measurement (Parsons & Taylor, 2011). Many agree, however, that engagement generally falls into three categories: behavioral, cognitive, and emotional (Fredricks, Blumenfeld, & Paris, 2004; Gibbs & Poskitt, 2010) (Figure 1). For the purposes of this study, engagement is defined as a student's involvement with school (Finn, 1989, 1993); a student's "psychological investment in and effort directed toward learning, understanding, or mastering the knowledge, skills, or crafts that academic work is intended to promote" (Newmann, Wehlage, & Lamborn, 1992, p. 12); and their interest and emotional involvement with teachers and peers as well as their motivation to learn (Steinberg, 1996). More specifically, cognitive engagement is measured by the time and physical energy students expend on activities in their academic experience (Kuh, 2003) and their willingness to study, practice, obtain feedback, analyze, and solve problems (Bigatel & Williams, 2015) (Figure 2). This definition provides a framework for examining various engagement strategies and what classrooms look like in the virtual sense.

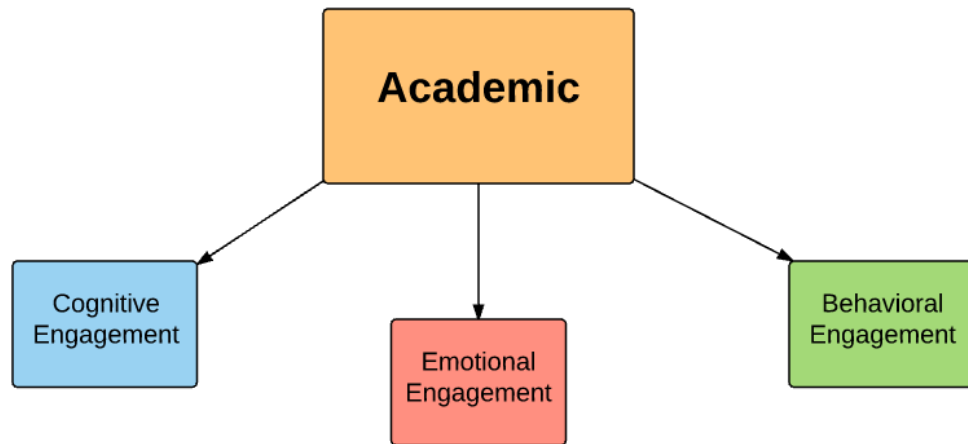


Figure 1. Academic Engagement. This figure illustrates that Academic Engagement is made up of three different elements: cognitive, emotional, and behavioral.

Literature on effort tends to run parallel with motivation and self-efficacy literature (Beaubier, 2012; Imhof, 2013; Joyce, 2007; LaSalle, 2015; Liu, 2005; Matovu, 2014). This is important because motivation and confidence (Garcia, 2014) can affect a student's engagement. Other areas connected to cognitive engagement are culture (Daniels, 2011), autonomy supportive teachers (Hofferber, 2014), mind mapping (Wilson, 2016), learning communities (Wilmer, 2009), music (Choi, 2005), and, most importantly, differentiated instruction (Subban, 2006).

Practices that undermine motivation seem to cause a drop in student engagement (Dolezal, 2003). Motivation, as Pink (2009) points out, can be broken down into three elements: autonomy, mastery, and purpose. These elements, when complimented by instruction that produce high engagement and achievement, can potentially foster what Dweck (2006) calls a growth mindset. However, instruction that consistently produces high engagement and achievement is complex. Skills instruction and holistic experiences are present in engaging classrooms (Dolezal, 2003) as well as cooperative

learning, holding students accountable for performance, scaffolding student learning, making cross cross-curricular connections, positive framing, student choice, and making the classroom fun (Baker, Afflerbach, & Reinking, 1996; Baker, Dreher, & Guthrie, 2000; Nicholls, 1989; Noddings, 1984; Pintrich & Schunk, 1996; Renninger, Hidi, & Krapp, 1992; Stipek, 2001; Verhoeven & Snow, 2001). Additionally, teachers who wish to make content interesting, challenging, and game-oriented find higher student engagement than those who simply deliver content (Bogner, 2002). As teachers develop and/or implement these instructional approaches there is a need to identify how students are being engaged cognitively.

Cognitive Engagement

Cognitive engagement is the centerpiece of this study. First coined by Corno and Mandinach (1983), cognitive engagement refers not only to the five elements previously listed (study, practice, obtain feedback, analyze, and solve problems) but also to the amount and quality of effort students commit to their academic expectations. The five elements will be discussed in more detail in the sections that follow. Figure 2 illustrates the five elements of cognitive engagement.

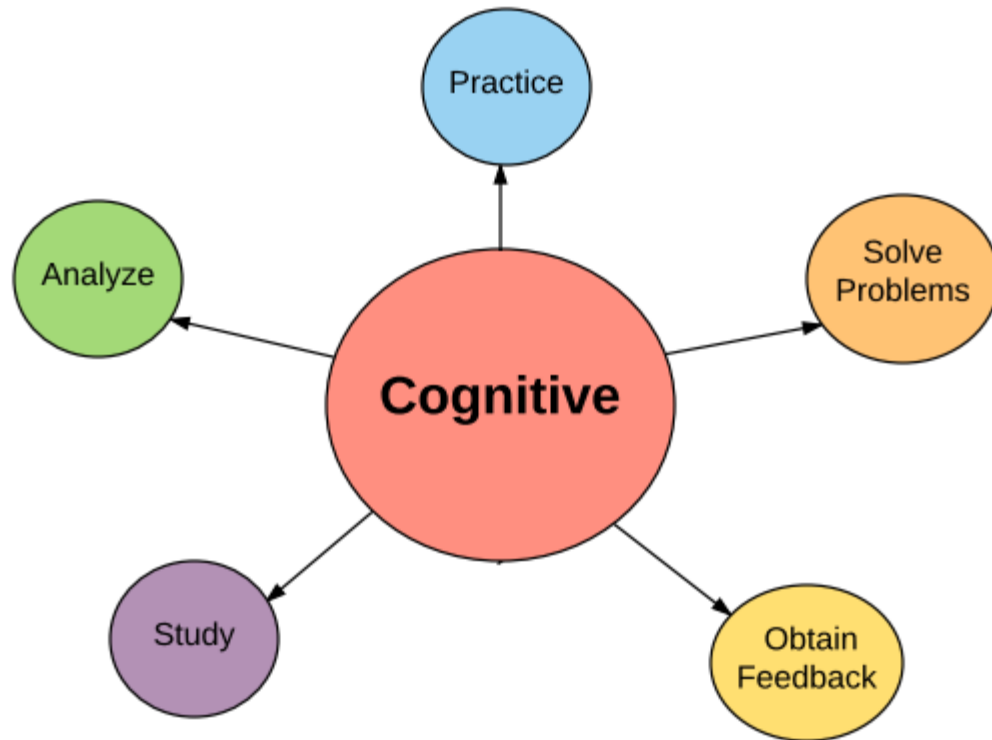


Figure 2. Five Elements of Cognitive Engagement. This figure illustrates how cognitive engagement consists of five different elements: study, obtain feedback, practice, analyze, and solve problems.

Practice

Some practice literature suggests that students should be persistent and be willing to ask for help (Singh, 2015). Duckworth's grit research shows students with a hyper-focus on persistence, which makes sense in the participants of her study (i.e. individuals working on personal goals). There is evidence that veterans of a system are often the most helpful to new learners. When a student is practicing new knowledge it is important that they reach out to someone who can relate to their struggle. Mackness (2013) observed this in a study of a massive open online course (MOOC) where veteran MOOC users served as role models and guides for novice users.

Student practice and study habits are integral to their success in any school, traditional or virtual. Odiri (2015) observed a significant relationship between students' study habits and their math assessment scores. He also found a significant difference in math achievement among students who either adopted good or poor study habits. Bilge (2014) found that students with good study habits also had high school engagement levels and low cynicism levels. Cynicism is important because it can negatively affect a student's willingness to study, practice, analyze, solve problems, and/or obtain feedback. Bilge suggests that students who were not overly cynical may have had more success in their school history and more positive academic experiences than those were highly cynical.

Students who are not overly cynical tend to value deliberate practice. Deliberate practice is different than practice as it emphasizes practice as a training activity. It is an act of "engaging in a focused, typically planned training activity designed to improve some aspect of performance" (Duckworth, 2011, p. 174). Deliberate practice has been found to correlate with world-class performers (Ericsson, 2006, 2007, 2009; Ericsson, Krampe, & Tesch-Römer, 1993; Ericsson & Ward, 2007). Duckworth (2011) observed and interviewed competitors at a National Spelling Bee and found that students who spent the majority of their time in deliberate practice performed at a higher level in the competition than those who preferred being quizzed by others or reading for pleasure.

Study

Owen (2010) found that students entering college are much more likely to drop out if they are unable to follow a research process, search for information, and evaluate and use appropriate information. Material that students are being asked to study today

has become more demanding and sophisticated than it was ten years ago (Glen, 2011). It is vital that teachers understand this as they develop and implement instructional strategies with cognitive engagement in mind.

Study and homework share commonalities for this study. Research on homework is dense (Bloom, 1984; Cooper, 1989, 2006; Fraser, 1987; Graue, Weinstein, & Walberg, 1983; Hattie, 1992; Paschal, Weinstein, & Walberg, 1984; Walberg, 1999) and universally suggests there is an 8 to 31 percentile gain in student achievement if done correctly. “Done correctly” means it should be structured in a way that suggests the students can complete it. It should also have a well-articulated purpose and relate specifically to previously-identified learning targets. Lastly, it should be designed so that each student can work on it independently with room to involve parents where needed (Marzano, 2007).

Solving Problems

Solving problems is no less important than study habits and practice skills. It is recognized as more than just an important academic skill. It is a life skill. Specific correlations between the role of cognition and problem solving have been made (Ibrahim & Rebello, 2013; Kohl & Finklestein, 2006; Cock, 2012). Efforts to illuminate connections between cognitive activities and problem solving have been made for quite some time (Bodner & Domin, 2000; Hu & Rebello, 2014; Malone, 2007) but little detail has emerged, suggesting it is still relatively unclear why some students are able to learn better via problem solving than others. Karatas and Kaki (2013) implemented a quasi-experimental design where students in two groups were instructed differently. The experimental group received instruction in a problem solving based

learning environment while the other group continued their traditional program of learning. Their findings suggest that when students have access to and are placed in a problem solving based learning environment they are better prepared to succeed in problem solving activities. The control group showed no significant gains.

Flexible problem-solving skills seem to be critical in STEM fields. The concept of flexible problem-solving skills refers to mindfully working through problems without having to stick to rigid textbook-like steps. Results from Guerra & Lim's (2014) study of Latina students suggest that participants struggled to translate their thinking into pre-determined algebraic structures, but when they were asked how they solved problems they were able to explain their reasoning well enough to indicate they understood necessary steps. The participants discussed how much they appreciated their teacher's emphasis on working through creative strategies to solve problems.

Analyze

Literature on analyzing skills is closely related to the critical thinking literature because when a student is cultivating critical thinking skills, they are purposefully reflecting and analyzing (Noyelles & Reyes-Foster, 2015). Analyzing, and therefore critical thinking, can be defined broadly in five different ways. First, it can be considered "the correct assessment of statement" (Ennis, 1962, p. 81). Next, it can be defined as calling into question pervasively held assumptions and reacting differently to those assumptions once they have been challenged (Brookfield, 1987). Third, critical thinking can be defined through student reflection about learning and making decisions based on those reflection (Ennis, 1987). Fourth, it can refer to a student's capacity to identify, asses, and make arguments (Tsui, 2002). Lastly, Waggoner (2014, p. 40)

defines critical thinking as “not only an act of following the rules of logic; it is also both an act and attitude of rebellion.”

An important component of analyzing relies on discussion. It is assumed that discussion is used to prompt students to think and engaged collaboratively.

Unfortunately, several studies suggest that online discussions do not stimulate critical thinking at a high level (Cleveland-Innes & Campbell 2012; Darabi, Arrastia, Nelson, Cornille, & Liang, 2011; Lee, 2014). However, there is some evidence that students appreciate opportunities to collaborate with peers via discussion forums (Szabo & Schwartz, 2011). It is important to note that many of these studies define online school as a primarily asynchronous activity which does not characterize all online learning experiences.

Feedback

The last element of cognitive engagement refers to the student’s willingness to obtain feedback. Ozden (2004) found that students appreciated computer-assisted assessments (CAA) primarily because of four areas: immediate feedback, randomized question order, item analysis of the questions, and obtaining scores immediately after an exam. Immediacy seems to be a common component of effective feedback. Leibold & Schwarz (2015) advise feedback be prompt, frequent, personalized, detailed, clear, specific and balanced. If feedback is provided this way the teacher can positively guide the student’s development. Additionally, feedback can develop and nurture teacher-student relationships (Fonseca, Carvalho, Conboy, Valente, Gama, Salema, & Fluza, 2015).

The relationship between students and teachers is critical in order for feedback to be beneficial. Teachers will often assign themselves the encourager role when it comes to feedback. Conversely, students often perceive this role as non-directive or passive. Korver & Tillema (2014) found that students often prefer one of two different feedback roles from their instructors: imperator (prescriptive/directive) or initiator (non-directive/stimulating).

Academic feedback can be defined as an objective description of a student's work given with the intent to guide future performance. Feedback is different from evaluation in that it is a process towards improvement, helping students see the areas where they are already on target and where they can improve or make corrections. Four important aspects of academic feedback should be considered: the timeliness; amount; modality; and the receiving audience (Brookhart, 2008).

The timing of feedback to the student should be prompt. It is crucial that the student feels like there is still time to adjust their understanding of the learning goal before a new goal is introduced¹. The amount of feedback should be considered so that it is given in a way that is manageable for secondary students. The modality of feedback will depend largely on the audience and, in the case of high school students, can be given either in written form or orally during live interactions. Lastly, by considering the receiving audience, the teacher should know in what way feedback will be most beneficial to students (Brookhart, 2008).

Intentional Instructional Strategies

¹ For example, if the learning goal of the week is to analyze The Gettysburg Address and students are not demonstrating mastery of that goal the teacher should reteach a part of the lesson before moving on to teach the Emancipation Proclamation.

Bogner (2002) hypothesized that real engagement occurs when teachers intentionally do things to promote engagement and do not undermine it. Bogner assumes that teachers who are mindfully adapting their instructional style to encourage students to engage with material on a personal level are those that see the dramatic increases in engagement and achievement. Bogner also hypothesized that engaging elementary teachers are in the minority in American schools. This is troublesome and the documented declines in student motivation as they advance through elementary grades is discouraging (Eccles, Wigfield, Harold, & Blumenfeld, 1993; Gambrell, Codling, & Palmer, 1996; Gambrell, Palmer, Codling, & Mazzoni, 1996; McKenna, Ellsworth, & Kear, 1995).

It is encouraging, however, that we see a correlation between using high level engagement strategies and increased student learning (Franke, 2015). One recent study observed the differences in classrooms that either used a “productive struggle” or “classroom discourse” to garner interest in math. Productive struggle is an engagement activity where students have to expend effort in conversations with one another to discover the meaning of a problem (Hiebert & Grouws, 2007). There is a healthy body of literature regarding the various elements behind the effectiveness of productive struggle (Azmitia & Montgomery, 1993; Barron, 2000; Brown, Campione, Webber, & McGilly, 1992; Roscoe & Chi, 2008; Wittrock, 1989). The nature of activities like productive struggle and classroom discourse is simply to get students talking to each other. Through explaining thought processes and discussing other students’ reasoning they are able to create justifications for why an answer may be correct or incorrect.

A design-based case study conducted at the Costa Rican National University of Distance Education in 2012 found that it might be possible for students' cognitive engagement to increase if changes are made to assignment structure, the number of face-to-face sessions, and facilitation strategies (Joo, 2014). This increase in cognitive engagement does not necessarily translate to assessment grades, however. Facilitation strategies correspond to the role a teacher should assume when students are interacting with new knowledge and practicing and deepening that new knowledge. Strategies in this vein are very unlike the 'sage on the stage' model where the teacher stands at the front of the room endlessly delivering content.

The development of cognitive skills occurs when the student is cognitively engaged. Kim (2015) found that when international college students conduct research with a faculty member and are satisfied with their advisor, they are more prone to develop cognitive skills at a higher level compared to those that worked in isolation. Cognitive skills is defined as any mental skills that are used in the process to acquire knowledge (Askar & Altun, 2009).

When students are not overly reliant on their teacher for their learning they are considered active. Active learning is divided into three categories: intellectually active, socially active, and physically active (Edwards, 2015). Intellectually active learning helps explain cognitive engagement. Edwards (2015) listed the following strategies teachers can implement to prompt intellectual activity in their classrooms: concepts maps, inquiry activities, problem-solving activities, synthesizing research for presentations or papers, and creating multimedia presentations synthesizing what they have learned. These strategies are helpful in that they require students to interact with

cognitively complex tasks instead of just receiving knowledge. It is important a teacher understand the intention behind each strategy before adapting their instructional approach to include any of the above. Andrini (2016) argues the importance of teacher awareness of inquiry-based teaching before they incorporate it because if it is done incorrectly the learning process could still lead to boredom, burnout, and misunderstanding.

Research suggests that children who exhibit self-control consistently perform better and are more engaged in both academics and athletics, but Duckworth believes there is a stronger more measurable indicator for student success: grit (Duckworth, & Carlson, 2013; Duckworth, Gendler, & Gross, 2014). Indeed, there are numerous benefits to self-regulation outside of education and sports (Eisenberg, Hofer, Sulik, & Spinrad, 2014; Eisenberg et al., 2009) and effortful control of one's short term goals and desires leads to immediate rewards. However, grit, often confused with self-control, pertains more to long term goals and desires that are more enduringly valued, however (Duckworth, Gendler, & Gross, 2014). Grit, as Duckworth defines, is perseverance and passion for long-term goals in opposition to hardships and obstacles (Duckworth, Peterson, Matthews, & Kelly, 2007). In other words, grit is self-regulation at its highest level. Grit defined in the context of education is sometimes referred to as academic diligence. Academic diligence is defined as working through academic tasks that prove to be incredibly tedious in the moment, but are perceived to be beneficial long-term (Galla, 2014). Self-regulation, grit, and academic diligence are all indicators of a self-engaged student and all contribute to a student's willingness to complete academic activities.

Additionally, a disengaged student and an unmotivated student are not the same, although engagement is often to blame for both. Recent studies suggest that if a student is self-engaged they are also motivated to complete cognitively complex tasks (Wickersham & Dooley, 2006). The relationship can be seen as symmetric. Studies regarding motivation have grown in popularity over the last few years thanks to two best-selling books: *Drive* by Daniel Pink and *Mindset* by Carol Dweck. Both texts look at self-determination, self-regulation, self-control, motivation, and goal-setting. Their research is primarily participant-focused with an emphasis on the direct effects of motivation and determination to achieve specific goals.

Full-Time Virtual Schools

The National Education Policy Center (NEPC) published a brief titled *Understanding and Improving Full-Time Virtual Schools: A Study of Student Characteristics, School Finance, and School Performance in Schools Operated by K12 Inc.* in 2012. This study identified several key elements they argue make up the majority of all full-time virtual schools. They found that three-quarters of K12 students are white or non-Hispanic. Black students make up only 10.7% and Hispanics 9.8%. Students qualifying for free or reduced-price lunch (FRL) constitute 39.9%. Special education students, or students who are identified with a disability and have an Individualized Education Plan (IEP), only make up 9.4%. Lastly, only 0.3% of K12, Inc. students participate in an English language learner program.

The study also found that students enrolled in middle school grades far outnumber those enrolled in the upper grades. They make two assumptions based on the data. First, some K12 schools did not allow new enrollments in the upper grades

because of a lack of enrollment plans in those grades. Second, they assumed that students were not sticking with K12, Inc. schools into the upper grades. They make this claim based on various studies regarding perceived attrition in virtual schools. Both assumptions pose a number of questions for further research.

Oklahoma Virtual Charter Academy (OVCA), the school observed for this study, is considered to be a charter school. The charter aspect of OVCA was not observed or analyzed. The fact that OVCA was a charter school played no part in this study as the focus was more on teacher perceptions and teacher actions than anything else.

Virtual School Classrooms

Classrooms in the virtual context take place on the internet via software that both the teacher and students have downloaded prior to the beginning of class. They enter a ‘room’ where they can engage in discussion using a variety of tools including a whiteboard, a webcam, chat, a microphone, and be divided into small groups via ‘breakout rooms’. It is presumed that these features have been added to the virtual classroom software because learning happens as students interact with each other, their teachers, and the routines of classroom instruction (Sternberg, 1994). Because several districts have adopted the Marzano Teacher Evaluation Model as their observation and evaluation tool, many high-achieving teachers in Oklahoma are expected to understand the importance of organizing students to interact with new knowledge, practice and deepen that knowledge, and then work through cognitively complex tasks (Marzano, 2014). When students come to class distracted, tired, or angry it is difficult to engage them in these three areas. It is no mystery that students are affected by out-of-

classroom circumstances (Alexander, 1997). These circumstances may seem magnified in the virtual sense as the physical space of the classroom is the student's bedroom, living room, kitchen, or any other room they deem fit. These spaces can easily distract a student who may not be engaged with the live instruction taking place in the virtual classroom. Because virtual teachers do not *see* their students in the traditional sense, they develop various methods – many of which were highlighted above - to show evidence of engagement.

Community Inquiry Model (CoI)

Garrison, Anderson, and Archer's (1999) community of inquiry (CoI) model provides the framework for this study. The model's emphasis on presence is fitting discussing virtual schools as oftentimes teachers and students never meet face-to-face. Social presence, cognitive presence, and teaching presence all make up this model, illustrated by Figure 3 below, and will be discussed briefly with special emphasis on cognitive presence.



Figure 3. Elements of an educational experience (Garrison, Anderson, & Archer, 2000, p. 88).

This figure illustrates the three types of *presences* that make up the Community of Inquiry model.

Social presence can be understood as the extent to which students and teachers feel connected to each other (Swan & Shih, 2005). Teachers in a recent study expressed that building strong relationships with their students was critical as they strove to develop social presence (Barbour & Bennett, 2013). Connell and Wellborn (1991) argued the importance of a sense of relatedness to a school, which would contribute to a student's adopting of goals. They also found that a lack of relatedness correlates with the rejections of goals (1991). Social presence and the development of community are closely related in this study. Osterman (2000) said that a community can only exist when its members find a sense of belonging to the group. Sense of belonging, as we know, is one-fifth of Maslow's (1962) hierarchy of needs. Students want more from their teachers than academic instruction. Their desires often revolve around feeling like they are a part of a group and that they matter (Phelan, Locke-Davison, & Thanh, 1992). Teachers in schools where there is a strong sense of belonging report that both teachers and students feel more comfortable talking and listening to each other about personal and social issues (Solomon, Battstich, Kim, & Watson, 1997).

When classroom activities are too simple, student disengagement can become an issue (Burger, Nadirova, & Keefer, 2012; Ministry of Education, 2008). This is where teaching presence, or how a teacher designs and facilitates the educational experience, is important (Garrison et al., 1999). There are three criteria a teacher should be aware of as they design activities: rigor, student interest, and purpose of the activity (Burger et al., 2012). It may seem obvious, but when students enjoy an activity they are more engaged with it (Wood, 2012). In the online setting, a teacher is most effective when

they assume a facilitator of learning role. As they develop activities, they must think of ways for students to interact with the material and each other.

Giving students opportunities to construct meaning through sustained communication is how a teacher develops a cognitive presence in their classroom (Garrison et al., 1999). Cognitive presence resembles critical thinking and higher-order thinking processes that relies upon students interacting with various methods of problem solving (Garrison, Anderson, & Archer, 2001). Interaction and group work are the primary criteria for creating a cognitive presence (Chen, Lambert, & Guidry, 2010; Hawkins, Graham, Sudweeks, & Barbour, 2013). Additionally, where interaction and collaboration are used frequently there is a higher rate of student completion of tasks (Hawkins et al., 2013).

As cognitive presence increases, social presence may decrease. This is evident in a recent study where an online teacher increased the amount of control they had in the classroom which affected the learning environment in a variety of ways (Costley, 2016). One way was the level at which students were asked to think critically. The teacher found that thinking critically was more of an independent activity than a collaborative one. Critical thinking is oftentimes synonymous with cognitive presence (Garrison & Akyol, 2013; Garrison & Archer, 2000) and the process of analyzation (Noyelles & Reyes-Foster, 2015). The authors argue that it is important teachers be aware of their behavior as it can affect how learners interact with the material and with each other.

Additionally, it should be taken into account the importance of cooperation and collaboration among learners within a community. Online learners typically feel

socially isolated and disconnected from their peers. This study will not address students' feelings of isolation and disconnectedness, but will allow teachers to share their perceptions of how they think their students are interacting with each other in live class connects. Namely, do the teachers believe their students exist in a community as they cognitively engage with subject matter?

Similar Studies

Scholars have conducted research about online education and engagement, however this study differs from other studies in that it discusses how teachers perceive their personal impact on their students' cognitive engagement. Studies tend to focus on practical approaches like how teachers perceive the effect of Socratic Seminars or their use of Venn Diagrams. These practices, regardless of their benefit, are not the focus of this study as they suggest the teacher's impact is more indirect (i.e. the student is engaging with the material via the resource). There are studies that discuss instructional approaches that are more cognitive than practical, where the teacher is not necessarily utilizing a tool or resource, but these studies highlight how the approach itself affected students. Also, where studies do focus on cognitive engagement there is little mention of how the teachers prompted it in their students other than structure and guidance.

Louwrens and Harnett (2012) focused on online engagement in middle school age students in a New Zealand distance education program where the authors considered the behavioral, emotional, and cognitive dimensions of engagement. The teachers in the Louwrens and Harnett study believed that increased levels of student engagement were a result of giving the students autonomy and providing assistance that allowed them to achieve mastery in their courses. Teachers and students agreed that

increased engagement was a result of giving students purpose in their courses. This was accomplished through making the lessons relevant by using real world examples when teaching and building community and relationships with fellow students and teachers. Additionally, students who engaged in peer feedback activities showed even greater cognitive engagement.

Fredricks et al. (2004) and Harris (2008) expanded the definition of cognitive engagement by highlighting the personal investment students make in their learning, such as understanding complex ideas. Additionally, Dixon (2010) recognized engagement as an important component in all teaching and learning. Engagement is especially high in situations when students show a personal investment in their own learning.

Zhang (2012) observed scaffolding strategies used in two different types of online inquiry processes as demonstrated by sixth grade students. Research results found that students only showed minimal engagement with content when teacher support was not offered. This minimal engagement in inquiry activities resulted in little time spent working on content and more time spent engaging in on off-task conversations with other students. The students read fewer of the resources provided, however they spent more time reading and taking notes. Students with the scaffolding assistance made deeper connections from their resources and used those in their assignments. The benefits of structure and guidance in the online environment were evident in the results and correlated with student engagement. Zhang's research suggests that engagement online requires intentional structure, teacher guidance, and modeled practice.

Weng (2014) found that students' cognitive engagement was significantly impacted when teachers facilitated good feedback. By using a treatment group and a control group they discovered the level of cognitive engagement was much higher than that of the control group and previous levels of cognitive engagement of the control group increased over time. The study consisted of eight modules within an online course run on Moodle. The difference between Weng's study and this study is that students at OVCA were not also receiving an in-person education. Also, the only three activities observed in the Weng study were reading and taking a quiz over the reading, discussion, and hands-on practice.

Borup (2016) identified four student behaviors that affected engagement: befriending, motivating, instructing, and collaborating. Instructing, motivating, and collaborating were chosen by the author because he wanted to use the Adolescent Community of Engagement (ACE) framework in his study. A fourth category, befriending, revealed itself during his survey process. He found it was important for students to be able to form friendships and interact with each other. The notion that students need social interaction is present in this study and, as I mentioned previously, it is sometimes considered a disadvantage to online learners. In this study I did not explore teachers' inclinations to provide students with time to interact socially, only academically.

Annamalai (2015) explored teacher engagement with students in an online writing environment. His findings suggested that teachers need to understand the appropriate use of technology, need to know how to use Web tools, and should know how to social network adequately when interacting with students online. The author

utilized the Garrison et al. (2000) Community of Inquiry Model (CoI), but the focus of the study was on the teachers' teaching presence where my study pertains more to the teachers' cognitive presence.

A case study conducted in Maine revealed four different indicators that were critical to an online learner's engagement: transactional distance, teacher response time, group work, and school filtering issues (Garthwait, 2014). Transactional distance is included here as the schools provided 'study hall' times during the month where students would travel to a pre-determined site to work with an instructor. School filtering issues referred to students' frustrations with two areas: unreasonably censored web sites and link rot, or sites not updated by the instructor. These two indicators, transactional distance and filtering, do not correlate with my study, but teacher response time and group work do. The author only interviewed students as well, another difference between our two studies.

Gray (2016) asserted that students are more invested in course content when the concepts are presented in more meaningful ways. He suggested that when students are shown how they can use the content they are more prone to stay motivated. This approach is more practical than cognitive in that teachers in his study were not necessarily prompting their students to think through concepts. Moreover, teaching presence was identified as one of the four significant indicators of student engagement. Its impact on student satisfaction was actually greater than the impact of student interaction. This is surprising as much of the literature suggests otherwise. Gray (2016) explains that it was due to effective communication from teachers, encouragement from

teachers, easily understood organization of the course, and the respect the teachers gave them. The notion that teaching presence is important is discussed in this study as well.

Conclusion

In this chapter, topics related to student engagement including academic engagement, intentional instructional strategies, cognitive skills, active learning, self-control and motivation, and the Community of Inquiry Model were discussed as were the five elements of cognitive engagement. The following methodology chapter will outline the structure and process of this study by detailing the participant selection process, data collection process, and interview process.

Chapter 3: Methodology

Case Study

In order to gain insight into the perceptions of various stakeholders at Oklahoma Virtual Charter Academy (OVCA), I conducted a case study about ten high school teachers and the ways they perceive they engaged students cognitively in their live classrooms. This study follows the Lincoln and Guba (1985) case study structure – the problem, the context, the issues, and the lessons learned - and is modeled after Stake's (1995) qualitative case study of reform in Harper School.

Participants

I employed a purposeful sampling strategy by selecting participants based on their subject areas and years of experience. Participants included ten end of instruction (EoI) teachers, defined as teachers and lead teachers across the four core subjects (math, language arts, social studies, and science) as they are categorized at Oklahoma Virtual Charter Academy, because they garner the most administrative attention during the school year. At the time this study was conducted, end of instruction (EoI) assessments (English II, English III, Algebra I, Algebra II, Geometry, U.S. History, Biology) were used by the state department and local school districts to evaluate a school's effectiveness. Therefore, one might suggest that EoI teachers are the most crucial to a school's success.

Of the ten teachers selected for this study, two teachers were men while eight were women. One has been teaching for less than five years, while the remaining nine show a range of experience from six to twenty years. Six of the ten teachers have taught solely online for six to seven years, two have taught solely online for four to five years, and the remaining two have taught solely online for one to three years. During

the 2015-2016 school year three of the ten selected teachers taught social studies classes, three taught English Language Arts (ELA) classes, two taught science classes, and the remaining two taught math classes.

Four of the ten teachers who were invited to take part in this study worked as leads. This title refers to the teacher's experience at OVCA and expertise in their subject area. Each teacher led their respective department (Social Studies, Science, Math, and Language Arts) and is seen as a resource to both new and veteran teachers. I chose to invite them to take part in this study because they taught EoI classes, but additionally I assumed their perceptions would strengthen this study because they were considered experts by their peers. Many of the instructional techniques used by new teachers were developed collaboratively with a lead teacher which suggested that many teachers approach lesson planning in similar ways.

Participants were designated as highly qualified teachers by the state of Oklahoma. The criteria for highly qualified is made up of three areas: the teacher must hold a minimum of a bachelor's degree, the teacher must have obtained full Oklahoma certification or licensure, and the teacher has demonstrated competency in each of the academic subjects which they currently deliver content knowledge. Of the 27 potential participants, 19 have bachelor's degrees and eight have master's degrees. There are three teachers with less than three years of experience, five teachers with experience between three and five years, seven teachers who have between six and ten years of experience, five with 11-15 years of experience, four with between 16 and 20 years of experience, and three teachers who have 21 or more years of experience. At least one teacher from each of these experience ranges was invited to take part in this study.

Methods

Merriam (1998) says “there is no standard format for reporting case study research” (p. 193), therefore, I selected what Creswell (1998) calls an overall rhetorical structure that is analytical in nature (some case studies generate theory or are simply descriptions of cases). Lincoln and Guba’s (1985) case study structure provides the general guiding outline for this study combined with Stake’s (1995) outline for the flow of ideas in a case study that shares similarities with the Lincoln and Guba model. Creswell (1998) says the writer can “identify the issue, the purpose, and the method of the study so the reader learns about how the study came to be, the background of the writer, and the issues surrounding the case” (p. 186). Then, a detailed description of the case and its context is given so the reader can feel like they have been or are there. Helping the reader understand the complexity of the case by providing key issues comes next. After that, “assertions are presented, a summary of what the writer understands about the case and whether initial naturalistic generalizations, conclusions arrived at through personal experience or offered as vicarious experiences for the reader, have been changed conceptually or challenged” (Creswell, 1998, p. 187).

Case study analysis is tethered to the detailed description of the case and its context. Additionally, Stake (1995) suggests a researcher be aware of four forms of data analysis that help interpret occurrences the researcher hopes to observe: categorical aggregation; direct interpretation; patterns; and naturalistic generalizations. Categorical aggregation is most appropriate for this study because it relies on the collection of trends from the data that can potentially create meaning related to perceived issues. Conversely, direct interpretation pertains to the process looking at one instance and

deriving meaning from it alone. Patterns, or the third of Stake's four forms, are established by the researcher when they are looking for relationships between two or more categories. The fourth form Stake discusses is naturalistic generalizations where the researcher provides generalizations from the case that readers can apply to their own contexts. Based on the research question stated previously, categorical aggregation is the appropriate approach for this study. However, the importance of identifying and analyzing patterns in the data must be noted as relationships exist between a teacher's perception of effective instruction and how they address cognitive engagement in their live classes.

There are several dimensions to representing research in a case study (Creswell, 1998). One is classifying. In a case study, researchers use categorical aggregation and establish patterns of categories. The categories established for this study are based on teachers' responses to questions from the first interview and then new, more descriptive, categories created based on responses from the second interview

I employed a mixture of different data analysis strategies outlined by Bogdan and Biklen (1992), Huberman and Miles (1994), and Wolcott (1994). There are 13 different analytic strategies based on their works that Creswell (1998) found helps reduce the data into codes or categories. Sketching ideas, displaying data, and reducing information share commonalities in each of the above authors' works. For sketching ideas, Wolcott (1994) says the researcher should highlight certain information in description while Miles and Huberman (1994) say the researcher should write margin notes in a field notes section. I used interviews and observations: sketched ideas, took

notes, summarized field notes, displayed data, identified codes (categories), counted frequency of codes (categories), and related categories.

For this study, codes included “teacher asked students to analyze,” “teacher provided feedback to students,” “teacher asked students to solve problems,” “teacher asked students to study during a live class,” and “teacher prompted students to practice.” Themes included the following: importance of teachers to their students, time and effort, Marzano Teacher Evaluation Model, student attendance issue, student engagement, and student participation.

The Community of Inquiry Model (CoI) was used as the conceptual framework for this study. Of the three ideologies situated in the model it was cognitive presence that proved to be most valuable to this study. Teacher perceptions and teacher actions were observed and analyzed with the teacher’s cognitive presence in mind. Additionally, I was mindful of each teacher’s personal definition of cognitive engagement during the observation and coding process. By being mindful of each teacher’s individual perception of student engagement I was able to assign symbols to the various instructional strategies developed and implemented by the teachers.

Data Collection

There are two basic types of information collected in this qualitative study: interviews and audio-visual observation.

Audio-Visual Observations. As I am what Creswell (1998) considers a *native*, the procedure for my observations will follow a series of steps. The first two steps include selecting a site and participants. The third step requires determining my role as an observer. My role was part participant and part observer. My responsibilities as an

instructional coach required that I observe 12 indicators (engaging students, standards and objectives, communication, presenting instructional content, teacher content knowledge, lesson structure and pacing, academic feedback, questioning, thinking, teacher knowledge of students, assessment, and expectations) each time I visited a teacher's classroom.

I archived audio-video recordings of teacher and teacher leaders' classes through my access to class connects, which are recordings included in each teacher's playback table (a link that includes all of a teacher's lessons). These recordings and the contents within (i.e. if the teacher used a video clip, interactive game, participation activity, etc.) comprised my audio-visual data for this study. I randomly selected three recordings to observe for each participant in the study. The recordings I chose were from the third week in January, February, and March as these three months are typically known as test preparation months.

The remaining steps of the observation process are to design an observational protocol as a method for recording notes in the field and record aspects such as portraits of the informant, the physical setting, particular events and activities, and researcher's reactions (Bogdan & Biklen, 1989).

Interviews. I conducted a structured interview with each participant during the month of July while teachers were working on lesson plans for the upcoming school year. The interviews were conducted in-person or electronically over Skype or Google Hangouts. Each interview lasted between 45 minutes to 1 hour. By using Skype or Google Hangouts I was able to video record the interview so I could access each teacher's facial cues and body language. These interviews were be transcribed

verbatim. The structured interview was guided by a list of questions pertaining to perceptions about effective online instruction and cognitive engagement and included demographic questions. The first interview provided information for formulating questions for the second interview.

Transcribed interviews were analyzed for emerging topics. Each question was relevant in that their responses indicated common or uncommon sets of beliefs they had about their abilities, tendencies, understanding, and instructional approaches. The topics that emerged were analyzed to identify a relevant number of categories related to the elements of cognitive engagement. Phrases and words used by teachers were coded to reveal which of the five elements they valued, addressed, misunderstood, or seemingly did not know, among others.

During the coding process I observed several unexpected themes and topics that I became mindful of during my observations. For example, one teacher suggested that many of the most engaging activities she implemented in “brick & mortar schools just won’t work here.” Other teachers shared similar concerns and I coded this as “traditional school vs. online school issue.” When I began observing these teachers I noticed how inconsistent they were with various instructional strategies. I would often hear the teacher say “this is something we’re going to try today” before they read the directions for the activity. Also, after the activity was implemented once I never saw the teacher implement it again. When a teacher doubted either themselves or the activity I coded that as a “confidence issue” during the observation process. “Confidence issue” was not a code, theme, or topic developed during the interview

process. In fact, my notes during the interview process would suggest that each teacher was at least mildly confident in their ability to keep students engaged in their classroom.

Limitations

OVCA is a small sample that does not represent every virtual school in America, or even every *K12, Inc.* school in the central region (Oklahoma, Texas, Colorado, Arizona, and Utah). What OVCA teachers perceive to be student disengagement is not necessarily what Utah Virtual Charter Academy teachers perceive to be student disengagement. The definition of engagement in schools is not consistent across studies (Cusick, 1983; Fredricks, Blumenfeld, & Paris, 2004; Gibbs & Poskitt, 2010; Goodlad, 1984; Oakes, 1985; Powell, Farrar, & Cohen, 1985; Sedlak, Wheeler, Pullin, & Cusick, 1986; Sizer, 1984).

Faking was a concern as well. Instead of answering honestly, teachers might have changed their answers since they knew their instructional coach was reviewing their responses. I reiterated the importance of honesty and the fact their responses had nothing to do with their job performance or surveys I filled out addressing their instructional growth.

What constitutes a disengaged student in this study had the potential to be problematic because participation was part of the criteria. Students may choose not to participate for a variety of reasons other than engagement. Perhaps they did not feel comfortable typing in chat, speaking on the microphone, or writing on the whiteboard. They may suffer from debilitating social anxiety, something very common with virtual school students, and did not want attention. Also, they may not have participated

because they did not understand the material. Class connects go silent when a teacher asks a question that no one knows.

Threats to Internal and External Validity

I avoided design contamination in this study, by not revealing what was expected of the participants or their students. I asked the teachers to keep the questions and their answers confidential. However, there was a chance that the teachers compared answers among one another since they are such a close knit faculty. External validity refers to the notion that results can be generalized to and across individuals, settings, and times. An external threat to population validity existed in this study. I did not establish a sample that was representative enough of OVCA or other virtual high schools to establish generalizability.

Trustworthiness

Lincoln and Guba (1985) suggest qualitative researchers establish four assumptions: credibility, transferability, dependability, and confirmability. To establish credibility I rose above my own preconceptions of the teachers' perceptions, built trust with each participant, and remained oriented to the online classroom context. Lincoln and Guba (1985) propose the researcher endeavor to remain open to multiple influences "as the purpose of persistent observation is to identify those characteristics and elements in the situation that are most relevant to the problem or issue being pursued and focusing on them in detail" because "if prolonged engagement provides scope, persistent observation provides depth" (p. 304).

To establish transferability I provide a thick description of my field experience in enough detail that one can begin to understand how the results seem transferable to

other times, settings, situations, and people. Additionally, since I worked on this study with potential professional development in mind, I put the social relationship patterns in context as I looked at how teachers perceive their students' engagement levels.

When a researcher strives to establish dependability they will oftentimes conduct an external audit. In the case of this dissertation, the members of my committee played an integral part in examining the research process and product to ensure that the findings, interpretations, and conclusions were not only supported by data but were presented in an academic manner.

Lastly, confirmability can be established in four ways: confirmability audit, audit trail, triangulation, and reflexivity. This study is perception-heavy, which means that the participants and I were constantly trying to create meaning based on reflections. My background and position affected the angle of my investigation. In this regard, reflexivity best fits. Participants had the opportunity to review my transcribed interviews and subsequent analysis to strengthen my interpretation of their responses. I maintained what Lincoln and Guba (1985) call a reflexive journal where I recorded methodological decisions and the reasons for them and reflected upon what was happening during the study.

Conclusion

In this chapter I explained why a case study structure best suits my topic. I detailed my sampling strategy and gave an overview of proposed methods. Additionally, I referenced my data collection process and revealed possible limitations and threats to internal and external validity. Lastly, I cited Lincoln and Guba's (1985)

four assumptions that researchers need to be mindful of as they establish trustworthiness. In the follow chapter I will present my findings.

Chapter 4: Findings

This study was designed to discover teachers' perceptions of how they engage students cognitively at Oklahoma Virtual Charter Academy and how their actions aligned with their perceptions. The study included data from 10 observations and interview responses from each selected teacher. The observations were of classes taught during the 2015-2016 school year. This chapter is organized around each of the interview questions that are, in some way, aligned with the research question: How are teachers at Oklahoma Virtual Charter Academy High School addressing the five elements of cognitive engagement?

Defining Cognitive Engagement

One of the interview questions pertained to how each teacher defines student engagement. Each teacher described it in one of three ways. "Participation in activities" came up the most while "teacher usage of engagement strategies" and "getting them to think" were also mentioned. Below is a response from a teacher that included all three:

Engagement is challenging in the virtual classroom because I can't see them in the same way as I did in the brick and mortar. However, I do feel like I have learned alternative strategies for finding out if my students are engaged. I utilize the tools within the Blackboard (online room teachers and students log into) platform like having students write on the whiteboard, type in chat, polling tools and using their webcams to show me evidence of their level of understanding.

Various themes came to light during the interview process including teacher's importance to their students, teacher's time and effort, the Marzano Teacher Evaluation Model, student attendance issues, student engagement, and student participation. These themes will be discussed in this section. The categories developed for this study were not developed before coding the data. This is important to note as "thematic analysis aims to identify themes within the data" (Ezzy, 2002, p. 88). During open coding (the first stage of coding during thematic analysis) I looked for things that each teacher valued. Phrases like "I want to be a resource for my students" and "I just want them to be successful" indicate that some teachers saw themselves as a potentially important person in their students' lives. I also looked for word repetitions and found that each teacher was aware of at least one of the following terms: Marzano Teacher Evaluation Model, attendance, participation, and engagement. Additionally, half of the teachers mentioned how much time and effort they "put into" their job.

Student-Centered Responses vs. Teacher-Centered Responses

During the interview process I noticed two primary topics emerge: responses that were student-centered and responses that were teacher-centered. Four categories made up the student-centered topic including understanding, thinking, collaboration, and student roles in the main room and in breakout rooms. Students were typically assigned roles once they entered breakout rooms to participate in an activity. One student was assigned the facilitator role and was deemed the 'manager' of the room. Another was assigned the reporter role and would present the group's findings to the entire class in the main room when the activity concluded. There was a timekeeper role where a student reminded the group how much time they have left to complete the activity.

Lastly, one student was assigned the ‘note-taker’ role where she was expected to write the group’s findings on the board during the discussion.

Student-centered responses that pertained to “understanding” included words such as content, demonstrate, mastery, and prove. “Thinking” consisted of responses referring to actions like interact, conclusions, and analyze. “Collaboration” responses most frequently pertained to break out rooms, group work, and teacher as facilitator. And “roles” responses assumed that students have a voice and contribute to the lesson in a variety of ways. Each teacher provided responses that hinted at the role they play in the cognitive engagement process as well. Teacher-centered responses consisted of three categories: facilitate; adapt; and prevent frustration.

Teacher-centered responses related to “facilitate” suggested that teachers felt like they needed to be motivational and entertaining while responses connected to “adapt” emphasized the importance of the teacher being flexible and willing to change methods. The third category, “prevent frustration,” suggested it is important that the teacher be aware of student learning difficulties.

Teacher Perceptions vs. Teacher Actions

Teachers at OVCA addressed the five elements of cognitive engagement in a variety ways but perceived the importance of each rather differently. Each teacher was asked how they address these five elements in their live class connects with students. Teacher perception data was considered first in each sub-section followed immediately by observation data pertaining to the element in question. I observed each teacher’s class ten different times throughout the 2015-2016 school year. Each observation

consisted of notes that were then coded as one of the five cognitive engagement elements. The coding is discussed in each sub-section. Observation notes and interview data were compared as discrepancies between the two appeared quite often.

Feedback

Leibold & Schwarz (2015) suggest that feedback be prompt, frequent, personalized, detailed, clear, specific and balanced. If feedback is provided this way the teacher can positively guide the student's development. During my interviews with teachers I did not mention the importance of feedback or that the teacher should be practicing it. In one case the teacher asked that I define feedback for her and I rephrased the question so that she understood it as a process of communicating with the student(s).

Teacher Perceptions of Facilitating Feedback. One teacher, Mrs. White, strived to develop and maintain a feedback loop in live class connects while the rest of the teachers tried to utilize the comments section on the online platform. The majority of teachers assumed that their role as a facilitator was most important when providing and obtaining feedback. This finding indicated that if the teacher did not continuously remind students to ask questions, send emails, and reply in the comments section of each assignment they would be missing out on teacher feedback. Feedback, as explained by the teachers, primarily existed outside of live class connects unless they continuously provided and asked for it during live class connects.

Teacher responses were negative when it came to student engagement with teacher feedback outside of live class connects. A common theme was that participants

felt most students did not appreciate or take advantage of the feedback process if it was not live as evidenced by Mr. Russell's response below:

I don't think they pay much attention to the feedback on an assignment that they've already turned in.

Mrs. Can shared how rare it is that her students engage in feedback with her:

Student response after my feedback is not the norm, whether in live CCs or any other occasion. It is rare enough that I can almost quote from memory the few I have received.

Mrs. Dee gave an example of a student's gratitude pertaining to feedback she gave:

Last year, a particularly bright student thanked me for the TGA (teacher-graded assignment) feedback. She said it made her feel like her work was important.

Mrs. Jones explained that breakout rooms are they key to high student engagement with feedback:

Most students respond well to feedback during live sessions and when I use breakout rooms it is more so. I don't think they pay much attention to the feedback on an assignment that they've already turned in.

Mrs. White said she was purposeful in her feedback process by making them respond:

I always make my students respond in live CC (class connect) settings to feedback. That interaction and conversation is when the growth happens. I rarely have response from feedback in assignments other than them revising - making changes to assignments as I request in the feedback. In live class via breakout

rooms, I think they appreciate that interaction and opportunity to grow for the most part via a feedback loop I try where I provide feedback, they take it and then provide feedback back to me. I try to always be encouraging and helpful in those moments so that students feel capable and not discouraged.

Mrs. Thomas suggested that her students obtain and engage in feedback most often during live class connects:

I have open lines of communication in CC's (class connects), and students most often give me immediate feedback during the class session. Many will ask clarifying questions or will message back that they understand and are thankful for the feedback.

Responses to the feedback question suggest that most teachers believed that their teaching presence was more important than their social or cognitive presence for this element of cognitive engagement. This is interesting as "supporting discourse," a reference to the process of providing and obtaining feedback, is not found in teaching presence per the Community of Inquiry Model (see Figure 3). Mr. Mills believed that by being present and selecting content (an indicator of teaching presence) based on student assessment data he was providing quality feedback:

This just depends. If a student is in CC (class connect), they are generally invested in what I am saying. There are occasions when they aren't, but for the most part, if they've taken the time to come into my live CC (class connect), they are there to hear what I have to say. As far as assignments go, I do not feel they are invested in my feedback. I can go into a student's view and see that

they've not looked at any comments the entire semester. However, I don't think it's a matter of them not caring. I think it's a matter of them having to click a few more buttons and they just don't want to. Many very engaged students don't read the feedback in the course.

Mr. Mills was not alone in his feeling that feedback is not as collaborative as it could be. According to participants, breakout rooms (i.e. small group or one-on-one sessions) tended to provide the most positive collaborative experience for both teacher and student, but teachers did not have the attendance that they would like to see in breakout rooms. Mrs Black shared:

I give feedback to students on essays and writing samples that they turn in once a month. I don't usually get responses back from students regarding my feedback. I do have one on one sessions with students where we go through their writing and the rubric to help them prepare for their state writing assessment. Students do seem to really enjoy those one on one feedback sessions when we have time for them which is usually once every few months.

Feedback can develop and nurture teacher-student relationships (Fonseca, Carvalho, Conboy, Valente, Gama, Salema, & Fluza, 2015). Mrs. White was very candid about her interactions with students via feedback and alluded to her desire to see similar participation levels outside of live class connects as she sees during them. As a follow up to her response of trying "to always be encouraging and helpful in those moments so that students feel capable and not discouraged" she added:

I have a handful - maybe ten percent or so, that will continue to resubmit their assignments and raise their scores, until it looks like what I want. In live CC (class connect), I have really a hundred percent participation on the back and forth questioning. I think they are much more engaged live than in the dropbox. Interestingly, some of the live students that participate do not resubmit following dropbox feedback.

The teachers seemed to believe that feedback would not happen unless they set the climate for it and facilitated it heavily and even then, the students were not consistently engaging with it. This theme of “teacher importance to students” showed up frequently in five different teachers’ responses across all elements.

Observations of Teachers Facilitating Feedback. The teachers’ perceptions of feedback are important, however their actions associated with those perceptions are equally important. Observation data provides information about what the teachers are doing to provide and obtain feedback. Specific examples were given by each teacher when asked about how they provide and obtain feedback. The below chart shows their responses (see Figure 4):

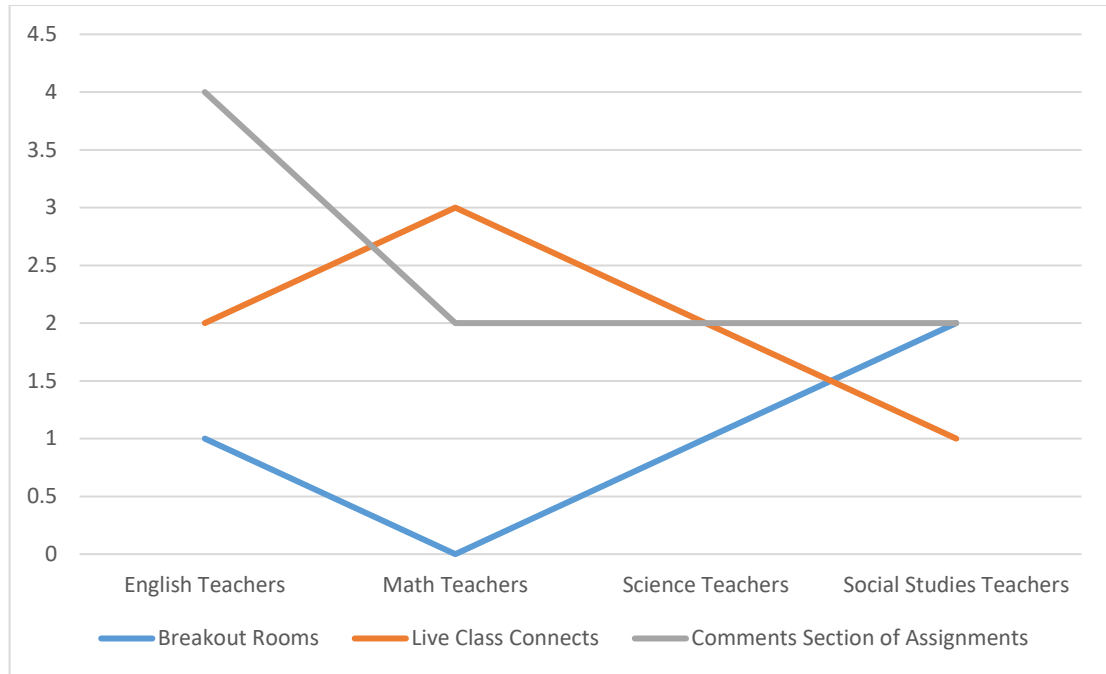


Figure 4. Where feedback happens based on subject area. This chart shows the number of times breakout rooms, live class connects, and comments section of assignments were mentioned in teachers’ responses to the feedback question.

There is evidence of feedback in four of Mrs. White’s ten classes. Often it was an opportunity for students to work directly with her after class for extra credit on an assignment. The extra credit approach was common in that it was evident in at least four other teachers’ classrooms. However, feedback was used in more ways than just extra credit. The following key terms and phrases were used for coding feedback in the teachers’ class connects: extra credit, effort, communication, student response, and OLS (online learning system). Of these five approaches, “student response” closely resembles what teachers believed to be most directly aligned with the definition of feedback.

Only one of the three ELA teachers provided feedback across ten observations. The feedback she offered students during that session pertained to an assignment they had turned in the week before. She pulled excerpts from various students’ essays and

explained how students were either meeting or not meeting the expectations of the rubric. The feedback was given in a general way to all students without mentioning whose essays she used as the models.

Even though there were only two instances of feedback from the social studies department, both happened during Mr. Mills' class, a teacher who perceived feedback as unnecessary as students were not "invested" in it. The other teacher from this department alluded to feedback in the OLS but never provided specific feedback during live class connects.

Mrs. Jones, a science teacher, believed that she offered feedback in every live class connect, but there was only one instance of it across ten observations. It became clear during the first two observations that Mrs. Jones misunderstood academic feedback as she often failed to provide objective descriptions of her students' work with the intent to guide future performance. Her perception of feedback, based on various phrases she used, suggested she thought it was more a celebration of the students' effort than it was a statement to prompt student engagement. Phrases like "good job" and "I'm liking what I'm seeing on the Unit 4 test so far" were not coded as evidence of feedback. The one instance of feedback from her class occurred during a breakout room activity where students were working on a virtual labs which consist of students working on clickable items within an application available on various websites. The other occurrence happened in one of Mrs. Dee's class connects where she made comments on and during student presentations.

Each math teacher was responsible for at least one instance of feedback in their live class connects. Mrs. Langdon adopted Mrs. White's practice of inviting students to

work directly with her after a live class connect, but adapted it so that her higher achieving students were provided opportunities to help their struggling peers. This occurred during 2 of my 10 observations. The other math teacher, Mrs. Thomas, showed data pertaining to test scores and provided feedback to students in a generalized way. She showed student test averages based on concepts and encouraged them to begin thinking about why they were performing so poorly. One example revolved around a class average of 27% on questions pertaining to polynomials. It makes sense that feedback happened more frequently in math classes than other subject areas. Math classes, by nature, consist of opportunities for students to demonstrate mastery and/or make mistakes. It was during those moments, especially when students were making errors, that feedback occurred most often.

Solve Problems

Many of the teachers selected for this study seemed to believe that their willingness to spend time solving academic problems with students in live class connects was somewhat paramount to the students' success in their course. Guerra & Lim's (2014) study suggested how much students appreciate a teacher's emphasis on working through creative strategies to solve problems and a few of the teachers in this study agreed, but almost all of the teachers agreed that it is ultimately the student's choice to participate either in live class connects or on their own.

Teacher Perceptions of Facilitating Problem Solving. Some teachers were hesitant to challenge students to solve problems in live class connects. Mrs. Langdon, a veteran math teacher, suggested that many students at OVCA struggled with anxiety

issues and instructional strategies that require students to work in front of or with other students, sometimes distracting their learning:

Most of my student who come to live class connects are willing to solve problems. However, outside of live CC's, it really is mostly those who attend and solve problems in live CC's already that are attempting this outside of class as well. Also, many of my students have anxiety issues and do not like to solve problems if they know that other students might see their work. I try to create situations where I am the only one who can see their thinking and that seems to encourage more participation. I usually get three to four students in a live class who consistently volunteer to solve problems live but I get about eighty percent of students that will turn in individual work outside of live class.

It seemed that Mrs. Langdon was not alone in her belief that students need positive reinforcement or a lot of encouragement before they showed willingness to work or participate in live class connects. Mrs. Black, an English Language Arts (ELA) teacher share this perception:

Most of my students are willing to solve problems during class if given guidance and encouragement. I just have to be very intentional in finding ways to get more students involved. Since not all of my students attend the live classes, I do get more participation from students by having them turn assignments in outside of live class. Usually I get about ninety percent of my students who turn in their work.

Mrs. Dee, a veteran science teacher who is working on a doctorate, indirectly echoed Black and Langdon's concern about student unwillingness to participate in live class connects, but she may have seen it more as a hesitancy than an unwillingness:

I think they are very willing. I guide when they get stuck, and try to ask leading questions without giving away the farm. I have made a safe environment in my class, where it is ok to be wrong, and even valued.

Each teacher indicated that teaching students to problem solve was important and several admitted that it is a struggle for a variety of reasons as evidenced in the response below by Mrs. Thomas:

I think they like to do things during class, but fear I would lose most of them if we just spent a majority of the time solving problems. I have been unsuccessful in my many attempts to go to breakout rooms and accomplish something meaningful. I did have one student talk to me this week about some things he was doing in his free time and how much he enjoys using the Khan Academy math and science videos to help him understand more deeply some of the physics topics we have just wiggled this year. He is the exception. I don't think many eighth grade cats are risking death with curiosity.

These reasons and others indicate that teachers approached this element in one of three ways. They were either confident in their ability to get students to solve problems in live class connects, hesitant about it as their past experiences suggested that students preferred not to be called on during live class connects, or they were neutral in that they

did not have an opinion on why they did or did not encourage students to solve problems in their classes.

Mrs. Jones, held the only divergent opinion from her peers. She was confident she could get students to solve problems in live classroom connects and believed that her students were not able to solve problems as asynchronously as her colleagues suggest:

My students do a great job of this in class. I always have a few students willing to jump in and try something. Soon, many other students follow. However, there is that element I mentioned earlier about students fearing failure, so that stops some from participating. Outside my live classes is another story. Students do not solve problems because they do not know how. This goes back to students being used to getting everything handed to them. Students today don't have to go look up an answer to a general question...they ask Siri in five seconds. So many parents today provide everything for their kids...too much in my opinion. I make it a mission of mine to teach students how to find answers. I do not give answers out. My mission statement as a teacher has always been about teaching students how to find answers. I do not give them the answers. They must work for it. I direct them, but I do not give anything to them. Students struggle with that. They just want the easy fix.

Mrs. Jones' approach to prompting students to solve problems on their own account for five of the seven instances the science department asked students to solve problems.

Observations of Teachers Facilitating Problem Solving. There were fifteen instances of math teachers asking students to solve problems in live class connects. Of these fifteen, nine were during ‘ice breaker’ and ‘warm-up’ times. Three times students were asked to solve problems collaboratively in breakout rooms and the remaining three times occurred in the main room when the teacher asked students to ‘work on’ a problem many of them had missed on a previous assessment.

I observed fourteen different instances of problem solving in ELA classes. Most of the time the teachers were asking students to correct grammatical mistakes in a text. This happened frequently and consistently as the ELA department shared a common approach to ‘bell work’. At the beginning of a live class there was typically a paragraph or two with various grammatical mistakes that students were asked to correct via the whiteboard tools.

There were nine moments in social studies classes where the teacher asked students to solve a problem. Problem solving in social studies classes differed from other subject areas as the teachers used hypotheticals more frequently. One example, from Mr. Mills’ class, prompted students to take a close look at the US/Soviet Union relationship during the Cold War and compose a peace treaty that both sides would potentially sign.

Students were asked to solve problems in science classes less frequently than the other subject areas. Many of the science lessons revolved around three to five key concepts that students would be assessed on at the end of the week. There were only seven instances of actual problem solving in these classes and nearly all of them occurred in breakout rooms.

Coding for this element consisted of a number of indicators that were tallied throughout the observation process. The most frequent indicators were: select; identify; use; name; and define. In math classes students were often asked to use more than any other indicator while students in ELA classes were asked to identify. There was more of a variety of indicators across science and social studies classes.

Teachers within the ELA department used small groups/breakout rooms more frequently than any other department (slightly beating out the math department). It was in those small group sessions that teachers challenged students to work through errors in their writing and complete assignments. Students were typically given roles in the breakout rooms and worked together to meet the expectations of a rubric or complete an activity provided by the teacher. Problems solved during these activities generally pertained to correcting grammatical mistakes, identifying an author's tone or style, and/or labeling text based on its structure.

Social studies teachers approached this element in one or two ways. First, slides would often consist of one big question at the top and a lot of blank space below. Students were responsible for answering that question on the whiteboard. Questions ranged from "How were the Populists and Progressives different?" to "What could Andrew Jackson have done differently to be considered a better president?" These questions were typically coded as opportunities for students to analyze, but in many cases the question was written in a way that had a specific answer (fill in the blanks, for example). The second way social studies teachers prompted students to solve problems included assessment questions. Mr. Russell, for example, would often pull up various questions that were on previous assessments and challenge students to determine the

correct answers during live class connects. These previous assessments often resembled the upcoming assessment the students were getting ready to take.

Students were asked to solve problems in half of all math classes observed. In classes where students were not asked to solve problems they were expected to follow along with the teacher who was doing the problem solving. The type of problem was based on what level of math the teacher was instructing. In Algebra I, students were asked to solve algebraic formulas in small groups/breakout rooms together or one student was asked to solve a problem on the whiteboard in front of the entire class. In Geometry, students would work together in breakout rooms and would fill in angle measures of an acute, right, or obtuse angle, for example. In Mrs. White's class, students were sometimes asked to evaluate another student's incorrect response to a problem and discuss where the student went wrong. Half of the time a teacher would show students how to work through a new formula and then stop the class connect recording and allow students to work on assignments together. Since this happened after live class connect recordings I could not observe what that process looked like.

Science teachers provided problem solving opportunities primarily during activities. These activities included virtual labs, T-charts, and Venn diagrams. The level of mastery evidenced in each of these activities ranged from knowledge to analysis. However, students were most often asked to label, list, recall, give examples, interpret, and summarize. Each of these actions typically fall under lower level comprehension skills. Mrs. Jones often challenged students to diagnose and justify their responses during activities (four instances across ten observations) while Mrs. Dee asked students to develop alternate plans to common practices. For example, in one

instance she asked students to look at all the pros and cons of three different sources of energy and develop a new, more effective source. Regardless of the level of mastery, the science department lagged behind the other three departments in this element.

Analyze

Analyzation can be demonstrated when a student calls into question assumptions they have always held and react differently to those assumptions once they have been challenged (Brookfield, 1987). Interview data suggested that teachers wanted their students to reflect on their learning and make decisions based on those reflections, but observation data will prove otherwise.

“Explain” was used most frequently by teachers when they were wanting students to analyze. Other terms used during the coding process for analyze were “apply,” “compare/contrast,” “construct,” and “discuss.” These five terms (including synonyms of each) were used across all subject areas. “Apply” was most often used in math classes, “explain” in social studies and science classes, and “construct” in ELA classes. “Discuss” and “compare/contrast” were seen across all subject areas.

Teacher Perceptions of Facilitating Analyzation. It appeared that science teachers at OVCA worried about student confidence when it came to answering higher order questions in live class connects. Teachers at OVCA attended a professional development on Bloom’s Taxonomy and are encouraged by administration and instructional coaches to be mindful of how challenging their questions are in live class connects. A Depth of Knowledge Chart (Appendix B) shows verbs that teachers are

expected to know and use in class to vary the level of cognitive complexity of their lessons. This is evidenced first in Mrs. Jones' response:

Now that it's in front of me, I probably don't use that exact vocabulary [analyze] as often as I should, but I have used it. It depends on the problem, but I find more often than not, if I give them a big clue to the first step, it really gets them going. They don't want to be wrong, or look stupid, but it's that risk taking that makes great scientists.

This sentiment, where students are afraid to make mistakes, is reflected in Mrs. Green's response as well:

I ask students to analyze often on assignments. Analyzing in live class can be a little tougher, though. Students are hesitant to analyze when their peers are watching.

In fact, students' fear of failure was a common response by teachers when asked how they prompt students to analyze in their classrooms. Mrs. Dee mentioned how her work with her instructional coach had made her realize the importance of challenging students even though they may be afraid of making mistakes in front of one another:

I don't ask students to analyze nearly enough. I know how extremely important this is, but I get so wrapped up in them being able to pass the assessments that I don't go there. I am so sad to admit that. In a perfect world, a teacher's only goal should be to make students think deeply. [My instructional coach's] coaching sessions have been particularly valuable in making me realize that I do indeed need to go there, and perhaps going there will facilitate the passing of the

test more than what I think I need to do and what students probably prefer...that is, the easy route.

Mrs. Can agreed with Mrs. Dee's thoughts on students needing to think deeply, but she struggled with the lack of student's responses when she challenged them to analyze:

I try to include at least one type of analysis question in each session. A few students will actively attempt, but I think that most just wait for the answer to be said or posted. It's very different than a brick and mortar setting where you can actively monitor participation. I think that students are afraid of being wrong.

Additionally, Mrs. Can was one of the teachers who thought that students were afraid of making mistakes in front of their peers and, consequently, did not participate in a way she expected. In fact, eight of the ten teachers indicated that students have some sort of fear of failure when being asked to analyze (or "think critically") in live class connects.

Even though the majority of teachers sensed that students were afraid of making mistakes in live class connects, they understood the importance of challenging the students at a high cognitive level. Mr. Mills confessed his concern regarding the rigor of his live classes:

I probably should have my students analyze more often. One thing that I am trying to do this year is have a piece of writing on the board in live class and have students use the rubric to analyze and score the writing. Many students in our school do not have a lot of support at home and I think that affects their attendance and participation or willingness in class.

Mr. Russell is a strong proponent of breakout rooms when it comes to providing opportunities for students to analyze, but he still sees a fraction of his students not participating at the level he would hope for:

Very rarely have I asked my students to analyze. I'm not sure why. A lot of them I feel like I am trying to drive the basic content home and don't think I could get that deep with them on such basic knowledge. But now that I think about that, I may be approaching that backward. I try to add in situations where students analyze as much as possible, probably about once a week. Scenarios where students can put themselves in the situation of an event from history and discuss the possible reasons why something happened seem to work best. We use breakout rooms for discussion and that seems to work well for my students. Some students don't participate, but the majority do - probably about seventy-five percent.

Mr. Russell's belief that students should use discussion during his class is apparent as he often provided students opportunities to answer each other's questions and compelled students to explain their answers. "Explain" and various synonyms of it came up three different times across ten observations of his class.

Observations of Teachers Facilitating Analyzation. Each social studies teacher asked students to explain and discuss in three of the ten different classes I observed. Each of these instances occurred when a new Unit was being introduced. After the introduction of the learning goal of a lesson, Mr. Russell would often pose a question that students would not know at first. His hope was that by the end of the class connect they would be able to construct an educated response. An example would be

from his class on Reconstruction: “Could sharecropping have been made fair by the white landowners? If so, how?”² Mr. Mills, on the other hand, used activities that required students to compare and contrast (two T-charts and one Venn diagram).

Mrs. Dee used activities as well. Her favorite seemed to be Venn diagrams. In one class, students were asked to examine similarities and differences of animal and plant cells and in another class the differences between whales and fish. Mrs. Jones encouraged students to analyze only one time and it pertained to identifying the differences between a helium atom and a lead atom. Mrs. Jones prides herself in small group and 1:1 sessions as evidenced in our interview. It seems she sees whole group instruction as an opportunity to simply deliver content and the small group sessions as a means to prompting student engagement.

Evidence obtained from observations of math teachers seems to revolve around their practice of asking students to explain why incorrect answers were incorrect. This occurred in each teacher’s class at least once and as many as four times as was observed in Mrs. White’s class. It happened in both breakout rooms and in the main room. In one case, the teacher asked students to write a question that had three incorrect answers that they thought other students would potentially choose and explain how those hypothetical other students could make those mistakes. This approach often resulted in one or two students using the microphone to explain their thoughts orally.

ELA teachers encouraged discussion more than any other department. A discussion component was evident in at least two class connects per teacher. Teachers

² See Appendix G for an example of students responding to this approach.

used philosophical chairs, pinwheel discussions, and affinity mapping most often. Mrs. Green attempted using the Socratic Seminar approach in one of her classes for the first time. ELA teachers at OVCA shared resources and these approaches were outlined in a professional development early in the year. Many of the classes I observed contained objectives that were not clearly aligned with engaging activities. In one case, the teacher posted an objective suggesting that by the end of class the students would be able to compare and contrast two key concepts. There was never a moment in the class where students were provided an opportunity to fill in a T-Chart, Venn Diagram, or share on the whiteboard what they thought the differences were. In fact, the activities in this class prompted students to define and match various other key terms, never the two terms mentioned in the objective. In another class the teacher posted three objectives within the same level of mastery. The teacher wanted students to be able to define, identify, and label a concept on the whiteboard. Each of these objectives fall under the knowledge level of mastery in Bloom's Taxonomy.

Study

Owen (2010) found that students entering college are much more likely to drop out if they are unable to follow a research process, search for information, and evaluate and use appropriate information. Each of these pertain to a student's study habits and even though Owen was discussing students entering college it is relevant to this study because OVCA considers itself a college preparatory charter school.

Teacher Perceptions of Facilitating Study. The teachers selected for this study tended to suggest how difficult it was to work with students on study skills because of how limited their interactions with students were. According to Mrs. White:

When I work with students in person (that I tutor), I always teach them study skills, but it's so hard to do in a virtual classroom because I can't see them. I give them a review of the test with similar questions but different numbers to help them prepare for the unit tests. I tell that that if they don't know how to do any of the questions, to let me know. I don't think virtual students study for assessments. I think they use their resources as they can...book, internet, notes. It does make me nervous about how much they're actually learning.

This nervousness that Mrs. White expressed seems to be common in other teachers as well as one used the word "anxious about their level of mastery" and another said she's "scared they won't do well on their final exams".

Mrs. Green went on to express the importance of one-on-one sessions with students when a unit exam or final exam was coming up:

Our one-on-one sessions are most valuable in my opinion for working on study skills. I enjoy talking to the students individually and they seem to appreciate the time to work together on what they can do to improve their writing and assessment scores.

Mrs. Black's response reflected Mrs. Green's where the participant explained that study mostly pertained to preparing students for impending exams:

I do not work with students directly on study skills. I do have a review session before each unit test where we go over key concepts from the unit.

Also, Mrs. Jones correlated study with test taking strategies as evidenced below:

We do test taking strategies basically every review...and lab. I try to give them hints and cheats for certain concepts, but most importantly, we always look for answer choices to rule out before we solve any problem, or in word problems, list the necessary information and label it. I try to get them to draw on things we know to unwrap what to expect. I don't really think most of them study enough for assessments, and although we review, we don't study together beyond that, unless they come for office hours.

A common belief among teachers was that students typically did not study outside of review sessions. Mrs. Thomas shared:

I offer small group sessions where students can come in to get personalized help with the curriculum. I find that only a few students take advantage of this opportunity. Many times the ones that really need extra help do not come. I think the majority of my students do not study outside of just completing the required assignments before taking the assessments.

Both Social Studies teachers suggested that students did not study for their assessments outside of live class connects even though they strongly urged them to. Also, both teachers indicated how important their review sessions were for students saying that pass rates were sometimes directly related to how many students attended those sessions. Mr. Russell connected pass rates to live class connect attendance:

Based on results, I have about sixty-to-seventy percent of my students that pass their midterm assessments which is interesting as that is about the percent in my live review sessions most weeks.

Mr. Mills' approach is more focused on small group study time:

I work on study skills at least twice a week with struggling students. They have ample opportunity to study with me. For one of my assessments, they need to have put in at least two to three hours of studying. I present a study guide to them. What I want them to do is use the technique of rote learning to memorize those answers. However, once they've memorized those answers, I hope they can apply those to more complex tasks, like analyzing. For instance, I want them to recall by memory that the US foreign policy after WWII was to contain communism. However, I want them to use that very basic fact to analyze why the US eventually moved away from containment and wanted to eradicate it altogether. Why did the US want to rid the world of communism? What was so bad about communism? Why wasn't it enough to just keep communism out of the US?

Mr. Mills' review sessions were crafted in a way that students had several opportunities to interact with the material as he seemed to believe his role in his students' study process was critical to their success in his class. The most frequent approach he used was a slide with a question at the top and blank space below it that is used for student responses (see Appendix C).

Mrs. Langdon, a math teacher, had a lot to say pertaining to students' study habits and the role she played in the process of helping them develop good study habits:

Well, once again, my answer embarrasses me. I do not work on study skills at all. Maybe how to study for an assessment or state test question in order to

increase your odds of getting it correct, but to actually just spell out what a study session might look like...no, it doesn't happen. I don't think they study much at all for assessments. They get three chances on most assessments and I believe they try it out first, then perhaps do a bit of studying if needed to increase their scores. Many take all three chances in rapid succession. The high school teachers have a joint study hall four days a week from two to four. No matter how often we talk it up in classes, not many take advantage of it. I will say that it is mostly used for math and some of my most rewarding teaching moments this year have come from sitting with students in study hall and watching...helping them work through math problems on the board. To slowly share and discuss a difficult math problem together is an amazing experience. I look at the clock and can't believe that an entire hour has passed.

Mrs. Jones explained her role as well and mentioned how she tried to encourage students to come to her office hours for study sessions, but she, like Mrs. Langdon, typically spent those hours alone. However, she believed that her class was a constant opportunity to teach students how to study:

We do test-taking strategies basically every review...and lab. I try to give them hints and cheats for certain concepts, but most importantly, we always look for answer choices to rule out before we solve any problem, or in word problems, list the necessary information and label it. I try to get them to draw on things we know to unwrap what to expect. I don't really think most of them study enough for assessments, and although we review, we don't study together beyond that, unless they come for office hours.

Mrs. Jones was not alone in her attention to test-taking strategies pertaining to the study element. When teachers heard the word “study” their responses seemed to be assessment focused with assessment results signifying students’ understanding.

Observations of Teachers Facilitating Study. Based on participants’ interview responses it was not surprising that teachers rarely asked students to study during live class connects. However, each teacher was only observed 10 times across the 2015-2016 school year and classes that took place just before a Unit assessment were not always included in their observation total. Each instance of teachers asking students to study occurred just before assessments.

Study activities seemed to fall under one of three categories: breakout rooms, example test questions, and student questions. Of these three, example test questions was most cited across the subject areas. Teachers posed a question that was similar to another question that students would see on an upcoming assessment (see Appendix F). Teachers would often use phrases like “know Poe’s tone in The Raven” or “be able to explain sharecropping” during these study sessions. This would suggest that they were preparing students for a specific question that would be asked on the assessment.

Students were rarely moved to breakout rooms to study. In both observed instances of this (one time in Mr. Russell’s class and one time in Mrs. White’s class), students were asked to complete an activity that was intended to prepare them for an essay question on an upcoming assessment. Students were expected to either use the chat tool to share their thoughts or the text tool to write their thoughts on the whiteboard. Students seemed to enjoy this approach as evidenced by their participation

rate (almost every student in each breakout room contributed to the discussion via chat or writing on the whiteboard).

Students were also given the opportunity to ask questions about upcoming assessments. This mostly happened in math classes where students asked questions about the test format and what concepts would be assessed. Assessments given in math classes always contained some sort of review section and students were more engaged during that section than the section about new concepts most recently learned.

Practice

Some practice literature suggests that students should be persistent and be willing to ask for help (Singh, 2015). We see a hyper-focus on persistence in Duckworth's grit research which makes sense in the participants of her study (i.e. individuals working on personal goals). There is evidence that veterans of a system are often the most helpful to new learners. When a student is practicing new knowledge it is often important that they reach out to someone who can relate to their struggle.

Teacher Perceptions of Facilitating Practice. We see an example of students being willing to reach out in Mrs. Can's "silent partners" activity:

There will always be those few students who just go for it. I think it comes from within them—not through anything I do. I constantly say, "Okay, time to just get some ideas out there so we have a starting point for discussion and practice." I assure them that we usually need to generate many mistakes to bring forth anything valuable. I'm pretty sure the ones who end up participating don't really need to hear my pep talk to take risks—like I said, it is already in them.

As for those unwilling souls, it could stem from so many things. Laziness could be a factor for just a few. Lack of interest in a subject is another reason.

Teacher failure to rally the troops is a real possibility. In our particular situation [virtual education] I believe many of our students have a significant degree of social awkwardness. I believe they are attracted to the anonymity our world offers. I hold out hope that the class silent partners are benefitting from the experience, and perhaps are stirred to think deeply... but we will probably never know.

Mr. Russell's response is another example of a positive outlook pertaining to student practice:

I feel like my students are very willing to practice with me and in front of their peers. Now, this isn't the case at the beginning of the year, this willingness takes time and trust and a lot of encouragement and support by the teacher. The anxiety level of many of our virtual students does limit how many of them are willing to put themselves out there in a live class. I find that I get the same small group of four to five students that are willing to practice in a live session and a few more that will if I encourage them to participate.

However, even in Mr. Russell's optimistic perception of student practice we see hints of students' unwillingness to participate based on anxiety or fear of making mistakes. Mrs. Black thought that breakout rooms could sometimes help with these two issues as students were not "putting themselves out there" in front of the entire class:

As I sort of mentioned before, some are cool with it, but there are at least half of them who do not want to practice in front of me or the whole class. Break out rooms really help, but even then I tell them they don't have to write on the board, they can type in the chat box or just share their answers.

Mrs. Jones echoed Mrs. Black's argument, but referenced "group work" instead of students working in breakout rooms:

They are better at group work together than when I call for someone to start us out on the board. That said, someone will normally volunteer, and ask good questions if they don't know exactly where to start. Their hesitance? I'm not too sure really. They really just want to get it I think. There is no shame in that.

In Blackboard Collaborate, where class connects are held, there are a variety of tools for teachers and students to use (see Appendix D), but Mr. Mills believed it was not the activity or the tool that prompted students to move from unwilling to willing to participate. He believed it began and ended with him, the teacher:

Certain students, the same ones who are problem solvers, are likely to practice new knowledge in class. Once a few students start to participate, I can usually get the more bashful one's going too. This environment is great for students who do not thrive in a group setting, however, it can be negative for them as well because they aren't forced to interact. I can't make anyone do anything in class connects. I just have to hope I'm persuasive enough to get them to participate. It's my job to build relationships outside of class so once they're in

class, they're comfortable with me. It's a personal goal of mine to develop those relationships so there is no need to be "scared" during class connects.

This again seemed to suggest that Mr. Mills, and many other teachers at OVCA, valued their teaching presence. They consider themselves important to their students.

Observations of Teachers Facilitating Practice. Practice tended to consist of activities where students were asked to apply what they just learned on the whiteboard via the text tool. Coding the observation data lead to three main categories: practice on whiteboard; practice in breakout rooms; and practice via chat discussion. Students practicing on the whiteboard was universal while practice in breakout rooms mostly existed in ELA (six times) and math (five times) classes.

In math classes a teacher showed them an example of how to work through a formula and then a student volunteer was asked to apply the formula to a new problem on the next slide. In ELA classes, a teacher would demonstrate how to identify a clause in an excerpt of text and then ask for student volunteers to locate other clauses in that text or a new excerpt of text on the next slide.

The majority of practice instances across all subject areas resided in either knowledge or comprehension levels of mastery. This means that students were most often asked to practice their understanding by identifying, defining, labeling, listing, summarizing, giving examples, classifying, or matching. However, students in math classes were sometimes asked to apply or analyze during practice opportunities. Specifically, Mrs. White asked students to calculate, predict, and design which are higher order skills. Calculate and predict are application levels of mastery while design

is a synthesis level of mastery per Appendix G, a resource instructional coaches use to observe/evaluate teachers.

Summary

In this chapter, the presentation and analysis of data were organized first by teacher perceptions of their instructional approach and then by observation notes. The goal of this study was to identify how teachers believed they addressed the five elements of cognitive engagement and then gather evidence during observations. In most cases, the teachers' actions seemed to align with the teachers' perceptions. For example, the low number of observed feedback occurrences in live class connects aligns with teachers' negative feelings toward student engagement with feedback. In other instances, teachers' perceptions did not dissuade them from prompting students to confront those perceived fears. For example, many teachers believed that students do not participate in live class connects because they were afraid of failure. Some teachers pointed to this fear as the reason they did not invite students to practice in live class connects. However, those same teachers utilized various practice activities where students were encouraged and expected to participate.

Chapter 5: Discussion

This study interrogated teachers' perceptions about their implementation of the five elements of cognitive engagement and examined how teachers in an online school in Oklahoma addressed each. The case study focused on a secondary school as there is an urgency to discover the causes of dropout at that level in that setting. Thus, the following research question was developed:

How are teachers at Oklahoma Virtual Charter Academy High School addressing the five elements of cognitive engagement?

The five elements of cognitive engagement include analyzing, feedback, practice, study, and solving problems. Each teacher was observed ten times over a school year and was interviewed once.

I was mindful of the three premises of symbolic interactionism during the process of observing and sharing my findings. First, I noted how every teacher defined the elements of cognitive engagement and how they addressed (or, acted toward) each (Blumer, 1969). Next, I analyzed how each teacher's personal meaning of the elements derived from their experience teaching online. Lastly, I examined how all ten teachers applied their interpretation of the five elements in live classes with students. The Community of Inquiry Model (CoI) was referenced throughout the study as it addressed three different ideologies of how teachers fulfill their instructional responsibilities. Namely, cognitive presence was discussed more than the other two presences as this study pertained more to how teachers perceive their effect on students' cognitive engagement. Each teacher's personal definition of cognitive engagement and how the

teachers prompt student cognitive engagement in their classrooms was recorded in my notes.

I used the Community of Inquiry Model (CoI) as my conceptual framework in an effort to identify each teacher's cognitive presence. I found that teachers often replace their cognitive presence with teaching presence, preferring more to micromanage students than to prompt students to theorize, analyze, or interact with cognitively complex tasks on their own. This was discouraging as I presumed I would see more examples of students working through rigorous material with their teacher more as a guide than a manager.

Each theme discussed in this chapter was developed during the interview process and analyzed during the observation process. In many cases what the teacher said is what the teacher did. However, it was more common that teachers perceived their practice and approach differently than how they were actually addressing student engagement.

Concerns and Questions

The data raised various concerns and questions over the course of the study. This chapter is outlined by those concerns and questions via headings. First, I will share an observation I made regarding the difference between 'review' lessons and regular lessons. Second, I examined how teachers used their instructional time at the beginning of each live class. Next, I suggest the teachers selected for this study define student participation in a variety of ways. A perceived lack of student social engagement is referenced next followed by a teacher's frustration with adapting face-to-

face strategies to the online setting. I then will analyze a common perception among teachers regarding fear of failure among students. One teacher shared a concern about the state standard literature and another confessed that he frequently simplified content to keep student participation high. I also note response time, student autonomy, teacher confidence, unclear lesson goals, teachers' perceptions of existing study habits, teaching presence, and college preparation. Additionally, I will discuss how apparent it is that student engagement is important to OVCA teachers and administrators.

Differences in Class Purpose

In many cases a teacher conducted a 'review' lesson where they delivered content a second time. These classes seemed to be the most interactive as the teacher developed and implemented a game or activity that required students to answer questions that would ultimately reappear on the student's unit exam. Review classes were very different from regular classes in that students contributed more to the lesson. They often determined the pace of the class as well. If students seemed to enjoy these classes more why are the teachers delivering them so infrequently? Or, why are teachers not allowing students to contribute more during regular classes?

Improving Use of Instructional Minutes

My next question pertained to the teachers' apparent unwillingness to lessen the amount of announcements they gave at the beginning of their live classes. I noticed that every teacher presented the same five or six slides about various upcoming events, lock dates (the last day a student can submit an assignment), and deadlines. On average, seven minutes of every class were used to read through these slides. This is relevant to

a student's cognitive engagement as they will not have as much time to interact with each other and/or the material when ten percent of the class is non-instructional. How might teachers streamline the announcement process so that time is not wasted in their live classes?

Definitions of Participation

Perceptions of participation began to interest me as well as I noticed two teachers may have misunderstood what comprises participation. For example, Mrs. Black stated the following:

Since not all of my students attend the live classes, I do get more participation from students by having them turn assignments in outside of live class. Usually I get about ninety percent of my students who turn in their work.

Based on her response it seems she links participation with students who turn in their work. In a general sense what she has said may be true; students show participation by completing a task. However, when any of the other eight teachers referred to student participation they summarized it as moments in live class connects where students are asked to type in chat, write on the whiteboard, or share responses over the microphone.

Perceived Lack of Social Engagement

One interesting finding pertained to teachers' perceptions of student disengagement outside of live class connects. Several teachers mentioned that if the students were left solely to work independently their class pass rate would drop significantly. The notion that online students are prone to feel more isolated and disconnected (Cook, 2007) was evident during my interviews with teachers and during

live classes. This could lead one to believe the teachers were highly aware of their students' lack of social engagement. Because this study set out to focus on teachers' perceptions of students' cognitive engagement, not as much attention was paid to findings outside of that context. A future study revolving around teacher perceptions of students' social engagement in an online school would complement this study.

Additionally, the amount of emphasis teachers placed on one-on-one and small group sessions seems to merit further study. The teachers suggest these sessions are paramount to their students' success in their courses, but we cannot be fully sure unless we single those students out (the ones attending one-on-one or small group sessions) and follow their progress for either a semester or school year.

Face-to-Face

One teacher noted her personal struggle with not being able to see her students in person:

When I work with students in person (that I tutor), I always teach them study skills, but it's so hard to do in a virtual classroom because I can't see them.

This is an area I could have explored further with each teacher. Every teacher had spent time working in traditional schools before joining OVCA. As I began re-reading my notes a few questions arose: Does Mrs. White believe she is less effective in the online setting? Do other teachers struggle with this? A future study pertaining to teachers' transition from traditional schools to virtual schools and how they have adapted their instructional strategies to engage online students would complement this study.

Fear of Failure

Teachers at OVCA seemed to be extremely concerned with their students' fear of failure, whether real or not. I asked two teachers to give examples of moments where this perceived fear of failure was evident and both were unable to recall specific instances. Fear of failure should not be the go-to reason that teachers are reluctant to encourage student participation. Bartles & Herman (2011) showed that fear of failure has been known to lead to self-handicapping and how it can easily limit a student's academic success. According to a few teachers, every instance a student was unwilling to answer a rigorous question in class it was because he was afraid to be incorrect in front of his peers. It is important they are not too hasty to arrive at this conclusion.

Perceptions of State Standard Rigor

Teachers may not challenge students for several reasons. One reason may revolve around the low complexity of state standards. Teachers like Mrs. Dee seem to be overly concerned with preparing students for state tests:

I don't ask students to analyze nearly enough. I know how extremely important this is, but I get so wrapped up in them being able to pass the assessments that I don't go there.

State standard literature is generally written using verbs from Bloom's Taxonomy. In Oklahoma's case we see an overuse of verbs like identify, define, and label. Because the standards are written at a low level the teacher may think they do not need to challenge students at higher levels. Why ask students to analyze if they will only be asked to define terms on the state test?

Teachers at OVCA are not alone in their concern about student performance on state standardized tests. Teaching to the test has become the go-to strategy in many failing schools. Because the stakes are so high, teachers may think it is more important for their students to pass an exam than demonstrate mastery of concepts. Also, teachers may think their students mostly want the “meat and potatoes” of the content instead of all the “fluff”. Mr. Mills said the following when asked about engaging students in feedback:

As far as assignments go, I do not feel they are invested in my feedback. I can go into a student’s view and see that they’ve not looked at any comments the entire semester. However, I don’t think it’s a matter of them not caring. I think it’s a matter of them having to click a few more buttons and they just don’t want to.

His perception may suggest that he thinks his students are willing only to put forth minimal effort. So, he decides to challenge them with exactly what will be on a state test and nothing more.

It is a disservice to students when teachers are unwilling to challenge them with more rigorous tasks. When students are asked to analyze, for example, they are expected to demonstrate their ability to break concepts down into parts, figure out how things work, classify something, and/or criticize. By not regularly and consistently prompting students to engage in these higher level thinking skills the teachers at OVCA were not preparing students to engage with complex material. However, one department did attempt to establish a routine of student analysis. Analysis was most frequent in ELA classes where it generally pertained to analyzing a text, but the

students were primarily describing or summarizing and the teachers never redirected them or pushed them to fully address the *why*'s of the text. This lack of redirection spilled over into an analytical writing assignment the students were given. One teacher mentioned in a live class that she was excited to see how descriptive the students were in their essays, but was disappointed by the lack of complexity in their writing.

It cannot be overstated how important it is to organize students to interact with cognitively complex tasks. The teachers interviewed for this study all agreed that getting students to think is one of the most important aspects of their position at OVCA. Several even believed they were challenging students at a high level, but after observing their classes their questions tended to start with verbs like define, identify, label, summarize, and predict which are all low levels of mastery per the Bloom's Taxonomy chart. In two cases I noticed teachers use higher level mastery verbs in their lesson objectives (criticize and design) without providing a moment in their lesson for students to demonstrate mastery at that level.

Response Time

It may not be the student's fear of failure that prevents teachers from developing and implementing lessons with cognitively complex lesson goals. It may, in fact, be the teacher's fear of silence in their live class connects. During the observation process I noticed how often teachers struggled with wait time between questions. When students failed to answer questions quickly the teacher typically took over and answered for them. In most cases the teacher did not even wait three seconds for a response from students. This is a concern as there are a number of benefits to waiting that long for student responses. Rowe (1972) suggests that teachers would see an increase in the

length of their students' responses, an increase in student confidence, and an increase in the response rate from 'relatively slow' students if they just waited three seconds after asking questions.

I observed that as the year progressed teachers began adapting their instructional methodologies as well. At the beginning of the year Mrs. Jones confessed the following:

My mission statement as a teacher has always been about teaching students how to find answers. I do not give them the answers. They must work for it.

However, she began simplifying her lessons and started providing answers to students who were struggling in breakout room activities. Mrs. Dee said something similar:

I guide when they get stuck, and try to ask leading questions without giving away the farm.

As the year progressed I noticed less guidance and more "giving away the farm."

Student Autonomy

It is interesting to note that when students were left to work on their own or in groups they produced their highest quality work during live class connects. This was true across all subject areas. I heard a math teacher suggest that her students who worked independently on concepts in breakout rooms a few days before an assessment performed better on that assessment than they did on the previous assessment where they spent little time preparing in breakout rooms. I observed the students in one of these collaborative breakout rooms and discovered how often they asked each other

questions and explained concepts to one another. Each student seemed to enjoy using the chat box and their microphone to converse with the others in their group. In an ELA breakout room I noticed students sharing and listening to one another's interpretation of a text. I never observed a breakout room where students refused to participate. Their zealous willingness to work together makes sense as students in the online setting rarely interact with each other in an academic manner.

Teacher Confidence

Students enjoying breakout room activities may directly correlate with their willingness to accept feedback, only in this case it is feedback from their peers. A finding that surprised me pertained to the lack of feedback OVCA ELA teachers provided their students in live class connects. It makes sense that longer assignments like essays or papers that occurred outside of live sessions were given detailed feedback, but it seems as though the teachers missed opportunities to give smaller versions of feedback to students during breakout room activities or when the students shared their writing on the whiteboard. A potential reason could be that the teachers did not want to embarrass the students. A professional development showing teachers how to provide non-aggressive live feedback may be beneficial here or perhaps a training on how to create peer-to-peer feedback opportunities in an online setting.

Teachers in this study admitted that it was often difficult to provide feedback to students during live class connects. I only observed one instance of it across ten observations of three ELA teachers and two instances of it in science and social studies classes. The math teachers provided feedback consistently (nine instances), generally following a unit assessment. When teachers neglect to provide feedback they are taking

away opportunities for students to feel a sense of achievement which potentially may motivate them to stay engaged.

The concern that the teachers may have could revolve around a lack of confidence in their ability to provide good feedback. This hesitation makes sense as each teacher in this study admitted how important it is to not discourage their students. There are several indicators a teacher must be aware of when crafting good feedback: promptness, frequency, are they giving adequate credit to students who answered correctly and being tactful in their feedback to students who answered incorrectly, and how often are they looking to other students to provide feedback. If the teacher is concerned about any or all of these they may ignore providing feedback altogether.

Unclear Lesson Goals

Feedback is also goal-driven. This is important to note as many of the interviewed teachers developed unclear lesson goals. When providing feedback the teacher should be aware of how close to the goal a student was and what sort of suggestions they can make to help the student complete the assignment or finish the task. This is difficult to do when the goal is unclear. If a student is tasked with writing an analytical essay, but writes a descriptive one instead the teacher should be willing to redirect the student by making specific suggestions. If the teacher failed to adequately explain what analytical writing is then she cannot fault the student for not writing an analytical essay. This example occurred in one of the ELA classes and the teacher gave students full credit if they simply turned in a 500 word essay.

Simplifying Content

Simplifying work or content was a common practice among teachers in this study. Science teachers typically prompted students to solve problems by asking questions that started with one of the five following verbs: select, identify, use, name, and define. Use, in this case, is the most rigorous of the five, but it was only used one time during a breakout room activity. The other four verbs all fall under either the knowledge or comprehension level of Bloom's Taxonomy. Knowledge and comprehension are the lowest levels of mastery.

When asking students to solve problems it is important to move beyond the types of problems the students already know. The science teachers believed they were doing a great job as the majority of their students easily solved problems in their live classes. I observed instances of students clicking through and completing virtual labs so quickly that they were allowed to leave class thirty minutes early because that is how much time the teacher allotted for the activity. In one instance every student completed the lab with at least twenty minutes left in class.

This is concerning for a number of reasons, mainly that students are not being prompted to explain their problem solving process. They are not given opportunities to engage with the problem, understand it, describe it, identify alternative solutions, or theorize. They are basically told to complete a task and are rewarded for finishing it quickly. Additionally, students who struggled with these activities may have been embarrassed by how 'slow' they were at completing their assigned lab.

Solving problems is no less important than study habits and practice skills. It is recognized as more than just an important academic skill. It is a life skill. Specific correlations between the role of cognition and problem solving have been made and this

study hopes to perpetuate those connections (Kohl & Finklestein, 2006; Cock, 2012; Ibrahim & Rebello, 2013). A student's cognitive engagement is made up of their willingness to think through concepts and eventually apply what they have learned to a task. When students are asked to problem solve they are prompted to determine a number of solutions that might be correct and choose the best one. When they are not asked to problem solve they are not given an opportunity to engage in this cognitive process. It may be beneficial for teachers at OVCA to learn how to appropriately teach students to problem solve across all subject areas. A study focusing on the increase or decrease in student cognitive engagement after students are asked to problem solve could add to the literature.

Teacher Perceptions of Existing Study Habits

It may not be surprising that there is a significant relationship between students' study habits and how well they perform in math classes and there is a profound difference in achievement between good study habits and poor ones (Odiri, 2015). It seems the ten OVCA teachers assumed that students knew how to study, so little time was spent modeling and advising during live class connects. A study regarding OVCA students' study habits and how well they performed on assessments or standardized tests may contribute to the literature.

Student Engagement Important to OVCA

The problem of disengagement is one that teachers and administrators at Oklahoma Virtual Charter Academy are desperately trying to solve as they implement numerous policies and programs to increase interaction activities within their live

classes. Professional development on instructional coaching, grit, and motivation have shown some results as teachers are experimenting with differentiated instruction at a higher rate than previously assumed. This differentiated instruction tends to revolve around various resources the teachers share with one another or resources provided to them via their instructional coaches. Flip charts (Appendix H), critical thinking charts (Appendix I), and Blooms' DOK charts (Appendix B) are the most common.

Resources like these are helpful, especially for new teachers, but they do not necessarily affect a teacher's perception of their students' cognitive abilities. It could be suggested that administrators and leaders at OVCA continue providing resources, but focus more on their teachers' understanding of their students' cognitive abilities.

Mr. Russell stated in our interview that he provided discussions in his live class connects because it provided opportunities for students to answer each other's questions and sometimes forced them to expand on their responses. When I asked him to identify what level of mastery he strives for during those discussions he was unable to give a clear answer:

Well, I think when they're talking to each other they're thinking about the content more and when they're thinking I feel like I got them. I feel like my job is to just get them talking and thinking about the material and go from there.

My theory is that Mr. Russell's explanation is common among the other teachers selected for this study. Discussion, as Mr. Russell and other OVCA teachers would suggest, requires students to show comprehension of the concepts being taught. What tends to happen in their lessons is that teachers post lesson objectives that use words like arrange, assemble, organize, evaluate, and justify which are more rigorous than the

comprehension level of mastery. Two instructional coaches were asked by OVCA administration to train teachers to look for appropriate student evidence, teach them how to craft rigorous objectives, and assist in the deconstructing of state standards.

One goal of the K12, Inc. instructional coaching program is to encourage teachers to become more mindful of the level of content mastery they want from their students. Coaches are asked to push their teachers to include a progression of rigorous lesson objectives in each class connect. Each objective should be aligned with at least one activity or opportunity for students to demonstrate mastery (Appendix J). Each element of cognitive engagement can (and has been) be included in these daily lesson objectives. Teachers and leaders at OVCA could observe the data in the Findings section above and implement programs to encourage teachers to incorporate more cognitive elements in their lesson objectives (more application objectives for science teachers, for example). A study regarding teacher creation of lesson objectives and learning targets that challenge students across numerous levels of mastery would be compelling.

Teaching Presence

Another interesting finding is that teachers tended to place themselves within the teaching presence in the Community of Inquiry (CoI) model (Figure 3). This makes sense as teachers might not fully understand their role in the other two presences. They knew how to select content, set climate, and a few knew how to support discourse, but very few understood fully how to approach students with all three presences in mind. A study identifying each teacher's perception or understanding of the CoI model could be valuable. A professional development examining the similarities and differences of

each presence could also be beneficial for teachers who may not know anything about the model, especially considering that teachers tend to think their presence in students' lives is the most important component of online education.

Policymakers and practitioners utilize teacher surveys as they make decisions concerning school improvement. There is seemingly no better way to get the pulse of a school than surveys. This is especially true in virtual schools as teachers, administrators, parents, and students primarily interact via email, over the phone, or in Blackboard Collaborate rooms. Surveys are typically created and utilized monthly for a variety of reasons in K12, Inc.-managed schools. Because the OVCA school culture is built around survey results it may be beneficial for teachers to survey their students' cognitive engagement with their class. The survey could consist of questions regarding student interest in the various tools and strategies developed and implemented by the teachers. The questions could even be specific to one or more of the five elements of cognitive engagement. An open-ended question like "Describe your study habits" would help teachers understand how they need to approach test preparation in their live classes.

College Preparation

Even though OVCA suggests it is a college preparatory school, students are not necessarily given a college advisor or mentor during their secondary years. This is a concern as mentors and advisors can outline a plan for students to follow that best prepares them for college entrance exams and college admissions. Students instead interact with their homeroom teachers who intermittently discuss college plans and offer ACT prep once every few months. These teachers do not always share their

students' interests, are not trained to offer the best support, and do not interact with their students over multiple years. These three areas have been found to be most impactful when mentoring and preparing students to look beyond their secondary education (DuBoise, 2002; Ensher, 1997; Herrera, 2000; MENTOR, 2009; Rhodes, 2005).

It is also concerning that teachers may believe their students already possess attributes that will make them successful once they graduate. For example;

I'm pretty sure the ones who end up participating don't really need to hear my pep talk to take risks—like I said, it is already in them.

This is interesting as Mrs. Can, like several other OVCA teachers, indicated that she is important to her students' success in her class. Mrs. Can may believe she does a good job of providing opportunities for students to participate and when students do not meet expectations it is generally their own fault.

Excuses

In other cases the teacher would make excuses for their students. This was apparent in one class where students refused to volunteer to complete an activity. The teacher said, "Okay, looks like we all have a case of the Mondays. Guess I'll do this for us." Teachers taking over and working through an activity for students was common. The above example occurred in one of Mr. Russell's classes. Mr. Russell is the teacher who shared the following in our interview:

I feel like my students are very willing to practice with me and in front of their peers. Now, this isn't the case at the beginning of the year, this willingness takes time and trust and a lot of encouragement and support by the teacher.

This happened during one of my final observations of Mr. Russell's class.

Mr. Russell was also the first teacher to mention his concern about his students' presumed anxiety:

Also, many of my students have anxiety issues and do not like to solve problems if they know that other students might see their work.

Four other teachers also noted their concern about their students' anxiety. I asked one teacher how she was sure her students were too anxious to participate in her class and she said:

They are just the type of student we get here. They tend to be socially awkward in their brick and mortar school so they come to us where they can kinda hide out. Mrs. Dee was the only teacher I asked to expand on the anxiety concern so I cannot assume every teacher simply assumes it is a problem. It may be a genuine concern and teachers may spend time with administrators, parents, and/or advisers to learn about each student's background. However, it does seem to parallel the teachers' assumption that the majority of their students are suffering from a fear of failure.

OVCA vs. Other Oklahoma Online Schools

The research from this study provided a unique glimpse into the teacher perceptions of a rapidly growing population of young virtual learners. These virtual learners will clearly need adaptable and creative educators who are willing to address the five elements of cognitive engagement into their practice. Implications for this study could encompass the future practice of engagement strategies used by administrators and teachers during synchronous and asynchronous virtual learning. At the time of this study, OVCA is one of only a few virtual school platforms in Oklahoma to provide live synchronous classes for students. Although the data suggests engagement is low in these

synchronous sessions, it is important to note that many virtual schools do not offer this option. Other K-12 online options in Oklahoma such as Epic Charter Academy and Connections High School only offer asynchronous options for students. In these other school platforms, peer to peer interactions are limited to discussion boards and infrequent optional in-person field trips. Despite the low cognitive engagement seen by some teachers, the synchronous learning option provides an opportunity for students to interact with each other in new and unique ways.

Conclusion

Corno and Mandinach (1983) first looked at cognitive engagement over 30 years ago as a way to measure how teachers were directly involved in the learning of their students. They also wanted to observe the amount and quality of effort they saw in students as they addressed their academic expectations. Today, teachers at OVCA tend to believe they are critical to their students' success in their courses, but that does not necessarily suggest they are critical to their students' learning experiences. For a teacher to be more involved in the learning process of their students, according to Corno and Mandinach (1983), they would need to not only be mindful of the five elements of cognitive engagement but knowledgeable of how to apply them as well.

The five elements of cognitive engagement can be used to observe how a teacher maintains student engagement in a live online class setting. However, they do not take into account a number of other factors that are known to positively affect student engagement: discussions (Duncan, 2015), fun (Deviney, 2013), student interest (Khalid, 2013), weekly newsletters (Nash, 2014), autonomy (Data Quality Campaign, 2016), and appropriate use of technology (iNACOL, 2013) to name a few. These

elements were chosen for this study because they make up the cognitive presence within the Community of Inquiry Model.

Teachers seemed to be preoccupied with how an instructional strategy may personally affect their students. Most were hesitant to challenge students with rigorous tasks because they presumed their students would give up due to a fear of failure. Some were also cautious to encourage participation in live classes because they were afraid their students were suffering from anxiety. From my limited time observing classes over the year I saw no indication that students were struggling with either a fear of failing or anxiety. In fact, when students were divided into groups and asked to work together I saw an increase in student engagement.

As I began thinking about how teachers at OVCA affect their students I assumed the majority adopted an instructional approach that was predominantly cognitive. I assumed the teachers were more interested in providing opportunities for students to think on their own or work together in varying group sizes. Indeed, there were instances of teachers prompting students to interact with one another in breakout rooms and share their own thoughts, opinions, and predictions about a topic, but these strategies did not occur as frequently as I thought they would. And where they did occur they were not always done appropriately.

During the coding process I was mindful of Blumer's theory of symbolic interaction. I began to wonder how often teachers in online settings develop their meaning of student engagement through their interaction with other online teachers or through their interaction with parents of online students. Perhaps teachers at OVCA are influenced by their negative interactions with a limited number of students and parents

who express their concerns about anxiety, fear and past failed school experiences. Blumer's theory may shed light on why teachers tend to absorb negative social interactions and modify them in a way that include affects their perceptions of "all or most" of their students, when in reality, it may only be a minority who suffer from perceived issues.

The findings of this study further the understanding of how teachers perceive they address the five elements of cognitive engagement during live classes at an online high school. Analysis of interview data and observation notes showed the struggle teachers had with knowing what is best for their students versus how to prepare them for state standardized tests. Additionally, the data revealed teachers at OVCA are highly aware of a perceived lack of social interaction among their students. These perceptions often lead to unsubstantiated assumptions about the personalities, handicaps, and mental capacities of their students. Focusing more on how to prompt students to cognitively engage with concepts than what they believe their students can or cannot do may better serve these teachers in the future.

My theory at the beginning of the study centered on the idea that teachers were mindful of how they prompt students to cognitively engage with new concepts and ideas. As I began interviewing each teacher I learned they valued various methods and instructional strategies that they assumed they could not implement in an online setting. However, each teacher struggled to admit this fact and I often noticed a struggle with articulating how they really felt about teaching online. Also, their personal definitions of cognitive engagement seemed to be firmly in place long before our interview or

before they came to OVCA. This was surprising as I assumed teachers are constantly adapting perceptions of how to engage a rapidly changing student demographic.

Initially, I wanted to focus on the cognitive presence area of the Community of Inquiry Model. I discovered rather quickly that the three presences overlapped in a very profound way. Teacher interview responses revealed how important they believe they are to their students' success. I did not anticipate this as I assumed I would see teachers consider their presence more cognitive than the other two. A study discussing this overlap would contribute not only to the Community of Inquiry literature but to the online teaching and learning literature as well.

References

- Alexander, K. L. (1997). Public schools and the public good. *Social Forces*, 76, 1-30.
- Andrini, V.S. (2016). The effectiveness of inquiry learning method to enhance students' learning outcome: A theoretical and empirical review. *Journal of Education and Practice*, 7(3), 38-42.
- Annamalai, N. & Tan, K. (2015). Exploring two teachers' engagement with their students in an online writing environment. *The EUROCALL Review*, Vol. 23, 2.
- Askar, P., & Altun, A. (2009). Cogskillnet: An ontology-based representation of cognitive skills. *Educational Technology & Society*, 12(2), 240–253.
- Asmussen, K.J., & Creswell, J.W. (1995). Campus response to a student gunman. *Journal of Higher Education*, 66, 575-591.
- Baker, L., Afflerbach, P., & Reinking, D. (Eds.). (1996). Developing engaged readers in school and home communities. Mahwah, NJ: Erlbaum.
- Baker, L., Dreher, M. J., & Guthrie, J. T. (Eds.). (2000). Engaging young readers. New York: Guilford.
- Barbour, M. K., & Bennett, C. (2013). The FarNet journey: Effective teaching strategies for engaging Māori students on the virtual learning network. *Journal of Open, Flexible and Distance Learning*, 17(1), 12–23. Retrieved from <http://journals.akoatearora.ac.nz/index.php/JOFDL/article/viewFile/195/156>
- Bartels, J. M., & Herman, W. E. (2011). Fear of failure, self-handicapping, and negative emotions in response to failure. Paper presented at the Annual Convention of the Association for Psychological Science (APS) 23rd, Washington, D.C., May 28, 2011

- Barth, P., Hull, J., & St. Andrie, R. (2012). Searching for the reality of virtual schools. Alexandria, VA. center for public education, National school boards association. Retrieved from <http://www.centerforpubliceducation.org/Main-Menu/Organizing-a-school/Searching-for-the-reality-of-virtualschools-at-a-glance/Searching-for-the-reality-of-virtual-schools-full-report.pdf>
- Bigatel, P. & Williams, V. (2015). Measuring student engagement in an online program. *Online Journal of Distance Learning Administration*, 18(2). Retrieved from http://www.westga.edu/~distance/ojdla/summer182/bigatel_williams182.html
- Beaubier, D.M. (2012). Improving student readiness: examining K-16 alignment of content and performance standards. *Collected Essays on Learning and Teaching*, 5, 109-113.
- Bernard, R.M., Abrami, P.C., Lou, Y., Borokhovski, E., Wade, A., Wozney, L., et al. (2004). How does distance education compare to classroom instruction? A meta-analysis of the empirical literature. Retrieved from <http://doe.concordia.ca/cslp/Downloads/PDF/CanKnow/Bernard>
- Bigatel, P. & Williams, V. (2015). Measuring student engagement in an online program. *Online Journal of Distance Learning Administration*, 18(2). Retrieved from http://www.westga.edu/~distance/ojdla/summer182/bigatel_williams182.html.
- Bilge, F., Tuzgol Dost, M., & Cetin, B. (2014). Factors affecting burnout and school engagement among high school students: study habits, self- efficacy beliefs, and academic success. *Educational Sciences: Theory and Practice*, 14(5), 1721-1727.
- Blazer, C. (2009). Literature review virtual schools. Research services office of

assessment, research, and data analysis Miami-Dade county public schools.

Retrieved from <http://drs.dadeschools.net/InformationCapsules/IC0817.pdf>.

Bloom, B.S. (1984). The search for methods of group instruction as effective as one-to-one tutoring. *Educational Leadership*, 41(8), 4-18.

Bocchi, J., Eastman, J., & Swift, C. (2004). Retaining the online learner: profile of students in an online MBA program and implications for teaching them. *Journal of Education for Business*, 79(4), 245-253.

Bodner, G. M., & Domin, D. S. (2000). Mental models: The role of representations in problem solving in chemistry. *University Chemistry Education*, 4(1), 24-30.

Bogdan, R.C., & Biklen, S.K. (1992). *Qualitative research for education: An introduction to theory and methods*. Boston: Allyn & Bacon.

Bogner, K., Raphael, L. M., & Pressley, M. (2002). How grade-1 teachers motivate literate activity by their students. *Scientific Studies of Reading*, 6, 135-165.

Bonner, J. (2008, May 22). Online school targets Hispanics, at-risk. *Casper Star-Tribune*.

Borup, J. (2016). Teacher perceptions of learner-learner engagement at a cyber high school. *International Review of Research in Open and Distributed Learning*. Vol. 17, 3.

Brookfield, S.D. (1987). *Developing critical thinkers: Challenging adults to explore alternative ways of thinking and acting*. San Francisco: Jossey-Bass.

Brookhart, Susan M. (2008) *How to give effective feedback to your students*.

Alexandria, VA: Association for Supervision and Curriculum Development.

Burger, J. M., Nadirova, A., & Keefer, K.V. (2012). Moving beyond achievement data

- development of the student orientation to school questionnaire as a noncognitive assessment tool. *Journal of Psychoeducational Assessment*, 30(4), 367–386. doi: 10.1177/0734282912449444
- Chen, P. D., Lambert, A. D., & Guidry, K. R. (2010). Engaging online learners: The impact of web-based learning technology on college student engagement. *Computers & Education*, 54(4), 1222–1232.
- Choi, A.L.Y., Tse, J.C.Y., So, C.S.N., & Young, A.S. (2005, May). Hong Kong parents' perceptions of benefits of music to their children. *New Horizons in Education*, 51, 111-123.
- Cleveland-Innes, M. & Campbell, P. (2012). Emotional presence, learning, and the online learning environment. *The International Review of Research in Open and Distributed Learning*, 13(4), 269-292.
- Claxton, G. (2007). Expanding young people's capacity to learn. *British Journal of Educational Studies*. 55(2), 1-20.
- Cock, M. D. (2012). Representation use and strategy choice in physics problem solving. *Physical Review Special Topics-Physics Education Research*, 8.
- Connell, J., & Wellborn, J. (1991). Competence, autonomy, and relatedness: A motivational analysis of self-system processes. Paper presented at the self-processes and development: The Minnesota Symposium on Child Development. Hillsdale, NJ
- Cook, D. (2007). Web-based learning: pros, cons and controversies. *Journal of the Royal College of Physicians*, 7(1), 37-42.
- Cooper, H. (1989). Homework. White Plains, NY: Longman

- Cooper, H., Robinson, J.C., & Patall, E.A. (2006). Does homework improve academic achievement? A synthesis of research, 1987-2003. *Review of Educational Research, 76*(1), 1-62.
- Corno, L., & Mandinach, E.B. (1983). The role of cognitive engagement in classroom learning and motivation. *Educational Psychologist, 18*(2), 88–108.
- Costley, J. (2016). The effects of instructor control on critical thinking and social presence: Variations within three online asynchronous learning environments. *The Journal of Educators Online, 13*(1).
- Creswell, J.W. (1998). *Qualitative inquiry and research design: Choosing among five traditions*. Thousand Oaks, CA: Sage.
- Cusick, P. A. (1991). Student groups and school structure. In J. P. Shaver (Ed.), *Handbook of research on social studies teaching and learning*, 276-289. New York: Macmillan.
- Daniels, E., & Steres, M. (2011). Examining the effects of a school-wide reading culture on the engagement of middle school students. *RMLE Online: Research in Middle Level Education, 35*(2) 1-13.
- Darabi, A., Arrastia, M.C., Nelson, D.W., Cornille, T., & Liang, X. (2011). Cognitive presence in asynchronous online learning: A comparison of four discussion strategies. *Journal of Computer Assisted Learning, 27*(3), 216-227.
- DeNovelles, A., & Reyes-Foster, B. (2015, September). Using word clouds in online discussions to support critical thinking and engagement. *Online Learning, 19*(4).
- Denzin, N. & Lincoln, Y. (1994). *Handbook of qualitative research*. Newbury Park, CA: Sage.

- Dixson, M. D. (2010). Creating effective student engagement in online courses: What do students find engaging? *Journal of the Scholarship of Teaching and Learning*, 10(2), 1–13. Retrieved from <http://josotl.indiana.edu/article/download/1744/1742>
- Dolezal, S., Welsh, L., Pressley, M., & Vincent, M. (2003). How nine third-grade teachers motivate student academic engagement. *The Elementary School Journal*, 103(3), 239-267.
- DuBois, D., Holloway, B., Valentine, J., & Cooper, H. (2002). Effectiveness of mentoring programs for youth: A meta-analytic review. *American Journal of Community Psychology*, 30, 157-197.
- Duckworth, A.L., Gendler, T.S., & Gross, J.J. (2014). Self-control in school-age children. *Educational Psychologist*, 49(3), 199-217.
- Duckworth, A.L., Grant, H., Loew, B., Oettingen, G., & Gollwitzer, P.M. (2011). Self-regulation strategies improve self-discipline in adolescents: Benefits of mental contrasting and implementation intentions. *Educational Psychology: An International Journal of Experimental Educational Psychology*, 31(1), 17-26.
- Duckworth, A. L., Kirby, T., Tsukayama, E., Berstein, H., & Ericsson, K. (2011). Deliberate practice spells success: Why grittier competitors triumph at the National Spelling Bee. *Social Psychological and Personality Science*, 2, 174-181.
- Duckworth, A. L., Peterson, C., Matthews, M. D., & Kelly, D. R. (2007). Grit: perseverance and passion for long-term goals. *Journal of Personality and Social Psychology*, 92(6), 1087-1101.

- Duckworth, A. L. & Quinn, P. D. (2009). Development and validation of the Short Grit Scale (Grit-S). *Journal of Personality Assessment, 91*, 166-174.
- Duckworth, A. L., Quinn, P. D., & Seligman, M.E.P. (2009). Positive predictors of teacher effectiveness. *Journal of Positive Psychology, 19*, 540-547
- Duckworth, A. L. & Seligman, M. E. P. (2005). Self-discipline outdoes IQ predicting academic performance in adolescents. *Psychological Science, 16*, 939-944.
- (Grit-S). *Journal of Personality Assessment, 91*, 166-174.
- Duckworth, A. L. & Seligman, M. E. P. (2006). Self-discipline gives girls the edge: Gender differences in self-discipline, grades, and achievement test scores. *Journal of Educational Psychology, 98*, 198-208.
- Duckworth, A. L., Tsukayama, E., & May, H. (2010). Establishing causality using longitudinal hierarchical linear modeling: An illustration predicting achievement from self-control. *Social Psychology and Personality Science, 1*(4), 311-317.
- Duckworth, A. L., Tsukayama, E., & Geier, A. B. (2010). Self-controlled children stay leaner in the transition to adolescence. *Appetite, 54*(2), 304-308.
- Duckworth, A. L., Tsukayama, E., & Kirby, T. (2013). Is it really self-control? Examining the predictive power of the delay of gratification test. *Personality and Social Psychology Bulletin, 39*(7), 843-855.
- Dweck, C. (2006). *Mindset: The new psychology of success*. New York: Random House, Inc.
- Eccles, J., Wigfield, A., Harold, R., & Blumenfeld, P. (1993). Age and gender differences in children's self- and task perceptions during elementary school. *Child Development, 64*, 830- 847.

- Edwards, S. (2015, May). Active learning in the middle grades. *Middle School Journal*, 46(5), 26-32.
- Ennis, R.H. (1962). A concept of critical thinking. *Harvard Educational Review*, 32, 81- 111.
- Ennis, R.H. (1987). A taxonomy of critical thinking dispositions and abilities. In J. Baron & R. Sternberg (Eds.), *Teaching thinking skills: Theory and practice*, 9-26. New York: W.H. Freeman.
- Ensher, E. A., & Murphy, S. E. (1997). Effects of race, gender, perceived similarity, and contact on mentor relationships. *Journal of Vocational Behavior*, 50(3), 460-481.
- Ericsson, K. A. (2009). Enhancing the development of professional performance: Implications from the study of deliberate practice. 405-431. Cambridge, UK: Cambridge University Press.
- Ericsson, K. A. (2007). Deliberate practice and the modifiability of body and mind: Toward a science of the structure and acquisition of expert and elite performance. *International Journal of Sport Psychology*, 38, 4-34.
- Ericsson, K. A. (2006). The influence of experience and deliberate practice on the development of superior expert performance. In K. A. Ericsson, N. Charness, P. Feltovich, & R. R. Hoffman (Eds.), *Cambridge handbook of expertise and expert performance*. 685-706. Cambridge, UK: Cambridge University Press.
- Ericsson, K. A., Krampe, R. T., & Tesch-Römer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review*, 100, 363-406.

- Ericsson, K. A., & Ward, P. (2007). Capturing the naturally occurring superior performance of experts in the laboratory: Toward a science of expert and exceptional performance. *Current Directions in Psychological Science, 16*, 346-350
- Eskreis-Winkler, L., Shulman, E., Beal, S., & Duckworth, A.L. (in press). The grit effect: Predicting retention in the military, the workplace, school and marriage. *Frontiers in Personality Science and Individual Differences*.
- Finn, J. D. (1989). Withdrawing from school. *Review of Educational Research, 59*, 117-142.
- Finn, J. D. (1993). School engagement and students at risk. Washington, DC: National Center for Education Statistics.
- Fonesca, J., Carvalho, C., Conboy, J., Valente, M.O., Gama, A.P., Salema, M.H., & Fiuza, E. (2015, August 4). Changing teachers' feedback practices: A workshop challenge. *Australian Journal of Teacher Education, 40*(8).
- Frankola, K. (2001). Why Online Learners Drop Out. *Workforce, 80*(10), 53.
- Fraser, B. J., Walberg, H.J., Welch, W. W., & Hattie, J. A. (1987). Synthesis of educational productivity research, special issue. *International Journal of Educational Research, 11*(2), 145-252.
- Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research, 74*(1), 59–109. doi: 0.3102/00346543074001059
- Galla, B. M., Plummer, B. D., White, R., Meketon, D., D'Mello, S. K., & Duckworth,

- A. L. (2014). The academic diligence task (ADT): Assessing individual differences in effort on tedious but important schoolwork. *Contemporary Educational Psychology, 39*(4), 314-325.
- Gambrell, L. B., Codling, R. M., & Palmer, B. M. (1996). Elementary students' motivation to read (research report). College Park, MD, and Athens, GA: National reading research center, Universities of Maryland and Georgia.
- Gambrell, L. B., Palmer, B. M., Codling, R. M., & Mazzoni, S. A. (1996). Assessing motivation to read. *Reading Teacher, 49*, 518-533.
- Garcia, R.M., & DeFeo, D.J. (2014). Finding your "Spanish voice" through popular media: improving students' confidence and fluency. *Journal of the Scholarship of Teaching and Learning, 14*(3) 110-131.
- Garrison, D. R., & Akyol, Z. (2013). Towards the development of a metacognition construct for communities of inquiry. *The Internet and Higher Education, 17*, 84-89.
- Garrison, D. R., Anderson, T., & Archer, W. (2001). Critical thinking, cognitive presence, and computer conferencing in distance education. *The American Journal of Distance Education, 15*(1), 7-23.
- Garrison, D. R., & Archer, W. (2000). A transactional perspective on teaching and learning: A framework for adult and higher education. Oxford: Pergamon.
- Garrison, D. R., Anderson, T., & Archer, W. (1999). Critical inquiry in a text-based environment: Computer conferencing in higher education. *The Internet and Higher Education, 2*(2), 87-105.
- Garthwait, A. (2014). Pilot program of online learning in there small high schools:

- Considerations of learning styles. *The Electronic Journal of e-Learning*, Vol. 12, 4.
- Gentry, R. (2012, December). Making college a success by assessing and navigating candidates' study habits. *Research in Higher Education Journal*, 18.
- Gibbs, R. S., & Poskitt, J. M. (2010). Student engagement in the middle years of schooling (years 7–10): A literature review. Wellington, New Zealand: Ministry of Education. Retrieved from <http://www.educationcounts.govt.nz/publications/schooling/student-engagement-in-themiddle-years-of-schooling-years-7-10-a-literature-review/introduction>
- Gielen, S., Peeters, E., Dochy, F., Onghena, P., & Struyven, K. (2010). Improving the effectiveness of peer feedback for learning. *Learning and Instruction*, 20(4), 304–315.
- Gilbert, J. (2007). Catching the Knowledge Wave: Redefining knowledge for the post-industrial age. *Education Canada*, 47(3), 4-8. Retrieved from www.cea-ace.ca
- Glenn, D. (2011). Presidents are divided on best ways to measure quality, *Chronicle of Higher Education*, 57(37), 10.
- Gollwitzer, A., Oettingen, G., Kirby, T. & Duckworth, A. L. (2011). Mental contrasting facilitates academic performance in school children. *Motivation and Emotion*, 35, 403-412.
- Gonzalez, J. (2015, October). The Big List of Class Discussion Strategies. Retrieved from <http://www.cultofpedagogy.com/speaking-listening-techniques/>
- Goodlad, J. I. (1984). A place called school: Prospects for the future. New York:

McGraw-Hill.

Graue, M.E., Weinstein, T., & Walberg, H J. (1983). School-based home instruction and learning: A quantitative synthesis. *Journal of Educational Research*, 76, 351-360.

Gray, J. & DiLorento, M. (2016). The effects of student engagement, student satisfaction, and perceived learning in online learning environments. *NCPEA International Journal of Educational Leadership Preparation*, Vol. 11, 1.

Guerra, P., & Lim, W. (2014, December). Latinas and problem solving: what they say and what they do. *Journal of Urban Mathematics Education*, 7(2), 55-75.

Harris, L. R. (2008). A phenomenographic investigation of teacher conceptions of student engagement in learning. *The Australian Educational Researcher*, 35(1), 57-79.

Hattie, J. (1992). Measuring the effects of schooling. *Australian Journal of Education*, 36(1), 5-13.

Hawkins, A., Graham, C. R., Sudweeks, R. R., & Barbour, M. K. (2013). Academic performance, course completion rates, and student perception of the quality and frequency of interaction in a virtual high school. *Distance Education*, 34(1), 64-83.

Herrera, C., Sipe, C.L., & McClanahan, W.S. (2000). Mentoring school-age children: Relationship development in community-based and school-based programs. Philadelphia, PA: Public/Private Ventures.

Hiebert, J., & Grouws, D. A. (2007). The effects of classroom mathematics teaching on

- students' learning. In F. J. Lester, Jr. (Ed.), *Second handbook of research on mathematics teaching and learning*, 371–404. Charlotte, NC: Information Age Publishing.
- Hofferber, N., Eckes, A., & Wilde, M. (2014). Effects of autonomy supportive vs. controlling teachers' behavior on students' achievements. *European Journal of Educational Research*, 3(4) 177-184.
- Hu, D., & Rebello, N. S. (2014). Shifting college students' epistemological framing using hypothetical debate problems. *Physical Review Special Topics-Physics Education Research*, 10.
- Hughes, J.N. & Chen, Q. (2011). 'Reciprocal effects of student–teacher and student–peer relatedness: Effects on academic self efficacy'. *Journal of Applied Developmental Psychology*, 32(5), 278–287.
- Ibrahim, B., & Rebello, N. S. (2013). Role of mental representations in problem solving: students' approaches to nondirected tasks. *Physical Review Special Topics-Physics Education Research*, 9.
- Imhof, M., & Spaeth-Hilbert, T. (2013). The role of motivation, cognition, and conscientiousness for academic achievement. *International Journal of Higher Education*, 2(3) 69-80.
- International Association for K-12 Online Learning (iNACOL). (2013). Retrieved from <http://www.inacol.org/wp-content/uploads/2015/02/fun-facts-about-online-learning.pdf>
- Jeffrey, L. M., Milne, J., Suddaby, G., & Higgins, A. (2012). Help or hindrance:

Blended approaches and student engagement. Wellington, New Zealand: Ako Aotearoa National Centre for Tertiary Teaching Excellence. Retrieved from <https://ako.aotearoa.ac.nz/download/ng/file/group-3089/help-or-hindrance-final-report.pdf>

- Joo, K.P., Andres, C., Shearer, R. (2014, December). Promoting distance learners' cognitive engagement and learning outcomes: design-based research in the Costa Rican national university of distance education. *International Review of Research in Open and Distance Learning*, 15(6) 188-210.
- Josephson Institute of Ethics. (2006). The ethics of American youth. Retrieved on September 11, 2015, from <http://www.josephsoninstitute.org/reportcard/>.
- Joyce, T.B.Y., & Yates, S.M. (2007). A Rasch analysis of the academic self-concept questionnaire. *International Education Journal*, 8(2) 470-484.
- Karatas, I., & Baki, A. (2013). The effect of learning environments based on problem solving on students' achievements of problem solving. *International Electronic Journal of Elementary Education*, 5(3), 249-268.
- Kim, Y.K., Edens, D., Iorio, M.F., Curtis, C.J., & Romero, E. (2015). Cognitive skills development among international students at research universities in the United States. *Journal of International Students*, 5(4) 526-540.
- Kohl, P. B., & Finkelstein, N. D. (2006). Effects of representation on students solving physics problems: A fine-grained characterization. *Physical Review Special Topics-Physics Education Research*, 2.
- Korver, B. & Tillema, H. (2014). Feedback provision in mentoring conversation:

- Differing mentor and student perceptions. *Journal of Education and Training Studies*, 2(2) 167-175. Apr. 2014.
- Krueger, R.A. (1994). *Focus groups: A practical guide for applied research* (2nd ed.). Thousand Oaks, CA: Sage.
- Kuh, G. D. (2003). What we're learning about student engagement from NSSE: Benchmarks for effective educational practices. *Change*, 35(2), 24-32.
- LaSalle, D. (2015). Intrinsic motivation and the five-paragraph essay: lessons learned on practitioner research, the role of academic research in the classroom, and assessing changes in student motivation. *Penn GSE Perspectives on Urban Education*, 12(1).
- Lee, S-M. (2014). The relationships between higher-order thinking skills, cognitive density, and social presence in online learning. *The Internet and Higher Education*, 21, 41-52.
- Leibold, N., & Schwarz, L.M. (2015). The art of giving online feedback. *Journal of Effective Teaching*, 15(1), 34-46.
- Lewin, K., Dembo, T., Festinger, L., & Sears, P.S. (1944). Level of aspiration. In J. Hunt (Ed.), *Personality and the behavior disorders*, 333–378. Oxford: Ronald Press.
- Lincoln, Y.S., & Guba, E.G. (1985). *Naturalistic inquiry*. Beverly Hills, CA: Sage.
- Lipman, M., Sharp, A. M. & Oscanyan, F. S. (1980). *Philosophy in the classroom*. Philadelphia: Temple University Press.
- Lister, D., & Ansalone, G. (2006). Utilizing modality theory to achieve academic success. *Educational Research Quarterly*, 30(2) 20-30.

- Liu, W.C., Wang, C.K.J. (2005). Academic self-concept: a cross-sectional study of grade and gender differences in a Singapore secondary school. *Asia Pacific Education Review*, 6(1), 20-27.
- Mackness, J., Waite, M., Roberts, G., & Lovegrove, E. (2013, October). Learning in a small, task-oriented, connectivist MOOC: pedagogical issues and implications for higher education. *International Review of Research in Open and Distance Learning*, 14(4), 140-159.
- Madia, B. P. and Lutz, C. J. (2004). Perceived similarity, expectation-reality discrepancies, and mentors' expressed intention to remain in big brothers/big sisters programs. *Journal of Applied Social Psychology*, 34(3), 598-623.
- Malone, K. L. (2007). The convergence of knowledge organization, problem-solving behavior, and metacognition research with the modeling method of physics instruction. *J. Phys. Tchr. Educ. Online*, 4(2).
- Marzano, R. (2014). 2014 Marzano teacher evaluation model: Desired effects. Retrieved from <http://www.marzanocenter.com>
- Marzano, R. (2007). *The Art and science of teaching*. ASCD Member Book. Alexandria, VA.
- Maslow, A. (1962). *Toward a psychology of being*. Princeton, NJ: VanNostrand.
- Matoyu, M. (2014, March). A structural equation modelling of the academic self-concept scale. *International Electronic Journal of Elementary Education*, 6(2), 185-198.
- McKenna, M. C., Ellsworth, R. A., & Kear, D. J. (1995). Children's attitudes toward reading: A national survey. *Reading Research Quarterly*, 30, 934-956.

- Mead, G. H. (1967). The "I" and the "Me." In C. W. Morris (Ed.), *Mind, self, and society: From the standpoint of a social behaviorist*. Chicago, IL: University of Chicago Press.
- Mead, G. H. (1913). The social self. *Journal of Philosophy, Psychology, and Scientific Methods*, 10, 374-380.
- Mead, G. H. (1908/1909). Editorial notes. *Elementary School Teacher*, 9, 327-328.
- MENTOR (2009). *Elements of effective practice for mentoring* (3rd edition). Alexandria, VA: MENTOR.
- Ministry of Education. (2008). A study of students' transition from primary to secondary schooling. Wellington: Research Division. Retrieved from <https://www.educationcounts.govt.nz/publications/schooling/31844/31846>
- Merriam, S. (1988). *Case study research in education: A qualitative approach*. San Francisco: Jossey-Bass.
- Miles, M.B., & Huberman, A.M. (1994). *Qualitative data analysis: A sourcebook of new methods* (2nd ed.). Thousand Oaks, CA: Sage.
- Ministry of Education. (2008). A study of students' transition from primary to secondary schooling. Wellington: Research Division. Retrieved from <https://www.educationcounts.govt.nz/publications/schooling/31844/31846>
- Miron, G. & Urschel, J.L. (2012). *Understanding and improving full-time virtual schools: A study of student characteristics, school finance, and school performance in schools operated by K12 Inc*. National Education Policy Center. Retrieved from <http://files.eric.ed.gov/fulltext/ED533960.pdf>
- Morgan, D. L. (1988). *Focus groups as qualitative research*. Newbury Park, CA: Sage.

- Newmann, F. M., Wehlage, G. G., & Lamborn, S. (1992). The significance and sources of student engagement. In F. Newmann (Ed.), *Student engagement and achievement in American secondary schools*, 11-39: New York: Teachers College Press.
- Nicholls, J. G. (1989). *The competitive ethos and democratic education*. Cambridge, MA: Harvard University Press.
- Noddings, N. (1984). *Caring: A feminine approach to ethics and moral education*. Berkeley: University of California Press.
- NSW DET (NSW Department of Education and Training) (2003). *Quality teaching in NSW public schools: Discussion paper*. Sydney: NSW DET, Professional Support and Curriculum Directorate.
- Oakes, J. (1985). *Keeping track: How schools structure inequality*. New Haven: Yale.
- Odiri, O.E. (2015). Relationship of study habits with mathematics achievement. *Journal of Education and Practice*, 6(10), 168-170.
- Owen, P. (2010). A transition checklist for high school seniors. *School Library Monthly*, 26(8), 20-23.
- Ozden, M.Y., Erturk, I., & Sanli, R. (2004). Students' perceptions of online assessment: A case study. *Journal of Distance Education*, 19(2), 77-92.
- Parsons, J., & Taylor, L. (2011). *Student engagement: What do we know and what should we do?* Alberta: University of Alberta. Retrieved from https://education.alberta.ca/media/6459431/student_engagement_literature_review_2011.pdf
- Paschal, R. A., Weinstein, T., & Walberg, H. J. (1984). The effects of homework on

- learning: A quantitative synthesis. *Journal of Educational Research*, 78, 97-104.
- Patton, M. Q. (1990). *Qualitative evaluation methods* (2nd ed.). Thousand Oaks, CA: Sage.
- Phelan, P., Locke-Davidson, A., & Thanh Cao, H. (1992). Speaking up; students' perspectives on school. *Phi Delta Kappan*, 73(7), 695-704
- Pink, D. H. (2009). *Drive: the surprising truth about what motivates us*. New York: Riverhead Books.
- Pintrich, P. R., & Schunk, D. H. (1996). *Motivation in education: Theory, research, and application*. Englewood Cliffs, NJ: Prentice-Hall.
- Powell, A.G., Farrar, E., & Cohen, D. K. (1985). *The shopping mall high school: Winners and losers in the educational marketplace*. Boston: Houghton Mifflin.
- Prensky, M. (2001). Digital natives, digital immigrants. *On the Horizon*, 9(5), 1-6.
- Renninger, K. A., Hidi, S., & Krapp, A. (1992). *The role of interest in learning and development*. Hillsdale, NJ: Erlbaum.
- Rhodes, J.E., Reddy, R., & Grossman, J. (2005). Promoting successful youth mentoring relationships: A preliminary screening questionnaire. *Journal of Primary Prevention*, 26, 147-168.
- Romer, D., Duckworth, A. L., Sznitman, S., & Park, S. (2010). Can adolescents learn self control? Delay of gratification in the development of control over risk taking. *Prevention Science*, 11(3), 319-330.
- Roorda, D.L., Koomen, H.M.Y., Spilt, J.L. & Oort, F.J. (2011). 'The influence of

- affective teacher–student relationships on students’ school engagement and achievement: A meta-analytic approach’. *Review of Educational Research*, 81(4), 493–529.
- Rowe, M. B. (1972). Wait-time and rewards as instructional variables: Their influence on language, logic, and fate control. *Resources in Education*, Education Resources Information Center, Presented at the National Association for Research in Science Teaching, Chicago, Illinois, April 1972.
- Santovec, M. (2004). Virtual learning communities lead to 80 percent retention at WGL. *Distance Education Report*, 8(8), 4.
- Sedlak, M. W., Wheeler, C. W., Pullin, D. C. & Cusick, P. A. (1986). *Selling students short: Classroom bargains and academic reform in the American high school*. New York: Teachers College Press.
- Singh, M.K.M. (2015). International graduate students' academic writing Practices in Malaysia: challenges and solutions. *Journal of International Students*, 5(1), 12-22.
- Sivin-Kachala, J. & Bialo, E. (2009). Social skills of mainstream students in full-time, online public schools: How they compare to traditional public school students. Retrieved from <http://www.k12.com/sites/default/files/pdf/IESD-Socialization-Study-Abstract-May-2009.pdf>
- Sizer, T. R. (1984). *Horace's compromise: The dilemma of the American high school*. Boston: Houghton Mifflin.
- Solomon, D., Battstich, V., Kim, D., & Watson, M. (1997). *Teachers practices*

- associated with students' sense of the classroom as a community. *Social Psychology of Education*, 1, 235-267.
- Spilt, J., Koomen, H.M. & Thijs, J. (2011). 'Teacher wellbeing: The importance of teacher–student relationships'. *Educational Psychology Review*, 23(4), 457–477.
- Stake, R. (1995). *The art of case study research*. Thousand Oaks, CA: Sage.
- Steinberg, L. (1996). *Beyond the classroom: Why school reform has failed and what parents need to do*. New York: Simon and Schuster
- Sternberg, Robert J., and Richard K. Wagner. (1994). *Mind in Context: Interactionist perspectives on human intelligence*. Cambridge, England: Cambridge University Press.
- Stewart, D.W., & Shamdasani, P.N. (1990). *Focus groups: Theory and practice*. Newbury Park, CA: Sage.
- Stipek, D. J. (2001). *Motivation to learn: Integrating theory and practice*. Needham Heights, MA: Allyn & Bacon.
- Strauss, A., Schatzman, L., Bucher, R., & Sabshin, M. (1981). *Psychiatric ideologies and 133 institutions*. (2nd ed). New Brunswick, NJ: Transaction Books.
- Swan, K., & Shih, L. F. (2005). On the nature and development of social presence in online course discussions. *Journal of Asynchronous Learning Networks*, 9(3), 115–136. Retrieved from <http://anitacrawley.net/Articles/Swan%20and%20Shih2005.pdf>
- Szabo, Z. & Schwartz, J. (2011). *Learning methods for teacher education: the use of*

- online discussions to improve critical thinking. *Technology, Pedagogy and Education* 20(1), 79-94.
- Tapscott, D. (1998). *Growing up digital: the rise of the net generation*. New York: McGrawHill.
- Taylor, S. J., & Bogdan, R. (1984). *Introduction to qualitative research methods*. (2nd ed) New York City: Wiley.
- Tsui, L. (2002). Fostering critical thinking through effective pedagogy: Evidence from four institutional case studies. *The Journal of Higher Education*, 73(6), 740-763.
- Tsukayama, E., Duckworth, A. L. (2010). Domain-specific temporal discounting and temptation. *Judgment and Decision Making*, 5(2), 72-82.
- Tucker, B. (2007). *Laboratories of reform: Virtual high schools and innovation in public education*. Retrieved from http://www.educationsector.org/usr_doc/Virtual_Schools.pdf.
- Verhoeven, L., & Snow, C. (2001). *Literacy and motivation: Reading engagement in individuals and groups*. Mahwah, NJ: Erlbaum.
- Waggoner, M. (2013). Cultivating critique: A (humanoid) response to the online teaching of critical thinking. *Liberal Education*, 38-43.
- Walberg, H. J. (1999). Productive teaching. In H.C. Waxman & H. J. Walberg (Eds.), *New directions for teaching practice research*, 75-104, Berkeley, CA: McCutchen.
- Watson, J., et. al. (2013). *Keeping pace with K-12 online & blended learning: An annual review of policy and practice*. Evergreen Education Group. <http://kpk12.com/reports/>

- Weng, G., Ye, C., Jing, L., & Yan, W. (2014). The effects of facilitating feedback on online learners' cognitive engagement: Evidence from the asynchronous online discussion. *Education Sciences, 4*, 193-208.
- Wickersham, L. E., & Dooley, K. E. (2006). A content analysis of critical thinking skills as an indicator of quality of online discussion in virtual learning communities. *Quarterly Review of Distance Education, 7*(2), 185–193.
- Willging, P., & Johnson, S. (2004). Factors that influence students' Decisions to dropout of online courses. *Journal of Asynchronous Learning Networks, 8*(4), 23-31.
- Wilmer, E. (2009). The influence of learning communities on the interaction levels of developmental English students, *Inquiry, 14*(1), 55-67.
- Wilson, K., Copeland-Solas, E., & Guthrie-Dixon, N. (2016, February). A preliminary study on the use of mind mapping as a visual-learning strategy in general education science classes for Arabic speakers in the United Arab Emirates. *Journal of the Scholarship of Teaching and Learning, 16*(1) 31-52.
- Wisconsin Virtual School. (2008). Retrieved from <http://www.wisconsinvirtualschool.org>
- Wolcott, H.F. (1994). Transforming qualitative data: Description, analysis, and interpretation. Thousand Oaks, CA: Sage.
- Wong, A.C.K. (2015). Understanding students' experiences in their own words: Moving beyond a basic analysis of student engagement. *Canadian Journal of Higher Education, 45*(2), 60-80.
- Wood, B. (2012). Reflective journal writing and student engagement. *Studies in*

teaching 2012 *Research Digest*, 145–150. Retrieved from

<http://college.wfu.edu/education/wpcontent/uploads/proceedings12.pdf#page=1>

49.

Zhang, M. (2012). Scaffolding strategies for supporting middle school students' online

inquiry processes, *Computers and Education*. 58(1), 181-196.

Appendix A

HOW TEACHERS AT OKLAHOMA VIRTUAL CHARTER ACADEMY ADDRESS THE FIVE ELEMENTS OF COGNITIVE ENGAGEMENT: AN INTERPRETIVIST CASE STUDY

Thank you for time and willingness to participate. As you know, I am interested in studying teachers' perceptions of how they cognitively engage students in online classrooms. Particularly, I am trying to explore the five elements of cognitive engagement: feedback, solving problems, analyzing, practice, and study. These elements make up my current research questions. You also have the option of declining to answer – passing on – any of the questions. Do you have any questions before we start?

Interview Questions

When and how did you decide to become a teacher?

How do you think you fit in with the career you have chosen?

How do you describe your approach to teaching?

How would you define effective teaching?

How would you describe engagement in your classes?

How often do your students respond to your “feedback” (in live cc’s or in the comments section after an assignment’s been turned in) and how invested do you think they are in what you share during a feedback moment?

How often do you ask students to “analyze” and how willing are they to “analyze” in live class connects?

Do you have a theory as to why they are or are not willing to “analyze” in front of you/other students?

In what ways do you work with students on “study skills” and do they have an opportunity to “study” with you?

Additionally, how much do you think your students study for assessments?

How willing do you think your students are to “solve problems” during a live class connect and how would you explain their willingness to “solve problems” outside of a live class connect?

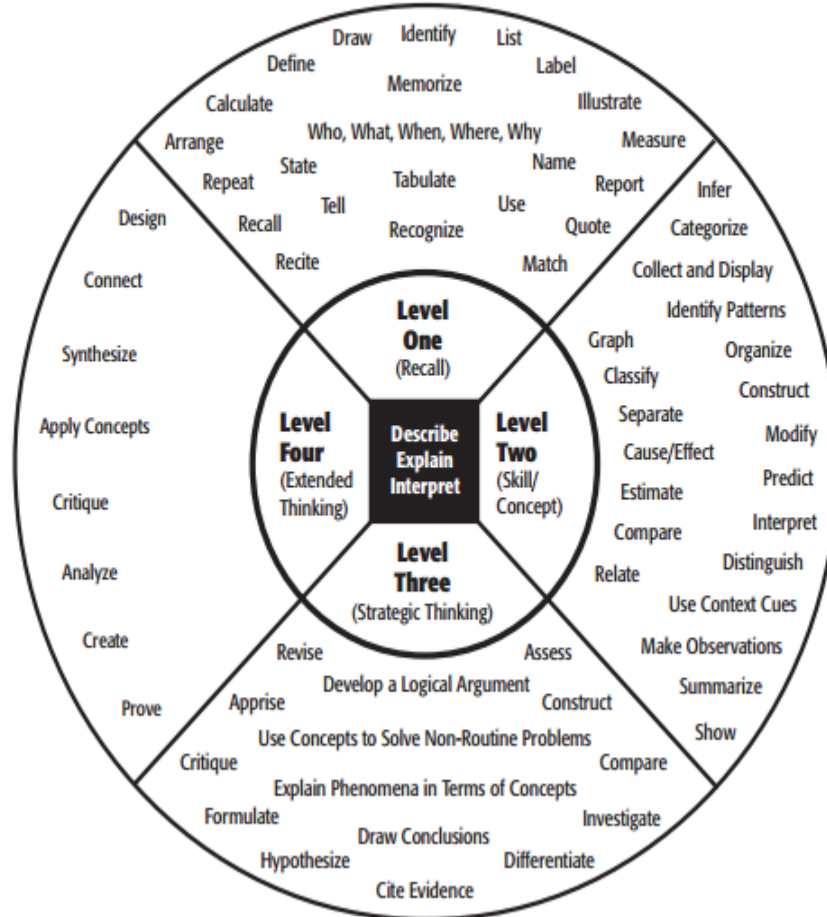
How willing are your students to “practice” new knowledge with and in front of you and their peers?

Do you think there’s a reason they are so willing/unwilling and, if so, what is it?

Now that we are done, do you have any questions you’d like to ask me about this research project? If you want to contact me later, here is my contact information. Also, I may need to contact you later for additional questions or clarification. Can I also have your follow-up contact information?

Appendix B

Depth of Knowledge (DOK) Levels



Appendix C

How were skyscrapers important to the growth and development of cities? (study guide #12)

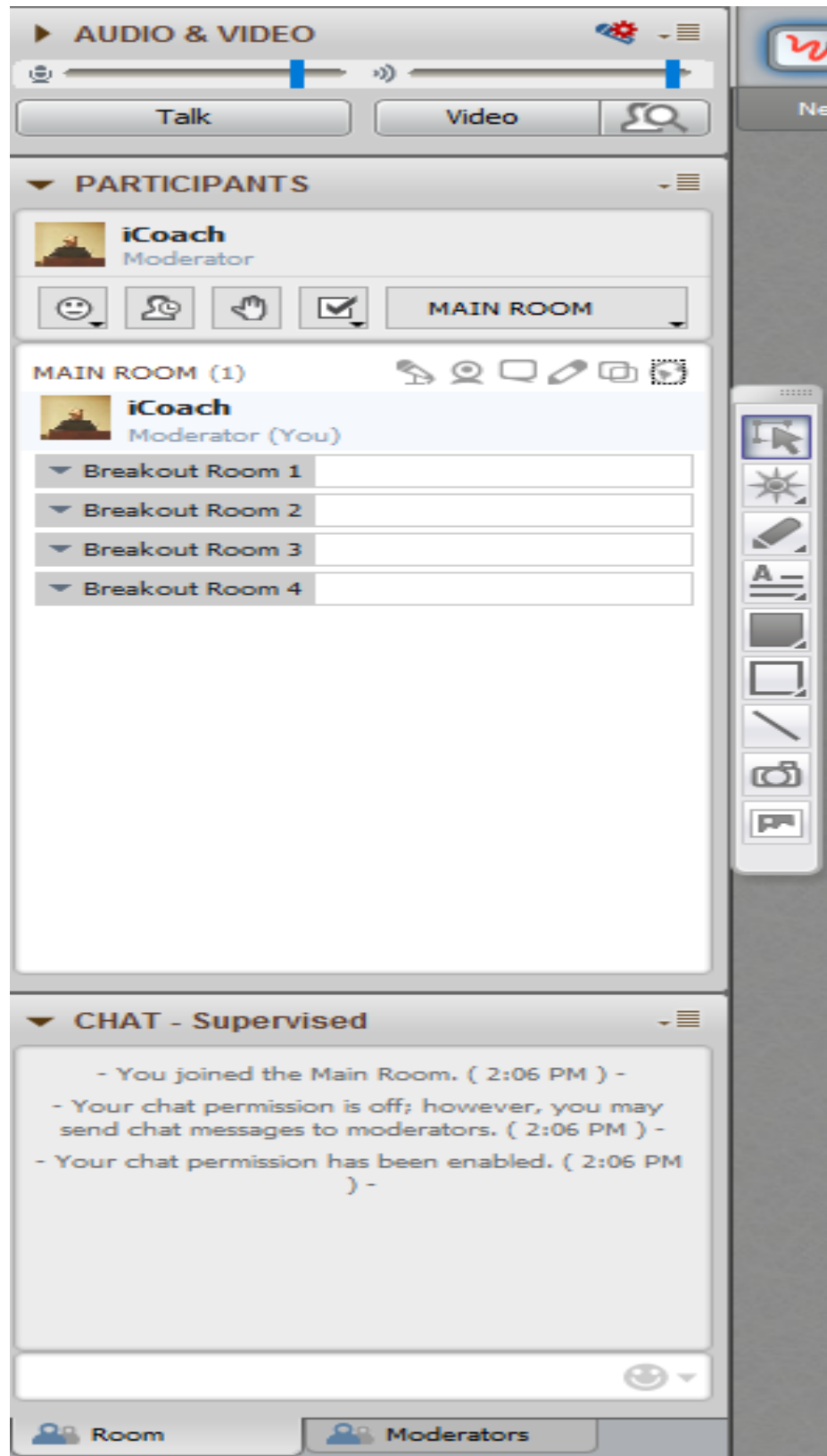
19

How were skyscrapers important to the growth and development of cities? (study guide #12)

20

They took advantage of vertical expansion when land was at a premium.

Appendix D



Appendix E

Could sharecropping have been made fair by the white landowners? If so, how?


8

Yes, a fair amount for both when it came to being paid for the crops

Yes, If white people had to do it too, and if the landlords actually were honest about how much money the farmers made with their crops.

Teach the sharecroppers to read the ledger

Give at least 50-60% of the profit to the workers


Yes it could be 

Landowners could help with the work, and split it evenly

Page 586



Appendix F

What is the Central Idea of the passage from *Common Sense*? 

- A. Any other European nation would do a better job of ruling America than Britain.
- B. Americans must fight a war for independence against the British.
- C. America derives no benefit whatsoever from its connection with Britain.
- D. Britain has neglected its duty to protect and provide for America.

Appendix G

Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation
define	classify	apply	analyze	arrange	assess
identify	compile	calculate	calculate	assemble	compare
label	conclude	demonstrate	categorize	compose	critique
list	discuss	develop	classify	construct	decide
match	describe	interpret	criticize	design	determine
name	explain	locate	compare	develop	establish
recall	express	operate	contrast	diagnose	evaluate
recognize	give examples	perform	determine	manage	judge
record	identify	practice	differentiate	organize	justify
relate	interpret	predict	distinguish	plan	measure
repeat	recognize	present	examine	propose	rate
select	summarize	report	outline	relate	recommend
state	translate	use	test	summarize	select

Appendix H

Level 5: Evaluating

Key Words:

appraise	interpret	compare
judge	explain	rate
criticize	support	rule on
defend	criteria	select
compare	dispute	recommend
award	evaluate	agree
choose	judge	value
conclude	justify	estimate
criticize	prove	appraise
decide	disprove	prioritize
defend	assess	deduct
determine	influence	

Level 4: Analyzing

Key Words:

analyze	simplify
classify	survey
categorize	test for
compare	distinguish
contrast	take part in
discover	infer
dissect	differentiate
divide	distinguish
examine	subdivide
inspect	survey

Questions:

- *When did...?
- *Who were the main...?
- *What is...?
- *How is...?
- *Where is...?
- *When did ___ happen?
- *How did ___ happen?
- *Why did...?
- *Can you recall...?
- *Can you list the three...?
- *Who was...?

Remembering

Questions:

- *How would you classify this type of...?
- *How would you compare...? Contrast...?
- *Will you state or interpret in your own words...?
- *How would you rephrase the meaning...?
- *What facts or ideas show...?
- *What is the main idea of...?
- *Which statements support...?
- *Can you explain what is happening...?
- *What is meant by...?
- *What can you say about...?
- *Which is the best answer...?
- *How would you summarize...?

Understanding

Appendix I





CRITICAL THINKING SKILLS

1 Knowledge Identification and recall of information	define fill in the blank list identify	label locate match memorize	name recall spell	state tell underline
	Who _____? What _____? Where _____? When _____?		How _____? Describe _____? What is _____?	
2 Comprehension Organization and selection of facts and ideas	convert describe explain	interpret paraphrase put in order	restate retell in your own words rewrite	summarize trace translate
	Re-tell _____ in your own words. What is the main idea of _____?		What differences exist between _____? Can you write a brief outline?	
3 Application Use of facts, rules, and principles	apply compute conclude construct	demonstrate determine draw find out	give an example illustrate make operate	show solve state a rule or principle use
	How is _____ an example of _____? How is _____ related to _____? Why is _____ significant?		Do you know of another instance where _____? Could this have happened in _____?	
4 Analysis Separating a whole into component parts	analyze categorize classify compare	contrast debate deduct determine the factors	diagram differentiate dissect distinguish	examine infer specify
	What are the parts or features of _____? Classify _____ according to _____. Outline/diagram/web/map _____,		How does _____ compare/contrast with _____? What evidence can you present for _____?	
5 Synthesis Combining ideas to form a new whole	change combine compose construct create design	find an unusual way formulate generate invent originate plan	predict pretend produce rearrange reconstruct reorganize	revise suggest suppose visualize write
	What would you predict/infer from _____? What ideas can you add to _____? How would you create/design a new _____?		What solutions would you suggest for _____? What might happen if you combined _____ with _____?	
6 Evaluation Developing opinions, judgements, or decisions	appraise choose compare conclude	decide defend evaluate give your opinion	judge justify prioritize rank	rate select support value
	Do you agree that _____? Explain. What do you think about _____? What is most important?		Prioritize _____ according to _____? How would you decide about _____? What criteria would you use to assess _____?	

Appendix J

Lesson Goals

1. Students will **identify** the differences between argumentative and informative writing.
2. Students will **determine** a position in response to an argumentative writing prompt.
3. Students will **write** a “rough draft” claim in response to the prompt.

4		Complete understanding of the lesson goals. I could explain these concepts to someone else.
3		Strong understanding of the lesson goals but a few things are unclear.
2		Basic understanding of the lesson goals but need more help.
1		Very little understanding of the lesson goals.