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Exploring the Facilitators and Barriers of Cognitive Engagement among Ninth Grade Students in Accelerated Curricula

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Exploring the Facilitators and Barriers of Cognitive Engagement
among Ninth Grade Students in Accelerated Curricula

by

Kai Zhuang Shum

A thesis submitted in partial fulfillment
of the requirements for the degree of
Education Specialist
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Abstract

Cognitive engagement has been linked to positive outcomes such as academic achievement (Eccles & Wang, 2012). However, students' level of cognitive engagement tend to decline as students move into middle childhood and adolescence (Archambault, Janosz, Morizot, & Pagani, 2009; Wang & Eccles, 2012a; Wiley & Hodgen, 2012). In addition, two out of three high school students nationwide reported feeling bored at school because the academic tasks are not interesting or relevant (Yazzie-Mintz, 2006). In regard to this matter, researchers have examined factors that relate to cognitive engagement. Most of the existing research is quantitative in nature and only involves students who are low or average achievers. This study addressed this gap in the literature by examining the facilitators and barriers of cognitive engagement from the perspective of high-achieving students with qualitative methods. Participants were ninth grade students in accelerated curricula (i.e., enrolled in Advanced Placement classes or International Baccalaureate Diploma program). A mixed-method sequential design was utilized. Forty-seven participants who scored at the top or bottom 10% on indicators of cognitive engagement, specifically the Goal Valuation and the Motivation/Self-Regulation subscales of School Assessment of Attitudes Survey-Revised (SAAS-R) were identified from a larger sample of 320 freshmen. Among the selected participants, 13 were invited and 12 took part in the qualitative part of the study— individual interviews. A generic approach, focusing on the constant-comparative method, was used to analyze data generated from interviews. The qualitative analyses revealed nine themes. The first theme provided context to the voices of participants, including why they decided to join accelerated curricula and how their experiences

in AP/IB classes have been. The next five themes were related to the facilitators of cognitive engagement. It includes (a) students' role, (b) teachers' role, (c) parents' role, (d) school connectedness, and (e) technology's role. Finally, the last three themes addressed barriers to cognitive engagement. Participants shared that some (a) student characteristics, such as mindset and life circumstance, (b) negative academic experiences, and (c) distractions deterred them from being cognitively engaged in their AP/IB coursework. Collectively, most of the themes generated from this study aligned with the findings from past research, except some themes from past studies were not found in this study. This study also discovered new themes that expanded upon the past literature's understanding on ways to promote and remove barriers that hinder cognitive engagement. Consistent with the theories of other researchers, the results of this study showed that the three different types of student engagement (i.e., cognitive, behavioral, emotional engagement) are interrelated to each other. This study also found relatively little differences in the sentiments provided by participants who self-reported higher or lower level of cognitive engagement. Implications of this study include expanding the current literature body on facilitators and barriers of cognitive engagement. The results of this study also serve as a general guidebook for educators of AP/IB students to (a) create a learning environment that promotes cognitive engagement, (b) suggest to students strategies that might increase their level of cognitive engagement, and (c) share with parents home-based strategies that may promote students' cognitive engagement. Future studies should focus on exploring the applicability of the findings on other student populations by conducting interviews with a more diverse set of participants (e.g., students with varying level of academic achievement) and further explore barriers to cognitive engagement.

Chapter I: Introduction

Student engagement has gained an increasing amount of interest over the last twenty years as researchers view this construct as a potentially malleable factor that predicts school success (Bempechat & Shernoff, 2012; Fredericks, Blumenfeld, & Paris, 2004; Shernoff, Csikszentmihalyi, Shneider, & Shernoff, 2003; Skinner & Pitzer, 2012). Furthermore, student engagement appeals to a wide range of educational stakeholders because it has been shown to link to positive outcomes (e.g., academic achievement) and it is relevant to all students (Darr, 2012; Wang & Eccles, 2012a). The construct of engagement was initially developed through a dropout prevention effort before researchers shifted their foci to view engagement as a potential factor that promotes school completion (Mahatmya, Lohman, Matjasko, & Farb, 2012; Reschly & Christenson, 2012). Specifically, Finn's (1989) participation-identification model states that school completion is not an event, but a long-term process of school engagement, which includes participating in and feeling a sense of belonging to school. In other words, researchers no longer view successful completion of high school as simply staying in school until graduation. Instead, students should fulfill the behavioral, social, and academic standards of schooling. In regard to this matter, researchers assert that promoting student engagement will lead students to reach these goals (Bempechat & Shernoff, 2012; Christenson, Sinclair, Lehr, & Godber, 2001; Reschly & Christenson, 2012).

Currently, there are two main schools of thoughts in the domain of student engagement research. Researchers who employ the engagement theory view student engagement as a multidimensional construct that includes *behavioral* (i.e., students' participation in school

activities), *emotional* (i.e., students' positive feelings toward teachers, peers, and school), and *cognitive* (i.e., students' willingness to invest in learning) engagement (Fredericks et al., 2004). Other researchers who adopt the motivational theory often incorporate motivational constructs in their model and view engagement as the outward manifestation of student motivation (Skinner & Pritzner, 2012). In summary, student engagement is a fairly new and complicated construct that heavily relies on student self-report measures to capture its existence.

Statement of the Problem

Among the different types of student engagement, cognitive engagement has been shown to link to various positive outcomes such as higher Grade Point Average (GPA) and further education (Wang & Eccles, 2012a). Mahatmya et al. (2012) also suggest that students' ability to be cognitively engaged in learning should increase as they grow older due to the biological maturation of the brain. Contrary to expectations, the trajectory of student engagement has been shown to decline across adolescence (Wang & Eccles, 2012a; Wiley & Hodgen, 2012). Moreover, a survey on high school students' engagement revealed that 66% of high school students feel bored in the classroom because school tasks are not interesting or relevant (Yazzie-Mintz, 2006). These findings pose major concerns as students who are not cognitively engaged in the classroom are less likely to complete school and more likely to dropout (Fredericks et al., 2004; Reschly & Christenson, 2012).

Some hypothesize that decrease in cognitive engagement across adolescence might be due to the misfit between students' developmental needs and their learning environment. As cognitively engaged students tend to focus on accumulating knowledge instead of getting good grades (i.e., mastery-oriented; Luo et al., 2009), their goal conflicts with the focus of the current education system that rewards academic performance (e.g., high standardized test scores;

Mahatmya et al., 2012). Other researchers hypothesize that the decrease in cognitive engagement across adolescence might be related to the drastic change in the learning environment between middle and high school (Wiley & Hodgen, 2012). If these hypotheses are confirmed, educators would have a strong rationale for modifying the current middle and high school learning environment to facilitate cognitive engagement among students.

Researchers also found that students, teachers, and parents each play a role in influencing students' level of cognitive engagement in the classroom. For example, students who adopt the mastery approach in learning (i.e., focus on accumulating knowledge instead of performing well in tests) and have high self-efficacy (i.e., confidence in academic abilities) reported higher levels of cognitive engagement (Greene, Miller, Crowson, Duke, & Akey, 2004). On the other hand, teachers and parents can foster cognitive engagement among students by promoting autonomy in and out of the classroom (Greene et al., 2004; Raftery, Grolnick, & Flamm, 2012). Although these factors were shown to relate to cognitive engagement through previous research, it is noteworthy that most of these studies were quantitative in nature, where participants fill out self-report questionnaires that tap into cognitive engagement. The amount of information researchers can gain from analyzing survey results is limited. Furthermore, some studies, such as Greene et al.'s (2004), only collected data at one-time point. This limitation makes it challenging to capture the dynamic events that influence one's level of cognitive engagement.

There are also other benefits of adopting a qualitative lens in studying cognitive engagement. Although quantitative methods are useful in separating the different elements among cognitive engagement (e.g., self-motivation, self-regulated learning, perceived relevance of school tasks, etc.), the context in which cognitive engagement occurs is less defined. In contrast, the use of qualitative method, such as evoking stories from participants, has the

potential to capture the dynamics between student, other individuals, and the environment during times when they are cognitively engaged. Lastly, cognitive engagement is also a highly inferential process. Thus, it is important to use qualitative methods to understand the different dimensions of cognitive engagement. Qualitative methods (e.g., mixed-method sequential study design) allow researchers to explore this gap in literature by (a) identifying students who reported relatively low or high levels of cognitive engagement and (b) exploring their thoughts on what facilitates or deters cognitive engagement in the classroom.

Purpose of the Current Study

The current study had three purposes. The first purpose was to investigate the facilitators of cognitive engagement among high school students in accelerated curricula. Accelerated curricula refer to program or classes that are designed to prepare high-achieving students for college. Specifically, the participants of the current study were either taking Advanced Placement (AP) classes or enrolled in the International Baccalaureate (IB) program. The current study attempted to add to the existing knowledge base on ways to foster cognitive engagement among this population of students. According to Yazzie-Mintz and McCormick (2012), most data in the current literature on student engagement share three characteristics: (a) quantitative, (b) standardized, and (c) capture a narrow view of students' schooling experiences. Thus, a purpose of the current study was to further explore students' schooling experiences, focusing on their thoughts on cognitive engagement in the classroom, with both quantitative and qualitative methods. The second purpose of the current study was to identify barriers to cognitive engagement among high school students in accelerated curricula. Through conducting interviews with high-achieving students, the current study aimed to explore barriers that prevented this population of students from being cognitively engaged in the classroom through the lens of the

stakeholders (i.e., students). The third and last purpose of the current study was to raise the awareness on the importance of listening to students' voices. Incorporating students' voices in the research of cognitive engagement helped the field better understand the construct from the perspectives of key stakeholder, whose opinions are often invisible in the current literature.

Definition of Key Terms

Behavioral engagement. Behavioral engagement refers to the extent that students participate in school-related activities, such as attending school, paying attention in class, engaging in academic tasks, and participating in extracurricular activities.

Emotional engagement. Emotional engagement encompasses students' feelings of belongingness and closeness to teachers, classmates, or school.

Cognitive engagement. In the current study, cognitive engagement is defined as the extent to which a student is willing to be self-motivated and use self-regulation strategies to reach self-determined academic goals that are relevant to his or her future aspirations.

Accelerated curricula. In the current study, accelerated curricula refer to Advanced Placement (AP) courses and International Baccalaureate (IB) programs. AP classes are rigorous, college-level coursework that are offered to high school students to prepare them for college (College Board, 2003). On the other hand, the IB Diploma program is an internationally recognized college preparatory program that is offered to high school juniors and seniors (IBO, 2013). Although the IB Diploma program is only offered to high school juniors and seniors, freshmen and sophomores can enroll in a pre-IB or Middle Years program to prepare themselves for the IB Diploma program (IBO, 2013). The participants of this study are ninth grade students either enrolled in AP Human Geography class *or* a pre-IB program with an assumed transition to the IB Diploma program during their junior year. Please note that when the term "IB program" is

used throughout this document, the researcher is referring to the pre-IB Diploma program.

Interpretivist. The current study adopted the interpretivist paradigm as described by Sipe and Constable (1996) to analyze the qualitative data generated from individual interviews. The current study aimed to understand the experiences of participants through their lenses and worldview, acknowledges that it is impossible to completely remove researcher's biases from the inquiry process, and has confidence that participants provided authentic responses.

Research Questions

The current study explored the following questions:

1. What are the facilitators of cognitive engagement among ninth grade students in accelerated curricula?
2. What are the barriers to cognitive engagement among ninth grade students in accelerated curricula?

Study Contributions to the Literature and Practice

The current study aimed to provide a unique contribution to existing literature by investigating what the stakeholders (i.e., students) believe is helpful to promote their levels of cognitive engagement in the classroom. To the best of this researcher's knowledge, there are minimal studies in the realm of cognitive engagement that focus on this student population. In addition, there are also relatively few studies that utilize a qualitative approach to examine ways to facilitate cognitive engagement. Like Yazzie-Mintz and McCormick (2012), this researcher aimed to "find the humanity in the data". By identifying these malleable environmental variables, this study attempted to contribute to practice by informing educators of ways to foster cognitive engagement in the classroom. The current study also aimed to reveal some of the barriers that prevent students in accelerated curricula from increasing their level of cognitive

engagement in learning. Educators may be more informed of the pedagogical practices that discourage students from having a high level of cognitive engagement through this study.

Limitations/Delimitations

There are limitations to the current study that may threaten the study's overall findings. One of the delimitations of this study is that it only involves participants enrolled in accelerated curricula from two high schools. This delimitation may affect the transferability of the results of the current study. On the other hand, all the participants are ninth grade students. It is possible that ninth grade students who just started high school may perceive cognitive engagement differently compared to high school sophomores, juniors, or seniors. Lastly, most of the interview questions required participants to recall instances when they were cognitively engaged or not engaged in learning. This heavy reliance on retrospective thoughts may be problematic as participants may not be able to recall all the details from memory. Even if participants can recall rich details, they may have trouble conveying their thoughts and experiences to the interviewer in a limited amount of time. More details on limitations are discussed in the Chapter III.

Chapter II:

Review of the Literature

This chapter includes a review of relevant literature to establish the study's significance. Although most researchers concur that student engagement is important for school success, there are various conceptualizations of engagement in the current literature, including different types and definitions of engagement (Appleton, Christenson, & Furlong, 2008; Reschly & Christenson, 2012). Thus, this chapter begins by reviewing the current conceptualizations of student engagement. Specifically, the two main schools of thoughts in the field of engagement were discussed and the relationships between the three different types of engagement were explored. Next, the conceptualization of cognitive engagement in the current study were described. This literature review then covers the methods of measuring cognitive engagement, developmental trajectory, and facilitators of cognitive engagement. Furthermore, student voices on student engagement were reviewed. Lastly, this literature review identified a gap in the current literature, that is the lack of qualitative studies and incorporation of student voices in the research of student engagement, particularly with high-achieving students.

Conceptualizations of Student Engagement

Student engagement is a relatively new construct. According to Appleton et al. (2008), the term engagement was first used in the 1980s. Hence, it is not surprising that a review of the current literature revealed conceptual haziness surrounding the construct of engagement. Some of the disagreements include whether engagement and disengagement exist on a continuum or two continua and if some subtypes of engagement precede the others (Reschly & Christenson,

2012). Nonetheless, most researchers agree that there are three subtypes of engagement, namely behavioral, emotional, and cognitive engagement. The following sections discuss how these three types of engagement are conceptualized through the motivational and engagement theory.

Motivational theory. In the context of motivational theory, student engagement is often viewed as a part of various motivational frameworks that focus on academic motivation within classroom learning. For instance, Skinner and Pritzer (2012) view engagement as an outward manifestation of motivation. They suggest that students who are motivated to learn in class demonstrate their motivation by being behaviorally (e.g., initiate tasks), emotionally (e.g., show enthusiasm), and cognitively (e.g., set academic goals) engaged. More specifically, Skinner and Pritzer (2012) proposed a four level model that incorporates both motivation and student engagement. The first level concerns student engagement within their *school and community* (i.e., socialization within these institutions). They assert that this level of engagement protects against risky behaviors (Skinner & Pritzer, 2012). The second level refers to student engagement in school-related activities by *participating in school events* (e.g., extracurricular activities), which protects against dropout. The last two levels concern student engagement in the classroom, where they form *strong relationships with teacher and peers*, as well as *invest in learning*. Skinner and Pritzer (2012) suggest that the last two levels of student engagement help foster students' academic competency and connectedness to school. In general, Skinner and Pritzer's (2012) model demonstrates how contextual factors can facilitate intrinsic motivation, which in turn increase student engagement.

Beyond Skinner and Pritzer (2012), there are other motivational researchers who agree that student engagement is the behavioral manifestation of motivation, such as Eccles and Wang (2012). However, they expand upon this notion and suggest that engagement is also an outward

manifestation of social and personal identities. Although motivation is closely related and necessary to understand engagement, it is important to note that student engagement is worthy of study in its own right (Appleton, Christenson, Kim, & Reschly, 2006).

Engagement theory. In the literature of engagement theory, the term engagement was first conceptualized by Finn (1989) as a long-term process of participating and feeling a sense of belonging to school. In Finn's (1989) model, participation refers to the behavioral component, whereas belongingness reflects the emotional component of the engagement theory. Building on Finn's (1989) model, researchers have expanded the conceptualization of student engagement to include two or more domains, such as academic and cognitive engagement. Most researchers agree with the model proposed by Fredericks et al. (2004), which conceptualizes student engagement as a multidimensional construct that includes three subtypes: behavioral, emotional, and cognitive engagement.

Behavioral engagement. Behavioral engagement refers to the extent to which students participate in school activities, such as academic tasks as well as social and extracurricular activities (Archambault et al., 2009; Fredericks et al., 2004; Reschly & Christenson, 2012). This definition encompasses a large pool of student behaviors. In order to examine the multidimensionality of behavioral engagement, Hospel, Galand, and Janosz (2016) performed an exploratory factor analysis on self-reported questionnaires completed by 1,197 eighth grade students to see if any dimensions of behavioral engagement emerge among the large variety of indicators used in past studies. They distinguished five dimensions from their study: participation, following instructions, withdrawal, disruptive behavior and absenteeism. Hospel et al. (2016) then performed confirmatory factor analysis on self-reported questionnaires completed by another 801 ninth grade students and confirmed that these five dimensions form a common

construct: behavioral engagement.

In terms of outcomes related to behavioral engagement, researchers have found consistent associations between teacher and student reported behavioral engagement and academic achievement across various samples (Fredericks et al., 2004). For example, Finn and Rock (1997) reported that resilient students (i.e., students who graduate from high school on time, scored at or above 40th percentile on Reading and Mathematics tests, and had a GPA equivalent to half Bs and half Cs or better) demonstrated higher behavioral engagement compared to non-resilient students (i.e., students who did not meet all three of the resilient criteria) in a large longitudinal study ($N = 1,803$; Grade 8 to 12). In addition, lower behavioral engagement has also been linked to higher school dropout (Archambault et al., 2009; Rumberger, & Rotermund, 2012). Specifically, Rotermund (2010) examined the data set of a national longitudinal study of tenth grade students over a two-year period and found that behavioral engagement, hereby defined as not absent, late, skipping class, or getting into trouble, is a protective factor against dropping out of high school.

Emotional engagement. Fredericks et al. (2004) defined emotional engagement as students' positive and negative feelings towards teachers, classmates, and school. They also claim that emotional engagement links students to an institution and influences students' willingness to do school-related work. Similarly, Park et al. (2012) conceptualize emotional engagement as concentration, interest, and enjoyment in learning situations. In current literature, emotional engagement has also been referred to as affective engagement (Appleton et al., 2008; Archambault et al., 2009). Furthermore, some researchers link emotional engagement to constructs such as "belonging," "school membership," and "school connectedness" (Finn & Zimmer, 2012). For example, Wang and Eccles (2012a) used school belonging items (i.e., "In

general, I like school a lot,” “I feel like a real part in this school,” “I feel happy and safe in this school,” etc.) to conceptualize emotional engagement in their study of engagement trajectories across school years with 1,148 African-American and European-American adolescents.

Wang and Eccles (2012a) found that emotional engagement is not directly connected to academic achievement. However, it is possible that emotional engagement influences academic achievement indirectly through behavioral and cognitive engagement (Archambault et al., 2009; Wang & Eccles, 2012a). On the other hand, Hirschfield and Gasper’s (2011) study of 2,768 fifth to eighth grade students revealed that higher emotional engagement reduces delinquency. Other than academic outcomes and delinquency, researchers also examined the relationships between emotional engagement and positive well-being. As an example, Carter et al. (2007) surveyed 643 adolescents age 11 to 14 years and found that participants who self-reported having a caring school climate and feeling emotionally engaged to school were significantly less likely to engage in health compromising behaviors (e.g., cigarette smoking, alcohol bingeing, fighting, etc.), and significantly more likely to perform health promoting behaviors (e.g., better nutrition, higher levels of physical activity, and cycle helmet use).

Cognitive engagement. In the literature of engagement theory, cognitive engagement generally refers to the idea of investment in learning (Fredericks et al., 2004). Some researchers also relate cognitive engagement to the extent to which students view education as relevant to their future goals (Reschly & Christenson, 2012). Although there are multiple definitions of cognitive engagement throughout the literature, they share some common features. To further illustrate this point, Table 1 demonstrates how various researchers define cognitive engagement and the common elements among the definitions (i.e., self-regulation, self-motivation, relevance/value, and goal setting). *Self-regulation* refers to students’ ability to initiate and sustain

behaviors and cognition that are focused on reaching goals, whereas *self-motivation* refers to students' psychological devotion to learn. That is, a desire to go above and beyond the basic requirements set by teachers and a preference for challenging tasks. The element of *relevance/value* indicates students' perceived significance of classroom learning to help them achieve future aspirations. Lastly, *goal setting* points to students' tendency to set learning-related goal.

As shown in Table 1 (page 15), self-regulation is the most common element among various definitions of cognitive engagement, followed by goal setting, perceiving education as relevant and valuable to future goals, and self-motivation. Thus, a compilation of definitions reveals that cognitive engagement- defined comprehensively- refers to one's willingness to self-motivate and use self-regulation skills to achieve self-determined school-related goals that are relevant to one's future aspirations.

Relationships between the Three Types of Student Engagement

As mentioned by Reschly and Christenson (2012), there is some conceptual haziness surrounding the construct of student engagement, and the three types of student engagement (i.e., behavioral, emotional, and cognitive engagement) are often found to be intercorrelated with each other. In essence, the three types of student engagement each represent a dimension of student engagement and some researchers argue that they interact with each other to affect students' level of engagement. According to Reschly and Christenson's (2012) model of student engagement, they suspect that cognitive and emotional engagement are potential mediators of behavioral engagement. In other words, they believe that changes in cognitive and emotional engagement precedes changes in behavioral engagement. Interest in learning, persistence towards academic-related goals, ability to relate classroom learning to future aspirations, and

emotional connection to teachers, peers, and school tend to lead a student to actively participate in school activities (Reschly & Christenson, 2012).

On the other hand, Finn and Zimmer's (2012) model of student engagement suggest that emotional engagement acts as the fuel for students to demonstrate cognitive and behavioral engagement. They view emotional engagement as the "motivation", and the other two engagements as acts of "investment." In addition to Finn and Zimmer (2012) and Reschly and Christenson (2012), there are alternative models of student engagement that suggest other possible relationships between the three types of student engagement. Thus, it is important to note that studying any one type of student engagement may lead to the discovery that one type of engagement influences other types of engagement, and vice versa.

Conceptualization of Cognitive Engagement in the Current Study

In the current study, cognitive engagement is conceptualized in alignment with the engagement theory, which includes the following components: (a) self-motivation, (b) self-regulation skills, (c) academic goal setting, and (d) relevance/value (Appleton et al., 2006; Archambault et al., 2009; Blumenfeld et al., 2006; Fredericks et al., 2004; Griffiths et al., 2012; Reschly & Christenson, 2012). In other words, a cognitively engaged student is self-motivated and uses self-regulation skills to attain self-determined academic goals that are relevant to his or her future aspirations. This definition captures the most integral mechanisms of cognitive engagement and paints a clear picture of how cognitive engagement manifests in the classroom. Furthermore, Cleary and Zimmerman (2012) suggest that motivation, self-regulation, and cognitive engagement are highly interrelated constructs that can help researchers understand the process through which students initiate and sustain high level of investment in learning.

Table 1

Definitions of Cognitive Engagement from Various Scholars

Researchers	Definition	Self-Regulation	Self-Motivation	Relevance /Value	Goal Setting
Fredricks, Blumenfeld, and Paris (2004)	<ul style="list-style-type: none"> • Self-regulation • Personal investment • Striving for mastery 	X	X		
Reschly & Christenson (2012)	<ul style="list-style-type: none"> • Self-regulation • Relevance of school to future aspirations • Goal setting 	X		X	X
Appleton et al. (2006)	<ul style="list-style-type: none"> • Self-regulation • Value/relevance • Goal setting 	X		X	X
Griffiths et al. (2012)	<ul style="list-style-type: none"> • Self-regulation • Relevance of schoolwork to future goals • Personal goal development 	X		X	X
Blumenfeld, Kempler, and Krajcik (2006)	<ul style="list-style-type: none"> • Willingness to expend effort to learn 		X		
Archambault et al. (2009).	<ul style="list-style-type: none"> • Use of self-regulation strategies • Psychological involvement in learning (e.g., willingness to engage in effortful learning) 	X	X		X

Methods of Measuring Cognitive Engagement

Similar to many psychological constructs, student engagement is a complex and dynamic phenomenon, posing challenges with creating questionnaire items that cover every aspect of the

construct (Samuelsen, 2012). However, researchers have attempted to capture student engagement by defining it, creating items that tap into its characteristics, piloting the items, and running statistical tests to examine the instruments' quality (e.g., reliability and validity). Currently, most researchers that study student engagement utilize self-report questionnaires. To illustrate this process, the following section will review the development and quality of one such measure, the Student Engagement Instrument (SEI; Appleton et al., 2006) with a focus on the cognitive engagement items. The SEI was selected for focus because it is a widely used measure in the current literature, and was included in many of the studies described in subsequent sections.

The SEI is a 33-item self-report questionnaire that measures cognitive (19 items) and affective (14 items) engagement. There are five subscales in this instrument. The *Control and Relevance of School Work* (CRSW; 9 items, e.g., "Most of what you learn in school is important to know.") and *Future Aspirations and Goals* (FG; 5 items, e.g., "I plan to continue my education following high school.") factors measure cognitive engagement, whereas the *Teacher-Student Relationship* (TSR; 9 items, e.g., "At my school, teachers care about students."), *Peer Support for Learning* (PSL; 6 items, e.g., "Other students at school care about me."), and *Family Support for Learning* (FSL; 4 items, e.g., "My family/guardian(s) want me to keep trying when things are tough at school.") factors tap into students' level of affective engagement. The SEI is scored with a four-point Likert-type scale (*1 = strongly agree, 2 = agree, 3 = disagree, and 4 = strongly disagree*).

The SEI was developed through reviewing literature on cognitive and affective engagement as well as existing scales of engagement. According to Appleton et al. (2006), the pilot study of SEI involves getting feedback on the clarity and perceived relevance of items from

31 ethnically diverse eighth grade students randomly selected from a single school. Appleton et al.'s (2006) findings also support the validity of scores with a variety of intended outcomes linked to engagement. Betts, Appleton, Reschly, Christenson, and Huebner (2010) administered the SEI to a large sample ($N = 2,416$) of students from grades 6 through 12 and found that all five factors are highly correlated ($r = .50 - .79$) with scale reliability that ranges from .70 (CRSW) to .80 (FG).

Beyond SEI, there are multiple self-report measures that capture various aspects of cognitive engagement. For example, the Motivation and Strategy Use Survey (MSUS; Greene & Miller, 1993) includes items that measure goal planning (e.g., "I made a plan for achieving the grade I wanted on this exam.") and self-regulation (e.g., "When I read for this exam I stopped to ask myself whether or not I am understanding the material."). The Approach to Learning Instrument (ALI; Miller et al., 1996) also contains items that measure cognitive engagement, focusing on the use of self-regulation strategies (e.g., "I make sure I understand the ideas that I study."). Similarly, the School Assessment of Attitudes Survey-Revised (SAAS-R; McCoach & Siegle, 2003) contains two subscales that tap on cognitive engagement: Goal Valuation (e.g., "Doing well in school is important for my future career goals.") and Motivation/Self-Regulation (e.g., "I spend a lot of time on my schoolwork.").

Some of the challenges researchers face in the process of developing instruments to measure engagement include inconsistencies in the conceptualization of cognitive engagement as well as the variation of engagement across time and population (Samuelsen, 2012). In regard to this matter, Samuelsen (2012) asserts that new statistical methods should be utilized to account for these variations. Other researchers have also tried to broaden our understanding of cognitive engagement through other venues, such as gaining students' perspective on this construct

(Appleton et al., 2006). Such researchers believe that cognitive engagement is highly inferential, thus understanding students' perspectives will provide a clearer picture of their experiences. This notion will be revisited in this chapter following a summary of findings from earlier studies that shed light on the predictors and outcomes of cognitive engagement, as identified using the SEI and other self-report measures such as the MSUS, ALI, and SAAS-R.

Positive Outcomes of Cognitive Engagement

Academic outcomes. Although there are many reasons as to why it is important to study cognitive engagement, the most compelling reason would probably be because it has been shown to be linked to academic success (Wang & Eccles, 2012a). Positive academic outcomes are not only important for high school students to get access to higher education, they are also tied to educators' performance under the Individuals with Disabilities Education Act (IDEA). Thus, studying cognitive engagement can have significant implications for the field of education as it is a potential facilitator of academic achievement.

Greene and Miller (1996) examined the relationships between students' cognitive engagement, learning goals, perceived ability, and academic achievement. They hypothesized that learning goals and perceived ability influence cognitive engagement, which in turn influence achievement. In their study, 108 undergraduate students took the Motivation and Strategy Use Survey (MSUS; Greene & Miller, 1993) before their midterm. The survey includes items tapping into cognitive engagement such as "I made a plan for achieving the grade I wanted on this exam." and "When I read for this exam I stopped to ask myself whether or not I am understanding the material." (Greene & Miller, 1996, p. 185). The results of a path analysis confirmed their hypothesis that achievement is indirectly affected by the participants' perceived ability and learning goals through cognitive engagement. Although path analysis is a great way

to explore the relationship between cognitive engagement and academic achievement, Greene and Miller (1996) recognized that the model might not capture the complexity of this relationship. Specifically, they did not include measures that tap into some of the central features of cognitive engagement, such as self-regulation.

Taylor, Pearson, Peterson, and Rodriguez (2003) also examined how cognitive engagement relates to learning, specifically the relationship between cognitive engagement in literacy learning and students' academic outcomes. They hypothesized that encouraging cognitive engagement (i.e., inducing higher level thinking and teaching word-recognition strategy) would increase students' growth in reading and writing. Participants included 88 teachers and 792 first to fifth grade students from nine schools involved in the Center for the Improvement of Early Reading Achievement (CIERA) School Change Project. Teachers were interviewed and observed to gain data on their classroom practices, while several assessments (e.g., standardized reading comprehension test) were used to gauge students' reading and writing level. Hierarchical linear modeling revealed that encouraging cognitive engagement in the classroom, especially using higher level questioning, is related to greater growth in reading and writing skills. Although their findings are meaningful in informing the field of education on how to improve students' reading and writing skills, it is noteworthy that the participating teachers were involved in a reform project that provided them additional training and feedback over the course of study. Thus, the generalizability of their findings is limited.

Wang and Eccles (2012a) also investigated the relationship between engagement and academic outcome. Specifically, Wang and Eccles (2012a) adopted a multidimensional approach to examine the developmental trajectories of all three types of engagement (i.e., behavioral, affective, and cognitive) during adolescence and their relationships with achievement over time.

Specifically, they analyzed data collected at three time points: seventh, ninth, and eleventh grade. This study provides great insight into understanding how cognitive engagement changes over the course of adolescence and how it relates to students' academic achievement. The participants were 1,148 seventh to eleventh grade students from 23 public middle schools in one county near Washington, D.C. The participants' Grade Point Average (GPA) served as the indicator for academic achievement, whereas self-regulated learning (e.g., "How often do you try to relate what you are studying to other things you know about?") was the indicator of cognitive engagement. Wang and Eccles (2012a) used multivariate latent growth modeling, and found that changes in cognitive engagement was positively associated with changes in GPA. As participants reported decline in cognitive engagement, there were corresponding declines in GPA over time. As this study relied on student self-report to assess engagement, Wang and Eccles (2012a) recommended the use of multiple methodologies (e.g., qualitative methods) to gain a diverse perspective on student engagement in future studies.

In summary, various research has shown that cognitive engagement is positively related to academic achievement. Greene and Miller (1996) found that cognitive engagement served as a mediator between students' perceived ability and achievement. They also reported that the relationship between setting learning goal and achievement is mediated by cognitive engagement. Moreover, cognitive engagement seems to be positively related to improvements in reading, writing, and GPA across various populations and age groups (Greene & Miller, 1996; Taylor et al., 2003; Wang & Eccles, 2012a). Thus, it is important to delve further into this construct to confirm these findings and investigate the facilitators of cognitive engagement.

Developmental Trajectory of Cognitive Engagement

According to Mahatmya et al. (2012), an individual's ability to become cognitively engaged is influenced by the development of his or her prefrontal cortex and limbic system because those brain areas affect higher order reasoning. During early childhood, a student learns to control his or her own behaviors to focus on learning, such as participating in classroom-related activities and paying attention to academic instructions (Mahatmya et al., 2012). As students move into middle childhood and adolescence, their ability to self-regulate and utilize various learning strategies increases. They are also more capable of self-reflecting on whether classroom learning is relevant to their future goals and aspirations. In theory, older children should be more biologically prepared to be cognitively engaged compared to younger children. Contrary to expectations, researchers found that cognitive engagement often declines as students become older (Archambault et al., 2009; Wang & Eccles, 2012b; Wiley & Hodgen, 2012).

As aforementioned, Wang and Eccles (2012a) conducted a longitudinal study that involved a large sample ($N=1,148$) of seventh to eleventh grade students in a county near Washington, D.C. Participants completed the self-report assessment of engagement when they were in 7th grade, the transition between 8th and 9th grade, and 11th grade. Using the same data set, Wang and Eccles (2012b) analyzed the participants' developmental trajectory of cognitive engagement. In this study, cognitive engagement refers to participants' subjective valuing of learning (e.g., "I go to school because I like what I am learning"). The results of multilevel growth modeling showed that participants' cognitive engagement decreased from grade 7th to 11th. In addition, they found that boys had lower levels of cognitive engagement compared to girls, and this gender difference increased over time. In addition to Wang and Eccles's (2012b) study, a longitudinal study conducted by Wiley and Hodgen (2012) on student engagement that

involved participants age 10 to 16 years also revealed that all dimensions of student engagement (i.e., behavioral, emotional, and cognitive engagement) decline as students' age increases. In summary, researchers have found that level of cognitive engagement tends to decline over adolescence.

Facilitators of Cognitive Engagement

As aforementioned, research has shown that cognitive engagement is associated with academic success but tends to decrease during middle and high school. In order to further understand the dynamics of cognitive engagement among students, other researchers tried to identify the facilitators of cognitive engagement in and out of the school setting. The current literature shows that students, teachers, and parents each play a role in influencing students' level of cognitive engagement.

Students' role. As cognitive engagement stems from one's willingness to expend effort to persist towards self-determined academic related goal and view classroom learning as relevant to future aspiration, it is not surprising that students themselves play an important role in facilitating their level of cognitive engagement.

Students' emotions and use of coping strategies. Reschly, Huebner, Appleton, and Antaramian (2008) studied the relationship between students' emotions, coping, and engagement. In their study, 293 seventh to tenth grade students from a rural area in Southeastern United States completed the Positive and Negative Affect Schedule–Children survey (PANAS-C; Watson, Clark, & Tellegen, 1988), Self-Report Coping Scales (SRCS; Causey & Dubow, 1992), and Student Engagement Instrument (SEI; Appleton et al., 2006). Through correlational analyses, Reschly et al. (2008) found that positive affect is significantly positively related to different aspects of cognitive engagement: control and relevance of schoolwork ($r = .47$) as well

as future aspirations and goals ($r = .37$). Reschly et al. (2008) also conducted regression analyses and found that the use of coping strategies (i.e., seeking social support and using problem solving strategies) mediate the association between positive affect and cognitive engagement.

Specifically, participants who reported higher positive affect were more likely to cope by seeking support from friends and family and attempt to solve problems through multiple ways, which in turn predicted greater cognitive engagement. All in all, Reschly et al. (2008) suggest that positive affect seems to be positively related to student engagement, but its effect is mediated by students' use of coping strategies. Although Reschly et al.'s (2008) study demonstrates a link between positive emotions, coping, and cognitive engagement, it is noteworthy that their study is cross-sectional and the link is not causal. Moreover, their sample is limited to one rural area in the Southeastern United States, hence its generalizability is limited. Nonetheless, it is possible that fostering and maintaining frequent positive emotions and using certain coping strategies (i.e., seeking social support and adopting problem solving process) might facilitate cognitive engagement among adolescence.

Students' attribution for success. Hufton, Elliott, and Illushin (2002) conducted semi-structured interviews with 144 youth (72 boys, 72 girls) around the age of 15 from 3 countries (Sunderland, England; Kentucky, United States; and St. Petersburg, the Russian Federation) to examine how students' (a) attitudes towards school, (b) self-efficacy in academic skills, (c) peer influence, and (d) perceived relevance of education to future goals influence their level of motivation and engagement in the classroom. They used non-native interviewers (i.e., a member of the Russian or American research team interviewed the Sunderland students and vice versa), arguing that this method allowed more "naïve" questions to be asked as no common understanding can be assumed by either party. All interviews were recorded, transcribed, and

analyzed. The authors reread the transcripts multiple times and compared the interviews within the same country and across different countries. Themes and repeated concepts were developed with a software package, *The Ethnograph*, v. 5.06. The research team stressed that all inferences reported in this study are the outcome of cross-cultural sharing between team members. In-depth analyses of the interview transcripts revealed that most students who *believe that effort plays a bigger role in academic success compared to innate ability* (e.g., talent in Math) also expressed higher level of classroom engagement and satisfaction with current academic standing. The authors urge educators and researchers who sought to increase student engagement and achievement to focus on convincing youth and their families to rely on efforts, rather than innate ability to produce meaningful gains.

Students' beliefs. Other than students' affect, coping, and attribution to success, researchers also found that students' mindset may influence their level of cognitive engagement. For instance, Greene et al. (2004) hypothesized that students' motivational beliefs (i.e., self-efficacy, achievement goals, and perceived instrumentality) influence students' level of cognitive engagement in classroom learning. Participants included 220 high school students from a suburban high school in the Midwest. Participants filled out various questionnaires in their English classes. Cognitive engagement was measured by 12 items on meaningful cognitive strategies used in studying embedded in the Approach to Learning Instrument (ALI; Miller et al., 1996). *Meaningful cognitive strategies* refer to learning methods that involve elaborative processing that aim to connect new information with existing knowledge (e.g., "I make sure I understand the ideas that I study."). Their conceptualization of cognitive engagement aligns with the engagement theory as it taps into students' willingness to invest in learning. *Self-efficacy*, one's confidence in his or her ability to be successful in learning, was measured by seven student

self-report items validated in their previous study (e.g., “I am sure I have the ability to understand the ideas and skills taught in this course.”). They predicted that high self-efficacy is linked to high cognitive engagement. Greene et al. (2004) divided *achievement goals* into mastery (i.e., improve competence; e.g., “Learning the ideas and skills in this class is enjoyable.”) and performance (i.e., demonstrate competence; e.g., “I want to look smart to my friends.”) approach, as measured by eight items from the ALI. They hypothesized that mastery approach is positively related to cognitive engagement. *Perceived instrumentality* was measured by asking students to what extent they perceive classroom learning as important to reaching their future goals (e.g., “My performance is important for becoming the person I want to be.”), with six items from the ALI.

Through confirmatory factor analysis, Greene et al. (2004) reported that the use of cognitive strategy is significantly correlated with self-efficacy ($r = .44$), mastery goal ($r = .65$), and perceived instrumentality ($r = .64$). In addition, cognitive strategy use and perceived instrumentality were positively correlated with students’ percentage of course points earned in their English class ($r = .33$; $r = .25$). Although *perceived instrumentality* is viewed as part of the definition of cognitive engagement in the engagement theory, Greene et al. (2004) treated this variable as a potential facilitator of cognitive engagement. Moreover, they did not include another core component of cognitive engagement, self-regulation. They recognized the exclusion of self-regulation as a limitation of their study. This speaks to the inconsistency of conceptualization of cognitive engagement across studies and the need for a new lens to define cognitive engagement, such as student perspective.

Greene et al. (2004) also conducted a path analysis and found that cognitive strategy use was predicted by self-efficacy, mastery goals, and perceived instrumentality, but not by

performance-approach goals. Participants who are confident in their academic abilities, value accumulation of knowledge, and believe that schoolwork is linked to future success reported using more meaningful cognitive strategy. In summary, Green et al.'s (2004) findings suggest that students' motivational beliefs are potential facilitators of cognitive engagement in the classroom, but their study is limited as they were only able to capture students' engagement at one-time point. Future studies should replicate Greene et al.'s (2004) study and re-administer the instruments over time to confirm their findings, specifically the anticipated temporal paths between constructs.

Patrick and Middleton (2002) conducted a mixed method study to investigate the construct of self-regulated learning, a key component of cognitive engagement. They observed, surveyed, and interviewed a sub-sample of seventh and eighth students ($N = 4-5$ students in each classroom) in suburban schools in Detroit and Chicago who participated in the National Science Foundation-funded Center for Learning Technologies in Urban Schools, the Chicago and Detroit Urban Systemic Initiatives in Science. The students were nominated by their teachers for great attendance, average achievement, and willingness to share thoughts. Observations were based on videotapes of lessons, where the researchers coded instances when students responded in ways that showed that they were cognitively engaged (e.g., interact with and show interest in academic tasks). Self-report surveys included modified items on students' use of cognitive strategies, motivation, and perceived collaborative support. Lastly, semi-structured interviews were conducted between 20-30 minutes to explore students' level of cognitive engagement (e.g., whether learning about science is interesting or useful, how they went about learning what they needed, etc.), collaboration with peers, and technology use. Analyses of data collected from self-reported survey showed that students who are *confident in their ability to learn, perceive value in*

task, and *wanting to understand* also tend to self-report higher level of cognitive engagement.

Patrick and Middleton (2002) explained that students who want to learn, believe they can, and believe it will be beneficial to them are more likely to engage cognitively with the tasks, and try to persevere.

Taken together, existing studies suggest that students can play a part in facilitating their own cognitive engagement in the classroom. Specifically, students who report higher positive affect, use more coping strategies (i.e., seeking social support and applying the problem-solving process), have higher self-efficacy, and adopt a mastery approach in learning tend to report higher cognitive engagement. Hence, all of the above-mentioned student factors may be potential facilitators of cognitive engagement.

Teachers' role. In addition to student variables, researchers have also studied the roles of teachers in facilitating cognitive engagement among students. For example, in the aforementioned study, Greene et al. (2004) examined students' perception of classroom structure in relation to students' cognitive engagement. Specifically, they included measures of *motivating tasks* (i.e., the degree to which students perceive classroom tasks to be relevant and meaningful), *autonomy support* (i.e., the extent to which students believe their teacher support their autonomy by offering choices and highlighting self-regulation of learning), and *mastery evaluation* (i.e., the degree to which students find their teachers emphasize learning instead of academic competition) in their study. Findings from confirmatory factor analysis showed that all three classroom perception variables were significantly and positively correlated with students' level of cognitive engagement (specifically, cognitive strategy use). Findings from path analyses revealed that cognitive strategy use was indirectly predicted by motivating tasks and autonomy support; whereas perceived instrumentality was predicted by motivating tasks. In other words, Greene et

al. (2004) found that students are more likely to be cognitively engaged if their teachers provide meaningful tasks, offer choices, and promote self-regulation. Nonetheless, it is important to note that these relationships are correlational in nature.

Another study that looked at the relationship between teacher support and students' cognitive engagement was conducted by Wang and Eccles (2012b). As aforementioned, this study was longitudinal in nature and involved a large pool of participants ($N = 1,147$) from seventh to eleventh grade. Cognitive engagement was indexed by the participants' subjective valuing of learning (e.g., "I go to school because I enjoy my classes"). Teacher support was measured by a 4-item self-report assessment of teacher social support (e.g., "How often do you talk to this student about how things are going in his or her life?"). Through multilevel growth modeling analysis, Wang and Eccles (2012b) found that increases in social support from teachers was associated with reduced decreases (i.e., a slower decline relative to the typical developmental progression) in cognitive engagement among participants. Wang and Eccles (2012b) suggested that it is important for teachers to show care and respect to secondary students to reduce the typical decline in cognitive engagement during adolescence.

Other than discovering ways in which students' characteristics play a role in influencing cognitive engagement, Patrick and Middleton (2002) also found ways in which teachers can enhance student' level of cognitive engagement in the classroom. Their interviews revealed that students view *questions that are interesting or related to the real world* (e.g., "When we learned about air pollution I kept thinking about my cousin with asthma"), *opportunities to talk and work with peers* (e.g., students liked it when "we worked with a group and we didn't have to work individual[ly]"), *hands-on activities* (e.g., "It isn't like you read about it and have to remember. You play around with it, explore, feel it."), and *technology use* (e.g., "I wouldn't want to learn on

just paper and pencil. I want to learn from a computer.”) as facilitators of cognitive engagement.

Thus, teachers who wish to increase students' level of cognitive engagement may consider employing the following instructional strategies: pose questions that are relevant to the real world, offer opportunities to work in groups, design hands-on activities, and encourage use of technology. In summary, findings of Greene et al. (2004), Patrick and Middleton (2002), and Wang and Eccles (2012b) suggest that promotion of autonomy and provision of social support by teachers is closely related to students' level of cognitive engagement.

Parents' role. Current literature suggests that parents also play a role in facilitating students' engagement. One of the family-related variables that has been shown to relate to students' academic success is parent involvement in school, which in general refers to parents' interactions with school and their child to promote academic success (Bempechat & Shernoff, 2012; Raftery et al., 2012). For instance, a meta-analysis that examined 52 studies that involved secondary school students revealed a positive effect of parent involvement on academic success (Overall $ES = .53$; Jeynes, 2007). Some researchers suggest that link is mediated by student engagement, such that parent involvement impacts students' engagement, which in turn increases students' academic achievement. According to this motivational model, when parents view school as important and share their beliefs with their child by linking school with outside activities, their child is more likely to develop a sense of competence that drives him or her to invest in learning at school (Raftery et al., 2012). This model is supported by a cross-sectional study by Fan and William (2010) that examined the effects of *parental involvement* on student engagement. They analyzed part of a larger archival data set (Educational Longitudinal Study; ELS, 2002), focusing on the time point when participants were in tenth grade. The weighted sample size included 15,325 adolescents and their parents. The engagement items in the data set

tap into students' effort and persistence in school work, which aligns with the conceptualization of cognitive engagement in the current study. Fan and William (2010) conducted multiple regression analysis and found that parental aspiration for students' postsecondary education ($\beta = .16, p < .001$) and parent participation in extracurricular activities with their children ($\beta = .05, p < .001$) positively predicted cognitive engagement.

In addition to parent involvement, parents' promotion of autonomy also seems to link to students' engagement. *Autonomy support* by parents is characterized by encouragement of independent problem-solving skills and adoption of their child's perspectives. Raftery et al. (2012) suggest that the current literature points to the link between parental autonomy support and academic motivation, which, in turn promotes student engagement and academic success. In a longitudinal study, mothers of 379 five-year-olds were interviewed (Joussemet, Koestner, Lekes, & Landry, 2005). Joussemet et al. (2005) measured autonomy support by coding the interviews with four categories (i.e., empathy, rationale for request, choice, and non-controlling language). They then asked teachers to rate the participant's academic behaviors using the Classroom Behavior Scale (CBS; Abbott, 1960) when they were five and eight years old. The CBS included items that tap into cognitive engagement (e.g., "How promptly does he begin his work on assigned academic tasks?" and "What kind of standards does he set regarding the appearance of his work?"). Joussemet et al. (2005) found that students whose parents were more supportive of autonomy were viewed as more focused in learning and preferred challenges in academic tasks by their teachers (Joussemet, Koestner, Lekes, & Landry, 2005).

Researchers have also found that another parental dimension, providing a *structured learning environment*, was related to student engagement. Raftery et al. (2012) interviewed over 160 sixth grade students from nine schools and found that participants reported higher cognitive

engagement (e.g., engaged in classroom learning), academic competency, and grades when their parents fostered a structured learning environment at home (i.e., clear and consistent guidelines and expectations, predictability of consequences, and authority).

In summary, current literature demonstrates that there are many parent-related variables that are associated with student engagement. However, there is limited research that clearly distinguishes the relationships between parental factors and each dimension of engagement (i.e., behavioral, emotional, and cognitive). Future research should investigate the effects of the above-mentioned parental characteristics (i.e., parent involvement, autonomy support, and structured home environment) on a specific type of student engagement to deepen our understanding on this area.

Student Voices

The High School Survey of Student Engagement (HSSSE) is a student-focused survey developed by the National Association of Independent Schools (NAIS) and the Center for Evaluation and Education Policy (CEEP) at Indiana University. The HSSE aims to investigate how students view and think about various dimensions of student engagement (specifically, cognitive, behavior, and emotional engagement). The survey contains questions that ask students about their attitudes, perceptions, and beliefs about academic-related work, school, and their relationships with the individuals in the school community. According to the 2006 HSSE report, 81,499 students from 110 schools within 26 different states participated in the survey (Yazzie-Mintz, 2007). The results of the survey revealed that two out of three students felt bored in class every day because the materials were not interesting or relevant to them. This indicates that most high school students across the nation do not feel or think that they are cognitively engaged in class.

Moreover, the qualitative portion of the survey (i.e., “Would you like to say more about any of your answers to these survey questions?”) also revealed that students wish to be cognitively challenged in learning (Yazzie-Mintz, 2007). One student wrote “Our school needs to be more challenging.” (Yazzie-Mintz, 2007, p. 10). The qualitative portion of the 2009 HSSE survey ($N = 42,754$) also revealed several themes that highlight the need of student voices in the realm of student engagement research (Yazzie-Mintz & McCormick, 2012). Similar to the 2006 HSSE report, students reported the wish to be intellectually challenged. Moreover, one other theme that emerged is that students expressed that their opinions do not matter to the school and they believe no meaningful change will come about filling out the survey. In short, students across the nation felt that their voices are not appreciated.

Daniels and Arapostathis (2005) also solicited students’ input in studying engagement and motivation. They interviewed eight boys who attended an alternative high school for low achieving students in a Southwestern town. Most of the participants are Hispanic boys who lived in the poorest areas of the community. There was only one girl among eight other boys that met the authors’ search criteria for students whose engagement level is low despite intact ability to achieve (i.e., students who received passing scores on standardized tests but did not meet the GPA requirement of the school). The girl withdrew from school after 2 months to be home schooled, thus was not included in this study. The goal of interview to understand what these students hope to have in class to help educators help these students succeed in high school. A set of questions was used in the same order during each interview. An example question is “Is doing well in school important to you? Tell me more about that answer.” Using a grounded theory approach, they transcribed the interviews, examined each line, noted recurring ideas, named the categories, incorporated codes from motivation literature, and found several themes across all

participants' interviews. The participants emphasized that they will be more likely to engage in learning if they are interested in or see the value of the task. They also spoke about being self-motivated and being able to recognize that what they are doing in school builds towards something better facilitates engagement in the classroom. All these themes point towards the components that form cognitive engagement. Combining the findings from Daniels and Arapostathis (2005), Yazzie-Mintz (2007), and Yazzie-Mintz and McCormick (2012), students seem to believe that cognitive engagement is important, but the question of how to promote cognitive engagement remains unanswered.

Through the Lens of High Achieving Students

The research conducted by Daniels and Arapostathis (2005), Yazzie-Mintz (2007), and Yazzie-Mintz and McCormick (2012) highlights the need to include students' perspectives in exploring the facilitators and barriers of student engagement. Research teams such as Hufton, Elliott, and Illushin (2002) and Patrick and Middleton (2002) are some of the few who incorporated student voices via qualitative methods in the study of student engagement. As described in the earlier sections, both parties chose to target students from a specific age group. It is important to include the voices of all students in the research of student engagement, thus the voices of students with varying level of academic achievement should also be included. Moreover, Wang and Eccles's (2012a) longitudinal study detailed in earlier sections suggested that changes in cognitive engagement were positively associated with changes in GPA. As high GPA is often a hallmark of high-achieving students, it is possible that high-achieving students tend to have higher level of cognitive engagement. There may be great value in exploring ways to facilitate cognitive engagement through the worldview of high-achieving students as they are more likely to have experienced success in facilitating their level of cognitive engagement in the

classroom.

Studying cognitive engagement among high-achieving students is not an entirely new idea in the field. Prusha (2012) investigated the construct of cognitive engagement through the lenses of twelve high school seniors classified as high-achieving due to membership in the National Honor Society. Adopting a phenomenological lens, Prusha (2012) investigated how students perceive cognitive engagement before and after receiving training in measuring student engagement on a system level. Specifically, Prusha (2012) trained her participants to measure the level of student engagement in their classrooms with the Instructional Practice Inventory (IPI), an observation-based data collection tool that captures students' level of cognitive engagement in the classroom. She conducted two focus groups and multiple individual, semi-structured interviews to explore her participants' perceptions regarding their own and other students' level of cognitive engagement. Prusha (2012) adopted the constant comparative method to analyze her qualitative data and found five themes: (a) feedback and encouragement, (c) enjoyment and interest, (d) challenge and rigor, (e) relationships and expectations, and (f) control and choice. She found that students appreciate consistent and specific feedback from teachers, enjoy lessons more if a variety of activities and learning strategies were used in place of traditional lectures, enjoy challenging tasks, and prefer teachers who are confident, passionate, and willing to form positive relationships with students. Students also reported that their level of cognitive engagement increases when given autonomy to control and make choices in their own learning.

The study of Prusha (2012) shows the potential of generating rich and useful data on cognitive engagement through the voices of high-achieving students. The current literature on cognitive engagement may benefit from more studies focusing on high-achieving students as there are minimal studies that target this population. Aside from National Honor Society

members, other potential populations of high-achieving students are students who are enrolled in accelerated curricular options during high school, namely Advanced Placement (AP) classes or International Baccalaureate (IB) program.

Advanced Placement (AP). AP courses are rigorous, college-level curricula that are offered to students in high school (College Board, 2003). AP courses were developed as part of the initiative to close the gap between secondary and higher education. Leaders in every discipline among higher education were recruited to develop AP courses, a set of courses with enough rigor to be granted college credit. A primary objective of offering AP courses is to provide high school students the opportunity to engage in rigorous curricula, thus better prepare them for college-level work in the future. According to the 2016 AP program summary report, AP courses cover a wide range of academic content areas (e.g., Human Geography, Biology, Chemistry). More than 14,000 schools offered AP courses and more than 2 million high school students took an AP exam that year (College Board, 2016). AP exams are nationally standardized and offered at the end of course. They are scored on a 5-point scale, where 5 indicates *extremely well qualified*, 4 indicates *well qualified*, 3 indicates *qualified*, 2 indicates *possibly qualified*, and 1 indicates *no recommendation*. Many universities award college-level credit in the event a student scores a 3 or higher on an AP exam. Students who scored 3 or higher on the AP exams were found to demonstrate higher retention rate and mean GPA (Mattern, Shaw, & Xiong, 2009) and higher college graduation rates (Mattern, Marini, & Shaw, 2013). Although most AP courses are offered to 11th and 12th grade students as suggested by the College Board policy, some subject areas are offered to 9th and 10th grade students (College Board, 2010).

International Baccalaureate (IB). The IB Diploma program was first offered in the United States in 1971 and had since expanded to include 1865 schools that offer the program in

United States (IBO, 2016). Moreover, 1,669 universities employ official policies for admitting IB students to their schools. The IB program is a not-for-profit-foundation that aims to raise inquiring, knowledgeable, and caring young adults to create a better world through intercultural understanding. Teachers, consultants, IB staff, and examiners/moderators work together to create and review a comprehensive, internationally recognized IB curriculum. The IB curriculum focuses on cultivating students' metacognitive thinking, cultural competence, and community service. Similar to the AP courses, the IB Diploma program includes end-of-course exams. Although the IB Diploma program is only offered to 11th and 12th grade students in the United States, many IB schools offer 9th and 10th grade students the opportunity to enroll in a Pre-IB curriculum (Suldo, Shaunessy, & Hardesty, 2008) or the Middle Years Program (MYP; IBO, 2016). To obtain the IB diploma, students need to complete (a) an extensive research project (i.e., extended essay), (b) a course that encourages critical thinking skills (i.e., theory of knowledge), (c) an array of activities that concern arts, physical activity, and community service (i.e., creativity, action, service), (d) one course from each of the five required subject areas, and (e) pass the end-of-course exams (IBO, 2013).

Conclusion and Gaps in Current Literature

In general, several issues exist in the current literature pertinent to student engagement. First, there is conceptual haziness surrounding the construct of student engagement. Although most researchers agree that student engagement is a multidimensional construct, inconsistencies exist in the number and types of engagement across various studies (Reschly & Christenson, 2012). Moreover, there is also a considerable amount of overlap between motivational and engagement constructs. Nonetheless, most researchers consider student engagement to consist of behavioral (e.g., participation in class and extracurricular activities), emotional (e.g., feeling

connected to teachers and school), and cognitive (e.g., willingness to invest in learning and view school tasks as relevant to future goals) engagement (Fredericks et al., 2004). The next issue in the current literature is that it is difficult to measure engagement. This is especially true for cognitive engagement because it is a highly inferential construct (Appleton et al., 2006).

Third, cognitive engagement, when indexed using available self-report measures of goal setting, perceived relevance of schoolwork, and self-motivation, has been linked to positive outcomes such as academic achievement (Wang & Eccles, 2012a), but a review of the literature indicates that cognitive engagement seems to decline during adolescence. Thus, it is important for researchers to discover ways to help facilitate cognitive engagement among older students (i.e., middle and high school students) in particular. Fourth, it is also noteworthy that studies that utilize student voices show many students think that the current educational environment is boring and unchallenging (Yazzie-Mintz, 2006). Although prior research has revealed several factors that might facilitate students' engagement, there are few studies that focus on cognitive engagement. Moreover, most of the extant studies are quantitative in nature. In other words, a gap in the existing literature on cognitive engagement is that there is a lack of research that further explores the meaning behind these quantitative findings. Hence, it might be valuable to investigate new ways to help students become cognitively engaged through gathering qualitative data, wherein the key stakeholders' voices can be heard. What is equally important is that qualitative studies allow researchers to explore potential barriers that prevent students from being cognitively engaged in the classroom. Lastly, to the best of this researcher's knowledge, there is a paucity of research on the construct of cognitive engagement among high-achieving students. Thus, there might be great value in investigating ways to facilitate cognitive engagement among students pursuing accelerated classes as they might provide unique perspectives on this matter.

Chapter III:

Method

The current study examined the facilitators and barriers of cognitive engagement among ninth grade students in accelerated curricula through students' perspectives. Students in accelerated curricula refer to those who are taking AP classes or enrolled in IB program. The following chapter describes the current study's design, theoretical orientation, researcher reflexivity, setting and participants, then provides information on the student self-report measure and interview protocol used. Next, the chapter describes the pilot study, recruitment and data collection for the primary study, as well as data analyses. Last, the quality of study, ethical considerations, presentation of findings, and limitations of the current study were reviewed.

Research Design

This study adopted a mixed method sequential study design, with an emphasis on the qualitative part (quan → QUAL). The first phase of the study was quantitative in nature, wherein participants who scored at the top or bottom 10% on indicators of cognitive engagement- namely the *Goal Valuation* and *Motivation/Self-Regulation* subscales of the *School Attitude Assessment Survey-Revised* (SAAS-R; McCoach & Siegle, 2003) questionnaire were identified and recruited. These students who reported higher or lower levels of cognitive engagement compared to their peers were anticipated to possess unique insights on cognitive engagement during the next phase of the study.

The second phase of the study was qualitative (i.e., narrative case study) in nature, wherein 12 youth who continued to agree to participate in phase two of the study underwent one

or more interview sessions. Some participants ($n = 4$ of 12) underwent a second round of interview to follow up, confirm, or clarify the initial themes generated from the first round of interview. This is a case study because this researcher set clear boundaries on the topic and population in interest. Specifically, this researcher decided to investigate a specific population's (i.e., freshmen who are taking accelerated curricula) viewpoint on what facilitates or discourages cognitive engagement. This is a narrative case study because the interview questions are based on narrative inquiry to evoke stories from participants. Stories collected from participants were compiled and used to answer the research questions. In this study, this researcher defined story as any narrative information that provides insight into the life of the participants, including his or her perspectives, experiences, worldview, feelings, and opinions. Through the lenses of an interpretivist paradigm, this researcher aimed to understand the participants' experiences through communication. Figure 1 demonstrates the design of the current study.

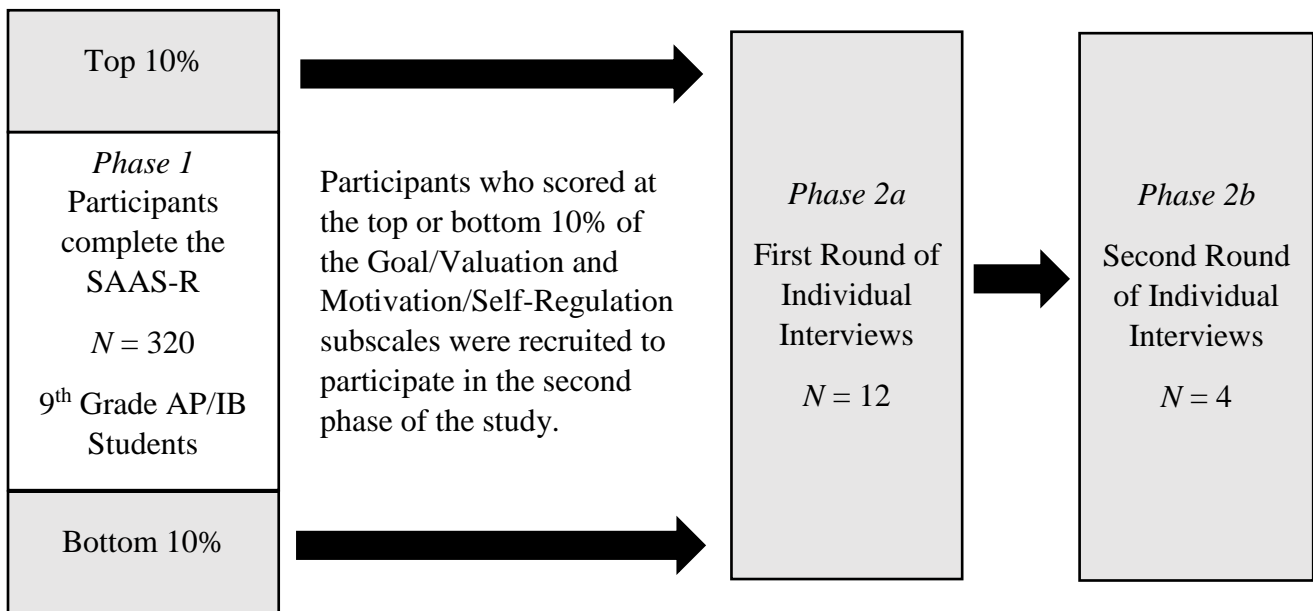


Figure 1. Flowchart that demonstrates the current study design.

There are several reasons for adopting a mixed method design. The quantitative part of this study aimed to identify extreme cases, namely students who reported having higher or lower levels of cognitive engagement compared to their peers. Students who reported higher level of cognitive engagement shared different perspectives on cognitive engagement compared to students who reported lower level of cognitive engagement. Thus, the current study gained a better understanding on what facilitates or impedes cognitive engagement through two different lenses. Cognitive engagement is also a highly inferential process (Appleton et al., 2006). This complicated and dynamic process may not be fully captured by self-reported surveys. Thus, the current study's narrative interviews (second phase) served to explore this construct through the experiences and opinions of participants.

In addition to adopting a mixed method study design, the current study also adopted a mixed method approach in analyzing the qualitative data generated through the second phase of study. The number of instances keywords mentioned throughout all interviews were quantified and compiled to form themes. The themes served to address the two research questions in the current study.

Theoretical Orientation

Research paradigm (interpretivist). The current study employs the view that researchers play an active role in social inquiry as they involve personal interests and invest personal efforts into studying the topic. Their passion gives birth to research studies and their prior knowledge, biases, and worldview affect how they interpret the results. Thus, it is impossible to totally eradicate biases in social science inquiry and there are multiple realities shaped by each individual's subjectivity. This view is consistent with the interpretivist paradigm as described by Sipe and Constable (1996). The current study also adopts the belief that

researcher and participants influence each other throughout the inquiry process. Participants may respond to the same set of interview questions differently based on the interviewer's race, language, accent, warmth, and other factors. In contrast, the researcher may possess assumptions about a participant based on prior knowledge and experiences, which may influence the way he or she interacts with the participant. Moreover, as mentioned by Lichtman (2013), no matter which paradigm or approach one adopts in qualitative research, the researcher acts as a filter through which data are collected, organized, and interpreted. This researcher acknowledges that as a researcher, she shaped the study but was shaped by it at the same time. This researcher also believes that knowledge is observable and assumes that the participants are authentic in their responses. Lastly, this researcher thinks that reality is subjective. Combining all these beliefs, this researcher adopted the interpretivist paradigm for this study.

Essentially, this researcher sought to understand the experiences of the participants through their lens and worldview. This researcher understands that it is impossible to completely remove her biases from the process and the data generated from this study will only represent some of the many truths within the realm of cognitive engagement. It is important to stress that this researcher does not believe that this inevitable interaction limits the validity of social science inquiry. In fact, this researcher believes it enhances the process by allowing researchers to communicate with participants in a reciprocal manner. Communication is key to understanding the experiences of others through their points of view. This researcher recognizes that it is important to document these interactions throughout the inquiry process to provide readers with more insight on the context in which the research was conducted.

Researcher Reflexivity

Heavily influenced by her upbringing as a Malaysian Chinese, education is one of the

most important aspect of this researcher's life, which is similar to the beliefs held by many students in accelerated curricula. Combining this factor with this researcher's age (24) and outer appearances that resembles someone substantially younger than the adults the participants usually encounter at school, the participants may have found it easier to open up and speak freely during interviews. However, as an individual who genuinely enjoys learning in the classroom, this researcher might possess assumptions on what might help the participants stay focused and interested in class. These assumptions may affect the way this researcher filter and interpret the participants' responses. Nonetheless, this researcher views the participants as valued others and relies on transactional communication to answer the research questions (i.e., What are some factors that facilitate or discourage cognitive engagement among high school freshmen who are taking accelerated curricula?).

Setting

The current study is part of a larger, four-year research project, which was funded by the Institute of Education Science (IES) in a grant (R305A150543) awarded to Drs. Shannon Suldo and Elizabeth Shaunessy-Dedrick (University of South Florida, College of Education). This study took part in Year 2 of the project (2016-2017 school year), in which 9th grade students enrolled in either AP classes or IB program at two high schools located in one large district in a Southeastern state participated in a 12-week curriculum that aims to teach these students coping and engagement strategies to deal with their unique stressors. This researcher is one member of the team of 8 researchers (2 professors, 2 postdoctoral fellows, and 4 graduate assistants including this researcher) who helped deliver this curriculum in a classwide format every week for one hour. Likely influenced by the content of the larger project, during the qualitative interviews of the current study the participants referenced several coping strategies introduced

within the universal curriculum. Some of the potential participants may have met or interacted with this researcher before invited to the second phase of the study (i.e., interviews). In terms of venue in which the interviews were conducted, this researcher chose a safe and quiet place (i.e., office) at both high schools to protect the participants' privacy.

Participants

Participants (i.e., ninth grade students enrolled in either AP Human Geography or IB Inquiry Skills at two high schools located in one large district in a Southeastern state) who gave written consent and assent participated in the larger IES (R305A150543) project's Year 2 baseline data collection. Three hundred and twenty students completed the baseline survey, which included the School Attitude Assessment Survey-Revised (SAAS-R; McCoach & Siegle, 2003). The first phase of the study involved 153 students (72% White, 7% Black, 22% Asian, 1% Indian/Alaska, 3% Native Hawaiian/Pacific Islander, 9% Other; numbers sum to over 100% because participants could indicate more than one category) from one high school with an IB program, and 167 students (85% White, 6% Black, 6% Asian, 2% Indian/Alaska, 1% Native Hawaiian/Pacific Islander, 6% Other) from the other high school that offered nine sections of AP Human Geography (primarily to 9th grade students). During the second phase of the study, this researcher recruited 13 participants from the pool of potential participants ($n = 46$ students with very high [top 10%] or very low [bottom 10%] level of cognitive engagement) for the semi-structured, narrative inquiry interviews. Twelve participants agreed to participate. As saturation was reached after 12 initial and 4 follow-up interviews, no additional students were recruited to participate in the interviews. No participants provided such limited responses during an interview as to warrant the discarding of an interview. This researcher invited four participants (two from low cognitive engagement group and two from high cognitive engagement group) out of the

twelve participants to the second phase of the study with the confidence that these students would provide the most useful and rich information that would further inform the research questions of this study. This researcher purposefully chose to invite participants who provided rich stories/narratives during the first round of interviews to further explore the themes emerged from the initial interviews. The information generated from the follow-up interviews helped the current study reach saturation. More details on the method of selecting the participants for follow-up interviews is included in Chapter IV.

Student Self-Report Measure

School Attitude Assessment Survey-Revised (SAAS-R). The SAAS-R is a student self-report measure that tap into two subtypes of engagement according to the engagement theory (i.e., emotional and cognitive engagement). The SAAS-R is a 35-item survey that measures *Academic Self-Perception* (i.e., self-evaluation of academic abilities, an aspect of motivation), *Attitude Toward Teachers* (i.e., positive appraisals of teachers, a dimension of emotional engagement), *Attitude Toward School* (i.e., positive appraisals and pride in one's school, another dimension of emotional engagement), *Goal Valuation* (i.e., students' perceived relevance of school learning to their future aspirations and goals, a dimension of cognitive engagement), and *Motivation/Self-Regulation* (i.e., willingness to invest effort in initiating and maintaining academic-related behavior through the use of cognitive strategies, another dimension of cognitive engagement). The Goal Valuation (GV) and Motivation/Self-Regulation (M/SR) subscales of SAAS-R are presented in Appendix I. Only the Goal Valuation (GV) and Motivation/Self-Regulation (M/SR) subscales were analyzed in the current study because these two subscales contain items that align with the conceptualization of cognitive engagement in this study. Participants will rate how strongly they agree or disagree with the items on a scale from 1

to 7 (1 = strongly disagree, 2 = disagree, 3 = slightly disagree, 4 = neither agree or disagree, 5 = slightly agree, 6 = agree, and 7 = strongly agree).

SAAS-R was developed by McCoach and Siegle (2003), in part to improve the original SAAS by adding in the Goal Valuation and Attitude toward Teacher factors, and removing the Attitudes toward Peer factor. The normative sample used to develop the SAAS-R contained 942 students in ninth to twelfth grade from a majority middle-class high school in the Northeast United States. McCoach and Siegle (2003) conducted a literature review to create the initial pool of 48 items for SAAS-R and piloted the measure to the above-mentioned sample. A confirmatory analysis was conducted and items that did not fit in the model were eliminated. McCoach and Siegle (2003) then conducted a second round of pilot study with the remaining 30 items. They reported a reasonable fit of the model. However, McCoach and Siegle were concerned about the low number of items on some subscales. Hence, they added 13 new items to the measure, which resulted in a 43-item measure. They then tested out the new version of SAAS-R with three convenience samples (146 juniors and seniors in a summer program, 200 ninth grade students from an ethnically diverse high school, and 299 high school students from 27 different school districts nationwide). Another confirmatory factor analysis was conducted and 8 items were eliminated sequentially.

The final version of the SAAS-R thus contains 35 items, and the model demonstrated reasonable fit, $\chi^2(550) = 1,581.7$, CFI = .911, TLI = .918, RMSEA = .059, SRMR = .057 through confirmatory factor analysis (McCoach & Siegle, 2003). In addition, the five factors have been found to be correlated with each other, with inter-factor correlations that range from .34 to .74. Dedrick, Shaunessy-Dedrick, Suldo, and Ferron (2015) reported high Cronbach's Alpha reliability for the Goal/Valuation ($\alpha = .89$) and Motivation/Self-Regulation (α

= .90) subscales in a study that involved 1,149 students (589 pre-IB 9th and 10th graders, and 560 IB 11th and 12th graders) from 10 public high schools recruited from five school districts in one state in the southeastern United States. Table 2 demonstrates the internal consistency reliability and sample items for the five factors as reported by McCoach and Siegle (2003).

Table 2

School Attitude Assessment Survey-Revised Scale Factors, Reliability, and Sample Items

Factor Name	# of Items	α	Sample Item
F1. Academic Self-Perception	8	.855	I can learn new ideas quickly in school.
F2. Attitude toward Teachers	7	.892	I relate well to my teachers.
F3. Attitude toward School	5	.665	I am glad that I go to this school.
F4. Goal Valuation	6	.889	Doing well in school is important for my future career goals.
F5. Motivation/Self-Regulation	10	.912	I spend a lot of time on my schoolwork.

Interview Protocol

According to Roulston (2010), a quality interview is partly determined by the extent to which the interviewer (a) clarifies the meanings of responses, (b) interprets meaning throughout the interview, and (c) elicits stories that does not require further descriptions. In line with Roulston's (2010) ideas, this researcher designed a semi-structured interview protocol that would help her fulfill these criteria. As an interpretivist, this researcher recognizes that her identity and biases will influence the design, implementation, and analysis of the interviews. In response to this realization, this researcher chose a semi-structured format to evoke storytelling among the participants. Through narration (i.e., stories), this researcher hoped to gain some insight into the

participants' perspectives, make sense of their experiences, and understand their social and cultural environment (Connelly & Clandinin, 1990). This data collection method best matches the ideologies of this study's research paradigm, interpretivism, in which the goal is to understand the facilitators and barriers to cognitive engagement through the lenses of the participants. This method also allowed the participants to clarify any misunderstandings during the interview. After each participant expressed his or her viewpoints in response to the prepared questions, this researcher asked follow-up questions to expand or clarify each participant's responses. Participants then provided corrective feedback to help this researcher understand their perceptions and reduces her biases in interpretation. Ultimately, this method contributed to the trustworthiness of this study's findings.

When this researcher designed the interview protocol (presented in full in Appendix B), she aimed to understand the participants' experiences through open and genuine communication. For example, the first question in the interview protocol (i.e., "What has led you to take AP classes or join the IB program?") serve to understand the stories behind each participant's involvement in accelerated curricula. This researcher was interested in understanding the context of the participants' stories and wished to establish a trusting relationship. Consistent with the Interpretivist paradigms, this researcher also believes that the participants can express their experiences accurately through interviews. In other words, this researcher believes that it is possible to access each participant's authentic self through interview talk. Thus, this researcher conducted a second round of interview to offer the participants the opportunity to confirm, add, or remove themes generated from the first round of interview. This researcher believes this two-step interview process generated rich data that enhanced the credibility and trustworthiness of this study (Roulston, 2010; Tracy, 2010).

As aforementioned, this researcher adopts the interpretivist paradigm and believes that the participants can and will provide genuine responses. To elicit rich information from the participants, this researcher evoked narration (i.e., stories) to gain participants' perspectives, make sense of participants' experiences, and understand participants' social and cultural environment (Connelly & Clandinin, 1990). In this study, story is defined as any narrative information that provides insight into the life of the participants, including his or her perspectives, experiences, worldview, feelings, and opinions. This researcher incorporated three scenarios that are relevant to the three aspects of cognitive engagement (i.e., willingness to self-motivate, use self-regulation skills to achieve self-determined academic goal, and perceive schoolwork as important to future aspirations) to elicit rich narrative data from the participants. An example of the scenario is as follow:

- Students who take AP classes or are enrolled in the IB program often have many different experiences in these classes. For example, imagine a 9th grade AP/IB student, Cameron. Cameron is currently taking AP Human Geography/HL Biology. Cameron realizes that it is very difficult for him/her to genuinely enjoy the class because it's boring. What advice would you give to Cameron so that the class becomes more interesting to him?

After each scenario, a follow up question was asked to elicit participants' perspectives on barriers to each of the aspects of cognitive engagement. An example of the follow-up question is as follow:

- You have a lot of great ideas on how to get interested in class, but I am curious if there has been anything that has prevented you from getting interested in your AP/IB classes?

Two other scenarios were created to capture the participants' perspectives on the facilitators and barriers on the other two aspects of engagement. In the early part of the spring 2017 semester, the interview protocol was reviewed by three doctoral-level advisors (thesis committee members) who have had experience working with the target population of the current study. They provided oral and written feedback and changes were made accordingly. Most of the changes were made to reduce jargon and increase flow and readability. This researcher then took an introductory course to qualitative methods and further refined the interview protocol with the help of the course instructor, Dr. Lauren Braunstein. Similarly, the thesis committee advisors reviewed the follow-up interview protocols before this researcher conducted the second round of interviews. The questions on the follow-up interview protocol was generated based on previous topics brought up by participants. The four participants (2 low cognitive engagement, 2 high cognitive engagement) had the opportunity to (a) clarify their sentiments from previous interviews and (b) confirm, disconfirm, or expand on the themes generated from first round of interview. Samples of the follow-up interviews were attached as Appendix E.

Pilot study. In March 2017, this researcher conducted a pilot study to estimate the time needed to conduct the interview protocol and to gain feedback on the clarity and validity of the questions. Two participants who have no background in psychology or other mental health field were recruited to participate in the pilot test of the interview protocol. Specifically, two young adults (e.g., undergraduate students in the USF honors college majoring in math and biomedical respectively) with prior enrollment in an IB program during high school participated in the pilot study. One doctoral-level advisor who has extensive experience interviewing high school students who are enrolled in accelerated curricula provided feedback on the first audio-recorded pilot interview. The researcher gained detailed feedback on interviewing techniques. She learned

to (a) be mindful of using open instead of close ended questions, (b) clarify the purpose of the meeting, and (c) keep the interview length to a minimal amount of time to respect the participants' time. Relevant changes were made on the interview protocol. The protocol presented in Appendix B reflects these changes.

Data Collection Procedures

Quantitative data collection. All ninth-grade students ($N = 320$) in the accelerated curricula (pre-IB program, AP Human Geography) at the two high schools in the Year 2 IES Goal grant study was recruited by their Assistant Principals and teachers at the start of school year to complete baseline measures of functioning and potentially also participate in interviews later in the school year. Consent and assent forms were distributed in August of 2016.

Participants with consent and assent to take part in the larger study completed various measures, including the SAAS-R at the beginning of the school year (September, 2016). Participants completed the battery of measures in medium to large groups (30 – 50 students). An approved member of the USF research team instructed participants on how to respond to Likert-type questions, then directed them to read and answer each item on the survey independently. After each participant completed the survey, a research team member checked the participant's responses and prompted him or her to consider completing any skipped or double-marked items to minimize the amount of missing data. Participants who took the survey received a \$10 iTunes gift card or a pre-paid movie pass (approximate value = \$10). All quantitative data were entered into the SPSS program for analysis.

Qualitative data collection. The second phase of this study adopted a purposive sampling method. Data from the *Goal Valuation* and *Motivation/Self-Regulation* subscales of the SAAS-R were analyzed to identify students who scored at the top or bottom 10% on both of these

subscales. Forty-seven participants were eligible and thirteen were recruited in the qualitative part of the study that was in line with the goal of the overarching project. They were provided an opportunity to withdraw assent for the individual interview if so desired. One of thirteen invited participants (92.3% participation rate) declined to participate in the second (qualitative) portion of the study, yielding a final sample of twelve participants. The interviews were conducted around the end of Spring semester (April 2017; following entry of phase 1 data and identification of the top and bottom 10% on the SAAS-R composite scores of interest). Although this period of time coincided with testing season, which affected the school climate and students' availability, it was necessary to wait until April given other activities transpiring as part of grant obligations (i.e., provision of universal and selective supports to students in the sample). The first round of interview sessions ($N = 12$) lasted for 27 minutes and 33 seconds on average ($SD = 4$ minutes and 54 seconds), with the longest interview of 39 minutes and 23 seconds and the shortest 23 minutes and 9 seconds.

After the first round of interviews, this researcher listened to the tape recordings and wrote down potential follow-up questions. Four out of the twelve students were asked to participate in a second round of interview to address follow-up questions and confirm the themes with the aim of enhancing the trustworthiness of intended statements; 100% agreed to participate in the 2nd interview. The second round of interviews occurred approximately a month after the initial interviews (May, 2017), and students were mostly done with formal tests during that period of time. The main purpose of the follow up interviews was twofold: (a) clarification, this researcher reminded participants of the point they made in initial interview and asked them clarifying questions, (b) exploration, this researcher explored emerging themes by prompting participants to talk about certain subject that came up during their initial interviews but was not

fully explored (e.g., use of technology). As examples, two of the four de-identified follow-up interview protocols were included as Appendix E. This researcher also generated initial themes during this process. The second round of interview session ($N = 4$) lasted for 21 minutes and 39 seconds on average ($SD = 2$ minutes and 15 seconds), with the longest interview of 23 minutes and 25 seconds and the shortest 18 minutes and 31 seconds.

Overview of Data Analysis

Quantitative analysis. To recruit participants who reported lower or higher level of cognitive engagement compared to others, participants who reported scores that fell into the bottom or top 10% of both Goal Valuation (GV) and Motivation/Self-Regulation (M/SR) subscales of the SAAS-R (McCoach & Siegle, 2003) were identified. First, participants' responses on the survey were entered into SPSS, then the average scores of each participant on GV and M/SR subscales were computed using SPSS. This resulted in two mean scores for each participant, one from GV and another from M/SR.

The distribution of scores on the GV and M/SR composites of the SAAS-R were reviewed. Two mean score cut-points that corresponded to $\leq 10^{\text{th}}$ percentile and $\geq 90^{\text{th}}$ percentile of scores for GV and M/SR were then determined. Two new categorical variables were created for GV and M/SR, and students were assigned values of 1 (mean scores $\leq 10^{\text{th}}$ of sample), 2 ($10^{\text{th}} < \text{mean scores} < 90^{\text{th}}$), or 3 (scores $\geq 90^{\text{th}}$) on each categorical version of GV and M/SR. After categorization, a total categorical score of cognitive engagement was created by adding values of the new GV and M/SR variables, such that sum scores ranged from 2 to 6. Students with a total score of 2 (bottom 10% of scores on both GV and M/SR; $N = 15$) and 6 (top 10% of scores on both indicators; $N = 32$) were identified. Among the 47 identified participants, 7 of the students with a total score of 2 and 6 students with a total score of 6 were recruited for

the second phase of the study. As aforementioned, only one student with a total score of 2 declined to participate in the interviews, yielding a 92.3% of participation rate for round 1 interviews and 100% for round 2 interviews.

Qualitative analysis. Analysis of qualitative data occurred throughout and after the collection of interview data. For example, results from the first round of interview informed the focus of the second round of interview. In general, the current study adopted the interpretivist paradigm and took a generic approach in analyzing the qualitative data.

Generic approach. The current study adopted a generic approach in analyzing the qualitative data. As described above, data analysis began after the first interview and continued to unfold throughout and after data collection. This researcher stopped conducting interviews when she believes that saturation has been reached, which is after 12 initial interviews and 4 follow-up interviews. To analyze the data collected from all the individual interviews, the audio recordings were first transcribed into a Word document. This researcher then read the transcription line-by-line several times and underlined important key words. Then, as the researcher immersed herself in the data, she incorporated a method from the grounded theory approach, namely the constant-comparative method. Themes and patterns were identified through systematic comparison of key words (Strauss & Corbin, 1990). This researcher also identified description, in vivo (words used by participants), emotions, values, and theory-related codes (Miles, Huberman, & Saldana, 2013). The final themes confirmed and expanded themes from the current literature on the facilitators and barriers of cognitive engagement among high school students in accelerated curricula. The following techniques recommended by Ryan and Bernard (2003) were used to help identify key words and themes:

1. *Identify Repetitions.* This researcher highlighted data that occurred and reoccurred or

recurred regularly.

2. *Identify Metaphors.* When individuals explain personal experience, metaphors are often used. This researcher highlighted any metaphors used by participants.
3. *Identify Theory-Related Material.* In order to fulfill the purpose of adding knowledge to existing literature, the current study identified experiences or phrases that align with or contradict the engagement theory.
4. *Create Word Lists & Key Words Lists.* After highlighting all the repetitive, metaphors, and theory-related words, this researcher entered the data into a computer software called Atlas.ti. The software counted the frequency of the key words across all data set. Key words were then grouped together to form initial themes and to compare across high and low cognitively engaged groups.
5. *Identify Similarities & Differences.* By using the constant comparison method, this researcher searched for similarities and differences among the initial themes by comparing them systematically across all interviews.
6. *Sorting.* The current study used the Atlas.ti to attach codes to key words or phrases and sorted the data with similar codes into themes.

Although it is the aim of this study to explore facilitators and barriers of cognitive engagement through the lens of the participants, this researcher adopted the interpretivist paradigm and thus acknowledged that she began data analysis with some preconceptions, such as expecting students to confirm some of the themes emerged from past research. The qualitative analyses of this study revealed some themes to be consistent with the set of a priori themes derived from current literature targeting each research questions (Table 3 on page 55).

Data Storage. The researcher stored data in a single electronic file with separate sections for interview recordings and transcriptions with students who reported high vs. low level of cognitive engagement. As this study is also part of the larger IES grant as mentioned above, all the interview recordings, transcriptions, and codes were also stored in the university’s secure storage area (the “p drive,”), where data from the larger IES grant study is stored and able to be accessed by all approved team members.

Table 3

A Priori Themes

Research Questions	A Priori Themes
1. What are the facilitators of cognitive engagement in accelerated curricula?	Mastery Approach in Learning Students’ academic self-efficacy Students’ positive affect Students’ use of coping strategies (i.e., seeking social support and adopting problem-solving process) Attribution to success – effort Autonomy promotion at school/home Care from teachers Hands-on activities in the classroom Work with peers in the classroom Use of technology in the classroom Promotion of self-regulation at school Relatable tasks at school Parents value of education Structured home environment Other: _____
2. What are the barriers to cognitive engagement in accelerated curricula?	Attribution to success – innate ability Other: _____

Data checking. After generating a set of initial themes and codes from the qualitative data, this researcher provided four other researchers the first version of the code book (attached as Appendix F) that includes a list of initial themes and code descriptions. The four researchers are doctoral students in the School Psychology program, two of whom are research assistants for

the larger grant funding the current study. During individual training session(s), this researcher reviewed the list of initial themes and codes with the other researchers and explained what each code meant. The other researchers then coded the transcripts independently. Lastly, this researcher discussed and resolved any inconsistencies in coding with the other researchers in individual meetings by comparing the original coded transcript and the transcripts coded by the other four researchers. During this process, several of the initial codes were merged, renamed, or reorganized to form a final list of codes (attached as Appendix G). This collaboration served to enhance the quality and trustworthiness of the analysis, but precluded calculation of inter-rater reliability due to the evolving nature of the codebook.

After data checking, a list of final codes was formed. This researcher then imported all data into a qualitative analysis software, Atlas.ti. Through Atlas.ti, this researcher assigned code to each highlighted quote as agreed upon during data checking. Next, this researcher used Atlas.ti to generate frequency counts and used the results to guide the formation of final themes. The final codes are organized under themes in the final version of code book (attached as Appendix G). More details on theme formation can be found in Chapter IV.

Considerations in Quality of Study

According to Tracy (2010), the quality of a qualitative study is highly related to the degree to which the study design incorporates (a) a worthy topic, (b) rich rigor, (c) sincerity, (d) credibility, (e) resonance, (f) significant contribution, (g) meaningful coherence, and (h) ethics. The first criteria is to pick a worthy topic. Tracy (2010) asserts that a worthy topic is relevant, timely, and often emerge from disciplinary priorities. This study surrounds the construct of cognitive engagement, a topic that is relevant and timely to the field of education and school psychology. To be best of this researcher's knowledge, there is minimal qualitative study that

focuses on the view of high achieving freshmen who are in accelerated curricula on how to facilitate cognitive engagement. As cognitive engagement has been shown to link to higher academic achievement (Wang & Eccles, 2012b) and little is known about how to facilitate this type of student engagement, this study's topic is worthy of being studied. More details on the worthiness of this topic is described in chapter I of this document.

To address the second criteria, rich rigor, this study collected complex data through interviews to answer the research questions (i.e., what are the facilitators and barriers of cognitive engagement?). The author interviewed multiple participants who fit the criteria as described above (i.e., freshmen in accelerated curricula who reported highest or lowest level of cognitive engagement) until saturation is met. A second round of interviews were also conducted to confirm initial themes and enrich data collection. Moreover, the interview protocol was carefully constructed to help the author asks a good breadth of questions.

The third criteria, sincerity, refers to the extent to which the researcher is self-reflective, transparent, and honest about his or her biases (Tracy, 2010). This researcher engaged in self-reflexivity during the planning, implementation, and analyzation of this study. This researcher also acknowledged her biases documented the decision-making process throughout the study. To the best of this researcher's ability, the study was designed to maintain sincerity and transparency. More details on self-reflexivity can be found on the reflexivity statement above.

The fourth criteria, credibility, is one of the most important mark of quality qualitative research and it refers to the trustworthiness and plausibility of research findings (Tracy, 2010). The current study attempted to attain trustworthiness with thick description, crystallization, multivocality, and member checking. This researcher provided thick descriptions by giving concrete details on the context in which interviews were conducted. This study also involved

four researchers as described in “data checking” to encourage crystallization (i.e., to reach a deeper understanding of the data). This study also provided space for a variety of opinions (i.e., multivocality) by including students who reported low or high level of cognitive engagement. This study took this one step further by purposefully selecting participants of different gender and ethnic backgrounds. Lastly, this study included member checking in data analysis. This researcher invited participants for a second round of interview to seek their input on the credibility of the initial themes. Specifically, the researcher encouraged participants to collaborate in data analyzation by providing critique, feedback, and affirmation.

The fifth criteria, resonance, refers to the transferability of the study results. Transferability is achieved when readers resonates with the findings and apply the research into their own situation (Tracy, 2010). This study maximized the transferability of this study by providing clear themes that emerged from pool of data and supplemented the description of themes with rich examples (e.g., student quotes, description of context, etc.). It is the hope of this researcher that educators, parents, and students find ideas or inspirations from this data on how to facilitate cognitive engagement in and outside of the classroom.

The sixth criteria, significant contribution, surrounds the idea of whether the current study adds knowledge to theory and practice. As described in Chapter I, this study aims to fill in a gap in the current literature on ways to facilitate cognitive engagement and provide practitioners with ideas on strategies to enhance level of cognitive engagement through the stakeholders’ (i.e., students) lens.

The seventh criteria, meaningful coherence, examines whether a study plausibly accomplish its purpose with methods that align with the chosen paradigm (Tracy, 2010). The current study achieved meaningful coherence by interconnecting the research design, including

theoretical rationale for the study, data collection method, and data analysis with the overarching theoretical framework of interpretivism. Last, the researcher views the eighth criteria, ethics, as an integral part of the study design. Thus, the following section is devoted to ethical considerations.

Ethical Considerations

Several precautions were taken to protect the rights and confidentiality of the participants in this study. First, the USF's IRB and the author's major professors reviewed the interview protocol to ensure all procedures or interactions with the student would present minimal risk of harm. In addition, all participants' parents received and signed written consent forms that explains the purpose of the study, their children's roles in the study and potential risks and benefits if their children take part in the study. After the participants' parents gave consent for the participants to take part in the study, the participants were given written assent forms that further explain the content of consent forms. Only students who have both consent and assent forms signed participated in the current study. The consent and assent form provided contact information for the USF researchers, in the event there are any concerns. Moreover, the participants were told before the interviews that they are free to withdraw from the session anytime. To protect youth identities, participants did not include any identifying information on the survey packet. They were given a participant code instead. This researcher also assigned pseudonyms to the participants who were involved in interviews, in order to avoid exposing their identities and confidentiality. All interviews were audio recorded and uploaded to the p-drive to enable data sharing among approved project staff, but no youth participants names were retained on these audiofiles. To account for the diversity of the participants, the interview questions were carefully constructed so that students from diverse background would be able to understand and

respond to the questions readily. Last, the researcher always attempted to feel and convey respect for the participants, and acknowledged that her character and actions influenced the participants and vice versa during interviews.

Presentation of Findings

A set of final themes emerged in collaboration with the other independent researchers after thorough analysis of the interviews. Some of the themes overlapped or resonated with the set of a priori themes that derived from current literature. The themes were organized to address each of the research questions, whereby a set of themes addressed the first research question (i.e., What are the facilitators of cognitive engagement among ninth grade students in accelerated curricula?) and another set of themes answered the second research question (i.e., What are the barriers to cognitive engagement among ninth grade students in accelerated curricula?). Another set of themes are included to provide context to the interviews (e.g., reasons for joining IB or taking AP classes). Under each theme, descriptions were provided to explain how it answers the respective research question and how it fits in the context of the study. The researcher also utilized specific examples (e.g., student quotes) to enrich the description. A full presentation of the results is included in Chapter IV of this document.

Limitations

There are several limitations to the datasets analyzed in the current study. First, the participants are limited to ninth grade students who are enrolled in AP classes or IB program in two high schools. This limitation may threaten the transferability of the findings of this study to older students or high school students of any age in general education. While the results of this study may be valuable to inform the current literature on how to foster cognitive engagement among high-achieving students, it is possible that students outside of this population perceive

cognitive engagement differently. On the other hand, it is noteworthy that the survey measure of cognitive engagement was administered at the beginning of the school year. As all participants were incoming ninth grade students who are going to start a new chapter of their lives, they might report higher level of cognitive engagement compared to other high school students. Moreover, there is a seven months gap (September 2016 to April 2017) between the administration of the quantitative measure on cognitive engagement (i.e., SAAS-R; McCoach & Siegle, 2013) and the qualitative interviews. It is possible that participants' level of cognitive engagement had changed substantially during the period of seven months. In addition, participants have to rely heavily on retrospective thoughts and memories to answer most of the interview questions. Thus, it is possible that the participants may not be able to recall details of instances when they were or were not cognitively engaged. Furthermore, communicating memories is a complicated process and the participants may not be able to convey their experiences accurately during a relatively short interview. The first round of interviews was also conducted during a stressful time of the school year (i.e., end of year exam period), and space to interact with students was limited in the schools. These environmental factors may had influenced the comfort level of participants during interviews.

Chapter IV:

Results

This chapter includes results of quantitative and qualitative analyses conducted to answer the two research questions in the current study. First, this chapter presents the results of quantitative analyses to illustrate the process of identifying potential participants for the second phase of study (i.e., interviews). Then, this chapter describes results of qualitative analyses to demonstrate themes emerged from two rounds of narrative case study interviews. A general overview of themes and how themes were formed are presented before the themes are described in greater details within three sections. The first section provides context to the interviews. It illustrates why participants decided to take AP classes or join the IB program. It also captures participants' perception on their school's academic and social climate. Themes in the second section address the first research question (i.e., What are the facilitators of cognitive engagement among ninth grade students in accelerated curricula?). It includes (a) students' role, (b) teachers' role, (c) parents' role, (d) school connectedness, and (e) technology's role. Finally, the third section pertains to the second research question (i.e., What are the barriers to cognitive engagement among ninth grade students in accelerated curricula?). It includes (a) student characteristics, (b) negative academic experiences, and (c) distractions.

Quantitative Results

To recruit participants who reported lower or higher level of cognitive engagement compared to others, participants who reported scores that fell into the bottom or top 10% of both Goal Valuation (GV) and Motivation/Self-Regulation (M/SR) subscales of the SAAS-R

(McCoach & Siegle, 2003) were identified. Participants' responses on SAAS-R were first entered into SPSS, then the average scores of each participant on GV and M/SR subscales were computed. Each participant obtained two mean scores, one for GV and another for M/SR. The distribution of scores on the GV and M/SR composites of the SAAS-R were then reviewed and two mean score cut-points that corresponded to $\leq 10^{\text{th}}$ percentile and $\geq 90^{\text{th}}$ percentile of scores for GV and M/SR were determined. The cut off points for the bottom and top 10% of the GV subscale were ≤ 6.0 and ≥ 7.0 ; whereas the cut off points for the bottom and top 10% of the M/SR subscale were ≤ 4.3 and ≥ 6.8 .

After identifying the cut points, two new categorical variables were created for GV and M/SR. All 320 participants were assigned values of 1 (mean scores $\leq 10^{\text{th}}$ of sample), 2 ($10^{\text{th}} <$ mean scores $< 90^{\text{th}}$), or 3 (scores $\geq 90^{\text{th}}$) on each categorical version of GV and M/SR. A total categorical score of cognitive engagement was created by adding values of the categorized GV and M/SR variables, such that the sum scores ranged from 2 to 6. Students with a total score of 2 (bottom 10% of scores on both GV and M/SR) and 6 (top 10% of scores on both indicators) were identified, and recruited for the second phase of the study.

A total of 15 students had a total score of 2 (i.e., Low Cognitive Engagement group), whereas 32 students had a total score of 6 (High Cognitive Engagement group). Two students in the Low Cognitive Engagement group were excluded from the potential list of participants to be invited for interviews due to reasons out of this researcher's control (e.g., dropping out of AP).

This researcher purposefully selected about 6 students from each of the Low and High Cognitive Engagement groups to participate in the second phase of this study. With the goal of maximizing the diversity of the sample, this researcher invited roughly equal number of males ($n = 5$) and females ($n = 7$). Because there was only 1 female student among the Low Cognitive

Engagement group, most of the female participants belong to the High Cognitive Engagement group. There were only White and Asian students among the pool of potential participants (all students in the Low and High Cognitive Engagement groups), with far more White students; this researcher invited all 3 minority (Asian) students. One of 3 Asian students declined to participate in the interviews. The final list of participants includes 10 White and 2 Asian students. Among the twelve participants, four participants (i.e., Angel, Kerry, Ryan, and Damian) whom this researcher believed would provide the most useful data were invited to participate in follow-up interviews. The demographic information of phase two participants is summarized in Table 4.

Table 4

Phase Two Participants' Demographic Features and SAAS-R Scores

Participant Pseudonym	Cognitive Engagement Group	Score on GV Subscale	Score on M/SR Subscale	School	Gender	Ethnicity
Ryan	Low	4.00	3.00	AP	Male	White
Danny	Low	5.50	4.30	IB	Male	White
Derek	Low	4.50	4.30	IB	Male	White
Larry	Low	5.00	4.30	IB	Male	White
Damian	Low	3.33	4.00	IB	Male	White
Brittany	Low	5.83	3.90	AP	Female	White
Jerry	High	7.00	7.00	AP	Male	White
Ivan	High	7.00	7.00	IB	Male	White
Kerry	High	7.00	6.90	AP	Female	White
Brenda	High	7.00	7.00	IB	Female	Asian
Barbie	High	7.00	7.00	IB	Female	White
Angel	High	7.00	6.80	IB	Female	Asian

Qualitative Results

This study adopted a generic approach in analyzing the qualitative data generated from narrative case study interviews. This study relied heavily on the constant-comparative method to generate themes that reflects the collective voices of participants. As a result, several themes emerged to answer the two research questions of this study. To enhance the quality and

trustworthiness of the qualitative results, four independent coders, as described in the data checking section in Chapter III, analyzed the transcripts and resolved any inconsistencies in coding with the author. This section begins with an overview of all themes generated from the interviews, then describes how themes were formed. Themes that provide context to the interviews are then discussed. Finally, this section presents themes that address each of the research questions (i.e., facilitators and barriers of cognitive engagement).

Overview. During the interview, participants shared strategies to (a) increase AP/IB students' interest in their accelerated curricula's coursework, (b) persist towards a self-determined goal in AP/IB courses, and (c) relate what students learn in their AP/IB courses to future aspirations. Participants also discussed the barriers that prevented them from performing the above-mentioned tasks. Through a general approach focusing on the constant-comparative method, analysis revealed that participants view the three components of cognitive engagement as highly related to each other and strategies that apply to one could also apply to others. In addition, participants provided some context on their experiences in accelerated curricula, including reasons they enrolled in AP/IB and their school's academic and social climate. In regard to the first research question (i.e., What are the facilitators of cognitive engagement among ninth grade students in accelerated curricula?), results suggest that the facilitators of cognitive engagement shared by participants can be grouped into five themes:

1. *Students' Role:* Participants recommended changing one's beliefs, being involved in and out of the classroom, using coping strategies, and matching one's interest to coursework as ways to increase level of cognitive engagement.
2. *Teachers' Role:* Participants stated that several types of teacher support, instructional practices, and characteristics help facilitates cognitive engagement.

3. *Parents' Role*: Participants shared that parents can facilitate students' level of cognitive engagement through providing specific types of support, conveying the importance of education, and providing an appropriate study environment at home.
4. *School Connectedness*: Participants mentioned that feeling connected to their peers, teachers, and school enhances their level of cognitive engagement.
5. *Technology's Role*: Participants stressed how technology enhances their learning experiences and increases their level of cognitive engagement in AP/IB courses.

To answer the second research question (i.e., What are the barriers of cognitive engagement among ninth grade students in accelerated curricula?), analysis revealed that the barriers that prevented participants from being cognitively engaged in their AP/IB courses can be grouped into three themes:

1. *Student Characteristics*: Participants mentioned that their mindset, life circumstances, and lack of time and task management (TTM) skills serve as barriers to cognitive engagement in AP/IB courses.
2. *Negative Academic Experiences*: Participants shared that disconnection from teachers and negative experiences in the classroom prevented them from being cognitively engaged in their AP/IB courses.
3. *Distractions*: Participants pointed out social and technology distractions as barriers to their cognitive engagement in and out of the classroom.

Overall, most of the themes aligned with the a priori themes derived from past literature on facilitators and barriers of cognitive engagement. Some of students', teachers', and parents' role corresponded to the list of a priori themes (e.g., autonomy promotion, hands on activities in the classroom, promotion of self-regulation, etc.). In contrast, some of the a priori themes were

not found in this study, including students' positive affect and attribution of success to innate ability. Finally, analyses also revealed new themes for facilitators and barriers of cognitive engagement (e.g., technology's role, school connectedness, negative academic experiences, etc.). More details on how the themes generated from this study align with the themes found in past literature can be found in Chapter V.

The frequency with which each of the theme was mentioned throughout first and second round of interviews was calculated. Results show that *students' role* was mentioned the most ($n = 185$), followed by *teachers' role* ($n = 90$), and *parents' role* ($n = 47$). The frequency for mentions of facilitators ($n = 365$) is also much higher than barriers ($n = 59$). It is also noteworthy that participants in the High Cognitive Engagement (CE) group ($n = 242$) contributed slightly more sentiments than the participants in the Low CE group ($n = 213$). Table 5 (page 68) lists all the themes derived from the analyses of this study with the frequencies in which participants in High vs. Low CE group mentioned the themes and the total number of times the theme has been mentioned throughout the second phase of this study.

In summary, qualitative analyses revealed five themes for facilitators and three themes for barriers of cognitive engagement. Most of the themes align with the list of a priori themes derived from past literature, but this study discovered some new themes and did not find some a priori themes. Results also suggest that *students' role* was mentioned the most, participants who reported higher level of cognitive engagement contributed more, and there were more mentions of facilitators compared to barriers. The following sections describe each theme's subcategories to provide a better understanding on how the themes facilitate or prevent AP/IB students' cognitive engagement through the lens of the twelve participants in phase two of this study.

Table 5

All Themes and Frequency by High vs. Low CE Group and Total across Groups

	High CE	Low CE	Total
Contextual Themes	15	16	31
Facilitators			365
Facilitator 1: Students' Role	104	81	185
Facilitator 2: Teachers' Role	45	45	90
Facilitator 3: Parents' Role	25	22	47
Facilitator 4: School Connectedness	15	13	28
Facilitator 5: Technology's Role	7	8	15
Barriers			59
Barrier 1: Student Characteristics	12	11	23
Barrier 2: Negative Academic Experiences	9	14	23
Barrier 3: Distractions	10	3	13
Total	242	213	455

Note. CE= Cognitive Engagement. Values included within table reflect the total number of times a sentiment within a theme was expressed across all interview.

Theme formation. As mentioned in Chapter III, this study employed a general approach in analyzing the qualitative data generated from individual interviews. In line with the *interpretivist* paradigm, this researcher is most interested in participants' opinions on what facilitates or act as a barrier to cognitive engagement. Therefore, this researcher grouped all interviews (initial and follow up) and analyzed them together because she is more concerned about the participant's views on this issue, instead of whether a sentiment came from initial or follow up interview. As aforementioned, the purpose of follow-up interview is two-fold, to clarify and explore. For example, this researcher offered Damian (IB, Low) an opportunity to clarify his statement from the first round of interview. This researcher asked,

The last time we met, you mentioned that teachers play a big role in your IB experiences so far. Some are more “motivated” to teach than the others. You think that your biology teacher was one of the “motivated” teachers. What do you mean when you say a teacher is “motivated” to teach?”

Other than clarification, this researcher also further explored themes that were generated from the first round of interviews during follow-up. For instance, the theme of technology was brought up by several students but was never fully explored due to time constraints. Thus, during the follow-up interview with Ryan (AP, Low), this researcher asked,

You mentioned the use of online resources, such as YouTube videos are helpful in getting students interested in class. I thought that is very interesting. How has technology/online resources affected your progress towards a goal you set for yourself in your AP classes?

In sum, the follow-up interviews allowed this researcher to seek clarification and explore themes at a deeper level with a few chosen participants whom this researcher believed would provide rich data to aid in analysis. The follow-up interviews were successful in reaching these goals and contributed to the saturation of data. It is also important to note that in the follow-up interviews, participants were never prompted to talk about things that they did not mention in their initial interviews. Hence, N (number of participants who mentioned a specific code) is not inflated. As for n (number of times a specific code appeared across all interviews), the number may be inflated but only slightly given the small number of follow-up interviews conducted (i.e., 4). It is also important to note that during follow-up interviews, participants were still free to talk about anything within the topic that they previously mentioned, thus confirm, contradict, or expand on the initial codes and themes. The following paragraph describes the process of theme formation in detail.

All the interviews (12 initial and 4 follow ups) were first transcribed into Word documents by this researcher. Then, this researcher highlighted (a) quotes that occurred and reoccurred regularly, (b) metaphors, and (c) experiences that align or contradict the engagement

theory. Next, this researcher compared and contrasted the highlighted data to create a list of key words that capture the essence of the highlighted quotes. The list of key words was compiled into a code book, where numerous codes were categorized under a set of initial themes (attached as Appendix F). This initial set of themes simply represented this researcher's understanding of the data after comparing and contrasting the highlighted data once, as opposed to emerging from systematic analysis of data. These themes were meant to serve as a guide to help this researcher and the independent coders apply codes to highlighted data across all interviews.

When a quote was long but focuses on the same topic, this researcher coded such quotation only once, even if a follow-up question fell in between. This researcher only applied a specific code more than once if another quotation pertinent to the topic/code appeared in another part of the interview. This is to make sure the number of instances a specific code occurred across interviews is not inflated. For example, the long quotation below was coded as one instance of *getting involved*, as she continued to expand on the importance of getting involved in the classroom after the follow up question:

Angel: I would say not just be in class, not just a student detached from the class, like you're just there doing the work not speaking not participating. I would participate more, I would talk more, I would gradually get to the point you feel yourself comfortable talking in class.

Interviewer: Those are really great ideas. Anything else that you can think of that Cameron can do to help herself be more interested in class?

Angel: I would say, although I already said this, participate in class more. I feel like in the beginning of the year I didn't really participate that much I would just be in class just doing no work, and throughout the year I became like... adding on to what I said about

the beginning of the year, I'm a quiet person usually and I don't really work well with like new people, I like hide away and shy myself away from people and I was really timid, but throughout the year I try to push myself a little more, do some more talking, talk to more people, that's how I like, kind of blossom, I can talk to like a lot of people now, especially new people that I didn't know and so I think that's a good thing to like participate in class, try to get yourself to talk a little more, try to get yourself to warm up to people and not just shy away from it.

After coding all the interview transcripts, this researcher oriented 4 independent coders (school psychology doctoral students) to the codebook, including how the codes were organized and what they meant. The independent coders then coded the transcripts separately and discussed any inconsistencies in coding with the researcher. They also helped this researcher merge, rename, or rearrange the codes. As a result, a final list of codes was formed. The codes can be found in the final version of code book (attached as Appendix G), where they are organized by main and secondary themes. The following paragraph describes how this researcher derive the themes. Note that the independent coders did not help with theme formation, they ensured that the quotes match the most appropriate codes.

After data checking (i.e., resolving inconsistencies in coding and finalizing codes with independent coders), this researcher imported all the transcripts into a qualitative analysis system (Atlas.ti) and attached each highlighted quote with the appropriate code. Through Atlas.ti, this researcher examined (a) how many times each code emerged throughout all sixteen interviews and (b) how many participants mentioned each code. Only codes that had been mentioned by more than one participant were retained. Among the remaining codes, several were grouped together to form secondary themes. Several secondary themes were then grouped together to

form the main themes. Note that there are several main themes that only have secondary themes because the codes could not be grouped together and thus became secondary themes. The following sections provides an overview of the main themes (i.e., contextual themes, facilitators themes one to five, and barriers themes one to three), describes the secondary themes (e.g., *reasons, student beliefs, mindset, etc.*) that fall under each section, expands on the codes (e.g., *model, long-term goal, irrelevant, etc.*) that fall under each theme if there are any, and summarizes the findings of each theme in a table. Between contextual and facilitator theme 1, this researcher included a section that signals the transition from discussing context to facilitators. Similarly, a section transitions between facilitator and barrier themes. These transition sections are not main themes.

Using the first section as an example, the main theme is *contextual themes*; the secondary themes are *reasons, academic climate, and social climate*; whereas the codes include *quality education, model, positive, etc.* Table 6 (page 73) summarize the findings. In the tables, *n* refers to the total number of times each theme had been mentioned throughout the 16 interviews (i.e., frequency); *N* refers to the number of participants who mentioned the secondary theme, or code. The tables also display the number of times (*n*) a particular theme or code occurred in the high vs. low cognitive engagement group. Note that the most frequently mentioned themes were always described first in this document. More often than not the themes that were mentioned most frequently were also mentioned by the most number of participants. Nonetheless, all codes and secondary themes were mentioned by more than one participant, so this researcher is confident that the pattern was observed across interviews.

To guide readers through the rest of this chapter, Table 6 describes all the terms and notations that will be used to illustrate the findings of the qualitative analysis of this study.

Table 6

Descriptions of Terms and Notations Used to Illustrate the Findings of Qualitative Analysis

Term or Notation	Description
Quote	A direct quote highlighted from interview transcriptions. Each quote is paired with a code.
Code	A keyword used to capture the essence of quotes. In vivo codes are codes that were named with the words used by participants. Relevant codes are grouped to form secondary themes.
Secondary Theme	A small theme that describes components of the main theme. Several secondary themes form a main theme. In some instances, codes are too specific, thus becomes a secondary theme by itself.
Main Theme	A big theme that represent topic common to the secondary themes that fall under it. In this study, there are 9 main themes (i.e., contextual theme, facilitator theme 1 to 5, barrier theme 1 to 3).
Initial Theme	Theme that was formed after first round of comparing and contrasting quotes. Serve to guide the initial coding process.
CE	Cognitive Engagement.
N	Number of participants across the low and high CE groups who mentioned the theme or code
n	Frequency with which the theme or code had been mentioned throughout all 16 interviews from 12 participants (12 initial interviews, and 4 follow-up interviews)

Contextual themes. The first-round interview protocol included two questions that encouraged participants to share information that provided context to their experiences in accelerated curricula. The first question is “What has led to you to take AP classes or join the IB program?” From this question, all twelve participants shared the *reasons* ($n = 14$) why they enrolled in accelerated curricula. The second question urged participants to share their experiences in AP classes or IB program after two semesters in accelerated curricula. This question prompted all participants to talk about their schools’ *academic* ($n = 14$) and *social climate* ($n = 3$). Participants also mentioned their school’s *academic* and *social climate* at other points during interview. Participants in high ($n = 15$) and low ($n = 16$) group contributed equally to form this theme.

Reasons. Under the theme of reasons, half of the participants ($N = 6$) stated that they took AP classes or joined the IB program for *quality education*. Derek (IB, Low) shared, “The IB program is more beneficial than the other schools.” Ivan (IB, High) elaborated,

I joined just to have a little more of a challenge. I think [the] traditional program didn’t give me enough challenge in level or in work. I think the involvement of the teacher to take time to go in depth about the learning really helped me understand the material better. [It’s] a better set up.

Other than *quality education*, participants ($N = 4$) also mentioned that the reason they enrolled in accelerated curricula is because someone they know had been through accelerated curricula and inspired them to follow their path (i.e., *model*). As Angel (IB, High) stated,

My uncle from my mom’s side was in the IB program too, and he is very successful in what he’s doing now. He is a doctor, well he’s a surgeon, and I want to be a doctor too. So, I am kind of following my uncle’s footsteps.

In summary, the reasons participants took AP classes or joined the IB programs can be grouped to either searching for a *quality education* or following the footsteps of someone they know (i.e., *model*).

Academic climate. When asked about their experiences in accelerated curricula, seven participants regarded their accelerated curricula experience as *positive*, two as *negative*, and three considered it *mixed*. The high CE group described their schools’ academic climate as *positive* five times and *mixed* once. Barbie (IB, High) shared, “I feel that I’ve done very well in a lot of the classes.” Her sentiment was echoed by Kerry (AP, High), who said, “It’s been a lot more stressful than my regular honors classes but it is manageable. It is more manageable than most people were telling me.” In contrast, participants in the low CE group described their schools’

academic climate as *positive* three times, *negative* twice, and *mixed* three times. Derek (IB, Low) described his experiences in IB as a mixture of hardships and support, “It always starts out really bad. I had bad grades at the beginning of the year but now I am in a study group. I’m focused and I know what I’m doing. Not everything is so hard as it was.” Damian (IB, Low) described a negative experience he faced in his IB program,

I think I mentioned this previously but our Biology teacher left and we have a rotating roster of subs and progressively it’s getting worse. They put a lot of work on us and it’s not going to be graded or checked and it’s not helpful to us. If anything, it’s hindering our ability to learn or discuss anything in class.

In sum, participants who reported a lower level of CE seem to have less *positive* academic experiences in their AP/IB courses.

Social climate. Among the twelve participants, three described their school’s social climate when asked about their experiences in AP or IB. All three participants shared *positive* experiences. As stated by Derek (IB, Low), “I get to know a lot of new people.” Barbie (IB, High) described positive interactions with her teachers, “The teachers are all very kind and want to get you to help you out in whatever way they can.”

Overall, participants mentioned that they took AP classes or joined the IB program for quality education or to follow a role model’s footsteps. Moreover, less students ($N = 3$) mentioned *social* climate when inquired about their AP/IB experiences, and their responses are often short compared to instances when they describe *academic* climate. To summarize this theme, Table 7 (page 76) illustrates the secondary themes, description, and the frequency in which participants mentioned the theme and secondary themes.

Table 7

Contextual Theme, Secondary Themes, Descriptions, and Frequency by High vs. Low CE Group and Number of Participants Who Mentioned the Secondary Themes

Theme Category	Description	High CE	Low CE	<i>N</i>
Reasons (<i>n</i> = 14)				
Quality Education	View AP/IB as a platform to receive quality education	5	5	6
Model	Follow the footsteps of others	2	2	4
Academic Climate (<i>n</i> = 14)				
Positive	Positive academic experiences/perception	5	3	8
Negative	Negative academic experiences/perception	0	2	2
Mixed	Combination of Positive and Negative	1	3	4
Social Climate (<i>n</i> = 3)				
Positive	Positive interactions with others	2	1	3
Total (<i>n</i> = 31)		15	16	12

Note. CE= Cognitive Engagement. *n* = frequency with which the theme or code had been mentioned throughout all 16 interviews; *N* = number of participants across the low and high CE groups who mentioned the theme or code. The same participant may mention the same theme more than once, thus the number of participants (*N*) who mentioned the theme may be lower than the total *n* mentions.

Facilitator themes. The next five themes address the first research questions of this study (i.e., What are the facilitators of cognitive engagement among ninth grade students in accelerated curricula?). The interviewer presented three scenarios to participants and asked participants to give advice to incoming ninth grade AP/IB student on ways to get interested in accelerated curricula, persist towards a self-determined academic goal, and relate accelerated coursework to future goals. The emerged themes include (a) students' role, (b) teachers' role, (c) parents' role, (d) school connectedness, and (e) technology's role.

Facilitator 1: students' role. The theme that was mentioned most among facilitators is *students' role* (*n* = 185). All twelve participants mentioned various ways in which students can help themselves be more cognitively engaged in the classroom. *Student beliefs* had the highest frequency (*n* = 91), followed by *student involvement* (*n* = 40), *use of coping strategies* (*n* = 36),

and *student interests* ($n = 18$). Participants in the high group contributed more ($n = 104$) than the low group ($n = 81$) to produce this theme: students' role.

Student beliefs. All participants ($N = 12$) shared that *student beliefs* play a role in facilitating one's level of cognitive engagement. Specifically, every participant stressed that keeping one's *long term goal* in mind helps one be more cognitively engaged in accelerated curricula. This sentiment can be illustrated with Brenda's (IB, High) words, "You have to constantly remind yourself that you are here for a reason, it's not just school, you're here to get that extra transition to college, extra credits when you graduate." Larry (IB, Low) affirmed, "Just think about the end goal. Just think about it as a race and there are more check points. Once you reach it, you are closer to the end goal." Ryan (AP, Low) also shared,

If his family members and guidance counselor talk to him about how AP classes affect how colleges look at you and your GPA and all that kind of stuff, he will definitely see the importance of it because those are very crucial in getting into college. You need to take a lot of AP courses. You may not like it, but if you want to get into a decent college and get scholarship that's what you have to do. I said that previously but it's a very necessary point.

In addition to keeping *long term goals* in mind, seven participants mentioned that believing in one's own ability to reach a self-determined goal in AP/IB courses (i.e., *Expectancy-Value*) facilitates cognitive engagement. Kerry (AP, High) shared, "Do all your homework and read all the assignments, then you'll feel better about yourself. Once you get into class you'll realize you did everything correctly it will keep motivating you to keep going." Larry (IB, Low) expanded on this idea,

For example, Algebra. I used to think that it's very boring, and then I tried harder to grasp

it and understand it. When I understand it, I can solve problem very easily for certain things. I felt a sense of accomplishment when I complete a problem and it helped me.

That helped me out a lot.

Next, nine participants shared that adopting a *performance approach* (i.e., aim to demonstrate competency to others or gain extrinsic rewards) in learning helps students be more cognitive engaged in accelerated curricula. For instance, Barbie (IB, High) recommended, “If she could give herself a little reward along the way, like if I finish studying I can take a little five minutes break or maybe eat a snack. I can do that each time I finish a section. It helps her stay motivated.” Derek (IB, Low) also mentioned, “I like small games and small prizes, like if you get something right.” Larry (IB, Low) described how gaining recognition helps him be more cognitively engaged,

Biology I definitely see how it can be applied, like on TV shows about Science, and just hear people talk in general I always see stuff that I’ve learned and I remember it and I can like sound smart in front of my parents and friends because I can remember a lot of stuff about Biology and I can talk about it.

Interestingly, four participants mentioned that the opposite of *performance approach*, *performance avoidance* (i.e., aim to avoid failure or disappointment) also helps facilitates cognitive engagement. Damian (IB, Low) shared, “You have to think about it like overall, if you don’t pass that class you’re out of the IB program.” Danny (IB, Low) affirmed this statement,

I guess some classes are just... I don’t plan on doing anything with all this English stuff.

But I do know that if I fail English, if I didn’t pass English, it’s not going to look good for any resume or anything.

Last, three participants asserted that adopting a *mastery* (i.e., be intrinsically motivated to

learn and view learning as an enjoyable task) approach in learning facilitates cognitive engagement among AP/IB students. As described by Larry (IB, Low),

I think school is supposed to be about learning and acquiring knowledge and I think in this day it's like just doing the work, getting the grade and it doesn't matter anymore. I think focusing less on the grade, or still focused on the grade, but actually try to really learn what you're doing... for Spanish, if I am bored I'll be like wow I'm learning another language, if I keep up to this I would be able to speak to people who I would never be able to speak to any other way. Just things like that. Just focus on learning it and how learning it add to your life.

Ryan (AP, Low) also resonated with this idea, "I've learned a lot of things about the world from this class that I never knew of before. I wouldn't even have thought of it. It's taught me a lot." These participants demonstrated genuine enjoyment in learning.

In summary, participants shared that keeping *long term goal* in mind, believing in one's capability to achieve an academic goal (i.e., *expectancy-value*), as well as adopting *performance approach*, *performance avoidance*, and *mastery approach* in learning are different ways in which students can help themselves be more cognitively engaged in their accelerated curricula.

Student involvement. Every participant in phase two of this study affirmed that students can *explore* new and fun ways to learn to facilitate cognitive engagement. Angel (IB, High) described the importance of making learning fun through exploring new ways to study,

I would say to try to change... not like change what you're learning but change the way you're learning it, or studying, like if you keep looking at the book or keep looking at one little thing, it is boring. So, I would say, as you're studying key terms, make games out of the index cards or like go on "Quizlet", you can put all your terms and definitions, and

they have like a game, and you can like play the game to learn your definitions, and not just use like the same ways of studying, just vary it up a little bit, so sometimes you do this sometimes you do that, and that's like fun for learning.

Other participants also mentioned the importance of exploring the topics they learn in accelerated curricula. For example, Damian (IB, Low) recommended,

If you have any free time, maybe spend some time researching the topic. If you take your time to research topics even deeper. Delve deeper into the curriculum again then you can go and find like a deeper understanding of what it is, then you have more of the appreciation for what you're learning. In Biology, we learned about stem cell regeneration and cancer. From there I knew that radiation can also play a part in cancer so from there I branched off and started learning about engine production and that interest me a lot especially nuclear energy and it's made me to want to go into the field of Physics.

In addition, participants mentioned the importance of exploring how course content applies in the real world. As described by Larry (IB, Low), "I mean I try all the time in real life to see what I've learned in school and how can I apply it. A lot of it is everywhere you just have to look around in the real world."

Other than exploring, eight participants shared that *getting involved* in and out of the classroom also helps students get more cognitively engaged in their AP/IB courses. Some mentioned the importance of paying attention in class. For example, Kerry (IB, High) stated, "try to be more engaged when the teacher is teaching." Danny (IB, Low) elaborated, "I would pay attention to what the teacher was saying. Try to be attentive. Just try to understand the materials better." In addition to paying attention, some participants recommended asking questions in

class. Ryan (AP, Low) shared,

I asked my teacher a lot of questions on the stuff we were learning and try to answer questions in class. Usually I just kind of sit in the back and watch and don't really talk that much. I got a lot more involved in the class. It helped me a lot actually to learn stuff. I remember asking a question about the organization of Eastern Europe like Yugoslavia and Russia and that kind of helped. I still remember it now. That actually helped me on the AP exam.

Other participants stressed the importance of joining extracurricular activities. Damian (IB, Low) shared his personal experiences to demonstrate this point,

Before I got involved in certain clubs in school, I didn't feel as involved in the school here. I wasn't part of any extracurricular activities and I didn't know that many people but I joined a club and as soon as I did that I like it here now. At first, I was planning on dropping out because it just seemed pointless at that point, but I started joining extracurricular activities I realize I want to stay here now and ever since then my grade has just been steadily going up and up.

In sum, participants shared that students in accelerated curricula can *explore* and *get involved* in their coursework and other school activities to be more cognitive engaged.

Use of coping strategies. When asked about strategies to facilitate cognitive engagement, participants suggested behaviors that may be described as ways of coping with academic stressors although the scenarios that were used to prompt participants were not meant to depict stress. These coping strategies include effective and ineffective strategies as deemed by research conducted by Suldo, Shaunessy-Dedrick, Ferron, & Dedrick (2017). Ten participants recommended *effective* coping strategies, such as (a) seek academic support (“She can get a tutor

and get a different perspective of that subject can help her.”; Brenda, IB, High), (b) turn to family (“I’ll tell her to just talk to them, because your parents are going to help you grow and achieve your goals.”; Angel, IB, High), (c) positive thinking (“Self-talk can usually help me get through it because I know it’s going to be okay and a couple of bad grades really won’t hurt you.”; Ivan, IB, High), (d) relaxation (“like we learned in the ACE program, just take a breather, take a chill, take a peace time rest. Rest your mind, rest from what you’re learning a little bit.”; Angel, IB, High), and (e) time and task management (“managing your time is really important. If there is something that you’d rather do then maybe schedule it at a later time and you’ll be able to do it.”; Brittany, AP, Low).

Interestingly, only one participant (Derek, IB, Low) suggested the use of what researchers (Suldo et al., 2017) have deemed an *ineffective* coping strategy. He shared that taking a mental health day from school helps him refocus on schoolwork,

There are actually days like you have a ton of work to do that one day and you’re like I can’t come to school because I am not going to be able to finish all those. If you are a parent let them stay home like at least once every three months.

All in all, participants mentioned more *effective* compared to *ineffective* coping strategies. It is also noteworthy that the participant that recommended the use of ineffective coping strategy dropped out of IB after the interview, whereas others stayed in the IB program or AP classes.

Student interests. Participants mentioned that student interests affect one’s level of cognitive engagement. First, five participants asserted that *matching* the content in accelerated curricula to one’s interest or goal can aid in one’s attempt to be cognitively engaged in class. As shared by Angel (IB, High), “If you want to go into that particular field, you need to make sure you know basically a lot about that course.” Ryan (AP, Low) elaborated,

If Taylor wants to pursue a career in business, he should really pay attention to AP Human Geography because they talk a lot about ports and advancement of business industries, like different kinds of business. You'll see that it will relate a lot to him. He should probably be interested in that if he wants to do business.

Second, five participants affirmed that keeping an *open* mind in what interests them helped them be more cognitively engaged in AP/IB coursework. Derek (IB, Low) described why it is important to keep an open mind, "You have to make sure you pay attention in class because you never know what you will end up being after high school." Brittany (AP, Low) expanded on this idea,

I will tell her that each class represents a different subject or a different major. It's like showing you what you're interested in and what you're not. If she would just try to get interested or think of it that way then maybe she would realize that she might be interested in something she didn't think she was.

In sum, participants recommended that *matching* one's interest and keeping an *open* mind on what is interesting facilitates cognitive engagement. Overall, participants revealed that students play a big role in facilitating their own level of cognitive engagement. *Students' beliefs, involvement, use of coping strategies, and interests* affects their level of cognitive engagement in accelerated curricula. Table 8 (page 84) includes the secondary themes, description, and the frequency in which participants mentioned the theme and secondary themes.

Table 8

Facilitator 1: Students' Role, Secondary Themes, Descriptions, and Frequency by High vs. Low CE Group and Number of Participants Who Mentioned the Secondary Themes

Theme Category	Description	High CE	Low CE	<i>N</i>
Student Beliefs (<i>n</i> = 91)				
Long Term Goal	Belief in long term benefits of AP/IB	29	20	12
Expectancy-Value	Belief in competence to reach goal	17	3	7
Performance Approach	Demonstrate knowledge/competence	5	7	9
Performance Avoidance	Avoid demonstrating failure	1	4	4
Mastery	Enjoy/prioritize learning	2	3	3
Student Involvement (<i>n</i> = 40)				
Explore	Seek fun and new ways to study	12	8	12
Get Involved	Participate in and outside of class	6	14	8
Use of Coping Strategies (<i>n</i> = 36)				
Effective	Coping strategies linked to positive academic and emotional outcomes	24	10	10
Ineffective	Coping strategies linked to negative academic and emotional outcomes	0	2	1
Student Interests (<i>n</i> = 18)				
Match	Relate AP/IB coursework to interest	5	5	5
Open	Be open to get interested in new topics	3	5	5
Total (<i>n</i> = 185)		104	81	12

Note. CE= Cognitive Engagement. *n* = frequency with which the theme or code had been mentioned throughout all 16 interviews; *N* = number of participants across the low and high CE groups who mentioned the theme or code. The same participant may mention the same theme more than once, thus the number of participants (*N*) who mentioned the theme may be lower than the total *n* mentions.

Facilitator 2: teachers' role. The theme that was mentioned second most as facilitating cognitive engagement pertained to *teachers' role* (*n* = 90). All twelve participants recommended ways teachers can help them be more cognitively engaged in their AP/IB coursework. In terms of frequency, *teacher support* came first (*n* = 34), followed closely by *instructional practices* (*n* = 33), and *teacher care* (*n* = 23). Participants in the high and low group contributed equally much (*n* = 45) to build this theme.

Teacher support. Participants affirmed that teachers can provide support that facilitates cognitive engagement. Specifically, ten participants expressed that teachers can monitor their progress towards academic goals and keep them on track to reach their goals (i.e., provide *feedback*). Jerry (AP, High) shared, “[Teacher] can help him not get held back. Help him if there is a point he is missing. Inform Taylor what would happen if he doesn’t do the things he is supposed to do.” Ryan (AP, Low) further expanded on this suggestion,

If the student wants an A the teacher sees that he has a C right now, she should probably talk to him and be like hey you have a C, you want an A, you need to work towards that. I have some grades I can put in to help your grades but you need to work for it.

Other participants ($N = 4$) asserted that teachers who promote *autonomy* (e.g., open to students’ feedback and give students choices) facilitate cognitive engagement among students. As shared by Derek (IB, Low), “Give them a little bit of freedom. They can have breaks or little games that make the lesson fun for them.” Kerry’s (AP, High) personal experience also captured the essence of this secondary theme,

I went to my teacher and we spoke about what we could do to make it more interesting. So, she made this PowerPoint thing, I don’t know what it was called but it was like a virtual reality, and I think a lot more students were actually engaged and active during that time compared to just like a normal PowerPoint writing down notes.

Finally, three participants mentioned that having *structure*, such as clear expectations and regular check of understanding in the classroom is helpful to increase cognitive engagement among AP/IB students. Barbie (IB, High) described how this type of support looks like in the classroom, “The teacher could ask her questions to get her more focused and participate in class and try to make sure she’s focusing. Maybe like make eye contact with her so that she is paying

attention in class.” Damian (IB, Low) elaborated,

It seems that if their [teachers] presence is not felt in the classroom then there’s no order or organization to what the classroom is supposed to be. We are supposed to be self-taught in IB but without a guiding hand we don’t know where we are supposed to be going or what we are supposed to be learning at all. They don’t have to teach us directly but they need to at least guide us to the correct direction so we know what to learn.

In sum, participants shared that teachers can support AP/IB students’ cognitive engagement through providing students *feedback* on progress towards self-determined academic goals, supporting students’ *autonomy*, and setting *structure* in the classroom.

Instructional practices. Participants mentioned that how teachers deliver course content play a role in facilitating students’ level of cognitive engagement. For instance, eight participants hoped that their teachers would relate course content to *real world* experiences, such as applying class content to real world scenarios. As described by Angel (IB, High),

I would want my teacher to go over more things that relate to the concept. Instead of telling us this is the function, this is how it looks, this is the definition of it, talk about how it is used in the real-world situation to give us more understanding about it. I would ask to see how it relates to actual, real world scenario.

Participants also expressed the need for teachers to share past students’ success stories. Barbie (IB, High) shared, “They can tell stories about kids who already graduated from the program and have a career set up and everything done. They can just say... these kids have gone through what you did and became accomplished, happy and successful.” Kerry (AP, High) elaborated,

The teacher could tell the students about past students, what they are doing now since they took that AP classes. I know Ms. P has talked about old students and like where they are now and how well they are doing and that has motivated me to keep taking AP classes.

Nine participants affirmed that incorporating *hands on* activities that are interactive and fun helps facilitates cognitive engagement. As described by Jerry (AP, High), “I would like it to be more interactive instead of him or her just talking the whole time. Actually involves, like the students can follow along with a work sheet or something like that.” Larry (IB, Low) also expressed, “She [Teacher] can give us fun tasks, like maybe making a poster or for example making a little booklet that you have to color.”

Finally, four participants explained that teachers can facilitate cognitive engagement by allowing students to *socialize* and work with each other. Damian (IB, Low) spoke of the benefits of working in a group, “...you are sat in a different group, you rotate throughout the groups and you get to meet everyone in there, you all work together and you usually understand it by the end.” Brenda (IB, High) also expressed similar ideas, “You can just work in a team to do it. And it’s fun to do it, not just sitting down and talking about it. More active, just moving around trying to do it right. You get to share it. It just helps.” In general, participants stated that *real-world* application, *hands on* activities, and *socialization* aids in facilitation of cognitive engagement among high school students in accelerated curricula.

Teacher care. Most participants ($N = 10$) suggested that some teacher characteristics, such as being *caring/responsive*, enhances students’ level of cognitive engagement. Barbie (IB, High) painted a picture of a *caring* teacher, “The teacher can have a one on one conversation with him and try to understand what he’s not grasping... maybe like just helping them getting a

light bulb and finally understand it.” Damian (IB, Low) further explained what constitutes being responsive,

Meaning they are willing to engage with the class, they are willing to do something to target some of the learners in the class, and they are willing to do one on one help with you if you do need it rather than just giving you busy work and letting you learn on your own.

Ivan (IB, High) shared a personal experience that he felt illustrated the elements of a *caring* teacher,

I was writing some sort of essay, it had to be about the history of something and I don't really know a lot of history. The teacher asked me about my interest and I told him I really like baseball and he had me do an article on baseball and I like that. Even though it is still history but it's something I enjoy and it was easier for me to write then. The connection there was really great and I appreciate that teacher explaining that to me.

All in all, participants mentioned that teachers who are *caring* can facilitate students' level of cognitive engagement in AP/IB courses. To summarize this theme, Table 9 (page 89) demonstrates the secondary themes, description, and the frequency in which participants mentioned the theme and secondary themes.

Facilitator 3: parents' role. The third most mentioned theme among facilitators is *parents' role* ($n = 47$). All twelve participants shared different ways parents can help AP/IB students be more cognitively engaged in their coursework. The most frequently mentioned secondary theme is *parents' value* ($n = 23$), followed by *parent support* ($n = 17$), and *home environment* ($n = 7$). Participants in the High CE group ($n = 25$) contributed as much as the Low CE group ($n = 22$) to this area.

Table 9

Facilitator 2: Teachers' Role, Secondary Themes, Descriptions, and Frequency by High vs. Low CE Group and Number of Participants Who Mentioned the Secondary Themes

Theme Category	Description	High CE	Low CE	<i>N</i>
Teacher Support (<i>n</i> = 34)				
Feedback	Monitor progress towards goal	17	6	10
Autonomy	Open to student feedback and input	2	4	4
Structure	Clear expectations in the classroom	2	3	3
Instructional Practices (<i>n</i> = 33)				
Real World	Relate content to real life experiences	9	5	8
Hands On	Interactive and fun activities	4	9	9
Social	Allow students to work together	1	5	4
Teacher Care (<i>n</i> = 23)	Responsive to student needs	10	13	10
Total (<i>n</i> = 90)		45	45	12

Note. CE= Cognitive Engagement. *n* = frequency with which the theme or code had been mentioned throughout all 16 interviews; *N* = number of participants across the low and high CE groups who mentioned the theme or code. The same participant may mention the same theme more than once, thus the number of participants (*N*) who mentioned the theme may be lower than the total *n* mentions.

Parents' value. Ten out of twelve participants affirmed that parents can help students be more cognitively engaged in their AP/IB coursework by conveying the importance and relevance of education (i.e., *value education*) to their students. Danny (IB, Low) shared, "It's easier for a kid to see something directly in his parents, explaining what they did in school helped them do something they want to do." Jerry (AP, High) elaborated on this idea,

Maybe parents can say if you want to provide for your family and you want this job, this is what you need to do, you need to do well in your AP courses because that is the best way of getting you that job.

Other than importance, Ryan (AP, Low) described how parents can help their students see the relevance of AP/IB coursework, "If one of their parents is in a similar career that they want to be in, they can just talk about how this relates to work, like following the curriculum and

making connections to what they do in real life.” In general, participants shared that parents can facilitate cognitive engagement through communicating the *value of education*.

Parent support. Half of the participants ($N = 6$) mentioned that *emotional* support from parents plays a role in facilitating cognitive engagement. For example, Angel (IB, High) explained that she would want her parents to encourage her to pursue her academic goals,

I would want them to try to encourage me to do it with the goal. And say, “If you really want this, you need to be able to do this and this and let’s try to improve it.” Have them more involved and help me with what I needed to do to achieve that goal.

Barbie (IB, High) also appreciated her parents’ emotional support during time of stress, “My parents let me take breaks from my homework and talk to me and help me when I am stressed out with a bunch of homework. I just become happy again and feel motivated to finish my work.” Other participants mentioned that they would like their parents to show interest in their accelerated coursework and understand their struggles. Larry (IB, Low) stated,

Family members can try to understand what Cameron is going through and they can look at whatever he is trying to learn. For example, take a look at the history book and see like it’s really boring, see why Cameron is struggling and just why Cameron is really bored.

Interestingly, only participants from the Low CE group (five out of six) expressed that they would like *academic* support from their parents to help them be more cognitively engaged. Derek (IB, Low) mentioned, “If you don’t know something they [parents] can explain it to you, make it more clear to you because like it’s easier to explain to one person rather than twenty.” Larry (IB, Low) provided an example, “If family members have time they could read the subject matter and they could create something fun for Cameron to do, to learn whatever he needs to learn.” Overall, participants expressed that *emotional* and *academic* support from parents are

both facilitators of cognitive engagement.

Home Environment. Five out of twelve participants shared that parents can help students be more cognitively engaged by providing a quiet *space* for learning at home. Angel (IB, High) described an appropriate study space provided by her parents,

We have a little study area in the front room of our house and we have to do our work there 'cause my parents know that if I go to my room I am not going to get anything done, so they told me that I have to work in that little study area.

In addition to providing a quiet space, participants also mentioned that parents should limit distractions from their study space. As described by Brittany (AP, Low), “Some parents just take away distractions, like my parents take my phone for like a certain amount of time after school so I can just focus on my work and not anything else.”

Two participants also shared that parents should allow students ample *time* for studying at home. Damian (IB, Low) provided examples of tasks that take away studying time,

Such as chores or if you have any siblings, like watching them. If they [parents] can go ahead and take off some of the burden of so we have more free time at home to either relax or do work, it really helps because that way you have a way to relieve yourself from a stressor at home, you go and take on more at school.

In general, participants expressed that parents can support students' level of cognitive engagement through providing them with study *space* and *time*. To summarize this theme, Table 10 (page 92) demonstrates the secondary themes, description, and the frequency with which participants mentioned secondary themes within this topic.

Table 10

Facilitator 3: Parents' Role, Secondary Themes, Descriptions, and Frequency by High vs. Low CE Group and Number of Participants Who Mentioned the Secondary Themes

Theme Category	Description	High CE	Low CE	<i>N</i>
Parents' Value (<i>n</i> = 23)				
Value Education	Convey the importance of education	15	8	10
Parent Support (<i>n</i> = 17)				
Emotional	Show encouragement and interest	9	2	6
Academic	Provide instrumental help	0	6	5
Home Environment (<i>n</i> = 7)				
Space	Provide quiet space for learning	1	4	5
Time	Allow ample time for learning at home	0	2	2
Total (<i>n</i> = 47)		25	22	12

Note. CE= Cognitive Engagement. *n* = frequency with which the theme or code had been mentioned throughout all 16 interviews; *N* = number of participants across the low and high CE groups who mentioned the theme or code. The same participant may mention the same theme more than once, thus the number of participants (*N*) who mentioned the theme may be lower than the total *n* mentions.

Facilitator 4: school connectedness. The fourth most mentioned theme among facilitators is *school connectedness* (*n* = 28). This theme was not included in the a priori theme. More than half of the participants (*N* = 11) shared that being connected to *peers*, *teachers*, and *school* helped them be more cognitively engaged in their accelerated curricula. Participants mentioned having good relationships with *peers* most frequently (*n* = 18), followed by *teachers* (*n* = 8), and *school* (*n* = 2). Both high (*n* = 15) and low groups (*n* = 13) contributed equally to build this theme.

Peers. Every participant (*n* = 8) who mentioned school connectedness brought up the topic of forming good relationships with peers. In general, participants shared that peers provide emotional and academic support. For example, Angel (IB, High) described the importance of having friends for emotional support, "Having friends in the class kind of motivated me a little bit too, so you're not all alone." Barbie (IB, High) affirmed the importance of emotional support

from peers,

To help stay interested, students can set up a study group and have other people there to provide support. If they are going through the same thing they can connect and feel supported and feel like they can help me through this and we are all learning the same thing. That helps a lot.

In addition to emotional support, Damian (IB, Low) turned to peers for academic support, “You learn better from your classmates... because sometimes they understand it in a different way your teacher does and they explain it in a different way.” Brittany (AP, Low) elaborated, “Maybe work with other people in the same class to see how they or what they do in order to get an A.” Moreover, Kerry (AP, High) pointed out that friends can aid in advocacy,

If you’re quiet you can have your friend to ask your question for you so you’re never behind in what you’re learning.... I am kind of quiet in that class sometimes so I didn’t know some things like I couldn’t hear what the teacher was saying, sometimes she goes too fast on her PowerPoint. I didn’t want to say anything out loud so I asked my friend to tell her to go back a slide. I don’t know I just don’t like drawing attention to myself and that would do that.

In sum, participants view *peers* as an important source of support to enhance their level of cognitive engagement in AP/IB courses.

Teachers. Four participants mentioned the positive effects of having good relationships with *teachers* on their level of cognitive engagement. As shared by Larry (IB, Low), “Maybe they need to have a good relationship... because if he feels more comfortable he will be more likely to reach his goal and do well.” This idea is further elaborated by Angel (IB, High),

A teacher-student bond is really good too. If you’re not interested in the class, you could

talk to your teacher, you can ask her all the questions you need to, and you can get the more in-depth feel of the idea, and then maybe you'll like the topics.

In other words, participants stated that having positive relationships with *teachers* facilitate cognitive engagement in the classroom.

School. Two participants shared how feeling belonged and being proud of their *schools* facilitates cognitive engagement. Damian (IB, Low) explained how feeling connected to school is important for both academic and emotional outcomes,

If you don't like the school, if you say, "I came here and it was a mistake," then you're not going to try as hard in your classes and your grades are going to fall off because you feel like I don't belong here, I don't want to be here, this doesn't matter to me anymore. But if you feel involved in the school, you feel like this is my school, I want to be here, then you want to pass the classes, you want to show that you care, and having that mindset allows you to have higher grades. Then, you just seem happier overall.

In summary, participants view school connectedness (i.e., connecting to *peers*, *teachers*, and *school*) as one of the many ways to facilitate cognitive engagement in their rigorous coursework. To summarize this theme, Table 11 (page 95) illustrates the secondary themes, description, and the frequency with which participants mentioned the themes.

Facilitator 5: technology's role. The fifth most mentioned topic among facilitators is *technology's role* ($n = 15$). Similar to Facilitator 4: school connectedness, this theme was not included in the a priori list of anticipated themes. Half of the participants ($N = 6$) described how technology helped them be more cognitively engaged in their accelerated coursework. In terms of frequency, *access* was mentioned the most ($n = 10$), followed by *familiar* ($n = 3$), and *one for all* ($n = 2$). Both high ($n = 7$) and low groups ($n = 8$) contributed equally to build this theme.

Table 11

Facilitator 4: School Connectedness, Secondary Themes, Descriptions, and Frequency by High vs. Low CE Group and Number of Participants Who Mentioned the Secondary Themes

Theme Category	Description	High CE	Low CE	<i>N</i>
School Connectedness				
Peers (<i>n</i> = 18)	Good relationships with peers	9	9	8
Teachers (<i>n</i> = 8)	Good relationships with teachers	6	2	4
School (<i>n</i> = 2)	Feel proud to be part of the school	0	2	2
Total (<i>n</i> = 28)		15	13	11

Note. CE= Cognitive Engagement. *n* = frequency with which the theme or code had been mentioned throughout all 16 interviews; *N* = number of participants across the low and high CE groups who mentioned the theme or code. The same participant may mention the same theme more than once, thus the number of participants (*N*) who mentioned the theme may be lower than the total *n* mentions.

Access. Five out of twelve participants mentioned that technology acts as a gateway for them to *access* other resources to enrich their learning experiences. For example, Ryan (AP, Low) described how technology helped him gain different perspectives on his AP course content, “I think just having extra resources I can rely on to help me with learning helps a lot and those YouTube videos, just other people teaching the subject too. It’s like getting multiple teachers online teaching me.”

Participants also touched on the ability to connect with other people around the world through technology. For example, Damian (IB, Low) shared, “If you are playing video games and you have friends who are over in Spain and you want to talk to them, you can practice Spanish with them.” Angel (IB, High) said,

[Technology] can make me interested by it letting me look at other successful people that was in IB or like talking to other people that used to be in IB and seeing how it affected them. If it helped them, if it really had no effect on them. I want to be a doctor so I ask other doctors what kind of school did you go to in high school did you go to an IB

program did you went to a medical high school, does it even matter what high school you went to. That's a way I can connect to other people that were in the same situation as me.

In general, participants affirmed that technology opens doors for students to *access* extra resources, which helps them be more cognitively engaged.

Familiarity. Two participants asserted that technology helps students be more cognitively engaged in their accelerated coursework because it feels *familiar* to students. Damian (IB, Low) described this idea as follows:

Whenever I am on technology I feel more connected to it and whenever I'm using it I feel like I can learn better than having a book in front of me. Textbooks just don't have the same connection as technology because as we grew up we were connected to technology and I feel like I have a deep psychological connection to it. We hold it in our hands a screen and we will pay more attention to it than if we have a book. If we go and learn online then I feel like we learn better.

Kerry (AP, High) resonated with this sentiment, "Since we are in the age of technology it's very interesting because students, they are not more interested in books, they are more interested in like a computer so it got the attention of more people." All in all, some participants explained the attraction between students and technology as providing *familiarity*.

One for All. Two participants also expressed that technology is helpful in facilitating students' level of cognitive engagement because it accommodates all learning styles (i.e., *one for all*). Kerry (AP, High) provided detailed explanation on how technology satisfy the needs of all learners,

[Technology] helped a lot because it got into everyone's way of learning. It wasn't like if you listen well but we are playing a video then it's your problem. All these different

forms help different types of learners. I think I am a mix of all of them so I really grasp on the concept, but it helps other students who are like a one type of learner.

In sum, several participants shared that *technology* plays a role in facilitating AP/IB students' level of cognitive engagement as it provides *access* to other learning resource, it is *familiar* to students, and it suits the needs of various learners (i.e., *one for all*). To summarize this theme, Table 12 includes the secondary themes, description, and the frequency with which participants mentioned the themes.

Table 12

Facilitator 5: Technology's Roles, Secondary Themes, Descriptions, and Frequency by High vs. Low CE Group and Number of Participants Who Mentioned the Secondary Themes

Theme Category	Description	High CE	Low CE	<i>N</i>
Technology's Role				
Access (<i>n</i> = 10)	Enable access to other sources of information	4	6	5
Familiarity (<i>n</i> = 3)	Familiar with the usage of technology	1	2	2
One for All (<i>n</i> = 2)	Suitable for all types of learners	2	0	2
Total (<i>n</i> = 15)		7	8	6

Note. CE= Cognitive Engagement. *n* = frequency with which the theme or code had been mentioned throughout all 16 interviews; *N* = number of participants across the low and high CE groups who mentioned the theme or code. The same participant may mention the same theme more than once, thus the number of participants (*N*) who mentioned the theme may be lower than the total *n* mentions.

Barrier themes. The next three themes answer the second research questions of this study (i.e., What are the barriers of cognitive engagement among ninth grade students in accelerated curricula?). The interviewer asked participants if there were any things that prevented them from getting interested in accelerated curricula, persisting towards a self-determined academic goal, and relating accelerated coursework to future goals. The emerged themes include (a) student characteristics, (b) negative academic experiences, and (c) distractions.

Barrier 1: student characteristics. There are two themes that had the highest frequency of mentions as barriers to cognitive engagement. The first theme involves *student characteristics* ($n = 23$), including traits that students carry with them into the classroom that serve as barriers to cognitive engagement. All participants but one ($N = 11$) described characteristics that prevented students from being cognitively engaged in accelerated curricula. *Mindset* was mentioned most frequently ($n = 16$), followed by *life circumstances* ($n = 4$), and *lack of academic skills* ($n = 3$). Participants from High and Low CE groups contributed equally to form this theme ($n = 12$ and 11 , respectively).

Mindset. Participants shared that students' *mindset* can hinder with one's attempt to be cognitively engaged. Specifically, eight out of twelve participants asserted that they simply could not find any relevance between some of their course content to their future aspirations (i.e., *irrelevant*) no matter how hard they try to change their mind. Barbie (IB, High) shared, "Sometimes in either History or Spanish I learn materials and I just don't know how I am going to use it in my future career. I just kind of get lost and frustrated and I just don't know how to focus." Participants also find it harder to concentrate in class if the content is irrelevant to their interests. As described by Brenda (IB, High), "When we were learning World History. I am not into history so it was a lot of extra work to try to retain some of the information since I wasn't interested in it."

On the other hand, three participants suggested that *bad grades* prevented them from being cognitively engaged in their AP/IB coursework. For example, Ivan (IB, High) described how a bump in the road discouraged him from persisting towards his academic goal, "Sometimes when I get a lower grade when I thought I was going to get a better grade, that kind of pushes me back a little bit." Angel (IB, High) said,

If I get a bad grade I can lose a little interest, I'll think like "Oh I'm not going to get the ideas, I'm not going to get the topics, I'm going to not do well in my exam." That's how I lose interest. I really feel like bad grades are big part of losing interest in class.

In sum, participants affirmed that not being able to find relevance (i.e., *irrelevant*) and having a *bad grade* affects their level of cognitive engagement in accelerated curricula.

Life circumstances. Participants shared that there are sometimes *physical* or *mental* barriers to cognitive engagement. For example, three participants, including Jerry (AP, High), explained how *mental* barrier stopped him from being cognitively engaged in class, "Since I have ADHD, sometimes she [teacher] talks too fast, so when she goes to next slide I'm still behind. It's hard to write down and remember what she says because she goes so fast." Ryan described how a change in *home environment*, such as moving, and *physical* barrier, such as lack of sleep, affected his level of cognitive engagement in his AP class,

When I was moving I wasn't paying attention in class, like I didn't sleep well. For a month I actually don't have a bed to sleep on. I was sleeping on a blown up mattress because we moved a lot of furniture. I was kind of distracted because I was very tired a lot of the time.

Overall, participants shared that they face some *physical*, *mental*, and external (i.e., *change in home*) barriers that are out of their control. These barriers prevented them from being cognitively engaged in their AP/IB coursework.

Lack academic skills. Three participants mentioned that lack of *time and task management* skills prevented them from pursuing their academic goals in their accelerated courses. Kerry (AP, High) shared the following example:

I have been procrastinating not wanting to do anything and that has stopped me from getting an A because I just feel like I was getting too much work all at once even though my teacher did separate everything and take small steps I just didn't do it at the right time so it's just like a lot of work. That has stopped me before.

All in all, participants affirmed that students' *mindset*, *life circumstances*, and *lack of academic skills* can serve as a barrier to cognitive engagement. Table 13 demonstrates the secondary themes, description, and the frequency in which participants mentioned the themes.

Table 13

Barrier 1: Student Characteristics, Secondary Themes, Descriptions, and Frequency by High vs. Low CE Group and Number of Participants Who Mentioned the Secondary Themes

Theme Category	Description	High CE	Low CE	N
Mindset (<i>n</i> = 16)				
Irrelevant	Perceive AP/IB as irrelevant to goals	6	7	8
Bad Grades	Pessimistic about reaching goals	3	0	3
Life Circumstances (<i>n</i> = 4)				
Physical/Mental	Physical/mental barriers to learning	1	2	3
Change in Home	Changes in home environment	0	1	1
Lack Academic Skills (<i>n</i> = 3)				
Time and Task Management	Ability to organize and prioritize tasks	2	1	3
Total (<i>n</i> = 23)		12	11	11

Note. CE= Cognitive Engagement. *n* = frequency with which the theme or code had been mentioned throughout all 16 interviews; *N* = number of participants across the low and high CE groups who mentioned the theme or code. The same participant may mention the same theme more than once, thus the number of participants (*N*) who mentioned the theme may be lower than the total *n* mentions.

Barrier 2: negative academic experiences. The other most mentioned theme among barriers is *negative academic experiences* (*n* = 23). More than half of the participants (*N* = 9) mentioned various negative academic experiences that had prevented them from being cognitively engaged in accelerated curricula. *Classroom experiences* were mentioned in higher

frequency ($n = 18$) compared to *disconnectedness* ($n = 4$). It is also noteworthy that the codes that formed this theme were more commonly found among interviews with participants from the Low CE compared to the High CE group. This theme was mentioned 14 times across interviews with the low CE group, and only 8 times with the high CE group.

Classroom experiences. Seven out of twelve participants affirmed that a *boring* classroom impedes their ability to be cognitively engaged in their AP/IB courses. Work coded as *boring* includes assignments that serve no purpose in the participants' opinion. As described by Brenda (IB, High), "Busy work. Work that were just given to us to give us work. Not really a purpose to doing it." Larry (IB, Low) further expanded on what makes a class *boring*,

[History] is definitely the most boring class because all we do is work on a text book. We just read and write down terms. I really don't think that there's much you can do in that situation. With textbook learning, you can't do much to not be bored.

Participants also mentioned *lack of support* as part of the negative academic experiences that prevented them from being cognitively engaged in class. Brenda (IB, High) shared an example when she felt unsupported in her learning,

[The teacher] kind of just gives you the text book and go here it is, do work. That is very hard for me because it's not one of my strongest subjects. Hard for me to not understand the subject in the first place and not having a teacher. It's just weird because you would think a teacher will help you but some just don't, I guess they're just give you a book. It doesn't help.

Damian (IB, Low) also shared a similar opinion,

I keep on saying this but again it's the teachers. If they don't allow you to go ahead at your own pace then you are maybe being pushed too far behind or too far ahead. You just

start stumbling and you can't get back up. You don't understand the curriculum anymore you just don't like it.

Throughout his interview, Damian (IB, Low) mentioned how teachers-related factors prevented him from being cognitively engaged in his IB courses three times ($n = 3$). In summary, some participants expressed that feeling *bored* and *lacking support* in the classroom serve as obstacles to cognitive engagement.

Disconnectedness. Three participants pointed out that feeling *isolated* from teachers, peers, and course content prevented them from being cognitively engaged in their AP/IB coursework. Ivan (IB, High) described why being *isolated* from others negatively affects one's cognitive engagement, "Being disconnected it's kind of not helping him as much and he won't want to learn because he feels like the teacher is kind of ignoring him." He continued to elaborate on this idea with an example,

If something is really not interesting and the teacher doesn't try to explain it. That kinds of disconnect you from it and you're like 'Well if they're not going to try to explain it why is it important and why do I have to understand it.' Then you lose the connection there. I think that's really the only time when I would not be interested in learning.

Two participants also stressed that teachers who felt more like a *stranger* to them prevented them from being cognitively engaged. Barbie (IB, High) explained why it is important to know her teachers, "If I don't feel connected to the teachers, if I don't know them that well, I just drift off." All in all, some participants shared that feeling *isolated* in the classroom and not knowing their teachers well (i.e., *stranger*) can interfere with students' ability to be cognitively engaged in their courses. Table 14 (page 103) demonstrates the secondary themes, description, and the frequency in which participants mentioned the themes.

Table 14

Barrier 2: Negative Academic Experiences, Secondary Themes, Descriptions, and Frequency by High vs. Low CE Group and Number of Participants Who Mentioned the Secondary Themes

Theme Category	Description	High CE	Low CE	<i>N</i>
Classroom Experiences (<i>n</i> = 18)				
Boring	Limited novelty and interactions	3	8	7
Lack Support	Limited or no support	2	5	5
Disconnectedness (<i>n</i> = 5)				
Isolated	Negative interactions with others	3	0	3
Stranger	Weak relationships with teachers	1	1	2
Total (<i>n</i> = 23)		9	14	9

Note. CE= Cognitive Engagement. *n* = frequency with which the theme or code had been mentioned throughout all 16 interviews; *N* = number of participants across the low and high CE groups who mentioned the theme or code. The same participant may mention the same theme more than once, thus the number of participants (*N*) who mentioned the theme may be lower than the total *n* mentions.

Barrier 3: distractions. The last theme among barriers is *distractions* (*n* = 13). Half of the participants (*N* = 6) pointed out that various distractions in the environment deter them from being cognitively engaged in their accelerated coursework. They described two types of distractions: *technology* (*n* = 9) and *social* (*n* = 4). Participants from the High CE (*n* = 10) contributed more compared to the Low CE (*n* = 3) group during the emergence of this theme.

Technology. Half of the participants (*N* = 6) shared that *technology*, such as phone and computer, sometimes distracts them from their academic work. For some, the negative influences of *technology* are significant. When asked about barriers to cognitive engagement, Brenda (IB, High) shared, “Definitely technology. Sometimes I procrastinate and I will realize that it has been 30 minutes and I have to put my phone away.” Angel (IB, High) resonated with this statement, “My biggest distraction is my phone.” She elaborated on the effects of *technology* on her learning,

My phone prevented me a lot from staying focused at times. I sometimes FaceTime my friend during [work]. If I do homework and talk to someone while doing it, that really intrudes your time, like it slows you down a lot. Sometimes my computer, although I use my computer a lot to like go and research things and do my assignments on the documents, I'd maybe go to a different file, maybe like go on to some website, go shopping or something and get distracted from that so I need to make sure I don't distract myself on my computer.

Jerry (AP, High) explained why students are distracted by their phones, "Because when you look at your phone you are attracted to it. The work gets boring and you just go on your phone and text your friends." In sum, some participants identified *technology*, such as phone and computer as one of the two distractors that deterred them from being cognitively engaged in their accelerated curricula.

Social. The other type of distractor brought up by four participants pertained to *social* distractors. Participant sentiments categorized as *social* distractors involved individuals who interfere with their learning. Derek (IB, Low) illustrated his experience with *social* distractor in the classroom, "Sometimes you have people bothering you. During your free time as well, you get bothered by people." Participants also mentioned *social* distractors unique to home. For example, Angel (IB, High) shared, "My sister, she is younger than me and she likes to bother me a lot and sometimes I get distracted by that and that prevents me a lot too." Barbie (IB, High) pointed out another *social* distractor at home, "I have a pet dog; I get distracted and play with him." Overall, both *technology* and *social* distractors served as barriers to some participants' cognitive engagement. Table 15 (page 105) includes the secondary themes, description, and the frequency in which participants mentioned the themes.

Table 15

Barrier 3: Distractions, Secondary Themes, Descriptions, and Frequency by High vs. Low CE Group and Number of Participants Who Mentioned the Secondary Themes

Theme Category	Description	High CE	Low CE	<i>N</i>
Distractions				
Technology (<i>n</i> = 9)	Distracted by phone/computer/etc.	7	2	6
Social (<i>n</i> = 4)	Distracted by friends/siblings/pets	3	1	4
Total (<i>n</i> = 13)		10	3	6

Note. CE= Cognitive Engagement. *n* = frequency with which the theme or code had been mentioned throughout all 16 interviews; *N* = number of participants across the low and high CE groups who mentioned the theme or code. The same participant may mention the same theme more than once, thus the number of participants (*N*) who mentioned the theme may be lower than the total *n* mentions.

Summary of Findings

The quantitative analyses of this study identified participants who reported relatively high or low (i.e., top or bottom 10%) levels of cognitive engagement compared to other students who took the same survey. From this pool of participants, thirteen were purposefully chosen (i.e., maximized diversity to the extent possible given the restricted sample) and invited to take part in the second phase of this study. Twelve participants agreed to participate in individual interviews. The sixteen (12 initial and 4 follow up) semi-structured interviews conducted during the second phase of this study generated data for the qualitative analyses.

The qualitative analyses (i.e., general approach with a heavy focus on constant-comparative method) of this study revealed nine themes. The first theme (i.e., contextual theme) provided context to the voices of participants, including why they decided to join accelerated curricula and how their experiences in AP/IB have been.

The next five themes addressed the first research question. When the author asked participants what facilitates cognitive engagement among high school students in accelerated curricula, they shared that *student*, *teacher*, and *parent* each play different roles. These themes

align with the a priori theme derived from previous literature on cognitive engagement. Interestingly, two new themes emerged from the analyses of this study, namely *school connectedness*. Participants pointed out that feeling connected to school, teachers, and peers enhanced their level of cognitive engagement in AP/IB courses.

Finally, regarding the last three themes answered the second research question of this study (i.e., What are the barriers to cognitive engagement among ninth grade students in accelerated curricula?), participants shared that some *student characteristics*, such as mindset and life circumstance, prevented them from being cognitively engaged in the classroom. Additionally, participants described *negative academic experiences* and *distractions* that deterred them from being cognitively engaged in their AP/IB coursework.

Collectively, all twelve participants contributed rich information that formed the above-mentioned themes. Through thorough analyses and member checking, this author believes that their voices are appropriately represented in this chapter. The next chapter discusses the significance of these findings, including how these themes align with or expanded upon the results from past research.

Chapter V:

Discussion

The purposes of the current study were to (a) explore the facilitators and barriers of cognitive engagement and (b) include student voices in the engagement literature. Specifically, this study interviewed ninth grade students who enrolled in accelerated courses (i.e., AP classes or IB program) and reported especially high or low levels of cognitive engagement compared to their peers. Qualitative data generated from the interviews provided rich information on the factors that facilitate or prevent youth from being cognitively engaged in their accelerated classes. Through recruiting students who reported relatively higher or lower level of cognitive engagement to participate in interviews, this study also included a range of student voices.

To make sense of the findings, this chapter first reviews the importance of including high achieving students' voices in the cognitive engagement literature. Then, this chapter summarizes the key findings of this study in the context of the current literature, focusing on how the themes emerged from qualitative analyses align with or expand on discoveries from past research. After that, the relationships between cognitive, emotional, and behavioral engagement are explored. The chapter next compares pooled responses from the high cognitive engagement group to those from low cognitive engagement group. Implications of findings for educators, including teachers and school psychologists, are then discussed. Last, this chapter reviews this study's limitations and offers recommendations for future research.

Including the Voices of High Achieving Students

Past research on cognitive engagement that included students' voices to understand what factors facilitate or hinder students' ability to get interested in class, persist towards a self-determined academic goal, and relate schoolwork to future aspirations often focused on a specific age group. To reflect all student voices in the realm of cognitive engagement, it is important to solicit a range of students' opinions on this matter. In addition to interviewing students from different age groups, researchers should also listen to what subgroups of students who are diverse in a way other than age have to offer. This study recruited high achieving students (i.e., students who are enrolled in AP classes or IB program) as they are an overlooked group in this line of research. Moreover, students who have been academically successful may provide unique insight into ways to promote cognitive engagement in the classroom. As suggested by Wang and Eccles's (2012a) longitudinal study results, increases in level of cognitive engagement were associated with increases in GPA. Interviewing the selected few from this group of academically successful students, all of whom reported relatively high level of cognitive engagement (i.e., cut scores for the *lowest* 10% of the Goal Valuation and Motivation/Self-Regulation subscales on SAAS-R were 6 and 4.3 respectively, on a scale from 1 to 7; McCoach & Siegle, 2003), led this study to confirm some pre-existing themes and reveal some new themes on factors that promote or hinder cognitive engagement.

To provide more context to the findings of this study, this section describes the reasons why participants took AP classes or joined the IB program. Half of the participants ($N = 6$) viewed AP classes or the IB program as a platform to receive quality education; whereas four participants followed the footsteps of other family members to take advanced level courses. Most of the participants perceive AP classes or IB program as beneficial in the long run. More than

half of the participants ($N = 8$) also perceived the climate of their accelerated courses as positive. Although few participants ($N = 3$) mentioned social climate, all notions regarding the social climate of their accelerated courses were positive.

Key Findings

During the qualitative interviews, participants were asked to give advice to an incoming AP/IB ninth grader on ways to increase cognitive engagement (i.e., interest in class, persist towards a self-set academic goal, and relate coursework to future goals). They were also asked to share some barriers that prevented them from being cognitively engaged in their accelerated courses. In terms of facilitators of cognitive engagement, participants mentioned strategies within their own control (i.e., students' role) most frequently ($n = 185$ times across 16 interviews with 12 participants). Specifically, participants most frequently shared sentiments related to adopting certain beliefs, such as keeping their long-term goal in mind and believing in own competence to reach goal. In comparison, the number of instances participants discussed what teachers can do to help them be more cognitively engaged in their accelerated courses reduced to less than half ($n = 90$). Participants shared their appreciation for teacher support (e.g., receiving feedback on their progress towards school-related goals) most frequently. After discussing their own roles and teachers' roles in facilitating their level of cognitive engagement, participants described ways parents can adopt to promote their level of cognitive engagement. Again, the number of sentiments on parents' roles nearly halved compared to teachers' roles ($n = 47$). The most frequently mentioned parent strategy is to convey the importance of education to students. In addition to students', teachers', and parents' role, participants also emphasized the importance of school connectedness (i.e., feeling close to teachers, peers, and school) and technology use. This interesting trend may suggest that students who are enrolled in accelerated courses tend to

rely on self the most when it comes to facilitating cognitive engagement in classroom learning, but are open to seeking support from teachers, parents, peers, and technology use.

This study also generated three barriers to cognitive engagement that are relatively new to the literature. Participants suggested that some student characteristics (e.g., lack of certain academic skills), negative academic experiences (e.g., feeling unsupported in class), and distractions (e.g., social media) prevented them from being cognitively engaged in learning. They mentioned student characteristics and negative academic experiences in similar frequency ($n = 23$), and distractions less ($n = 13$). This study generated much less data on barriers compared to facilitators of cognitive engagement, which is consistent with the state of the current literature. The following section explores the alignment of the current themes with a priori themes.

Alignment with A Priori Themes

The qualitative analyses of this study generated five facilitators and three barriers themes. Among these themes, some aligned with the list of a priori themes derived from past literature. In contrast, some themes from past literature were not found in this study. Interestingly, this study also discovered new themes that were not mentioned in past literature on cognitive engagement. This section discusses (a) the commonalities found across a priori and current themes, (b) a priori themes that were not found in this study, and (c) new themes that emerged from this study.

Common themes. The qualitative analyses of this study revealed many commonalities between the a priori and current themes on cognitive engagement. Specifically, some of the *students'*, *teachers'*, and *parents' role*, as well as the use of *technology* corresponded to the facilitators themes derived from past literature.

Students' role. Reschly et al.'s (2008) study on relationships between students' emotions, coping, and engagement found that use of *coping strategies* (i.e., seeking social support and

using problem solving strategies) mediated the positive relationship between positive affect and cognitive engagement. They suggested that students who reported higher positive affect tend to seek support and solve problems systematically during time of stress, and the use of such coping strategies may have led to higher level of cognitive engagement. Consistent with the findings of Reschly et al. (2008), nearly all participants ($N = 11$) recommended using coping strategies during time of stress to increase one's level of cognitive engagement. Interestingly, they recommended coping strategies beyond seeking support and problem solving, such as positive thinking, relaxation, and time and task management. This discovery confirmed that qualitative methods utilized in this study further expanded on the field's understanding on facilitators of cognitive engagement. When given the opportunity to share, students provided constructive suggestions on ways to help them be more cognitively engaged in their accelerated courses.

Other than the use of coping strategies, this study found another theme that corresponded to the findings of past research, *students' academic self-efficacy*. Through research with 220 students from a suburban high school in the Midwest, Greene et al. (2004) suggested a positive correlation between students' confidence in their own academic abilities (i.e., self-efficacy) and cognitive engagement. Similarly, Patrick and Middleton's (2002) mixed method study found that students who are confident in their ability to learn reported higher level of cognitive engagement. The current study resonates with Greene et al.'s (2004) and Patrick and Middleton's (2002) findings, as the qualitative analyses revealed that being confident in one's ability to do well in class is key to being cognitively engaged in the classroom. Participants ($N = 7$) shared that they are more likely to be cognitively engaged if they believe they can do well in the class.

In addition to academic self-efficacy, Greene et al. (2004) also found that students who adopt a *mastery approach* in learning tend to report higher level of cognitive engagement. In the

current study, a few participants ($N = 3$) mentioned that being intrinsically motivated to learn and view learning as an enjoyable task are some ways to facilitate cognitive engagement. These sentiments fit Greene et al.'s (2004) description of mastery approach in learning, thus corresponded to their findings.

Hufton et al. (2002) also investigated the facilitators of cognitive engagement with qualitative methods (i.e., interviews) across three countries. Their findings suggest that students who *attribute success to effort* tend to report higher level of cognitive engagement. In the current study, every participant ($N = 12$) shared that getting involved in their own learning, such as participating in class and finding different ways to make learning interesting helped them be more cognitively engaged in class. It seemed like the data provided by participants in the current study provided some explanation on the relationship between attributing success to effort and being cognitively engaged in the classroom. Essentially, they seemed to view putting in effort as key to being engaged in learning, which ultimately contributes to academic success.

Overall, the qualitative analyses of this study confirmed some of the previous findings on facilitators of cognitive engagement. Students in accelerated courses perceive that cognitive engagement co-occurs with- or is promoted by- use of *coping strategies*, adopting high *academic self-efficacy*, adopting *mastery approach in learning*, and *attributing success to effort* to increase their level of cognitive engagement.

Teachers' role. In addition to student variables, Greene et al. (2004) also investigated the role of teachers in facilitating students' level of cognitive engagement. Their analyses revealed that teachers who provide *relevant tasks*, *support students' autonomy*, and *promote self-regulation* are more successful in promoting students' level of cognitive engagement. Patrick and Middleton (2002) also found that students favor tasks that are *relevant* to the real world. The

qualitative analyses of this study discovered similar themes. For example, participants ($N = 8$) shared that teachers can help them be more cognitively engaged in the classroom by relating classwork to real-world phenomena (i.e., relevant tasks). They ($N = 4$) also urged teachers to offer choices and consider students' input in designing and delivering course content (i.e., support students' autonomy). Lastly, they ($N = 10$) appreciate teachers who provide them feedback on their progress towards self-determined goal, which *promotes self-regulation* towards goal.

Wang and Eccles (2012b) investigated the relationship between teacher support and cognitive engagement and found that teachers' social support (i.e., *showing care*) was associated with a slower decline in cognitive engagement compared to the typical developmental trend. The sentiments from the current study's participants resonate with Wang and Eccles's (2012b) findings. Participants ($N = 5$) shared that teachers who show care (i.e., genuine interest in students' learning) help promote their level of cognitive engagement in their accelerated courses.

Through qualitative analyses, Patrick and Middleton (2002) found that the *opportunity to work with peers* and pursue *hands-on activities* are potential facilitators of cognitive engagement. The current study's qualitative analyses aligned with Patrick and Middleton's (2002) discoveries. Most participants ($N = 9$) repeatedly mentioned their preference for hands-on activities and group work during interviews

In summary, all the a priori themes on teachers' role was confirmed in the current study. To promote students' level of cognitive engagement, participants in this study urged teachers to provide *relevant tasks and hands-on activities, support students' autonomy, promote self-regulation, show care, provide students opportunity to work with peers* and *use technology* in the classroom.

Parents' role. Some researchers focused on parents' role in promoting students' level of cognitive engagement. For example, Raftery et al. (2012) suggested that *parents who value education* and share their values with their children often have children who reported being more cognitively engaged in school. Most participants ($N = 10$) in the current study shared similar views, as they mentioned having parents who communicate the importance of education helped them be more cognitively engaged in learning.

In contrast to how well the previous findings on students and teachers' role align with the current study's discoveries, there is only one parents' role (i.e., *value of education*) that corresponded to past literature. The new themes on parents' role are further explored in the latter part of this section.

Technology's role. Patrick and Middleton (2002) discovered that their participants believed that technology plays a big role in their learning experiences. Similarly, the participants ($N = 6$) in this study stressed the positive impacts of technology use on their level of cognitive engagement in the classroom. Although some of them mentioned the cons of technology (i.e., serve as a distraction to learning), all participants shared that the wise usage of technology brings more pros than cons to being cognitively engaged in their accelerated courses. Again, participants stressed that students play a major role (i.e., use technology wisely) in facilitating their own levels of cognitive engagement.

The next two sections describe themes examined in the current study that did not align with previous research, namely (a) a priori themes that were not found in this study and (b) new themes that derived from this study.

Missing a priori themes. Although the qualitative analyses of this study revealed many themes that correspond to findings from past literature, several facilitators (i.e., *students' positive*

affect, promotion of autonomy at home, and structured home environment) from previous studies were not found in this study. In contrast to Reschly et al.'s (2008) findings that suggest students who self-reported higher positive affect (e.g., happiness) tend to adopt more adaptive coping strategies, thus experience greater level of cognitive engagement, none of the participants directly mentioned that positive affect plays a role in being cognitively engaged in their accelerated courses. However, participants mentioned factors that has been shown to be associated with positive affect (e.g., school connectedness; Reschly & Christenson, 2012) as facilitators of cognitive engagement. Perhaps high school freshmen do not have sufficient self-awareness to recognize and verbalize how positive mood affected their level of cognitive engagement in the classroom. When asked what parents can do to help them be more cognitively engaged in learning, participants did not mention behaviors or circumstances that would fall under the categories of *autonomy promotion* or having *clear expectations at home*. However, participants did mention some other home factors that were not reported in past literature, which will be further explored in the next section. As this study focused on a unique population of student (i.e., students who are taking accelerated curricula), it is possible that these students have different thoughts on what facilitates cognitive engagement compared to other students.

On the other hand, the only a priori barrier theme (i.e., *attributing success to innate ability*) was not uncovered in this study. According to Hufton et al. (2002), students who believe that innate ability, such as talent in Math, plays a bigger role in academic success compared to effort tend to report lower level of cognitive engagement. None of the participants described innate ability as a barrier to cognitive engagement. As all participants in this study are high-achieving students who had experienced success in academics, it is possible that this theme is not relevant to them as they may have a relatively high level of academic ability.

New themes. The qualitative analyses of this study revealed new themes that expand upon the current literature's understanding of influences on cognitive engagement. This section explores new themes related to facilitators of cognitive engagement, then discusses new themes relevant to barriers of cognitive engagement.

Facilitators. Among the new facilitator themes, some fall under *students' role*. All participants expressed that keeping a *long term goal* in mind, such as getting into college, helped them be more cognitively engaged in their AP or IB classes. They also shared that adopting a *performance approach* (i.e., aim to demonstrate competency to others or gain extrinsic rewards) or *avoidance* (i.e., aim to avoid failure or disappointment) attitude can facilitate one's level of cognitive engagement. This is an interesting discovery as both opposites (i.e., performance approach vs. avoidance) were viewed as facilitators of cognitive engagement.

The qualitative analyses of this study also revealed some new themes related to *parents' role*. For instance, half of participants stressed that *emotional* ($n = 11$; e.g., encourage students to pursue academic goals) support from parents helped them be more cognitively engaged in their accelerated coursework. Participants ($N = 5$) also mentioned the importance of *academic* ($n = 6$; e.g., explain schoolwork) support from parents in promoting their level of cognitive engagement. In addition, participants ($N = 7$) mentioned that parents can provide *space and time for learning* ($n = 7$) to help them cultivate cognitive engagement. For example, participants appreciate a quiet space to study at home, free from distractions. They also believe that they will have more time to work on academic goals when parents lighten some of the chores burden. Note that this theme is qualitatively different from *establishing clear expectations* at home because participants did not stress the need for clear rules at home, but urged parents to grant them their wishes on having a personal space and ample amount of time to complete schoolwork. They have expectations that

they hope parents can understand and agree with.

School connectedness is also a new theme that emerged from this study. A majority of participants ($N = 8$) shared that feeling connected to *school* ($n = 2$), *teachers* ($n = 8$), and *peers* ($n = 18$) can increase one's level of cognitive engagement. They stressed that friends are important for emotional and academic support. They also shared that having a good relationship with their *teachers* made them feel more comfortable in the classroom. Lastly, they emphasized that feeling belonged and proud of their *schools* facilitates cognitive engagement.

Barriers. It is noteworthy that all the barrier themes derived from this study are new to the literature. As previous research on cognitive engagement often focused on facilitators, there is scant information on what prevents students from being cognitively engaged in the classroom. In this study, one of the research questions focused on barriers of cognitive engagement to fill out this gap in literature.

The current study revealed three themes pertinent to barriers. Under *student characteristics*, some participants ($N = 3$) shared that *lack of academic skills* (e.g., time and task management) can serve as a barrier to cognitive engagement. When they did not do well in a class and earned a *bad grade*, that too prevented participants ($N = 3$) from being cognitively engaged in the classroom. According to Angel (IB, High) and Ivan (IB, High), getting bad grades decreases their academic self-efficacy, thus negatively affecting their willingness to put in effort to get interested in the class content or persisting towards a class-related goal. Sometimes, simply *not being able to invest interest* in school task is a barrier. Many participants ($N = 8$) mentioned that no matter how hard they try; some accelerated courses simply do not fit their personal interest. Participants also shared that the inability to see the relevance between AP/IB coursework to future goals is one of biggest barrier ($n = 13$) to cognitive engagement. Other

times, students might *have life circumstances*, such as moving to a new place or having a medical problem, that prevent them from being cognitively engaged in learning.

Participants also shared that *negative academic experiences* blocked their efforts to be cognitively engaged in schoolwork. Negative academic experiences include *being bored* ($n = 11$; e.g., perceive model of delivery such as textbook reading as boring), *lack of support* from teachers in academic tasks ($n = 7$; e.g., perceive teachers as unwilling to help), and *feeling disconnected from school* ($n = 5$; e.g., feeling isolated from other individuals in school). Lastly, half of participants described distractions from social sources ($n = 4$; e.g., friends) and technology ($n = 9$; e.g., browsing unrelated websites) as factors that prevented them from being cognitively engaged in their accelerated coursework.

In summary, the qualitative analyses of this study revealed many themes that are similar to findings from past research. In contrast, some facilitators and one barrier of cognitive engagement that were mentioned in other studies were not found in this study. Moreover, some new themes were generated from the rich data of this study. It is possible high achieving students (i.e., ninth grade students who are either taking AP classes or enrolled in the IB program) perceived facilitators and barriers of cognitive engagement somewhat differently compared to other student populations. Table 16 (page 119) summarizes the similarities and differences between a priori and current themes.

Table 16

Similarities and Differences between a Priori and Current Themes on Facilitators and Barriers to Cognitive Engagement

	Common Themes	Missing A Priori Themes	New Themes from This Study
Facilitator: students' role	<ul style="list-style-type: none"> • Use of coping strategies • Students' academic self-efficacy • Mastery approach in learning • Attributing success to effort/getting involved 	<ul style="list-style-type: none"> • Students' positive affect 	<ul style="list-style-type: none"> • Keeping long term goal in mind • Performance Approach • Performance Avoidance
Facilitator: teachers' role	<ul style="list-style-type: none"> • Relatable tasks at school • Autonomy promotion • Self-regulation promotion • Care from teachers • Work with peers • Hands-on activities 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None
Facilitator: parents' role	<ul style="list-style-type: none"> • Parents value of education 	<ul style="list-style-type: none"> • Autonomy promotion at home • Structured home environment 	<ul style="list-style-type: none"> • Emotional and academic support from parents • Space and time at home for learning
Facilitator: school connectedness	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Connected to school, teachers, and peers
Facilitator: technology	<ul style="list-style-type: none"> • Use of technology to aid in learning 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None

Barrier: students' characteristics	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Attribution to success – innate ability 	<ul style="list-style-type: none"> • Lack of academic skill • Bad grades • Lack of interest in task • Life circumstances
Barrier: negative academic experiences	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Feel bored in class • Lack of support in class • Disconnected from school
Barrier: distractions	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • None 	<ul style="list-style-type: none"> • Social and technology distractions

Relationship between Cognitive and Behavioral Engagement

As mentioned in Chapter II, Reschly and Christenson (2012) pointed out the interrelated relationship between the three types of student engagement (i.e., *cognitive*, *behavioral*, and *emotional* engagement). When studying one type of student engagement, one should not be surprised to discover that it is highly influenced by other types of student engagement. For example, Finn and Zimmer (2012) hypothesize that *emotional* engagement fuels *cognitive* and *behavioral* engagement. They believe that *emotional* engagement (i.e., feels connected to school, teachers, and peers) and *behavioral* engagement (i.e., active participation in school activities) lead students to have higher level of *cognitive* engagement (i.e., interested in learning, persistent towards self-determined academic goal, relate coursework to future goal).

In this study, Finn and Zimmer's (2012) theory was partially confirmed. Although this study focuses on cognitive engagement, participants brought up sentiments related to emotional and behavioral engagement. Thus, the results of this study confirm the interrelatedness of the three types of student engagement. Specifically, qualitative analyses revealed that students perceive both *emotional* and *behavioral* engagement can facilitate *cognitive* engagement. *Emotional* engagement presented itself when participants shared the importance of feeling connected to peers, teachers, and school. Barbie (IB, High) affirmed the importance of emotional support from peers as she recommended holding study groups to get emotional support. Knowing that she is not the only going through the accelerated courses helped her be more cognitively engaged in class. Damian (IB, Low) shared that he learns better from his peers as they might provide him with a different learning perspective.

In addition to *emotional* engagement, *behavioral* engagement also emerged as one of the facilitators of *cognitive* engagement in this study. Participants described getting involved in

learning as one of the strategies to be more cognitively engaged in their accelerated coursework. Some of the ways to get involved include paying attention in class, asking questions, and participating in extracurricular activities. There are also instances where *behavioral* engagement facilitates *emotional* engagement, which ultimately lead to *cognitive* engagement and increase in grades. This was demonstrated in Damian's (IB, Low) aforementioned description of how joining a club led to forming relationships at school and liking school, which prevented him from dropping out and thus enabled him to be physically present for classes in which he could engage cognitively and experience academic success.

The results of this study demonstrated the complex relationship between *cognitive*, *emotional*, and *behavioral* engagement. Although it is hard to draw conclusions on which type of engagement comes first or weigh more than the others, one thing is clear. All three types of student engagement are highly related and may influence each other.

Sentiments from Students in High vs. Low Cognitive Engagement Groups

Overall, the high Cognitive Engagement (CE) group contributed a little more than the low CE group in forming themes in this study. Among the 455 quotes, 242 and 213 originated from the high and low CE group respectively. Twenty-nine more quotes came from the high CE group interviews. In general, this researcher also found it was easier to engage the high CE group in interviews. Participants from the high CE group tended to respond quickly and elaborate more without prompts. Nonetheless, both groups contributed to the formation of the themes of this study by providing rich and descriptive data that eventually led to saturation.

One interesting difference between the high and low CE group to note lies in their perception on coping strategies. Although the interview protocol does not focus on asking participants about the ways they manage stress, all participants naturally mentioned the use of

coping strategies. It seemed like participants view the ability to manage their rigorous workload as a prerequisite to being cognitively engaged in their learning. This is especially true for the second component of cognitive engagement. When asked what can be done to help students persist towards an academic goal, the use of coping strategies often emerged. Participants shared various coping strategies, some are deemed effective for students in accelerated curricula to cope with stress, others ineffective (Suldo et al., 2017). Interestingly, only one student recommended using an ineffective coping strategy. He suggested taking a mental health day when schoolwork becomes overwhelming when asked how to persist towards self-determined academic goal, such as getting an A in his IB class. Later in the study, this researcher learned that this student had dropped out from the IB program; whereas the other 11 participants remained in AP classes or IB program at the end of the school year.

Other than coping strategies, it seemed like there is little differences between the sentiments of high and low CE group. This might be because all participants were high-achieving students who are either taking AP classes or enrolled in an IB program, and this group collectively share some common views on cognitive engagement, despite the more minor than anticipated differences in their self-reported scores on the Goal/Valuation or Motivation/Self-Regulation subscales of the School Attitude Assessment Survey-Revised (SAAS-R; McCoach & Siegle, 2003). As aforementioned, the cut scores for the low CE group were still higher than the midpoint of possible scores. On a scale from 1 to 7 on the SAAS-R (McCoach & Siegle, 2003), the cut scores for the low CE group for the GV and M/SR subscales were 6 and 4.3 respectively. On the other hand, it is also possible that students who are enrolled in accelerated curricula (i.e., AP classes or IB program) are more cognitively engaged compared to students who are not taking accelerated curricula because the rigorous course content are less boring. Thus, this group

of students have very similar view on what facilitates or prevents cognitive engagement in the classroom.

Implications for Educators

As the field of education move towards an emphasis on high-stake testing and accountability, increasing students' academic achievement has become the top priority of many schools. Although cognitive engagement has been found to be associated with positive academic outcomes such as higher Grade Point Average (GPA) and further education (Wang & Eccles, 2012a), researchers discovered that students' level of cognitive engagement tends to decline during adolescence (Wang & Eccles, 2012a; Wiley & Hodgen, 2012). This study identified students in ninth grade accelerated curricula who self-reported relatively higher or lower level of cognitive engagement compared to their peers and interviewed them to attempt to address this issue.

The results of the qualitative analyses of this study (i.e., 5 facilitators and 3 barrier themes) can help educators understand what high-achieving students perceive as helpful or harmful in promoting their level of cognitive engagement, which in turn influences their academic achievement. The findings on how to create a learning environment that facilitates cognitive engagement (e.g., increase school connectedness) through the lens of high-achieving students can be especially helpful for teachers and administrators.

The value of the findings of this study is that it derived from student voices. As students are the main consumer of their own education, they should have a voice in shaping their own educational experiences. Many of the strategies shared by participants to increase cognitive engagement are self-oriented, which means that participants believe in taking actions within their power to enhance their own learning experiences. Educators, including school support staff such

as school psychologists and counselors, can share these self-oriented strategies to students who are struggling to be cognitively engaged in the classroom. Students may appreciate advice from other students who had been through what they are currently facing in their coursework.

Last, participants generously shared how parents can help them be more cognitively engaged in their learning. Educators can take this knowledge and share with parents to enhance home-school collaboration on increasing students' level of cognitive engagement.

In conclusion, participants shared self-oriented strategies, as well as some ways in which teaches, parents, school, and technology can help them be more cognitively engaged in the classroom. Table 17 (page 126) summarizes the facilitators and related strategies mentioned in this study.

All in all, the results of this study are easy to comprehend, practical to disseminate, and helpful for educators who wish to promote cognitive engagement among students.

Contributions to the Literature

As the interest in student engagement intensified over the past twenty years, there is still room for growth in this field. For example, there are relatively few studies on cognitive engagement that utilized qualitative methods. Most of the research on cognitive engagement is quantitative, thus does not fully capture the dynamic nature of cognitive engagement. The findings of this study demonstrated that students view cognitive engagement as a fluid and dynamic construct. The level of cognitive engagement changes as they experience success or failure in their learning and how they interact with peers, teachers, parents, and others.

Table 17

List of Facilitators and Related Strategies Shared by Participants

Facilitators	Strategies	Examples
Students' role	<ul style="list-style-type: none"> • Keep long term goals in mind • Find purpose in learning (i.e., to demonstrate competency to others, gain extrinsic rewards, or avoid failure/disappointment) • Make learning enjoyable (e.g., find out preferred way of learning, apply knowledge to real world, etc.) • Use coping strategies (i.e., seek academic support, turn to family, positive thinking, relaxation, and time and task management) • Attribute academic success to effort 	<ul style="list-style-type: none"> • “You have to constantly remind yourself that you are here for a reason, it’s not just school, you’re here to get that extra transition to college, extra credits when you graduate.” • “I always see stuff that I’ve learned, I remember it and I can like sound smart in front of my parents and friends.” • “If she could give herself a little reward along the way... It helps her stay motivated.” • “...not just use the same ways of studying... vary it up a little bit, sometimes you do this sometimes you do that, and that’s fun for learning.” • “I try all the time in real life to see what I’ve learned in school and how can I apply it. A lot of it is everywhere you just have to look around in the real world.” • “She can get a tutor and get a different perspective of that subject can help her.” • “Just talk to them, because your parents are going to help you grow and achieve your goals.” • “Self-talk can usually help me get through it because I know it’s going to be okay and a couple of bad grades really won’t hurt you.” • “Just take a breather, take a chill...” • “If there is something that you’d rather do then maybe schedule it at a later time and you’ll be able to do it.” • “For example, Algebra. I used to think that it’s very boring,

(i.e., I was successful because I tried very hard to reach my goal)

and then I tried harder to grasp it and understand it. I felt a sense of accomplishment when I complete a problem and it helped me. That helped me out a lot.”

- Be confident in own ability to achieve academic goals

- “Do all your homework and read all the assignments, then you’ll feel better about yourself. Once you get into class you’ll realize you did everything correctly it will keep motivating you to keep going.”

- Avoid social and technology distractions

- “My biggest distraction is my phone.”
- “...although I use my computer a lot to research things and do my assignments, I’d maybe go to a different file, go on to some website, go shopping or something and get distracted from that.”

Teachers’ role

- Provide relatable tasks at school

- “I would want my teacher to go over more things that relate to the concept. Instead of telling us this is the function, this is how it looks, this is the definition of it, talk about how it is used in the real-world situation.”

- Promote autonomy

- “Give them a little bit of freedom. They can have breaks or little games that make the lesson fun for them.”

- Promote self-regulation

- “If the student wants an A the teacher sees that he has a C right now, she should probably talk to him...”

- Express care

- “Meaning they are willing to engage with the class, they are willing to do something to target some of the learners in the class, and they are willing to do one on one help with you if you do need it.”

- Incorporate group/pair work

- “...you are sat in a different group, you rotate throughout the groups and you get to meet everyone in there, you all

Parents' role

- Incorporate hands-on activities
 - Incorporate technology use
 - Provide emotional support
 - Provide academic support
 - Provide a quiet space for learning at home
 - Allow students to have ample time to study
 - Convey the value of education
- work together and you usually understand it by the end.”
- “...it’s fun to do it, not just sitting down and talking about it. More active, just moving around trying to do it right. You get to share it. It just helps.”
 - “Whenever I am on technology I feel more connected to it and whenever I’m using it I feel like I can learn better than having a book in front of me.”
 - “My parents talk to me and help me when I am stressed out with a bunch of homework. I just become happy again and feel motivated to finish my work.”
 - “Family members can try to understand what Cameron is going through and they can look at whatever he is trying to learn.”
 - “We have a little study area in the front room of our house and we have to do our work there because my parents know that if I go to my room I am not going to get anything done”
 - “If they [parents] can go ahead and take off some of the burden of so we have more free time at home to either relax or do work, it really helps because that way you have a way to relieve yourself from a stressor at home, you go and take on more at school.”
 - “It’s easier for a kid to see something directly in his parents, explaining what they did in school helped them do something they want to do.”

School connectedness

- Help students feel more connected to
- “A teacher-student bond is really good too. If you’re not

school, teachers, and peers

interested in the class, you could talk to your teacher, you can ask her all the questions you need to, and you can get the more in-depth feel of the idea, and then maybe you'll like the topics."

- "Having friends in the class kind of motivated me a little bit too, so you're not all alone."
- "If you don't like the school, if you say, 'I came here and it was a mistake,' then you're not going to try as hard in your classes and your grades are going to fall off because you feel like I don't belong here"
- "I think just having extra resources I can rely on to help me with learning helps a lot and those YouTube videos, just other people teaching the subject too. It's like getting multiple teachers online teaching me."

Technology's role

- Use technology wisely to aid learning

The qualitative methods of this study allowed this researcher to delve deeper into understanding how to promote cognitive engagement among students. To the best of this researcher's knowledge, there are also minimal studies on cognitive engagement that target high achieving students. Exploring the facilitators and barriers of cognitive engagement through the lenses and worldview of high-achieving students (i.e., students enrolled in accelerated courses) provided this study with rich and meaningful data to add to the current literature.

Limitations

One limitation of this study is that it only involved ninth grade students. During individual interviews, some students has less experiences to share as they had only taken one AP class during their freshmen year. Readers should also be cautious to transfer some of these findings to students in general education, as they were derived from a group of students who are enrolled in accelerated courses. Nonetheless, there are many overlaps between the themes generated from this study and the findings from past research with more "typical" teenagers (i.e., those in the traditional, general education high school curriculum). It is also noteworthy that this study was part of a larger project where participants were exposed to a universal intervention that aims to develop effective coping and engagement skills to respond to academic stressors. Thus, mentions of coping strategies and school connectedness by participants of this study may be inspired by the larger project. Also, some of the interviews were conducted during testing season. It is possible that students may be less attentive during this interview as their focus was on their tests. Another obstacle of this study was finding a private space to interview students in schools. Sometimes, multiple interruptions occurred throughout one interview session, and may had impacted the participants' flow of thought. Despite these less than ideal conditions, this study is an authentic example of school-based research and the interviewer perceived the

participants provided logical responses suggesting attention to task.

Summary and Future Directions

This study aimed to explore the facilitators and barriers of cognitive engagement among ninth grade students in accelerated curricula. First, a group of students who self-reported particularly high or low level of cognitive engagement was identified. Then, thirteen of the students in this group were invited to participate in one or two rounds of individual interviews. A total of 16 interviews were conducted (12 initial and 4 follow ups; interviews divided equally between high and low cognitive engagement subgroups) and transcribed into Word documents. A generic approach with an emphasis on the constant-comparative method was used to analyze the qualitative data. The qualitative analyses revealed 9 themes. The first theme focused on context; participants reported they enrolled in accelerated courses to acquire quality education or to follow the footsteps of a role model. Most participants reported feeling positive about the academic climate in school and a few also described the social climate as positive. Five themes addressed the first research question (i.e., What are the facilitators of cognitive engagement among ninth grade students in accelerated curricula?). Participants shared various actions or thoughts students, parents, and teachers can adopt to facilitate cognitive engagement. They also mentioned the importance of being connected to school, teachers, and peers, as well as using technology to enhance learning experiences. The last three themes focused on barriers of cognitive engagement. Participants discussed the impacts of student characteristics (e.g., mindset and life circumstances), negative academic experiences, and distractions on their level of cognitive engagement.

Overall, many themes generated from this study are consistent with past research findings on cognitive engagement. However, factors such as students' positive affect, autonomy

promotion at home, and structured home environment that prior studies reported facilitate or prevent cognitive engagement were not found in this study. Moreover, this study discovered themes that expanded upon the current literature. For instance, (a) keeping long term goals in mind, (b) believing parents as academically and emotionally supportive, and (c) feeling connected to school, teachers, and peers are the major new facilitators theme that derived from this study. In regards to barriers, this study discovered new themes such as student characteristics (e.g., lack of academic skills, life circumstances), negative academic experiences (e.g., feel bored and unsupported in class), and distractions (e.g., distractions from social media). Although this study focused on cognitive engagement, participants naturally brought up the other components of student engagement. Thus, the qualitative analyses also confirmed the interrelatedness between the three types of student engagement (i.e., cognitive, emotional, and behavioral engagement). Last, there were only minor differences between the thoughts shared by high and low CE group. Perhaps this unique group of students share similar views on the topic regardless of their level of cognitive engagement.

Although this study added to the existing literature body on cognitive engagement, there is still much left to be explored. For example, the new themes generated from this study may be facilitators or barriers that are unique to high-achieving students, but they may also be new themes that had yet to be discovered by other studies of multiple samples of youth. Participants in this study shared unique ways in which parents can promote cognitive engagement. Their sentiments on parents' role is relatively inconsistent with past literature compared to teachers' role. Future studies should include participants with a range of academic achievement scores to investigate this matter. If the new themes are confirmed, perhaps they are transferable to students with a range of academic achievement scores.

Finally, future research should focus on exploring barriers to cognitive engagement. There are relatively few studies that mentioned barriers to cognitive engagement in past research, and the current study discovered much less barriers compared to facilitators of cognitive engagement. Understanding what factors can prevent students from being cognitively engaged in learning is as important as understanding how to promote cognitive engagement. After all, it can be difficult to facilitate cognitive engagement if barriers were not addressed.

Pending verification of findings, future studies should also assess the extent to which students' cognitive engagement changes as a function of teacher implementing strategies suggested by youth in the current study.

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Appendix A: Institutional Review Board Approval of Studies



RESEARCH INTEGRITY AND COMPLIANCE
Institutional Review Boards, FWA No. 00001669
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7/15/2015

Shannon Suldo, Ph.D.
Educational and Psychological Studies
4202 East Fowler Ave., EDU 105
Tampa, FL 33620

RE: **Expedited Approval for Initial Review**
IRB#: Pro00022787
Title: **Facilitating Academic Success and Emotional Well-Being Among High School Students in Accelerated Curricula**

Study Approval Period: 7/14/2015 to 7/14/2016

Dear Dr. Suldo:

On 7/14/2015, the Institutional Review Board (IRB) reviewed and **APPROVED** the above application and all documents contained within, including those outlined below.

Approved Item(s):

Protocol Document(s):

[Augmented Narrative for Goal 2 IES grant](#)

Consent/Assent Document(s)*:

[Honors Student Consent Year 1 Student Focus Groups FINAL.pdf](#)

[Parent Consent Year 1 Student Focus Groups FINAL.pdf](#)

[Parent-Teacher-Admin Consent Year 1 FINAL.pdf](#)

[SMH Provider Consent Year 1 FINAL.pdf](#)

[Student Assent Year 1 Student Focus Groups FINAL.pdf](#)

*Please use only the official IRB stamped informed consent/assent document(s) found under the "Attachments" tab. Please note, these consent/assent document(s) are only valid during the approval period indicated at the top of the form(s).

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review

research through the expedited review procedure authorized by 45CFR46.110 and 21 CFR 56.110. The research proposed in this study is categorized under the following expedited review category:

- (5) Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis).
- (6) Collection of data from voice, video, digital, or image recordings made for research purposes.
- (7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

This research involving children was approved under the minimal risk category 45 CFR 46.404: Research not involving greater than minimal risk.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval via an amendment. Additionally, all unanticipated problems must be reported to the USF IRB within five (5) calendar days.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,



Kristen Salomon, Ph.D., Vice Chairperson
USF Institutional Review Board

Appendix B: Interview Protocol

Interview Protocol

Procedures and Questions for Individual Interviews with Select 9th Grade AP/IB Students: AP/IB Students' Perception on Cognitive Engagement

Target Population

Ninth grade AP/IB students who scored highest or lowest (i.e., top or bottom 10%) on cognitive engagement measures included in the assessment battery completed at baseline (August 2016). Cognitive engagement measures include the Goal Valuation (GV) and Motivation/Self-Regulation (M/SR) scale from the School Attitude Assessment Survey-Revised (SASS-R; McCoach & Siegle, 2003).

Interview Goals

- To explore what AP/IB students believe facilitates cognitive engagement (i.e., interested in class; stay focused, persistent, and strategize to reach an academic goal; and value AP/IB classwork as relevant to long-term goals)
- To identify what AP/IB students consider to be barriers to cognitive engagement

Instructions for individual interviews (5 minutes):

- Present the opening statement:

Welcome! My name is _____. I am a graduate student at the University of South Florida's School Psychology program. Thank you for your willingness to join me to talk about how to get interested in AP/IB classes, stay focused and strategize to reach a goal in class, and relate the classwork to future goals. I have invited you because you are taking AP classes or in the IB program.

When we talk about motivation, there's three components to it. The first component is to get interested in a class, the second component is to set a goal and strategize to persist towards that goal, and the third part is to relate the classwork to future goals. During our conversation, we will talk about all three parts.

This topic is important because research has shown that AP/IB students who are interested in class, put a lot of effort into reaching a class-related goal, and view classwork as important also earn better grades, have higher GPAs, and aim to go further with their education. However, we don't know a lot about how to help AP/IB students do those things. I would like to know your thoughts on what helps students like yourself get interested, stay focused in, and

value their classes. On the flip side, I would also like to know what interferes with your ability to get interested, stay focused, and see the relevance of AP/IB to future goals. Your ideas are extremely valuable because it helps researchers like me uncover ideas that might be shared with future students like you.

We will be talking for about an hour. During our conversation, please feel free to share your experiences or simply talk about what comes to your mind. There are no right or wrong answers. I will be tape-recording this meeting only as a tool to capture all of your great ideas; your responses and ideas will be kept in strict confidence, and your name will not be attached to any of the documents I create.

This meeting is a part of the ACE program that you have previously given your written assent to take part in. As a reminder, you are free to stop participating at any point. At the end of our conversation, you will receive a pre-paid movie pass (or iTunes gift card) as a token of our appreciation for your help.

Any questions?

Interview Questions (45-55 minutes)

- *Before we get started, I am interested in getting to know you a little better. What has led you to take AP classes or join the IB program?*
- *You have been taking AP classes (or enrolled in the IB program) since the beginning of the year. I'd like to know about your experiences in the classes so far?*
- *Students who take AP classes or are enrolled in the IB program often have many different experiences in these classes. For example, imagine a 9th grade AP/IB student, Cameron. Cameron is currently taking AP Human Geography/HL Biology. Cameron realizes that it is very difficult for him/her to genuinely enjoy the class because it's boring. What advice would you give to Cameron so that the class becomes more interesting to him?*
 - *PROBE: How could the teacher help [Cameron be more interested in class]?*
 - *PROBE: How could family (caregivers or siblings) help?*
 - *PROBE: How could the student help him/herself?*
 - *PROBE: Anything else (perhaps something in the community)?*
- *You have a lot of great ideas on how to get interested in class, but I am curious if there has been anything that has prevented you from getting interested in an AP/IB class that you've taken since the beginning of the year?*
- *Here is another scenario. Alex really wants to get an A in his/her AP Human Geography/HL Biology course, but he/she has trouble persisting towards that goal. Sometimes he/she just gets off-track and it is hurting his/her chances to get an A in the class. What strategies do you think Alex can use to persist and stay focused on doing the work needed to get an A?*
 - *PROBE: How could the teacher help [Alex persist and stay focused on doing the*

- work needed to get an A]?
- PROBE: How could family (caregivers or siblings) help?
 - PROBE: How could the student help him/herself?
 - PROBE: Anything else (perhaps something in the community)?
- You have a lot of great ideas on how to persist and stay focused in class, but I am curious if there has been anything that has prevented you from persisting and staying on track to reach your goals in an AP/IB class that you've taken since the beginning of the year?
 - Here is the last scenario. Taylor is currently taking AP Human Geography/HL Biology. He/She finds it difficult to relate what he/she is learning in class to what he/she wants to do after high school. What advice would you give Taylor to help him/her recognize the importance, relevance, and value of AP/IB classwork to his/her future goals?
 - PROBE: How could the teacher help [Taylor to recognize the importance, relevance, and value of AP/IB classwork]?
 - PROBE: How could family (caregivers or siblings) help?
 - PROBE: How could the student help him/herself?
 - PROBE: Anything else (perhaps something in the community)?
 - You have a lot of great ideas on how to recognize the value of AP/IB coursework, but I am curious if there has been anything that has prevented you from relating what you learn in an AP/IB class to what you want to do after high school? In other words, what challenges have you faced when you were trying to relate what you learn in your AP/IB classes to what you want to do after high school?
 - [Summarize sentiments student expressed during interview]
 - Is there anything else about how students get interested in AP/IB classes, stay focused and strategize to reach a goal in class, and relate the classwork to future goals that you think is important to share?
 - Thank you so much for participating! I really appreciate your ideas and responses. If you think of anything else or have any questions or concerns after this meeting, please do not hesitate contact me at the number or email provided on your copy of the consent form.
 - As a token of appreciation for spending your valuable time with me, please accept this gift card!
 - Distribute gift card and get student's signature.

Appendix C: Parent Consent Letter

Study ID:Ame5_Pro00022787 Date Approved: 7/14/2016 Expiration Date: 7/14/2017

Dear Parent or Caregiver:

This letter provides information about a research study that will be conducted at your child's school by professors and graduate students from the University of South Florida (USF). Our goal in conducting the study is to develop an educational program to teach AP and IB students evidence-based strategies for managing stress inherent to their rigorous courses. This program is intended to improve students' emotional well-being and academic outcomes.

- ✓ **Who We Are:** We are Shannon Suldo, Ph.D., and Elizabeth Shaunessy-Dedrick, Ph.D., Professors in the College of Education at the University of South Florida. We are planning the study in cooperation with district and school administrators to ensure the study provides information that will be helpful to the school.
- ✓ **Why We are Requesting Your Child's Participation:** This study is part of a project entitled, "Supporting High School Students in College-Level Classes." Your child is being asked to participate because he or she is enrolled in an accelerated curricular program—International Baccalaureate (IB) or Advanced Placement (AP).
- ✓ **Why Your Child Should Participate:** Schools need evidence-based programs to help high school students navigate the academic rigor of college-level courses, in order to help them stay emotionally well and academically successful. To address this need, we are developing an informational program intended to facilitate all AP and IB students' coping skills and strong connections to their school. We are also developing brief, individualized supports for students who experience particular challenges managing stress associated with academic demands. The information that we collect from students will be used to improve our program materials. This refinement process will ensure the program is highly usable with future AP and IB students. Please note neither you nor your child will be paid for your child's participation in the study. However, all students who participate by completing a packet of surveys on personal well-being, or take part in an interview conducted to further improve parts of the program, will receive a \$10 gift card on each occasion. Also, all students who return this completed form (whether or not you grant your child permission to participate) will be entered in a drawing for a \$50 gift card.
- ✓ **What Participation Requires:** All 9th grade students in AP courses or the IB program at this school are going to participate in an educational program designed to help AP and IB students manage stress related to their schoolwork. All teachers and parents of 9th grade AP and IB students will be offered information intended to help support students' development of skills in managing stress through using effective coping and engagement strategies. We would like input from students on program materials in order to improve them. Your child is being asked to participate in the research study that is being conducted to evaluate and improve the program because he or she is a student in an AP or IB class. Students with permission to participate will provide feedback on the content of the program. At the end of each weekly presentation, participants in this study will be asked questions about the value and quality of program materials through completing brief rating scales about the information presented. It will take about 5 minutes to complete the brief forms, on each occasion. In addition, before and after the program begins, students will be asked to complete a packet of surveys asking questions about their academic demands and emotional well-being. It will take about 45 minutes to complete the survey packet, on each occasion. Some students will be asked to take part in interviews, in order to gather additional information related to aspects of the program that may need further development. It will take about 45-60 minutes to complete an interview. All activities will occur during regular school hours, scheduled to be minimally disruptive to your child's academic course schedule. All discussions during interviews will be digitally audio recorded for later review and transcription. Consenting for your child to participate in this research project indicates your consent for your child to be audio recorded. In total, participation will take no more than five hours of your child's time during the 2016-2017 school year.
- ✓ **Confidentiality of Your Child's Responses:** This research is considered to be minimal risk. That means that the risks associated with this study are the same as what your child faces every day. There are no known additional risks to those who take part in this study. Your child will receive no benefits by participating in this research study. Your child's privacy and research records will be kept confidential to the extent of the law. Authorized research personnel, employees of the Department of Health and Human Services, the USF Institutional Review Board and its staff, and other individuals acting on behalf of USF may inspect the records from this research project, but we will not share your child's individual responses with school system personnel or anyone other than us and our research assistants. Your child's responses during interviews will be digitally audio recorded, and then assigned a code number to protect the confidentiality of his or her statements. Only we will have access to the locked file cabinet stored at USF that will contain all records linking code numbers to participants' names. All records from the study (e.g., transcribed interviews) will be destroyed in five years. Please note that although your child's specific responses will not be shared with school staff, if your child indicates that he or she intends to harm him or herself or someone else, we will contact district mental health counselors to ensure the safety of your child and others.

DEPARTMENT OF EDUCATIONAL AND PSYCHOLOGICAL STUDIES • COLLEGE OF EDUCATION

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Version 1; July 1, 2016; Page 1 of 2

Appendix D: Student Assent Letter

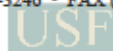
Study ID:Ame5_Pro00022787 Date Approved: 7/14/2016 Expiration Date: 7/14/2017

Dear Student:

You are being asked to take part in a research study. This study is part of a larger project we are conducting. The goal of the project is to develop an educational program to help AP and IB students manage stress tied to their rigorous courses. This program is intended to improve students' academic outcomes and emotional well-being.

- ✓ **Who We Are:** We are Shannon Suldo, Ph.D., and Elizabeth Shaumessy-Dedrick, Ph.D., Professors in the College of Education at the University of South Florida (USF). We are working with your school's leadership to make sure this study provides information that will be helpful to your school.
- ✓ **Why We're Asking You to Take Part in the Study:** This study is part of a project titled, "Supporting High School Students in College-Level Classes." You are being asked to take part because you are a student in either the International Baccalaureate Program or an Advanced Placement class.
- ✓ **Why You Should Take Part in the Study:** We are in the process of creating an informational program to build all AP and IB students' coping skills and strong connections to their school. We are also developing brief, individualized supports for students who experience particular challenges managing school stress. The information that we collect from students will be used to create and improve our program materials. Please note you will not receive money in exchange for taking part in the study. However, all students who participate will receive a \$10 gift card each time they complete a packet of surveys on their well-being or take part in an interview conducted to improve the program.
- ✓ **Taking Part in the Program Evaluation:** All 9th grade students in AP courses or the IB program at this school will participate in an educational program designed to help AP and IB students manage stress related to their schoolwork. You are being asked to take part in a voluntary evaluation of this program. In the program evaluation, students in this study will provide feedback on the program materials in order to improve them. At the end of each weekly presentation, you will complete brief rating scales that ask your opinion of the information presented. It will take about 5 minutes to complete the brief forms, on each occasion. Before and after the program begins, you will complete a packet of surveys about your academic demands and emotional well-being. It will take about 45 minutes to complete the survey packet, on each occasion. Some students will be asked to take part in interviews, in order to gather more information related to aspects of the program that may need further development. It will take about 45-60 minutes to complete an interview. All activities will occur during regular school hours. We will schedule them to be least disruptive to your academic course schedule. All discussions during interviews will be digitally audio recorded. In total, participation will take no more than five hours of your time during the 2016-2017 school year.
- ✓ **Confidentiality of Your Responses:** This research is considered to be minimal risk. That means that the risks associated with this study are the same as what you face every day. There are no known additional risks to those who take part in this study. You will receive no benefits by participating in this research study. Your privacy and research records will be kept confidential (private, secret) to the extent of the law. People approved to do research at USF, people who work for the Department of Health and Human Services, and the USF Institutional Review Board may look at the records from this research project, but your individual responses will not be shared with people in the school system or anyone other than us and our research assistants. Your responses will be given a code number to protect the privacy of your responses. Only we will have access to the locked file cabinet stored at USF that will contain all records linking code numbers to names. Please note that although your specific responses will not be shared with school staff, if you indicate you plan to harm yourself or someone else, we will let district mental health counselors know in order to make sure you and others are safe.

DEPARTMENT OF EDUCATIONAL AND PSYCHOLOGICAL STUDIES • COLLEGE OF EDUCATION
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Appendix E: Follow Up Interview Protocols

Procedures and Questions for Follow Up Interviews with Select 9th Grade AP/IB Students:

Interview for Angel (IB Student; Female; High Level of Cognitive Engagement)

Target Population

Ninth grade AP/IB students who scored highest or lowest (i.e., top or bottom 10%) on cognitive engagement measures included in the assessment battery completed at baseline (August 2016) and participated in the first round of the interview. Cognitive engagement measures include the Goal Valuation (GV) and Motivation/Self-Regulation (M/SR) scale from the School Attitude Assessment Survey-Revised (SASS-R; McCoach & Siegle, 2003).

Interview Goals

- To clarify or expand on initial themes.
- To verify the interviewer's understanding of the participants' original sentiments.
- To explore additional thought participants may have had after the first interview.

Instructions for individual interviews (5 minutes):

- Present the opening statement:

Welcome! My name is _____. I am a graduate student at the University of South Florida's School Psychology program. Thank you for your willingness to talk to me again! I have invited you because you are taking AP classes or in the IB program and you have participated in another interview with me. Like I mentioned last time, I would like to meet with you again to follow up on some of the things you said during our last meeting. Your ideas are extremely valuable because it helps researchers like me uncover ideas that might be shared with future students like you.

We will be talking for about half an hour. During our conversation, please feel free to share your experiences or simply talk about what comes to your mind. There are no right or wrong answers. I will be tape-recording this meeting only as a tool to capture all of your great ideas; your responses and ideas will be kept in strict confidence, and your name will not be attached to any of the documents I create.

This meeting is a part of the ACE program that you have previously given your written assent to take part in. As a reminder, you are free to stop participating at any point. At the end of our conversation, you will receive a pre-paid movie pass (or iTunes gift card) as a token of our appreciation for your help.

Any questions?

Interview Questions (20 minutes):

- *Before we get started, I would like to quickly review the three components of motivation. The first component is to get interested in a class, the second component is to set a goal and strategize to persist towards that goal, and the third part is to relate the classwork to future goals.*
- *Since we last met a month ago, did you have any other ideas about how students get interested in AP classes, stay focused and strategize to reach a goal in class, and relate the classwork to future goals?*
- *The last time we met, you mentioned that students who finds it difficult to get interested in class should “change the way they learn”.*
 - *What do you mean when you say “change the way they learn”?*
 - *Can you give me an example of when you change the way you learn to make a class more interesting to you?*
- *You mentioned students can “change the way they think about the class” to make it more interesting.*
 - *Can you give me an example of when you “change the way you think” to make a class more interesting to you?*
 - *PROBE: What thoughts did you change?*
- *When I asked you how can teachers help students be more interested in class, you mentioned that teachers can ask students more questions and praise them when they get it right. This works because everyone loves being praised and it boosts a student’s self-confidence on the subject. I thought that was very interesting.*
 - *Can you tell me more about that?*
 - *When a teacher involves you more and asks you more questions in class, what emotions do you feel?*
- *You mentioned that parents can help their children get interested in class by showing interest in what they’re learning in class. Can you give me an example of that?*
 - *PROBE: How can parents show that they care?*
- *You mentioned the use of your phone and computer is a big distractor when you are studying. Sometimes you just go on other online sites to shop or browse. However, you need to use your computer to do research for your assignments. I thought that is very interesting.*
 - *Tell me more about this situation.*
 - *How has technology such as phone and computer affected...*
 - *Your progress towards a goal you set for yourself in your IB class?*
 - *Your interest in an IB class?*
 - *How you relate what you are learning in your IB classes to what you want to do after high school, to become a doctor?*
- *Towards the end of our last meeting, you mentioned that it is very important that IB students*

participate in other activities in schools, relax, and have fun on top of studying. I thought that was very interesting and wanted to follow up on that.

- *How does having a good work-life balance help IB students get interested in IB classes, stay focused and strategize to reach a goal in class, and relate the classwork to future goals?*
- *Is there anything else about how students get interested in IB classes, stay focused and strategize to reach a goal in class, and relate the classwork to future goals that you think is important to share?*
- *Thank you so much for participating! I really appreciate your ideas and responses. If you think of anything else or have any questions or concerns after this meeting, please do not hesitate contact me at the number or email provided on your copy of the consent form.*
- *As a token of appreciation for spending your valuable time with me, please accept this gift card!*
 - *Distribute gift card and get student's signature.*

Procedures and Questions for Follow Up Interviews with Select 9th Grade AP/IB Students:

Interview for Ryan (AP Student; Male; Low Level of Cognitive Engagement)

Target Population

Ninth grade AP/IB students who scored highest or lowest (i.e., top or bottom 10%) on cognitive engagement measures included in the assessment battery completed at baseline (August 2016) and participated in the first round of the interview. Cognitive engagement measures include the Goal Valuation (GV) and Motivation/Self-Regulation (M/SR) scale from the School Attitude Assessment Survey-Revised (SASS-R; McCoach & Siegle, 2003).

Interview Goals

- To clarify or expand on initial themes.
- To verify the interviewer's understanding of the participants' original sentiments.
- To explore additional thought participants may have had after the first interview.

Instructions for individual interviews (5 minutes):

- Present the opening statement:
Welcome! My name is _____. I am a graduate student at the University of South Florida's School Psychology program. Thank you for your willingness to talk to me again! I have invited you because you are taking AP classes or in the IB program and you have participated in another interview with me. Like I mentioned last time, I would like to meet with you again to follow up on some of the things you said during our last meeting. Your ideas are extremely valuable because it helps researchers like me uncover ideas that might be shared with future students like you.

We will be talking for about half an hour. During our conversation, please feel free to share your experiences or simply talk about what comes to your mind. There are no right or wrong

answers. I will be tape-recording this meeting only as a tool to capture all of your great ideas; your responses and ideas will be kept in strict confidence, and your name will not be attached to any of the documents I create.

This meeting is a part of the ACE program that you have previously given your written assent to take part in. As a reminder, you are free to stop participating at any point. At the end of our conversation, you will receive a pre-paid movie pass (or iTunes gift card) as a token of our appreciation for your help.

Any questions?

Interview Questions (20 minutes):

- *Before we get started, I would like to quickly review the three components of motivation. The first component is to get interested in a class, the second component is to set a goal and strategize to persist towards that goal, and the third part is to relate the classwork to future goals.*
- *Since we last met a month ago, did you have any other ideas about how students get interested in AP classes, stay focused and strategize to reach a goal in class, and relate the classwork to future goals?*
- *The last time we met, you mentioned that students who finds it difficult to get interested in class should “see if they could have any real-life connections”.*
 - *What do you mean by “real-life connections”?*
 - *Can you give me an example or two of when you made “real-life connections” to make a class more interesting to you?*
- *When I asked you how can teachers help students persists towards a goal they set for themselves in class, you mentioned “blackmail sometimes work”. You then said they can remind students about the importance of getting a good GPA.*
 - *Can you tell me more about that?*
 - *What do you mean by “blackmail sometimes work”?*
- *You mentioned that parents can help their children stay focused on their goal in class by showing interest in what they’re learning in class.*
 - *How can parents show interest in their children’s learning? Can you give me an example or two?*
 - *How do all these things help students stay focused on their goal in class?*
- *The last time we met, you also mentioned that one of the barriers of persisting towards a goal you set in class is being distracted by things out of your control, such as moving to a new place.*
 - *I am curious what strategies did you use to overcome that barrier?*
- *You mentioned the use of online resources, such as YouTube videos are helpful in getting students interested in class. I thought that is very interesting.*
 - *How has technology/online resources affected...*

- *Your progress towards a goal you set for yourself in your AP class?*
 - *Your interest in AP class?*
 - *How you relate what you are learning in your AP class to what you want to do after high school, to become a doctor?*
- *Towards the end of our last meeting, you mentioned that it is very important that parents and teachers tell students how much colleges value good grades in AP classes. You said “the student may not like it, but if he wants to get into a decent college and get decent scholarships, that’s what you have to do.” You said that is a very “necessary point”. I thought that was very interesting and wanted to follow up on that.*
 - *Tell me more about this very “necessary point”.*
 - *Can you give me an example when knowing what colleges look for helped you get interested in AP classes, stay focused and strategize to reach a goal in class, and relate the classwork to future goals?*
 - *Is there anything else about how students get interested in IB classes, stay focused and strategize to reach a goal in class, and relate the classwork to future goals that you think is important to share?*
 - *Thank you so much for participating! I really appreciate your ideas and responses. If you think of anything else or have any questions or concerns after this meeting, please do not hesitate contact me at the number or email provided on your copy of the consent form.*
 - *As a token of appreciation for spending your valuable time with me, please accept this gift card!*
 - *Distribute gift card and get student’s signature.*

Appendix F: First Code Book

Cognitive Engagement Initial Theme and Code List - Facilitators

Question: What are the facilitators of cognitive engagement in accelerated curricula?

Domain 1: Students' Role

1. Attribution to Success or Failure		
1.	1 Attr: effort	I tried very hard and it felt good when I accomplish something
2.	1 Attr: growth	One bad grade can be improved with effort
2. Reward		
a.	1 Reward: Intrinsic	Getting an A is important to me, feel accomplished after doing work; genuinely wants to learn instead of focusing on grades
b.	1 Reward: Extrinsic	Phone time; Competition with others (be better); Money from parents; it's not going to look good if I fail; brag about what you know
3. Academic Self-Efficacy		
a.	1 AcadSE: High	Confident in own academic ability
b.	1 AcadSE: Build	Read before class to feel more confident in the subject; understanding the materials; when you understand you can apply it and answer questions; sense of accomplishment
4. Perception of Connectedness		
a.	1 Connect: Support	Feel supported at school; feel understood
b.	1 Connect: Integrated	Feel belonged in the classroom; part of the family
5. Use of Coping Strategies		
a.	1 Coping: Seek Social Support	Initiate and maintain relationships with teachers, tell teachers about needs, tell parents about school, trust that parents care, go to guidance counselor; talk to older siblings
b.	1 Coping: Seek Academic Support	Go to after-school tuition/Saturday school; ask teacher or peers or siblings or parents to help
c.	1 Coping: Problem-Solving	Learn new ways of studying; make learning fun (e.g., turning it into a game)
d.	1 Coping: Positive Thinking	Adopt a positive mindset; make up bad grades; change perspective; positive self-talk
e.	1 Coping: Time and Task Management	Avoid procrastination; set small and realistic goal; limit distractions; remind self to concentrate
f.	1 Coping: Relaxation	Take a break from schoolwork
g.	1 Coping: Self-monitoring	Monitor focus during instruction time
h.	1 Coping: Ineffective	Not pay attention; skipping school; withdraw to self; taking short cuts)

6. Participation/Involvement		
a.	1 Par/Inv: Classroom	Talk more in class, participate more in class, pay attention more; immerse yourself in the lecture
b.	1 Par/Inv: Understanding	Dive deeper into the learning materials
c.	1 Par/Inv: Friends	Make friends in class; study with friends; study groups; learn from friends
d.	1 Par/Inv: Real Life	Makes connection to real life
e.	1 Par/Inv: Research	Research more about the subject; talk to others in the field
f.	1 Par/Inv: Non-example	Just do the work
7. Long Term		
a.	1 Longterm: Goal/Purpose	Keep long term goals in mind; success; why am I doing this
b.	1 Longterm: Benefits	This may be useful in the future (e.g., in college and in life); more prepared in life; get college credit; useful in life but unrelated to career
c.	1 Longterm: Like my Family	Want to be successful like parents, or want to avoid being unsuccessful like parents
d.	1 Longterm: Purpose	Find a purpose for the subject (e.g., communicate with dad about politics)
8. Goal Orientation		
a.	1 GoalOrient: Avoidance	I want to do this to avoid having a bad life; I do this to avoid failing
b.	1 GoalOrient: Achieve	I want to do this to reach my life goal; I want to get an A
9. Interest		
a.	1 Int: Match	Match classes to personal interests or career goals
b.	1 Int: Explore	Has a wide interest; sees classes as chances to explore interest; what if I change my mind and it becomes relevant
10. Work-Life Balance		
a.	1 WLB: Extracurricular	Participate in extracurricular activities
b.	1 WLB: Have Fun	Enjoy the learning process, do what you need, study smart

Domain 2: Teachers' Role

1. Warmth (MIGHT NEED TO SEPARATE THIS DOMAIN)		
a.	2 Warmth: Care and respect	Involve students in lessons by asking them questions; want student to succeed; know students' goal;
b.	2 Warmth: Connect	Ways to connect with students; get to know the students; greet students
c.	2 Warmth: Flexibility	Offer chances to make up grade; accommodate different learning styles; Extend due dates
d.	2 Warmth: Praise	Praise students; acknowledge their efforts
e.	2 Warmth: Academic support	Answer questions; offer free time before class and during lunch; explain things in a different way; provide overview on challenges to come; explicit instructions; one-on-one instructions

f.	2 Warmth: Passionate	Love what they do
g.	2 Warmth: Experiences	Share their own experiences; be a mentor; share past student's success stories; experienced in the content
h.	2 Warmth: Remind Goal	Reminds students of their end goal; explain the purpose of schoolwork
i.	2 warmth: Authoritative	Warm yet firm
2. Autonomy Promotion		
a.	2 Auto: Freedom	Let students have breaks and play games
3. Self-Regulation Promotion		
b.	2 Self-reg: Time and Task Management	Help students prioritize and schedule school tasks
c.	2 Self-reg: Grades slip	Reminds students when their grades are slipping
4. Classroom Experience		
a.	2 ClassExp: Hands-On	Discussions; group projects; move around; students teach others
b.	2 ClassExp: Relate to Real World	Share own experiences, how the concepts apply in real-world scenario
c.	2 ClassExp: Group work	Allow students to work in groups
d.	2 ClassExp: Technology Use	Allow students to use computer or internet; upload materials online so students can access them
e.	2 ClassExp: Strategies	Fast pace keeps students awake, mix and match teaching strategies to teach concepts
f.	2 ClassExp: Management	Be able to manage the classroom; provide guidance on what to do
g.	2 ClassExp: Neutral	Don't show discrimination due to differences in personal beliefs

Domain 3: Parents' Role

1. Provide Support		
a.	3 Supp: Reward	Praise; tangible reward for good grades
b.	3 Supp: Academic	Quiz student; use own expertise to guide student's learning
c.	3 Supp: Accountable	Monitor students' progress towards goal and hold them accountable
d.	3 Supp: Emotional	Provide verbal encouragement; listen; show interest; support goal; understand their struggles
e.	3 Supp: Social	Encourage student to seek teacher support
f.	3 Supp: Advocate	Advocate for student; talk to the teacher
g.	3 Supp: Be Available	Available to help if needed, be present; let student teach them
h.	3 Supp: Relate to real life	Help student see how learning connects to real life
i.	3 Supp: Reduce stress	Alleviate home stress by reducing chores or responsibilities
2. Value of Education		
a.	3 ValEd: Importance	Preparation for college and career;
b.	3 ValEd: Life	Provide for family; improvement in life quality
c.	3 ValEd: Experience	Share success stories, or other experiences in high school; share how doing well in school had helped them
3. Autonomy Promotion		

a.	3 Aut: Age appropriate	Allow student to try first
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4. Provide Appropriate Study Environment

a.	3 AppEnv: Study Space	Provide space for study purpose
b.	3 AppEnv: Limit Distraction	Keep students' phone or other source of distractions

Domain 4: Sibling's Role

1. Competition

a.	4 Comp: Rivalry	Motivates student to show what they know
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2. Support

a.	4 Supp: Academic	Share academic experiences
b.	4 Supp: Not Distract	Not distract student when they are studying

Cognitive Engagement Domain List - Barriers

Question: What are the barriers to cognitive engagement in accelerated curricula?

Domain 1: Students' Role

1. Mindset

a.	1 Mindset: Fixed	I got a bad grade and I will never get the ideas.
b.	1 Mindset: Give up	There is nothing I can do about it; it's too late to do anything;
c.	1 Mindset: Not worth it	There is not relationship between doing well in school and doing well in life
d.	1 Mindset: Lack perspective	Feel trapped or overwhelmed; fall too far behind in class

2. Past Experience

a.	1 PastExp: Bumps in the road	Bad grades
b.	1 PastExp: Medical Condition	ADHD
c.	1 PastExp: Fatigue	Feeling tired physically

3. Interest

a.	1 Int: Lack of Interest	Not interested in the subject
b.	1 Int: Unrelated	Unrelated to career goals; unrelated to real life; wasting time; no purpose

4. Lack of Academic Skills

a.	1 LackAcadSkills: Time and Task Management	Procrastination, missing assignments
b.	1 LackAcadSkills: Attention to Detail	Not knowing which assignment is important and not work on the important assignment.
c.	1 LackAcadSkills: Understand	Low Academic self-efficacy, don't understand what's going on
d.	1 LackAcadSkills: Follow Directions	Student fail to follow teacher's direction/assignment

5. Distractions

- | | | |
|----|----------------------------|-------------------------------------|
| a. | 1 Distract: Technology | Phone, computer |
| b. | 1 Distract: Social | Facetime; siblings; classmate; pets |
| c. | 1 Distract: ECA | Cheer |
| d. | 1 Distract: Out of control | Moving to a new place; teacher left |
-

Domain 2: Lesson Delivery

1. Format

- | | | |
|----|-----------------------------|---------------------------------|
| a. | 2 Format: Textbook Reading | Only uses textbook in teaching |
| b. | 2 Format: Busy Work | Work that has no purpose |
| c. | 2 Format: Lecture | Too much didactic content |
| d. | 2 Format: Faulty Technology | Technology failure |
| e. | 2 Format: Pace | Pacing does not match students' |
-

2. Disconnectedness

- | | | |
|----|--------------------|--|
| a. | 2 Disconn: Teacher | Perceive teacher ignore him or her; not knowing the teacher well; perceive teacher as unfriendly; perceive teacher as against me |
|----|--------------------|--|
-
-

Appendix G: Final Code Book

Cognitive Engagement Final Theme and Code List - Facilitators

Question: What are the facilitators of cognitive engagement in accelerated curricula?

Theme 1: Context

1. Reasons

a.	1 Reasons: Quality education	View AP/IB as a challenge; better education
b.	1 Reasons: College	Boosts resume to get into college; get college credits
c.	1 Reasons: Model	Someone who has been in AP/IB inspired the student to join

2. Academic Climate

a.	1 Academic Climate: Positive	Good school academically, classes are interesting/challenging; positive academic experiences/perception; peers care about academics
b.	1 Academic climate: Negative	Classes are hard/difficult; negative academic experiences/perception (e.g., lack of consistent teacher)
c.	1 Academic climate: Mixed	Combination of positive and negative

3. Social Climate

a.	1 Social Climate: Positive	Positive interactions (people are friendly, helpful, caring, respectful; positive social experiences/perception)
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Theme 2: School connectedness fosters AP/IB students' level of cognitive engagement

1. Perception of Connectedness

a.	2 Connectedness: Connect School	Proud to be part of the school; Feel integrated as part of the system feel belonged
b.	2 Connectedness: Connect Teacher	Good relationships with teachers; perceive teachers as friendly; feel supported by teachers
c.	2 Connectedness: Connect Peers	Good relationships with peers; have friends in AP/IB classes

Theme 3: Students' use of coping strategies fosters AP/IB students' level of cognitive engagement

1. Effective Coping Strategies

a.	3 Effective: Seek Academic Support	Attend after-school tuition; seek academic help from teachers/peers/parents/siblings; consult guidance counselor
b.	3 Effective: Turn to Family	Turn to parents during time of distress; trust that parents care
c.	3 Effective: Positive	Adopt a positive mindset; positive self-talk

Thinking	
d. 3 Effective: Relaxation	Take a break from school work to relax
e. 3 Effective: TTM	Time and Task Management: limit procrastinations; limit distractions; schedule activities; prioritize work; break work into manageable pieces

2. Ineffective Coping Strategies

a. 3 Ineffective: Skip School	Take a day off from school to get work done
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Theme 4: Student beliefs foster AP/IB students' level of cognitive engagement

1. Beliefs

a. 4 S Beliefs: Mastery	Mastery/Intrinsic: develop knowledge/competence; enjoy/prioritize learning, challenge, growth, goals, curious
b. 4 S Beliefs: Perf-approach	Performance Approach/Extrinsic: demonstrate knowledge/competence (academic: grades, rewards, honors; social: gain adult recognition, respect, status)
c. 4 S Beliefs: Perf-avoid	Performance Avoidance: avoid demonstrating failure, trouble, disappointment (e.g., "I don't want to fail")
d. 4 S Beliefs: Long Term Goal	Believe that AP/IB coursework is important to achieve long term goal (e.g., college, job)
e. 4 S Beliefs: Expectancy-Value	Self-Efficacy/Expectancy Value: Believe in own competence to achieve in AP/IB courses; Build academic self-efficacy (e.g., research the topic, read before class, do extra work to understand the topic, immerse oneself in the curriculum).

Theme 5: Students' interests foster AP/IB students' level of cognitive engagement

1. Interest

a. 5 S Interests: Match	Students' personal or career interests matches course content
b. 5 S Interests: Open	View AP/IB courses as an opportunity to explore career interests; Keep an open mind on what is or is not relevant to career or personal interest (i.e., "I might change my mind about what is relevant or not in the future").

Theme 6: Teachers foster AP/IB students' level of cognitive engagement

1. Teacher Care

a. 6 Teacher Char: Care	Care about students' goals and interests; connect learning to students' goals; responsive to students' academic needs; involve students in lessons; provide tutoring outside of regular class time; help students understand through explaining; accommodate various learning styles
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2. Teacher Academic & Emotional Support

a. 6 Teacher Supp: Autonomy	Autonomy support: Give students choices, explain relevance of material, open to student feedback and input
b. 6 Teacher Supp: Structure	Structure: Clear expectations, explicit instructions, establish

	order, routines, monitor student learning, check for understanding, monitor student behavior (pay attention)
c. 6 Teacher Supp: Feedback	Feedback: Goal setting, encouragement, monitor progress towards goal, hold students accountable, provide rewards/praise, instrumental help (tutor, study/test skills, self-advocacy skills), time management/organization (backpack, planner, agenda)

3. Teacher Instructional Practices

a. 6 T Practices: Hands on	Hands-on activities (e.g., projects)
b. 6 T Practices: Real World	Apply to real-world
c. 6 T Practices: Social	Social interaction around academics (e.g., class discussion; group work)

Theme 7: Parents foster AP/IB students' level of cognitive engagement

1. Parents Support

a. 7 Parent Supp: Academic	Instrumental help (tutor, study/test skills, self-advocacy skills); time management/organization (backpack, planner, agenda)
b. 7 Parent Supp: Emotional	Encourage; be available; support students' goal

2. Parents' Value of Education

a. 7 P Value: Importance	Believe that education is the key to success (e.g., college and career); Believe that education is beneficial (e.g., provide for family); Share own experiences in how learning connects to real life
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3. Appropriate Home Environment

a. 7 P Environment: Space	Provide space for studying/working
b. 7 P Environment: Time	Take away chores so students have more time to study

Theme 8: Technology foster AP/IB students' level of cognitive engagement

1. Enhance Learning Experiences

a. 8 Tech Learning: Suitable for all learners	Technology makes it possible to accommodate different types of learning styles and pace
b. 8 Tech Learning: Extra sources	Technology acts as a gateway for students to access other sources of information; technology as extra resource to learn; as a source to see how knowledge apply in new world
c. 8 Tech Learning: Familiar	Feel familiar and comfortable with using technology to learn

Cognitive Engagement Final Theme and Code List - Barriers

Question: What are the barriers to cognitive engagement in accelerated curricula?

Theme 1: Student characteristics act as a barrier to AP/IB students' cognitive engagement

1. Student Mindset

- | | |
|------------------------------|---|
| a. 1 B S Mindset: Bad Grades | Low confidence in academic ability to grasp ideas in class/catch up on work/fix a bad grade |
| b. 1 B S Mindset: Irrelevant | Perceive no relationship between doing well in school and doing well in life |
-

2. Students' Life Circumstances

- | | |
|--------------------------------|--|
| a. 1 B S Life: Physical/Mental | ADHD serve as a barrier to concentrate in class; lack of sleep |
| b. 1 B S Life: Change in Home | Moving to new place reduce time and energy to learn |
-

3. Student Lack Academic Skills

- | | |
|----------------------|--|
| a. 1 B S Lack: B TTM | Lack Time and Task Management Skills: procrastinate; not scheduling time effectively; not prioritizing |
|----------------------|--|
-

Theme 2: Negative academic experiences act as a barrier to AP/IB students' cognitive engagement

1. Classroom Experiences

- | | |
|--------------------------------|---|
| a. 2 B T Practices: Boring | Lack of interest, relevance, limited novelty, limited interaction (e.g., textbook work; too much lecture) |
| b. 2 B T Practices: No support | Limited/no support (lack of time commitment, no student input); no guidance; no explanation |
-

2. Disconnectedness

- | | |
|-----------------------------------|--|
| a. 2 B Disconnectedness: Isolated | Alone, not belonged, negative interactions with others in school |
| b. 2 B Disconnectedness: Stranger | Weak relationships with teacher. |
-

Theme 3: Distractions act as a barrier to AP/IB students' cognitive engagement

1. Distractions

- | | |
|-----------------------------------|--|
| a. 3 B Distractions: B Technology | Phone, computer, FaceTime, online shopping |
| b. 3 B Distractions: B Social | Friends. siblings, pets |
-

Appendix H: CITI Completion Report

		Completion Date 06-Sep-2015 Expiration Date N/A Record ID 17174584
This is to certify that:		
Kai Zhuang Shum		
Has completed the following CITI Program course:		
Social and Behavioral Responsible Conduct of Research (Curriculum Group) Social and Behavioral Responsible Conduct of Research (Course Learner Group) 1 - Basic Course (Stage)		
Under requirements set by:		
University of South Florida		
		
Verify at www.citiprogram.org/verify/?w0a4ea148-c550-423d-b14e-b4db26e94aef-17174584		

**Appendix I: Goal Valuation (GV) and Motivation/Self-Regulation (M/SR) scales of the
School Attitude Assessment Survey-Revised (SAAS-R; McCoach & Siegle, 2003)**

Directions: Please rate how strongly you agree or disagree with the following statements. In answering each question, use a range from (1) to (7) where (1) stands for *strongly disagree* and (7) stands for *strongly agree*. Please circle only one response choice per question.

Statement:	Strongly Disagree	Disagree	Slightly Disagree	Neither Agree nor Disagree	Slightly Agree	Agree	Strongly Agree
Goal Valuation (GV) Scale							
1. I want to get good grades in school.	1	2	3	4	5	6	7
2. It is important for me to do well in school.	1	2	3	4	5	6	7
3. Doing well in school is one of my goals.	1	2	3	4	5	6	7
4. I want to do my best in school.	1	2	3	4	5	6	7
5. It's important to get good grades in school.	1	2	3	4	5	6	7
6. Doing well in school is important for my future career goals.	1	2	3	4	5	6	7
Motivation/Self-Regulation (M/SR) Scale							
7. I check my assignments before I turn them in.	1	2	3	4	5	6	7
8. I work hard at school.	1	2	3	4	5	6	7
9. I am self-motivated to do my schoolwork.	1	2	3	4	5	6	7
10. I complete my schoolwork regularly.	1	2	3	4	5	6	7
11. I am organized about my schoolwork.	1	2	3	4	5	6	7
12. I use a variety of strategies to learn new material.	1	2	3	4	5	6	7
13. I spend a lot of time on my schoolwork.	1	2	3	4	5	6	7
14. I am a responsible student.	1	2	3	4	5	6	7
15. I put a lot of effort into my schoolwork.	1	2	3	4	5	6	7
16. I concentrate on my schoolwork.	1	2	3	4	5	6	7

Appendix J: Permission to Include SAAS-R

Seeking Permission to include SAAS-R in Ed.S. Thesis

3 messages

Kai Zhuang Shum <kshum@mail.usf.edu>

Mon, Oct 2, 2017 at 8:35 PM

To: betsy.mccoach@uconn.edu, del.siegle@uconn.edu

Hello Dr. Mccoach and Dr. Siegle,

I am a School Psychology Phd student at University of South Florida. I am interested in using SAAS-R to identify students who self-report higher or lower level of engagement compared to their peers in my thesis study. After identifying these students, I plan to interview them and seek their opinion on how to facilitate cognitive engagement in their accelerated courses (AP classes or IB program).

I am writing to seek your permission to include the SAAS-R in my thesis. My thesis study is part of a larger Institute of Education Science (IES) grant (R305A150543) awarded to Drs. Shannon Suldo and Elizabeth Shaunnessy-Dedrick (University of South Florida, College of Education), where the SAAS-R is used as part of the outcome measure. The SAAS-R is truly an outstanding measure and I hope that you will grant me permission to include this measure in my thesis study!

Thank you for your kind attention. I look forward to your reply!

Sincerely,
Kai Zhuang Shum

--

Kai Zhuang Shum, M.A.
Doctoral Student, School Psychology Program
University of South Florida
Email: kshum@mail.usf.edu



Mccoach, D. Betsy <betsy.mccoach@uconn.edu>

Tue, Oct 3, 2017 at 4:27 AM

To: Kai Zhuang Shum <kshum@mail.usf.edu>

Sure- you have my permission to use the SAAS-R.

Betsy

Sent from my iPhone-- please excuse typos- I use voice recognition software!
[Quoted text hidden]

Siegle, Del <del.siegle@uconn.edu>

Tue, Oct 3, 2017 at 10:08 AM

To: Kai Zhuang Shum <kshum@mail.usf.edu>

We are happy to give you permission.