MISALIGNMENT BETWEEN TEACHING AND LEARNING

by
Heather Lee Whiteside

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Abstract

According to system wide assessment results for students in American schools, achievement scores remain well below the top ten among developed nations. Despite concerted efforts to improve the educational process, student achievement in reading and math has remained relatively stagnant between 2015 and 2018 (Organisation for Economic Development, 2019). Although teachers continue to provide content-based instruction, test results do not indicate student mastery of concepts, which indicates a misalignment between teaching and learning. This is a problem because education is a cornerstone of economic productivity. To mediate the misalignment between teaching and learning, participants were provided Professional Learning (PL) and coaching to implement the Evidence-based Practices of Active Student Responses (ASRs) and Spaced Practice (SP) instructional strategies. Using a multiple baseline and mixed methods design, findings indicated the following: PL and coaching was provided as intended with most participants highly engaged during PL and coaching sessions; there was an increase in both knowledge and implementation of ASRs from baseline to coaching phases; and an increase in general teacher self-efficacy along with an increase in teacher self-efficacy with implementing ASRs and SP. Results indicated positive effects of the intervention on decreasing the misalignment between teaching and learning at the secondary level, across content areas, and within both remote and in-person environments. Limitations and future implications will be discussed.

Keywords: misalignment, Active Student Responses, Spaced Practice, self-efficacy

Primary Reader and Advisor: Tamara Marder

Secondary Readers: Chrissy Eith, Marcia Davis

Dissertation Approval Form

Student's Name: Heather Whiteside Date: 20 March 2021

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The student has made all necessary revisions, and we have read, and approve this dissertation for submission to the Johns Hopkins Sheridan Libraries as partial fulfillment of the requirements for the Doctor of Education degree.

Dr. Tamara Marder	Digitally signed by Tamara Marder DN: cn=Tamara Marder, o, ou, email=tmarder1@jhu.edu, c=US Date: 2021.03.22 14:59:26 -04'00'	03/22/2021
Adviser	Signature	Date
Dr. Christine Eith		3-22-21
Committee Member	Signature	Date
Dr. Marcia Davis	Marcia Davis Digitally signed by Marcia Davis DN: cn=Marcia Davis, o=Johns Hopkins University, ou=School of Education, email=marcy@jhu.edu, c=US Date: 2021.03.22 13:10:09 -04'00'	
Committee Member	Signature	Date
Committee Member	Signature	Date

Dedication

This dissertation is dedicated to my family:

To my father, John W. Lee, who is an amazing, hard-working educator,

To my mother, Ellen J. Lee, who modeled the importance of lifelong learning,

To my sisters, Jo Ellen L. Platania and Lynn M. Lee, who provided enduring encouragement and advice,

To my daughter and son, Camryn L. Whiteside and Sawyer J. Whiteside, who constantly inspired me to continue learning,

And finally, to my husband, James A. Whiteside, who partnered in my doctoral journey and provided ongoing love, enormous support, and eternal patience.

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Executive Summary

Within the field of education, it is hypothesized that there is a discrepancy between the information provided by the teacher and the knowledge acquired by the students. This is characterized as a misalignment between teaching and learning. It is proposed that "misalignment" could be defined as the disparity between teacher presented instructional material and student gained learning. As it will further be described, the term misalignment is appropriated from the field of economics to describe the mismatch between the instruction provided and the knowledge learned (Zhao, 2016).

According to the Organisation for Economic Development (2019), when compared to other developing countries, the United States is ranked 13th in reading and 37th in math. This indicates the United States is ranked below many other nations, and there is a substantiated need for improvements to teaching and learning. Conditions that contribute to the misalignment between teaching and learning are: 1) the misidentification of students' prior knowledge (Dávila, 2015; Lee & Chen, 2014); 2) instructional tasks too high or low to meet learning needs (Abrams, Varier, & Jackson, 2016; LeMire, Melby, Haskins, & Williams, 2012); and 3) unmet learning objectives (Brink & Bartz, 2017; Cotton, 2018). These conditions create a misalignment loop resulting in missed learning opportunities.

Factors Associated with Misalignment

Specific factors associated with the misalignment between teaching and learning were explored through the layered framework of the ecological systems theory (Bronfenbrenner, 1994). Underlying causes to the misalignment include policies, school level factors, and student level factors. Although multiple layers exist, the researcher had limited opportunities to affect policy change or influence student factors. Additionally, it was hypothesized that school level

factors such as Evidence-Based Practices (EBPs; Schalock, Gomez, Verdugo, & Claes, 2017), teacher self-efficacy (Bandura, 1977), and the complexity with meeting the needs of diverse learners (Reschly & Christenson, 2006; Tomlinson, Brighton, & Hertberg, 2003) would have the largest impact on teaching and learning.

Context of the Study

The context of this study is an American middle high school within an overseas location. There are approximately 400 students enrolled in the middle high school, and student demographics included White (58%), Asian (19%), Black (17%), Pacific Islander (2%), American Indian (2%), and decline to report (2%). Additionally, 71 teachers' demographics included White (69%), Black (11%), Asian (10%), and Hispanic (10%). To protect the privacy of students and teachers, additional contextual information is not reported.

Theoretical and Empirical Rationale

To determine the theoretical and empirical rationale for the study, a needs assessment was conducted in the spring of 2018. The needs assessment measured the constructs of instructional practices, teacher self-efficacy, and assessment for learning. Both quantitative and qualitative data were collected from multiple sources including a teacher survey, grade reports, customer satisfaction survey, standardized test scores, teacher interviews, and a focus group.

Needs Assessment Results

Results of the teacher survey (Classroom Practices Inventory for Teachers; CPIT) indicated that teachers were challenged with integrating Active Student Responses (ASRs), which are teacher created opportunities for student responses because increased responses improves academic skills (Davis & O'Neall, 2004). Survey results also indicated teacher challenges with using individualized interventions and understanding students' prior knowledge.

Grade report data showed that 25% of middle high school students received at least one D or F on their quarterly report cards, indicating that a portion of students are not learning presented content. Next, the customer satisfaction survey results revealed that, although a majority of parents (60%) and teachers (56%) were comfortable with the academics, little more than one-third of students (36%) believed academic success was promoted at school. Additionally, results from the Preliminary Scholastic Assessment Test/National Merit Scholarship Qualifying Test (PSAT/NMSQT) indicated that 58% of 8th-11th grade students did not meet the standards for math, reading, or writing. Last, according to interviews and a focus group, teachers were often surprised by low test scores and indicated the need for training to implement EBPs.

Data Analysis of Needs Assessment

The analysis of the needs assessment data revealed multiple indicators suggesting a misalignment between teaching and learning across grades and contents. These indicators include: 1) student knowledge not systematically identified, 2) teachers not proficient with implementing ASRs, 3) a lack of content mastery with academic skills, 4) a discrepancy between teacher and student beliefs related to academic success, and 5) contradictory information between teachers' ratings of self-efficacy, implementation of teaching strategies, and assessment for learning as compared to results obtained from other data sources. The analysis indicated a misalignment exists between content presented by teachers and knowledge acquired by students; this misalignment negatively impacts educational investments and affects the global economy.

Potential Solution to the Misalignment

To explore potential solutions to the misalignment between teaching and learning, a conceptual framework was hypothesized. The framework was drawn from three distinct

concepts; Zone of Proximal Development (ZPD; Vytosky, 1978), flow theory (Csikszentmihalyi, 1990), and motivation (Skinner, 1957). Each concept will be briefly discussed.

Vygotsky (1978) explains that when instruction is provided at a level perceived as attainable, teaching and learning can be more closely aligned. Additionally, Nakamura and Csikszentmihalyi (2014) describe cohesively balanced learning experiences during which activities are not too hard and not too easy. This allows students to experience flow, defined as "a sense that one's skills are adequate to cope with challenges at hand" (Csikszentmihalyi, 1990, p. 71). In addition to targeting a student's ZPD to support them with experiencing a flow while learning, it is important to understand environmental conditions also affect a student's motivation (Skinner, 1957). If students are asked to complete activities perceived as too difficult, the teacher and the activity may be viewed as aversive, thereby decreasing the reinforcing value of learning. Thus, importance must be placed on the integrating ZPD, flow, and motivation.

Purpose of the Study

The purpose of the study was to determine the effectiveness of PL and coaching on teachers' ability to integrate specific EBPs (ASRs and Spaced Practice strategies) into classroom instruction. PL and coaching sessions provided teachers with information regarding when, how, and why to implement ASRs and SP. It was hypothesized that, as teachers increased their understanding of ASRs and SP, their self-efficacy with implementing EBPs would also increase.

Research Questions and Design

To measure the effectiveness of the intervention program, process and outcome evaluation questions were created. Process research questions were focused on the extent PL and coaching evaluations were provided to participants as well as participant engagement during PL and coaching sessions. Outcome research questions were focused on the extent PL and coaching

increased teachers' knowledge of ASRs and Spaced Practice, increased teachers' implementation of ASRs and Spaced Practice, and impacted teacher self-efficacy. To determine answers to these questions, a mixed method, convergent parallel design evaluated the process and outcomes of the intervention. Incorporating mixed methods into program evaluations strengthens the results (Bamberger, Tarsilla, & Hesse-Biber, 2016; Smith, Cannata, & Haynes, 2016). Additionally, the combination of quantitative and qualitative approaches to evaluate outcomes is more effective than each of these approaches on their own (Creswell & Plano Clark, 2018; Mertens, 2018).

Intervention

The intervention directly evaluated the use of PL and coaching to increase teachers' self-efficacy and teachers' knowledge and implementation with ASRs and SP. Prior to implementing the intervention, baseline data was collected to measure frequencies of ASRs and SP as well as teacher self-efficacy ratings. The PL phase of the intervention included PL sessions, weekly observations, and self-reported frequency of SP. The coaching phase included bi-weekly coaching sessions, weekly observations, and self-reported frequency of SP. Once the intervention was complete, follow-up data was also collected.

Due to the COVID-19 pandemic, the setting of the intervention was modified to ensure a healthy and safe environment for the researcher and participants. Rather than providing face-to-face PL and coaching, all sessions were completed online. Eleven middle high school teachers volunteered to participate in the study which included certified teachers from each core content including math (n=2), English Language Arts (n=4), social studies (n=2), science (n=2), and foreign language (n=1). Teachers ranged in ages from 33-59 years and included 9 females and 2 males. As the study sought to examine the efficacy of ASRs and SP within different content areas, it was important to ensure that participants taught a variety of subjects. This allowed the

researcher to examine the differences in rates of ASRs and SP across contents and assess generalizability. Since 100% of the core subjects were represented, each cohort included at least two teachers from the same content areas, with the exception of foreign language.

Results

During the intervention, the participants increased their knowledge with ASRs and SP, increased their rate of implementation with ASRs and SP, and increased teacher self-efficacy. As the results indicate, the PL and coaching sessions proved engaging and relevant for participants and were effective for increasing participants' knowledge and implementation of ASRs and SP. PL and coaching sessions positively affected general teacher self-efficacy, related to student engagement, classroom management, and instructional strategies, and specific self-efficacy, related to ASRs and SP.

Discussion

The study addressed the misalignment between teaching and learning by providing participants with PL and coaching to increase their knowledge and implementation of ASRs and SP as well as positively affect their self-efficacy. During the needs assessment, respondents expressed they were surprised with student outcomes on unit tests "every time." The current intervention increased the alignment between teaching and learning by training teachers to implement ASRs and SP strategies to increase their understanding of students' concept mastery (ASRs) as well as assist students with retaining learned information (SP). Self-efficacy was also positively affected as participants implemented masterful experiences, engaged in discussions, and received feedback regarding the integration of EBPs. Overall, results indicate the intervention was effective at the secondary level, across content areas, and within both remote and in-person environments.

Chapter 1

Overview of the Misalignment Between Teaching and Learning

Within the field of education, it is hypothesized that there is a discrepancy between the information provided by the teacher and the knowledge acquired by the students. This is characterized as a misalignment between teaching and learning. It is proposed that "misalignment" could be defined as the disparity between teacher presented instructional material and student gained learning. As it will further be described, the term misalignment is appropriated from the field of economics to describe the mismatch between the instruction provided and the knowledge learned (Zhao, 2016).

Due to effects on the global economy, the misalignment between teaching and learning can be explored by comparing the performance of students within the United States to other countries. First, there has been little change in national scores in reading and math over time. For example, when comparing scores from 2015 to 2017, the National Center for Education Statistics reports a one-point increase in 8th grade reading, but no significant change in 4th grade reading, 8th grade mathematics, or 4th grade mathematics (The Nation's Report Card, 2017). Second, when compared to other countries around the world, the United States is not ranked in the top ten. According to the 2018 Program for International Student Assessment (PISA) conducted by the Organisation for Economic Cooperation and Development (2019), the United States is ranked 13th in reading and 37th in math. These national and world statistics indicate the United States is making limited progress with reading and math and is ranked below many other nations. Based on this data, there is a substantiated need for improvements to teaching and learning.

Education is an investment in the future. When high quality instruction is provided (e.g., standards aligned with curriculum and assessment, effective classroom management, engaged

teaching and learning, etc.), an investment is made to elicit returns in the future such as improved job opportunities, increased income, and an overall positive influence on world economics. Educational investments impact immediate learning and future student outcomes which affects our global economy. This literature review will define misalignment in terms of social learning theory and behavioral theory, further describe the relationship between teaching and learning, provide support for evidence based practices to address misalignment, examine factors associated with misalignment through the lens of ecological systems theory, and provide considerations for future impacts to address the misalignment.

Misalignment between teaching and learning can occur when lesson outcomes are not achieved due to one or more situations: 1) student prior knowledge is misidentified (Dávila, 2015; Lee & Chen, 2014; Vygtosky, 1978); 2) instructional tasks are too high or too low to meet learning needs (Abrams, Varier, & Jackson, 2016; LeMire, Melby, Haskins, & Williams, 2012; Wachob, 2015); and 3) assessment reveals unachieved learning objectives (Brink & Bartz, 2017; Cotton, 2017). These three situations create a misalignment loop (see Figure 1). When prior knowledge is misidentified, it impacts the ability to match instructional tasks to student' current

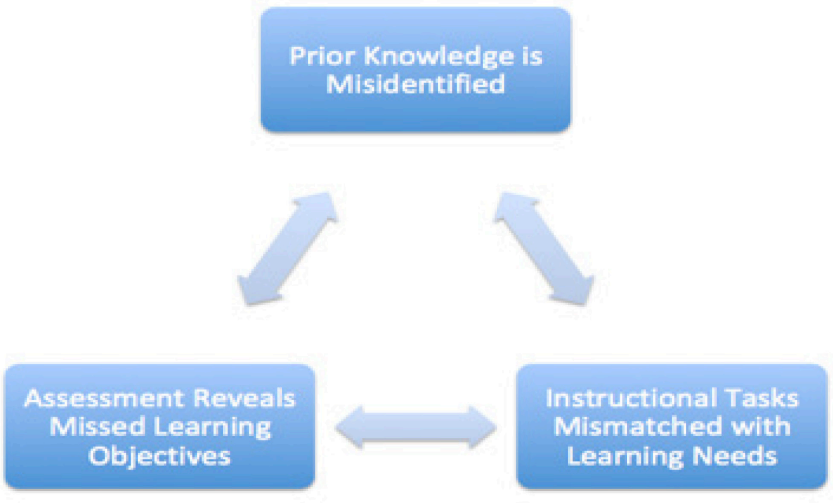

Figure 1. Conditions associated with teaching and learning which create a misalignment loop.

learning needs. The mismatch of instructional tasks to learning needs (too high or too low) results in learning objectives being unobtainable, and, therefore, important learning is missed.

Aligning instruction to students' needs is an extremely challenging task. Prior knowledge must be thoughtfully considered, instructional tasks should be matched to learning needs, and assessment results utilized to reteach unlearned objectives. Therefore, this misalignment, defined as a mismatch between teaching and learning, is characterized by one or more of the following: a misidentification of prior knowledge, a difference between taught objectives and learning needs, and an imprecise use of assessment toward reteaching unlearned information. In order to further understand misalignment, definitions for teaching and learning are provided.

Definitions of Teaching and Learning

Misalignment can be explored through defining teaching and learning from both social and behavioral perspectives. Social learning defines ***teaching*** as the process which focuses on prior knowledge, presents content just above students' current level, and scaffolds information to increase learning (Vygotsky, 1978). Social learning defines ***learning*** as a meaningful process often dependent on prior knowledge (Aldridge, 1993) and includes a triadic relationship between behavior, personal and cognitive factors, and environmental events (Bandura, 1986). Therefore, a social learning perspective of teaching and learning emphasizes prior knowledge, leveled content, and interactions between behavior, cognition, and the environment.

In contrast to social learning, the behavioral perspective of teaching and learning focuses on contingencies. From the behavioral viewpoint, ***teaching*** is defined as "the arrangement of contingencies of reinforcement which expedite learning" (Skinner, 1968, p. 707). The behavioral perspective defines ***learning*** as the acquisition of new information as contingencies change the

probability of responses (Skinner, 1968). Therefore, from a behavioral perspective, teaching and learning focuses on contingencies, reinforcement, and response probabilities.

By examining both social learning and behavioral perspectives, it is clear that teaching and learning have similar characteristics. For example, within the social learning perspective, teaching and learning rely on prior knowledge; within the behavioral perspective, contingencies are integral to teaching and learning. Social learning and behavioral definitions of teaching and learning provide insight into the crucial role prior knowledge and leveled content plays within misalignment. In addition to prior knowledge and leveled content, teaching and learning are also shaped through the integration of evidence-based practices (EBPs).

Why Are Evidence-based Practices Important to the Misalignment?

Definitions of EBP are available from diverse professions, including the American Psychological Association (APA), the National Autism Center, the field of education, and legislative guidance. According to the APA (2005), EBP integrates research within the "context of patient characteristics, culture, and preferences" (p. 5). Similarly, the National Autism Center (2009) emphasizes EBP integrate research outcomes with professional judgment, data-based decisions, and family preferences. Definitions from the educational field indicate EBPs demonstrate a "relation between specific practices and measured outcomes" (Schalock, Gomez, Verdugo, & Claes, 2017, p. 115) and produce reliable and valid results as evidenced through experimental design (Odom, Collet-Klingenberg, Rogers, & Hatton, 2010). Additionally, guidance issued by the Department of Education (2016) indicates that EBPs are interventions that "demonstrate a statistically significant effect on improving student outcomes" based on experimental evidence. These definitions indicate that when EBPs are incorporated within the classroom, a positive relationship exists between teaching and learning.

Research has led to the identification of EBPs which hold promise to improve academic instruction (Cooper et al., 2018). Such work has been done in settings that serve diverse student groups across multiple grades (Cooper et al., 2018) and content (Aydeniz & Kotowski, 2012; LeMire et al., 2012; Swanson et al., 2016). In the past 15 years, teachers have access to a wide number of resources that identify EBPs. A myriad of EBPs exist (see Table 1). Several EBPs will be discussed regarding the impact of EBPs on student outcomes.

First, ***matching the objective with the instructional level*** (Cooper et al., 2018; Sanford & Horner, 2013) allows the student to learn content within their zone of proximal development (Vygotsky, 1978). This enables students to succeed in meeting instructional objectives. Second, ***Active Student Responding*** (ASR) (Lambert, Cartledge, Heward, & Lo, 2006; Whitney, Cooper, & Lingo, 2015) provides opportunities for students to answer questions throughout the instructional process and receive feedback from the teacher. ASR enables the teacher to adjust instruction to meet the needs of individual students to ensure lesson objectives are mastered. Third, ***relevant and engaging content*** (Early, Rogge, & Deci, 2014; Ficarra & Quinn, 2014; Nayir, 2017) affords students the opportunity to understand content from a practical perspective and become actively involved in the lesson, which creates positive outcomes (e.g., enthusiastic participation, interactive dialogue, new understandings, etc.) for students (Lewis, Baudains, & Mansfield, 2009). Research suggests that EBPs improve student outcomes.

EBPs are important to understanding the misalignment between teaching and learning due to the relationship between teaching practices and learning outcomes. Effective teaching practices lead to improved learning outcomes. Strategies must be judiciously selected during planning to ensure high quality of instruction and increased learning outcomes. The thoughtful selection of EBPs will be discussed as related to misalignment between teaching and learning.

Table 1

Definitions of Sampled Evidence-based Practices

Evidence-based Practice	Definition	Citations
Matching the Objective with the Instructional Level	Ensuring students have the prerequisite skills for the lesson objective	Cooper et al., 2018; Sanford & Horner, 2013
Performance Feedback	Providing students with information regarding whether or not they are understanding the concepts in the lesson	Cooper et al., 2018; Fallon, Collier-Meek, Maggin, Sanetti, & Johnson, 2015; Ruiz Primo & Li, 2013; Sitzman, Rhodes, & Kornell, 2016; Whitney et al., 2015
Active Student Responding	Providing opportunities for students to answer questions related to lesson concepts to determine level of understandings	Lambert et al., 2006; Whitney et al., 2015
Mixing and Varying Demands	Interleaving easy and hard questions; interleaving information from different objectives and contents	Cooper et al., 2018; Rau, Aleven, & Rummel, 2013
Guided Notes	Providing a template of information with key concepts missing	Cooper et al., 2018; Larwin, D. Dawson, M. Erickson, & D. Larwin, 2012; Sweeney, Ehrhardt, & Hardner, 1999
Relevant and Engaging Content	Ensuring content presented is pertinent and interesting to the students	Early et al., 2014; Ficarra & Quinn, 2014; Nayir, 2017

Selection and Application of Evidence-based Practices

Due to the importance integrating EBPs within the instructional context, EBPs are taught to preservice teachers (Cooper et al., 2018; Daniels, Radil, & Wagner, 2016), incorporated within the teacher evaluation process (Borgmeier, Loman, & Hara, 2016; Early et al., 2014), and integrated within professional development activities (Borgmeier et al., 2016; Ciullo et al., 2016). Although the importance of EBPs is emphasized, the selection of appropriate evidence-

based practices can be an unwieldy process and overwhelming for educators. Over seventy-five differing practices have been identified as effective for certain populations, to teach certain skills, and within specific content areas (Cooper et al., 2018). However, despite evidence that supports the efficacy and widespread use of EBPs and the impact on learning outcomes, there still exists a misalignment between teaching and learning because training does not emphasize the importance of selecting specific EBPs within the appropriate context, to include setting, learner, and content.

Gaps in the Research

Current research typically focuses on how one particular strategy works within one grade level or content (Fallon et al., 2014; K. Larwin et al., 2012; Nayir, 2017; Rau et al., 2013; Sanford & Horner, 2013; Whitney et al., 2015) and does not provide the generalization of practice into other settings or content areas. Each reference refers to a specific EBP rather than focusing on the integration of appropriate EBPs for the context or the use of multiple EBPs to strengthen the connection between teaching and learning. Additionally, the implementation of specific EBPs cannot truly occur in isolation as context determines which EBP is appropriate for the situation (Schalock et al., 2017). For example, a plethora of research exists related to ASR, formative assessments (e.g., exit tickets, games, quizzes), active engagement, guided notes, and matching the objective to the appropriate level. However, the literature is conspicuously lacking regarding studies related to teacher selection of EBPs for appropriate contexts, which contributes to the misalignment between teaching and learning.

EBPs impact learning outcomes and will be discussed further within the teacher self-efficacy factor of the Ecological Systems Theory (EST). Each system (e.g., macrosystem, exosystem, mesosystem, and microsystem) within the EST impacts the student. The EST will

frame the problem of misalignment between teaching and learning, and additional factors within the EST will be discussed.

Ecological Systems Theory

The ecological systems approach will be used to understand the problem of misalignment between teaching and learning. An ecological systems theory (EST) is pertinent to discussing the misalignment between teaching and learning because it provides a layered framework for factors associated with problems (Bronfenbrenner, 1994, 2006). Each of the ecological systems (e.g., macrosystem, exosystem, etc.) are associated with experiences, positive and negative, which influence a student's development (Bronfenbrenner, 1994). The four major levels of EST assist with defining the factors associated with the misalignment between teaching and learning that can impact students. The four factors and their associated layers include:

1. Macrosystem-educational policy and culture that affect teaching and impacts the student
2. Exosystem-distinct practices and procedures in education that indirectly affect the student
3. Mesosystem-links between two or more settings which affect the student
4. Microsystem-school factors that directly affect the student, this includes the child's own behavioral and biological characteristics

This information is pictured in Figure 2. Each of the four levels of Bronfenbrenner's (1994) EST will be discussed in detail with regard to contributing factors of the misalignment between teaching and learning.

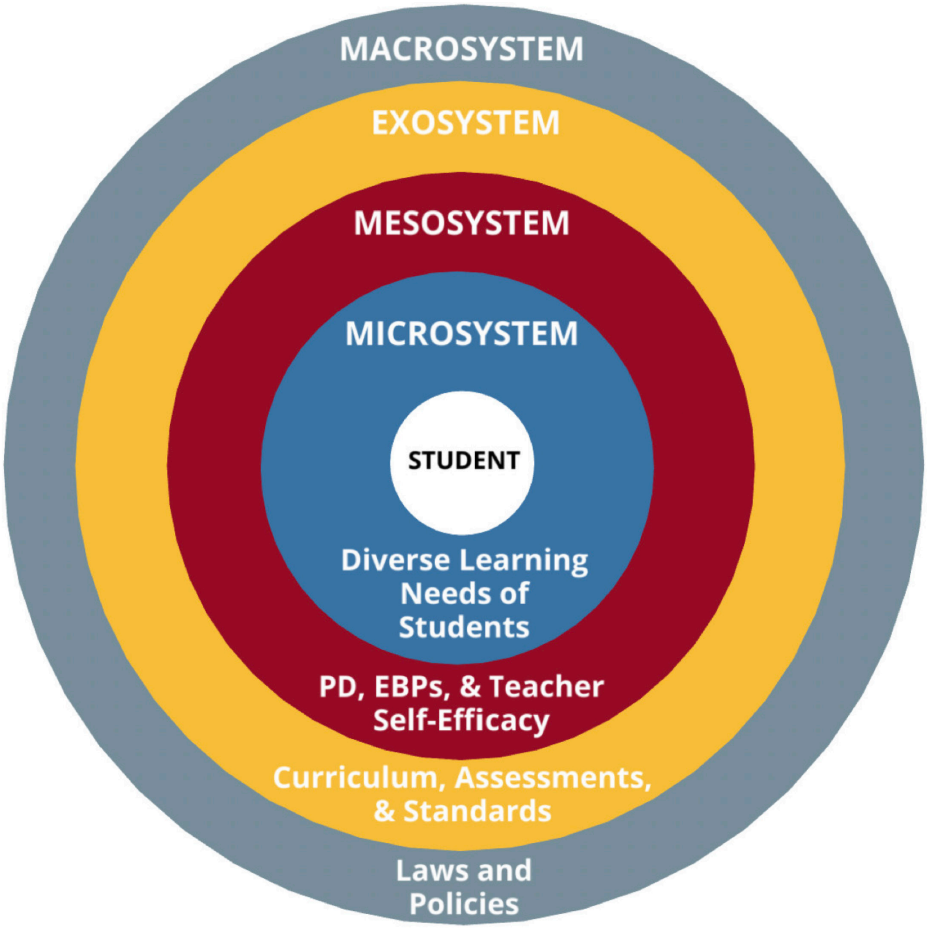

Figure 2. Factors associated with the misalignment between teaching and learning.

Macrosystem: Federal Policies

The macrosystem entails educational policies and cultures that can impact outcomes for students. First, the factors that have an impact on the misalignment between teaching and learning will be discussed. The specific factor includes federal policies. It is important to examine the macrosystem because federal policies indirectly affect teaching and learning that occurs in the school setting.

First, the macrosystem is comprised of educational policies that affect teaching and learning for the student. Although there have consistently been some level of diverse learners within the education system in the United States, educational policies such as the Bilingual

Education Act (Department of Education, 1968), Section 504 of the Vocational Rehabilitation Act (Department of Labor, 1973) and the Education for All Handicapped Children Act (Department of Education, 1975) opened the door for increased diversity of learners within the school setting, to include students with learning challenges, second language learners, and social emotional concerns. Additionally, with the reauthorization of Every Student Succeeds Act (Department of Education, 1994, 2015), Individuals with Disabilities Education Act (Department of Education, 1997), and No Child Left Behind (NCLB); (Department of Education, 2001), a renewed focus emerged with meeting the needs of diverse learners. After the implementation of such policies, general education teachers began to experience increased involvement and responsibility in the educational process of teaching diverse learners (Itkonen, 2007).

Historically, second language learners were provided English-only instruction in the early to mid-1900's. However, with the movement for Civil Rights and the passing of the Bilingual Education Act in the 1960's, legislation turned towards the bilingual instruction of second language learners. A focus on targeted instruction for this second language learners included "academic, linguistic, sociocultural, and emotional needs" (Kanakri, 2017, p. 64). Therefore, preparing second language students for inclusion within schools and society became a focus of the educational environment (Kanakri, 2017).

In addition to a focus on diverse populations, NCLB (Department of Education, 2001) was purposed to narrow the achievement gap between economically advantaged and disadvantaged students (Ward, Johnson, & Branson, 2014) through the use of mandated evidence-based practices in the classroom. Race to the Top (Department of Education, 2009) emphasized the need to increase academic achievement, decrease gaps between subgroups, and increase preparedness for college and careers. The Race to the Top Program also targeted the

need for increased learning time, dedication to students with high-needs, and support for active engagement and student achievement. Last, Every Student Succeeds Act (Department of Education, 2015) refined federal policies in an attempt to hold students to high academic standards, prepare them for college and career, and maintain accountability for academic performance. Notably, a lack of administrator and educator input into educational policy impacts the reform efforts of legislative policies (Bridich, 2016). Norms and values of these public policies mandate learning for all students and provide an inclusive culture for diverse populations.

As evidenced through various policies and legislation, the macrosystem has attempted to mediate the misalignment between teaching and learning. These educational policies include incorporating EBP into instruction (Department of Education, 2001), increasing academic achievement of students (Department of Education, 2009), and maintaining accountability for academic performance (Department of Education, 2015). However, the creation of federal policies alone does not provide a solution to the misalignment between teaching and learning. Therefore, federal legislation contributes to the misalignment of teaching and learning by mandating policies that require significant training and monies for effective implementation.

Exosystem: Local Education Agency Practices and Procedures

Second, the exosystem encompasses district practices and procedures that indirectly affect teaching and learning. The Local Education Agency (LEA) mandates standards, curriculum, and assessments to be integrated into the schools. Standards determine which information is to be taught, and the curriculum determines how and what materials will be used to teach the standards. Assessments identify learning progress and provide the teacher with information to match the lesson objective with the instructional level. When choosing school

standards, curriculum, and assessments, the LEA should consider the diverse needs of the student population (e.g., students with disabilities, second language learners, gifted students, etc.). This impacts misalignment because, when standards, curriculum, and assessments are not judiciously selected, teachers are challenged with ensuring students are provided instruction within their zone of proximal development (Tomlinson, Brighton, & Hertberg, 2003; Vygotsky, 1978).

Regarding LEA policies, school environments can be resistant to change. Lack of teacher participation in decision-making results in resistance to change (Olsen & Sexton, 2009). To facilitate an atmosphere of trust and respect, shared decision-making and control must occur (Ward et al., 2014). Teachers are trained to be competent with classroom instruction; however, teachers' views regarding changes within the educational system are not always sought and, therefore, not valued (Hinnant-Crawford, 2016; Ward et al., 2014). When teacher feedback is restricted, and decisions are not transparent, teacher hostility is created (Olsen & Sexton, 2009). Therefore, LEA policies which mandate standards, curriculum, and assessments are not always embraced by teachers, indirectly influencing the misalignment between teaching and learning.

Mesosystem: School Factors

Third, the mesosystem indicates connections between systems. School factors involving the developing individual which "comprises the linkages and processes taking place between two or more settings containing the developing person (e.g., the relations between home and school, school and workplace, etc.). In other words, a mesosystem is a system of microsystems" (Bronfenbrenner, 1994, pg. 1645). It is important to examine factors related to the mesosystem because the misalignment between teaching and learning includes connections between systems that include leadership, professional development and professional learning communities, parent involvement, and the self-efficacy of teachers.

Leadership. Leadership has an arduous responsibility to build teacher capacity and evaluate teacher effectiveness. When building capacity within an organization, necessary core practices have been identified to include "setting directions, developing individuals, redesigning the organization, and managing instruction" (Klar & Brewer, 2013). When building capacity within a school, trust, responsibility, and diversity are integral to a cohesive understanding for moving forward (Bennett, Ylimaki, Dugan, & Brunderman, 2013; Gilley, Heames, & Gilley, 2012). Conflict cannot be ignored or viewed as a road-block. Instead, conflict provides an opportunity for professional discourse, allows for the exploration of ideas, and provides increased opportunities for learning.

In addition to building teacher capacity, leaders are expected to evaluate teacher effectiveness. During the evaluation process, leaders often recommend changes to teacher instruction. However, in order for teachers to accept and welcome modifications to their instruction, the school culture must embrace change while learning to value and appreciate the evaluation process (Bridich, 2016). Leadership contributes to the misalignment between teaching and learning because the competence and evaluations of teachers affect the quality of instruction presented to students.

Professional Development and Professional Learning Communities. Learning within professional development (PD) and professional learning communities (PLCs) influences teacher competencies. PD can be a dynamic element for improving instruction and student assessment scores (Green & Allen, 2014). PLCs that provide well-designed instruction allow for "double and triple" (Green & Allen, 2014, p. 71) learning loops, which also contribute to the learning process. Additionally, there is evidence of a positive relationship between PD and the teacher use of EBPs (Kretlow, Cooke, & Wood, 2011; Lattuca, Bergom, & Knight, 2014). Therefore, PD

and PLCs impact the misalignment between teaching and learning due to their influence on teacher competencies.

Parent Involvement. In addition to leadership and professional development playing a role in the misalignment between teaching and learning, parent involvement is also a key factor, especially as the students move into middle and high school. As students grow older, parents decrease school-based involvement, which limits parent visibility and may negatively impact student achievement (Page, Pendergraft, & Wilson, 2014). Active parent involvement may actually encourage student achievement (Han, 2014; Kaplan Toren, N., & Seginer, 2015). Interestingly, teachers perceive increased parent involvement as necessary to increase educational achievement (Bol & Berry, 2005) and cite the need for increased parent education to facilitate student academic success. As student independence increases, and parents' school involvement decreases, parents have reduced information regarding their children's instructional needs, which can also contribute to the misalignment between teaching and learning.

Self-efficacy of Teachers. Within the framework of EST, a myriad of factors point to a misalignment between teaching and learning. A deep understanding of teacher self-efficacy is an essential variable because self-efficacy influences the professional development of teacher competencies (Cleary & Kitsantas, 2017). Self-efficacy is derived from social cognitive theory (Bandura, 1986) and is influenced through four factors: 1) performance accomplishments, 2) vicarious experiences, 3) verbal persuasion, and 4) emotional arousal (Bandura, 1977). A brief description of each characteristic is provided.

Performance accomplishments refer to mastery experiences in which individuals encounter repeated success. Vicarious experiences occur when an individual models effective actions while engaging in challenging activities. Verbal persuasion involves providing

suggestions and feedback to convince people they can be successful. Physiological arousal describes the states of arousal (e.g., increased heart rate, increased respiration, sweating) that individuals experience when they are fearful or anxious about their performance. According to Bandura (1977), self-efficacy is positive affected through mastery experiences, modeling, verbal persuasion, and physiological arousal.

Of the factors influencing self-efficacy, Tschannen-Moran and Hoy (2007) found the most influential to be mastery experiences. When masterful teaching experiences are combined with verbal persuasion, there is a close association with increasing teacher self-efficacy for implementing teaching practices (Tschannen-Moran & McMaster, 2009). Additionally, teachers with higher self-efficacy positively affect student achievement (Ashton and Webb, 1986; Callaway, 2017). Within a challenging instructional situation, teachers with high self-efficacy will provide continued efforts for students to learn a challenging objective which results in improved student outcomes.

When teachers feel accomplished in their performance, observe sustained efforts resulting in successful outcomes, receive encouragement and feedback regarding their capability to master challenging situations, and experience decreased anxiety related to their teaching performance, their self-efficacy increases and impacts how much effort will be expended within adverse circumstances (Bandura, 1977). Teachers that exhibit high self-efficacy are willing to select appropriate EBPs (Daniels et al., 2016), implement various EBPs (Cook et al., 2017), and exhibit sustainable effort (Tschannen-Moran & Hoy, 2001) with fidelity (Fallon et al., 2014). Therefore, the self-efficacy of teachers may impact their ability to utilize EBPs which contributes to the misalignment between teaching and learning.

Microsystem: School Factors

Last are the microsystem level factors. These factors depict the surrounding environment and interact directly with the student. The microsystem level includes the school and factors associated with the student and family. Regarding the school environment, factors such as diverse learning needs, student mobility, and student self-efficacy are poignant.

Diverse Learning Needs. Diverse learning needs may impact how students' learn. Diverse learners include students with learning challenges, social emotional concerns, giftedness, and second language learners, among others. As mentioned previously, legislative policies within the last 50 years have contributed to an increase of diverse learners within the classroom, impacting the distribution of learning profiles for students who attend school throughout the United States. Students with learning and social emotional challenges are reported to be less engaged and have higher dropout rates than the general population (Reschly & Christenson, 2006). Diverse student populations often need differentiated instruction (Tomlinson et al., 2003) based on zones of proximal development (Vygotsky, 1978) with reinforcement contingencies (Skinner, 1968). Therefore, teaching diverse learners requires instruction to be provided on different levels based on various representation of prior knowledge, while integrating multiple opportunities for reinforcement.

Additionally, to provide productive learning opportunities, academic and social supports are necessary (Carroll et al., 2011; Missett, Brunner, Callahan, Moon, & Price, 2014; Rogers, 2011) for all students, regardless of their individual learning needs. Although shared beliefs of educators typically indicate a welcoming attitude toward students with different learning profiles (Carroll et al., 2011), these beliefs do not always translate into appropriate teaching and learning situations. A "truly open-minded" school culture is needed (Thomas-Brown & Shaffer, 2016, pg.

287) to understand and meet the needs of diverse student populations. Therefore, the misalignment between teaching and learning is impacted for diverse populations when students' prior knowledge is misidentified, and instructional objectives are mismatched to the needs of students.

Student Mobility. Student mobility factors include the mobility rate of the students, school environment, and self-efficacy of students. Within this researcher's current context, there is a relatively high rate of student mobility. Many students register and then deregister within a two to three year period. Student mobility is associated with decreased academic achievement (Fan, 2017; Han, 2014), which may be partially attributed to complications that arise from new social relationships.

Learning challenges for students with increased mobility may be influenced by the adjustment to a new curriculum, a shifting instructional focus, or even alternate class offerings. Schools of highly mobile populations should secure resources to meet the instructional needs of the changing student population (Fan, 2017; Han, 2014). However, schools are often limited by their ability to remediate undesirable effects of student mobility (Scherrer, 2013). Therefore, student mobility is associated with decreased academic achievement and limited school resources. The misalignment loop is particularly poignant for a mobile student population as their prior experiences, learning needs, and previously administered assessments may be quite different from currently enrolled students. This contributes to the misalignment between teaching and learning as instruction is not structured to meet the needs of a mobile population.

Student Self-efficacy. In addition to student mobility and parent involvement, self-efficacy is also a contributing factor to the misalignment between teaching and learning. Student self-efficacy is an important predictor of academic achievement (Cleary & Kitsantas, 2017; Phan

& Ngu, 2016). Importantly, self-efficacy is malleable and can be bolstered through interactive learning experiences, vocal encouragement, and emotional circumstances (Phan & Ngu, 2016). When students feel valued, accepted, and supported, they are more likely to believe that mistakes are learning opportunities, and self-efficacy increases (Yu & Singh, 2018). Self-efficacy is related to the misalignment between teaching and learning because student self-efficacy impacts students' ability to master identified objectives (Cleary & Kitsantas, 2017; Phan & Ngu, 2016), even when presented within the students' zone of proximal development (Vygotsky, 1978).

Future Considerations

The misalignment between teaching and learning impacts the future, to include economics such as future employment and earnings. According to French, Homer, Popovici, and Robins (2015), a one-point increase in high school grade point average (GPA) can be attributed to increased future earnings for both males (over 11% per year) and females (over 13% per year). Therefore, educational investments will reap future success for today's global economy. Decreasing the misalignment between teaching and learning is a necessary educational investment, and teachers must be equipped to refine their teaching practices and inspire students to excel. A focus on instructional practices and student achievement within the exosystem and mesosystem will assist with determining the misalignment between teaching and learning within a multicultural middle high school. Based on the United States' limited progress with reading and math (Nations Report Card, 2017; Organisation for Economic Cooperation and Development, 2017), and considering the resulting economic factors which affect an individual's future earnings (French et al., 2015), the misalignment between teaching and learning is a problem that must be investigated.

Chapter 2

Needs Assessment of the Misalignment Between Teaching and Learning

Despite legislative efforts to improve student achievement, a misalignment exists between the information taught and the knowledge learned. Legislative policies within the last 50 years have contributed to an increase of diverse learners within the classroom. Meeting the needs of diverse learners is challenging (Ladson-Billings, 2011), and academic achievement for some American students continues to be a challenge (Cameron, Grimm, Steele, Castro-Schilo, & Grissmer, 2015).

Legislative efforts have attempted to mediate concerns with student achievement. No Child Left Behind (NCLB) (Department of Education, 2001) attempted to narrow the achievement gap and mandate evidence-based practices in the classroom, and Race to the Top (Department of Education, 2009) supported active engagement and reinforced a dedication to students with high-needs. Most recently, Every Student Succeeds Act (ESSA) (Department of Education, 2015) attempted to prepare students for college and maintain accountability for academic performance. However, schools within the United States are making minimal progress (The Nation's Report Card, 2017). As documented by the Organisation for Economic Cooperation and Development (OECD) (2019), the United States is ranked 13th in reading and 37th in math. Therefore, factors related to educational processes warrant examining.

Learning sciences and educational research have substantiated the need for improvement of instruction (Hoskins Lloyd, 2016; Simonsen, Fairbanks, Briesch, Myers, & Sugai, 2008) through evidence-based practices (EBP) (LeMire et al., 2012; Swanson et al., 2016). Factors associated with the misalignment between teaching and learning are framed within the EST (Bronfenbrenner, 1994, 2006) to include policies and school and family factors (see Figure 2).

However, the research indicates gaps with selecting the appropriate EBP to effectively teach content (Schalock et al., 2017). According to Hoskins Lloyd (2016), specific instructional strategies including reinforcement, connections to previous learning, and effective dialogue indicate a close alignment between teaching and learning. Although reinforcement for learning was observed through facial expressions (e.g., smiling at students after a correct answer) during a field observation, (personal communication, January 30, 2018), connections to previous learning and effective dialogue were not observed, which further demonstrates a need to examine classroom instructional practices.

Within the researcher's context, standardized assessment scores have not met the standard and quarterly grades include at least one D or F for many students. According to Preliminary Scholastic Assessment Test/National Merit Scholarship Qualifying Test (PSAT/NMSQT) data, the mean percentage of 8th - 11th grade students (*N*=239) that met the benchmarks for both Evidence-based Reading and Writing (ERW) and math was 42% (see Appendices A and B), which is less than half of the student population. These results suggest that limited student mastery can be explained by a misalignment between teaching and learning (The College Board Educator Summary Report, 2017). Using the PSAT/NMSQT to test students' achievement was initiated in the fall of 2017; therefore, only one year of data is available. Additionally, report cards during the first three quarters of the 2017-18 school year for 6th through 12th grades indicate that 25% of the student population (*N*=433) received at least one D or F on quarterly grade reports. Challenges with academic achievement indicate misalignment between teaching and learning as instruction should specifically target the learning needs of students, which may not be occurring if more than half of the students are not meeting language

arts and math standards and one quarter of the students receive at least one D or F on their grade reports.

Purpose of the Study

The purpose of this study is to determine how the implementation of evidence-based practices (EBPs), teacher self-efficacy, and assessment for learning affect the misalignment between teaching and learning in an overseas, American middle high school. Literature supports the integration of EBPs across secondary grades, content, and diverse learners (Aydeniz & Kotowski, 2012; LeMire et al., 2012; Swanson et al., 2016). Increased teacher self-efficacy is documented as essential for effective teaching (Cleary & Kitsantas, 2017). Systemic issues with EBPs, teacher self-efficacy, and assessment for learning will be discussed.

The selection of appropriate EBPs is an unwieldy process. Copious EBPs have been identified as effective for certain populations, to teach certain skills, and within specific content areas (Cooper et al., 2018). Due to the importance integrating EBP within the instructional context, EBP are taught to preservice teachers (Daniels et al., 2016), incorporated in teacher evaluations (Early et al., 2014), and integrated in professional development (Borgmeier et al., 2016). However, despite evidence that supports the efficacy of EBP, a discrepancy remains between the information taught and the material learned.

Teacher self-efficacy is the belief that teachers can confidently develop high-quality learning situations (Bandura, 1993). Teacher self-efficacy an essential variable because self-efficacy influences the development of competencies (Cleary & Kitsantas, 2017). Teacher competencies include the selection of EBPs (Daniels et al., 2016), sustainable effort (Tschannen-Moran & Hoy, 2001), and the willingness and intention to implement practices (Cook et al., 2017) with fidelity (Fallon et al., 2015). The literature indicates that when teachers believe in

their ability, student learning is positively impacted (Ashton and Webb, 1986; Callaway, 2017). The self-efficacy of teachers may have an impact on the misalignment between teaching and learning because, when teachers are not confident in their ability to implement EBPs, the quality of instruction is negatively impacted which negatively affects student learning.

An additional teacher competency vital within the instructional process is assessment for learning. Assessment for learning provides information regarding prior knowledge (Vygotsky, 1978). This step is important for effective teaching because when the knowledge level is established, teachers can integrate appropriate instructional practices. At times, teachers seem baffled by student mistakes. In the researcher's current school, one teacher was observed to tell his class, "This is not hard. Some of you [students] are trying to make it hard." (personal communication, January 28, 2018). Further exploration of assessment for learning is necessary to study the misalignment between teaching and learning.

Teaching and learning is a process. Integral to this process is teacher self-efficacy, which impacts the implementation of EBPs and assessments for student learning. The implementation of EBPs is challenging, and assessment for learning is vital to determining students' prior knowledge and current levels of understanding. Therefore, this study will examine the misalignment between teaching and learning as related to teacher self-efficacy with EBPs and assessment for learning.

Importance of Study

This study is important because the misalignment between teaching and learning impacts our future. Educational investments provide important returns such as increased productivity, higher salaries, and a stronger global economy. Teaching and learning are foundational components to our educational system, and it is imperative that teaching strategies be utilized to

maximize learning opportunities. The review of the literature indicates that EBPs (Cooper et al., 2018) and teacher self-efficacy (Cleary & Kitsantas, 2017) are important elements in student learning. This research is significant because daily decisions made by teachers have a close impact on teaching and learning. Therefore, to explore the misalignment between teaching and learning, teacher self-efficacy, as related to EBPs and assessment for learning will be the focus.

Social learning, behavioral, and social cognitive perspectives were considered in developing definitions of teaching and learning. Teaching is the creation of learning opportunities whereby presented content is leveled, based on prior-knowledge, and reinforced through arranged contingencies (Skinner, 1968; Vygotsky, 1978). Learning is a meaningful, engaging process by which contingencies are created within the environment to modify response probabilities whereby new understandings are formed (Aldridge, 1993; Bandura, 1986; Skinner, 1968). The definitions suggest a close relationship between teaching and learning.

A misalignment between teaching and learning occurs when lesson outcomes are not met due to one or more of the following: 1) misidentification of student prior knowledge (Dávila, 2015; Vygtosky, 1978), 2) instructional tasks mismatched with learning needs (Abrams et al., 2016; Wachob, 2015), and 3) misidentification of learned objectives through assessment (Brink & Bartz, 2017; Cotton, 2017). A misalignment loop is created as prior knowledge is impacted by mismatched instructional tasks, which affects assessment results. Misalignment is defined as a mismatch between teaching and learning characterized by a misidentification of prior knowledge, a difference between taught objectives and learning needs, and an imprecise interpretation of progress toward objectives. Therefore, isolating the variable that impacts this misalignment is important so that the problem can be identified and an intervention developed to increase effective learning opportunities for students.

Methods and Unit of Analysis

To explore the misalignment between teaching and learning, measured constructs included instructional practices, teacher self-efficacy, and assessment for learning (see Appendix C). Quantitative measures informed the development of questions used for qualitative interviews in the sequential mixed-methods design. Teachers were the unit of analysis for the Classroom Practices Inventory for Teachers (CPIT), the customer satisfaction survey, and interviews. Parents and students were the units of analysis for the customer satisfaction survey, and students were the unit of study for grades and the PSAT/NMSQT. Data collection using teachers, parents, and students as units of analysis within a sequential, mixed-methods design assisted with determining how the implementation of evidence-based practices (EBPs), teacher self-efficacy, and assessment for learning affect the misalignment between teaching and learning.

Questions

Underlying Causes

Underlying causes related to the misalignment between teaching and learning include federal and district policies, school level factors, and student level factors. Federal policies increase accountability (Department of Education, 2001; 2009; 2015) while district policies mandate standards (Pense, Freeburg, & Clemons, 2015), curriculum, and assessments (Fulmer & Polikoff, 2014). A focus on federal and district policies actually limits attention to instructional practices and learning and causes resistance to change within the school context (Olsen & Sexton, 2009). Because federal and district policies diminishes attention on instructional practices and learning, these factors will not be the focus of this study, and other factors will be explored.

Underlying causes at the school level, which contribute to the misalignment, include leadership (Bennett et al., 2013), teacher training (Green & Allen, 2014), parental involvement (Page et al., 2014), diverse learning needs of students (Reschly & Christenson, 2006), and teacher self-efficacy (Cleary & Kitsantas, 2017). Additionally, student level factors include mobility (Fan, 2017) and student self-efficacy (Phan & Ngu, 2016). Within the school context, factors such as teacher training and teacher self-efficacy are actionable through training and coaching opportunities for teachers. In contrast, factors such as mobility and student self-efficacy are less actionable due to the researcher's limited influence on student mobility and organizational policies which limits research involving students.

Therefore, federal and district policies, school level factors, and student level factors are all linked to misalignment. Although these factors impact misalignment in various ways, school level factors are the focus of this study because policy factors often diminish attention to instructional practices and learning. Additionally, the researcher had limited opportunities with influencing factors associated with students. It is hypothesized that school level factors will have the largest impact on teaching and learning due to the attention on instructional practices and learning as well as the researcher's ability to affect change through school level interventions.

Research Questions

To investigate the misalignment between teaching and learning, the following research questions will be addressed:

1. How do instructional practices of teachers affect the learning for students?
2. What types of instructional based practices produce a misalignment between teaching and learning?

3. How does the misalignment between teaching and learning affect student academic performance and assessments scores?

4. How is teacher self-efficacy related to the implementation of instructional practices?

To investigate these questions, definitions of the constructs will be briefly discussed.

Constructs

Three central constructs emerged from the literature as contributing to the misalignment between teaching and learning to include instructional practices, teacher self-efficacy, and assessment for learning (see Appendix C). Instructional practices integrate appropriate context, sound available evidence, professional discernment to create learning opportunities (Spencer, Detrich, & Slocum, 2012). Teacher self-efficacy is essential to integrate effective instructional strategies (Cleary & Kitsantas, 2017). Teachers with high self-efficacy trust their ability to create masterful learning opportunities and design instruction (Bandura, 1986). Recognizing prior knowledge and integrating instructional practices into the classroom is crucial. Learning must also be assessed. Assessment for learning is student performance based on classroom testing, end of quarter grades, and standardized testing results (Carpenter et al., 2016). The constructs of instructional practices, teacher self-efficacy, and assessment for learning are integral to teaching and learning. Each construct will be explored in relation to the misalignment between teaching and learning.

Methods and Procedures

Sample and Consent

The context of this research is a K-12 American school within an overseas location. For the needs assessment, the participants included teachers, parents, and students. Race demographics of the 71 teachers was ascertained by researcher observation to include White

(69%), Black (11%), Asian (10%), and Hispanic (10%). As of May 2018, current student enrollment was 762, with more students were enrolled in the middle high school (57%) as compared to the elementary school (43%). According to the school wide electronic database, student demographics included White (58%), Asian (19%), Black (17%), Pacific Islander (2%), American Indian (2%), and decline to report (2%). No demographic information for parents was available. To measure the constructs of instructional practices, teacher self-efficacy, and assessment for learning, data was collected from six different sources to include a teacher survey, customer satisfaction survey, grade reports, standardized test scores, interviews, and a focus group.

Consent was obtained for the teacher survey by placing a permission statement at the beginning of the document. Respondents were provided with a self-addressed, stamped envelope to ensure anonymity, and teacher consent was obtained through the Doctor of Education Needs Assessment consent form (see Appendix D). A total of 65 surveys were provided to teachers, and 46 surveys were returned. The completed surveys were placed in a locked file, and electronic information was stored on a password protected device.

A link to the customer satisfaction survey was sent out by the organization via e-mail to students, parents, and staff. The customer satisfaction survey included 10% of middle high school students (N=42), 9% of parents (N=47), and 41% of teachers (N=30). The customer satisfaction survey was a secondary data source. Therefore, limited information was accessible to the researcher to include participant demographics and the process for informed consent.

Grade report information for middle high school students was collected during the first three quarters of the 2017-18 school year. Percentages of students with low grades across the three quarters were compared by documenting the total student enrollment at the end of each

quarter to include the first quarter (*N*=433), the second quarter (*N*=436), and the third quarter (*N*=431). The school counselor compiled a list of 6th – 12th grade students who earned at least one D or F on their report cards. At the end of each quarter, the school counselor e-mailed the list of students with low grades to staff.

PSAT/NMSQT information was collected for 8th – 11th grade students. Only school-wide demographic information for students was available. The PSAT was administered to 8th and 9th grade students (*N*=104), and the NMSQT was administered to the 10th and 11th grade students (*N*=135). No consent was necessary as this is a standardized test administered to all students in 8th – 11th grades.

Three teachers were asked to complete follow-up interviews, and six teachers were asked to take part in a focus group. Participants were selected based on their willingness, diverse ethnicities, and grade levels taught. Race demographics of the three teachers who were interviewed included Black (12.5%), Hispanic (12.5%), and Asian (12.5%), while the race demographics of the five focus group teachers were White (62.5%). These demographics closely mirrors the percentages of races within the staff as a whole: White (69%), Black (11%), Asian (10%), and Hispanic (10%). Additionally, one teacher was selected to interview from each school (e.g., one from elementary, one from middle school, and one from high school), while focus group respondents were all middle high school teachers. All teachers signed a consent to participate (see Appendix D) prior to the interview or focus group.

Instruments

Classroom Practices Inventory for Teachers. In order to measure instructional practices, teacher self-efficacy, and assessment for learning, the researcher developed the Classroom Practices Inventory for Teachers (CPIT; see Appendix E). The CPIT was created by

merging information from existing instruments such as the Metacognitive Awareness Inventory for Teachers (MAIT; Balcikanli, 2011), The Survey of Effective Classroom Management Strategies (Ficarra & Quinn, 2014), and a survey developed by Reeves (2017) to measure the data use practices of teachers. The survey was divided into two parts consisting of 13 statements (Part A) and two questions (Part B). The statements in Part A included items related to instructional practices, self-efficacy, and assessment for learning. A 5-point Likert scale was used to rate statements, ranging from 1-Strongly Disagree to 5-Strongly Agree. Part B included two items in which respondents were requested to 1) rate the importance of elements in instructional planning, and 2) provide percentages of time dedicated to instructional preparatory activities. All teachers were provided with the opportunity to complete the CPIT.

To measure content validity of the questions, cognitive interviews were conducted prior to finalizing the survey items. As participants provided thoughtful feedback, the survey items were amended. The questions and feedback gained from the participants in the cognitive interviews assisted the researcher with modifying the survey items to reflect a higher-quality of items to be presented to elementary, middle, and high school staff members. Because the survey was developed through the merging of existing instruments, reliability was measured using Cronbach's Alpha, which ranged from acceptable to high for the three constructs. Assessment for learning was determined to have acceptable reliability (0.66) while instructional practices had good reliability (0.76). Additionally, teacher self-efficacy had high reliability (0.81). An overview of the CPIT (e.g., constructs, scale, number of items, participants, sample question) is available in Appendix F. Data analysis of the CPIT was useful in determining whether or not instructional practices, self-efficacy, and assessments impact teaching and learning within the school's context.

Preliminary Scholastic Assessment Test/National Merit Scholarship Qualifying Test data. In order to determine student proficiency with language arts and math concepts within the current setting, data was gathered from the results of the Preliminary Scholastic Assessment Test/National Merit Scholarship Qualifying Test (PSAT/NMSQT) administration. Scores for students in 8th through 11th grades were collected to determine the percentage of students that met the standard for Evidence-based Reading and Writing (ERW) and Math. According to the College Board Research Report (2010), the PSAT/NMSQT is a reliable and valid measure for reporting student performance. The 8th and 9th grade scores ranged from 120 to 720 points for each test, and the 10th and 11th grade scores range from 160-760 for each test. For the ERW and math tests, students receive a numerical score and either a met or not met classification. Benchmarks for each grade level and subtest are as follows:

- 8th grade: ERW-390, Math-430
- 9th grade: ERW-410, Math-450
- 10th grade: ERW-430, Math
- 11th grade: ERW-460, Math-510

The analysis of PSAT/NMSQT scores assisted with determining how many students were underperforming, which provided a way to understand whether or not there was a misalignment between teaching and learning.

Quarterly grade report. In order to determine whether students in grades six through twelve mastered content presented in the classroom, quarterly grade reports were examined. At the end of each quarter, a report was created which documented the names of students who received at least one D or F on their report card. This grade report provided an overview of the number of students who were at a risk of failing their classes. While research is sparse regarding

the relationship between grades and learning, grades are predictive of life outcomes (Borghans, Golsteyn, Heckman, & Humphries, 2016; French et al., 2015) and are one indicator of whether instruction results in learning. Review of the grade report assisted with determining the pervasiveness of student failures and was an indicator of whether or not teacher instruction resulted in student learning.

Customer satisfaction survey. In order to measure the beliefs of stakeholders regarding academics in the school context, the school sent a customer satisfaction survey to parents, students, and teachers. The survey is provided to stakeholders on a bi-yearly basis. It measures the broad categories of academics, communication environment, school safety, overall, and professional development on a 5-point Likert scale.

Statements were chosen from the California Healthy Kids Survey and the California School Climate Survey to comprise the academic, communication, school safety, and professional development domains; however, no information is available regarding why specific items were chosen for inclusion in the customer satisfaction survey. According to the WestEd website (2018), both the California Healthy Kids Survey and the California School Climate Survey are reported to be high in reliability and validity. The number of statements provided to each respondent group varied depending on the appropriateness of the information for the specific population. However, there were approximately four statements related to academics, 13 statements related to communication and environment, six statements concerning school safety, three overall statements, and nine statements related to professional development. The examination of the results of the customer satisfaction survey provided insight into the perceptions of student learning as perceived by each participant group.

Teacher interviews. In order to gather qualitative information from the participants regarding instructional strategies, assessment for learning, and self-efficacy constructs, three teachers were selected for follow-up interviews to include one elementary, one middle, and one middle high school teacher. The researcher created 15 interview questions (see Appendix G), which was divided into five parts. The interviews included three questions from each of the following categories: informative questions related to time in service and subjects taught, instructional strategies, and assessments. Additionally, six questions were related to teacher self-efficacy were also included. Teacher interview information provides a qualitative element to the mixed-methods design. This is important because data from the surveys provided limited evidence related to teachers use of instructional strategies, assessments for learning, and teacher self-efficacy. The teacher interviews allowed the researcher to gather additional data and gain deeper insights into the constructs associated with teaching and learning.

Focus group. In order to clarify information from the survey and interview responses, a small group of teachers were asked to participate in a focus group. The focus group was necessary because data from the surveys was limited in scope and because clarification was still needed regarding the use of instructional practices and assessments for learning in the classroom. Due to the possibility of false positive responses on the survey, information gleaned from a focus group was necessary to accurately answer the research questions. Additionally, more specific information was needed to determine how instructional practices were implemented and how teachers assessed for learning. Therefore, using the sequential mixed-methods design, 10 follow-up questions were created to clarify survey and interview responses (see Appendix H). The focus group allowed the researcher to clarify information from the surveys and interviews and gain

deeper insights into the instructional practices and assessments for learning currently used by the teachers in the classroom.

Data Collection

Within this section, the data collection methods will be described. This will include how the instruments were administered and how the data collection plan was implemented. Data collection procedures will be described for the CPIT, PSAT/NMSQT, grade reports, interviews, and the focus group. All of the data collected was downloaded to a password protected computer, and hard copies were printed and kept in a locked file cabinet.

Classroom Practices Inventory for Teachers. To measure instructional practices, teacher self-efficacy, and assessment for learning, the researcher administered the Classroom Practices Inventory for Teachers (CPIT). The surveys were color coded for each school level (e.g., elementary, middle, and high) to enable a separate analysis of teachers responses by the varying levels. Permission to administer the survey was granted by the educational organization. In June 2018, surveys were personally provided to each respondent.

To ensure compliance with the Institutional Review Board (IRB) protocol, a statement was placed at the beginning of the survey. This statement explained that participant responses would be kept "completely anonymous," participation was voluntary, and they could withdraw at any time (see Appendix E). The participants were provided with a paper copy of the CPIT, a 10-day timeframe for survey completion, and a self-addressed, stamped envelope, in which the competed survey was mailed back to the researcher. To procure a high response rate, a follow-up e-mail reminder was provided one week after the survey was distributed to the respondents.

Preliminary Scholastic Assessment Test/National Merit Scholarship Qualifying Test data. To determine student proficiency with language arts and math concepts within the current

setting, existing data from the results of the Preliminary Scholastic Assessment Test/National Merit Scholarship Qualifying Test (PSAT/NMSQT) were gathered. The data from the standardized test scores was procured from a shared drive on the school's intranet. The PSAT/NMSQT data was documented on a spreadsheet to include student scores on the ERW and math sections of the test. Additionally, the spreadsheet also provided documentation regarding whether or not the students had met the ERW and math benchmarks for specific grade levels.

Quarterly grade report. To determine whether students in grades six through twelve mastered content presented in the classroom, existing data from quarterly grade reports was collected. The data was procured from e-mails sent to the middle high school staff. A spreadsheet containing data regarding the number of students that had received a D or F for quarters one, two, and three of the 2017-2018 school year was downloaded to a password protected computer. Additionally, publicly available enrollment information was downloaded so that accurate percentages of students receiving a D or F each quarter could be calculated.

Customer satisfaction survey. To measure the beliefs of stakeholders regarding academics within the school, publicly available results from the customer satisfaction survey were obtained from the internet. This survey was administered during the spring of 2017, and results for parents, students, and teachers (see Appendices I, J, and K) were downloaded to include response rates. The customer satisfaction survey provided insight into the belief differences held by the different groups regarding academics, communication environment, school safety, overall, and professional development. Responses to the survey questions within the academic domain were targeted to gather specific information aligned to the research questions.

Teacher interviews. To gather qualitative information from the participants regarding the constructs of instructional strategies, assessment for learning, and self-efficacy, one elementary, one middle, and one middle high school teacher participated in follow-up interviews in June 2018. Written consent was obtained from the participants prior to the interviews. Teachers were provided with a hard copy of the 15 questions (see Appendix G), and the face-to-face interviews were conducted by the researcher for approximately 45 minutes each. Occasional follow-up questions were asked for clarification the participants' responses the structured questions. During the interviews, member checking ensured the validity of responses by ensuring that the research was accurately understanding the message conveyed by participants. Each interview was audio recorded and was later transcribed by the researcher.

Focus group. To clarify information from the survey and interview responses, additional qualitative information was obtained from a small group of teachers. In August 2018, five middle high school teachers, four females and one male, were invited and attended the focus group. Written consent was obtained from the participants, and the face-to-face group discussion was led by the researcher was approximately 60 minutes in length. Member checking was utilized by asking follow-up questions throughout the session to ensure the researcher gained an accurate understanding of the information provided by the participants. The focus group discussion was audio recorded, and the information was later transcribed by the researcher. Once the focus group was completed, the data collection process was concluded.

Initial Summary of Results

The initial summary of results included analyzing data from the teacher practices survey (CPIT), PSAT/NMSQT results, quarterly grade report, customer satisfaction survey, teacher interviews, and focus group. The CPIT was analyzed according to the identified constructs of

instructional practices, assessment for learning, and teacher self-efficacy. PSAT/NMSQT and the quarterly grade report information were examined to determine current levels of student academic achievement within the middle high school. The customer satisfaction survey was studied to better understand the beliefs of parents, students, and teachers related to academics within the school. Last, the interviews and focus groups were examined to gain deeper insights into the constructs of instructional practices, assessment for learning, and teacher self-efficacy than could be ascertained from the survey alone. The results from each data source was analyzed and considered in comparison to each additional data source to answer the aforementioned research questions. Information obtained from each data source will be examined.

Classroom Practices Inventory for Teachers

Data for the Classroom Practices Inventory for Teachers (CPIT) was analyzed using the Statistical Package for the Social Sciences (SPSS). The number of participant responses varied by construct due to ambiguous choices on the paper survey as indicated by instructional practices (N=44), assessment for learning (N=46), and teacher self-efficacy (N=45). A factor analysis of the constructs of instructional practices, assessment for learning, and self-efficacy was completed, and survey items three and five were removed from the analysis of data to improve reliability. Assessment for learning was determined to have acceptable reliability (0.66), while instructional practices had good reliability (0.76), and teacher self-efficacy had high reliability (0.81). Therefore, when analyzing the data in relation to answering the research questions, each construct was determined to be a reliable source (see Table 2).

The mean frequencies of the constructs were highest for instructional practices (19.27) and self-efficacy (17.13), and lowest for assessment for learning (12.00). Therefore, teachers rated themselves highly with utilizing instructional practices in the classroom and with

confidence in their ability to implement EBPs. They rated themselves lower with using assessments for learning. The standard deviations for all constructs was <1, which indicated a low response variance and general agreement among the respondents regarding their ratings.

Table 2

Constructs, Items, Reliability, Standard Deviations, and Number of Responses for the Classroom Practices Inventory for Teachers

Construct	Item Numbers	*N*	α	M	SD	CV
Instructional Practice	1, 9, 12	44	0.76	19.27	2.99	0.16
Assessment for Learning	4, 6, 7, 10	46	0.66	12.00	2.21	0.18
Teacher Self-efficacy	2, 8, 11, 13	45	0.81	17.13	2.73	0.16

When examining the descriptive statistics, the means of each construct appeared to be inflated, possibly due to the anonymous, self-report method of the survey. To investigate this further, means of individual items were analyzed. As indicated in Table 3, respondents rated themselves most highly with designing appropriate instructional activities (4.57), providing students with frequent opportunities to respond (OTR; 4.52), implementing EBPs (4.39), utilizing performance feedback (4.30), and using higher-order questioning (4.28). Additionally, respondents rated themselves as having the most difficulty with using Active Student Responses (ASRs; 3.49), utilizing individual interventions with students (3.61), and understanding students' prior knowledge (4.02). Although this information has some merit for determining for which EBP teachers are most comfortable (e.g., designing instructional activities, OTR, and performance feedback) and for determining for which EBP teachers are most uncomfortable (e.g., active student responding and individual student interventions), the Likert scale presented

in the survey does not allow for participants to provide information as to how often these particular strategies are used and in what contexts.

Table 3

Constructs, Items, and Means for the Classroom Practices Inventory for Teachers

Construct	Item Numbers	Item Categories	M	SD	Variance
Instructional Practice	1	Prior Knowledge	4.02	0.93	0.87
	9	OTR	4.52	0.78	0.61
	12	Performance Feedback	4.30	0.87	0.75
Assessment for Learning	4	Questioning	4.28	0.83	0.69
	6	Individualized Interventions	3.61	1.11	1.22
	7	ASRs	3.49	1.31	1.71
	10	Measure Growth	4.11	0.97	0.94
Teacher Self-efficacy	2	Using Student Data to Inform Instructional Planning	4.16	0.93	0.86
	8	Design Activities	4.57	0.78	0.61
	11	Modify Instruction	4.04	0.92	0.84
	13	Utilize EBPs	4.39	0.75	0.56

The results of the CPIT analysis were utilized to gain an understanding of teachers' use of instructional practices and assessment for learning, determine the level of teacher self-efficacy with using EBPs, and form questions presented within a focus group. The focus group questions were designed to delve deeper into why teachers rated themselves so highly with providing students with frequent OTR, implementing EBPs, utilizing performance feedback, and using higher-order questioning. Data analysis of the CPIT also informed focus group questions

regarding how often EBPs were used and how individual student interventions were utilized within the classroom. Therefore, data analysis of the CPIT provided quantitative information related to instructional practices, assessment for learning, and teacher self-efficacy and informed the creation of focus group questions to gain deeper insights into these constructs.

Preliminary Scholastic Assessment Test/National Merit Scholarship Qualifying Test

Data for the Preliminary Scholastic Assessment Test/National Merit Scholarship Qualifying Test (PSAT/NMSQT) was analyzed using measures of central tendency to explore the academic needs of students within the current professional context. These measures provided the percentage of students in 8th – 11th grades that met the Evidence-Based Reading and Writing (ERW) and math benchmarks. A visual analysis of the data presented in Figure 3 indicates that a larger percentage of students met the ERW standard (71.13%) when compared to the math standard (44.35%) for both groups. Additionally, not even half (41.84%) of the students met both the ERW standard and the math standard. This analysis of student performance points to a

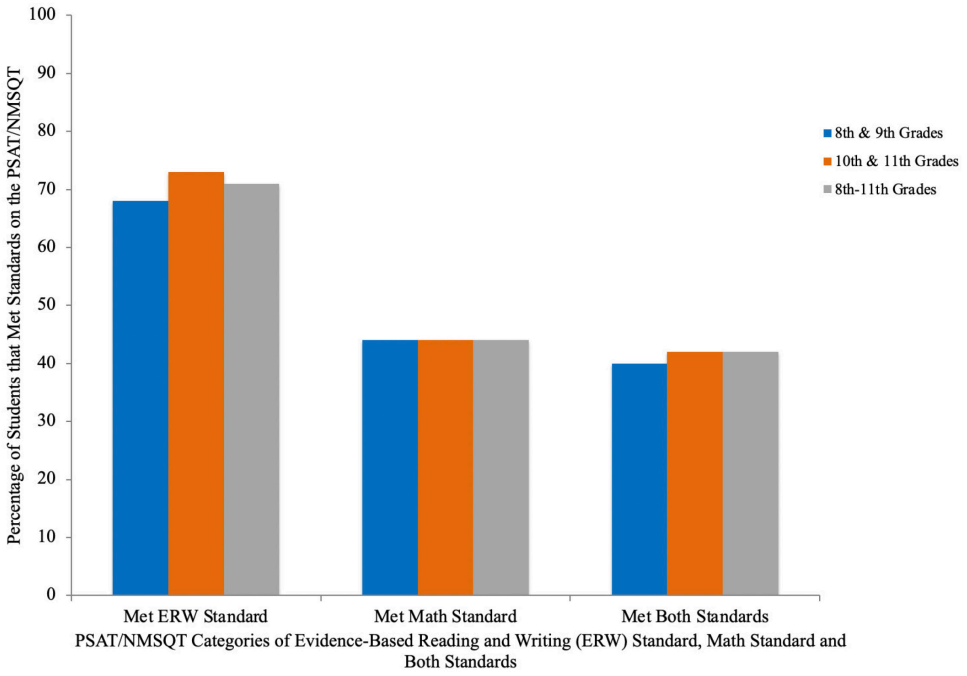

Figure 3. Percentage of 8th – 11th grade students that met standards on the PSAT/NMSQT.

misalignment between teaching and learning because, although the teachers indicated proficiency on the CPIT with EBPs such as designing instructional activities and providing performance feedback, less than half of the students met performance standards for both ERW and math.

Grade Report

Data of the grade reports were analyzed with measures of central tendency regarding the percentage of students that received a D or F on their quarterly report card. When a student receives a D or F on their report card, it indicates that a mastery of the standards was not achieved. The data was collected three times during the school year (e.g., November, January, March), and the mean frequencies were compared (see Figure 4). At the end of the first quarter, 24% of the students received a D or F, as compared with 23% of students at the end of the second quarter, and 29% of the students at the end of the third quarter. The mean data across

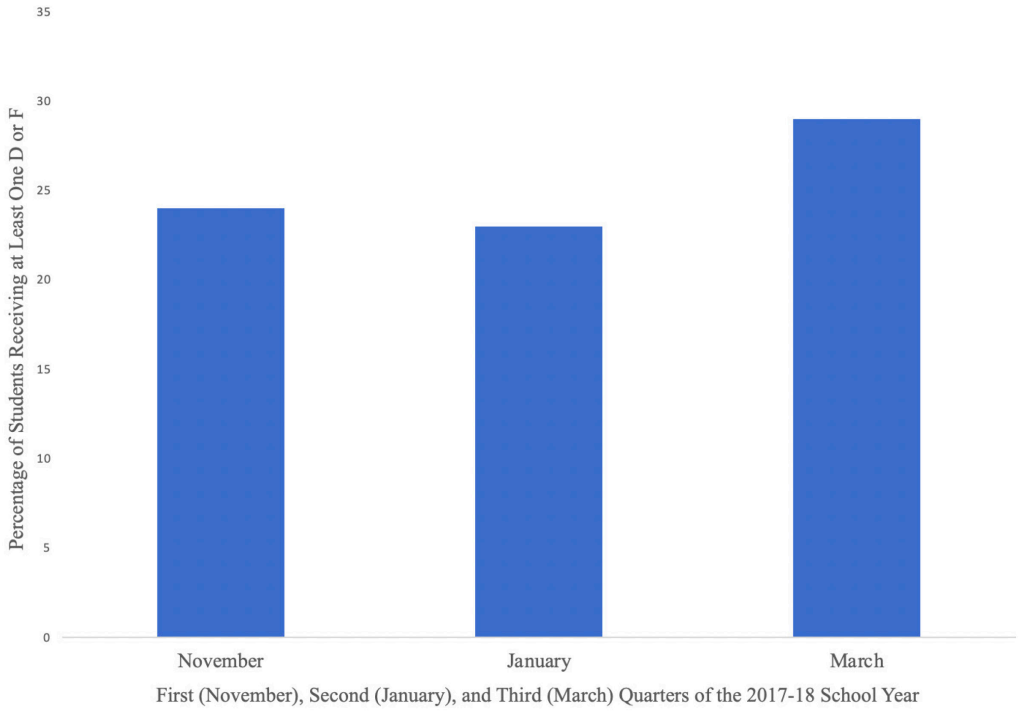

Figure 4. Percentage of students who received at least one D or F during each report card cycle.

middle high school students indicates that one quarter of students (25.33%) received at least one D or F during the first three quarters of the 2017-18 school year. This information indicates a misalignment between teaching and learning because, although the teachers are presenting the grade-level content, approximately one quarter of the students are not demonstrating knowledge of the content, as measured by grade reports.

Customer Satisfaction Survey

The customer satisfaction survey was analyzed for teachers, parents, and students to determine how satisfied the participants were with the school's promotion of academic and future success. Means were compared on two items from the academic category (see Figure 5). The first item, promoting academic success for ALL students, was reported as agree or strongly agree for parents (60%), teachers (56%), and students (36%). The second item, learning what he

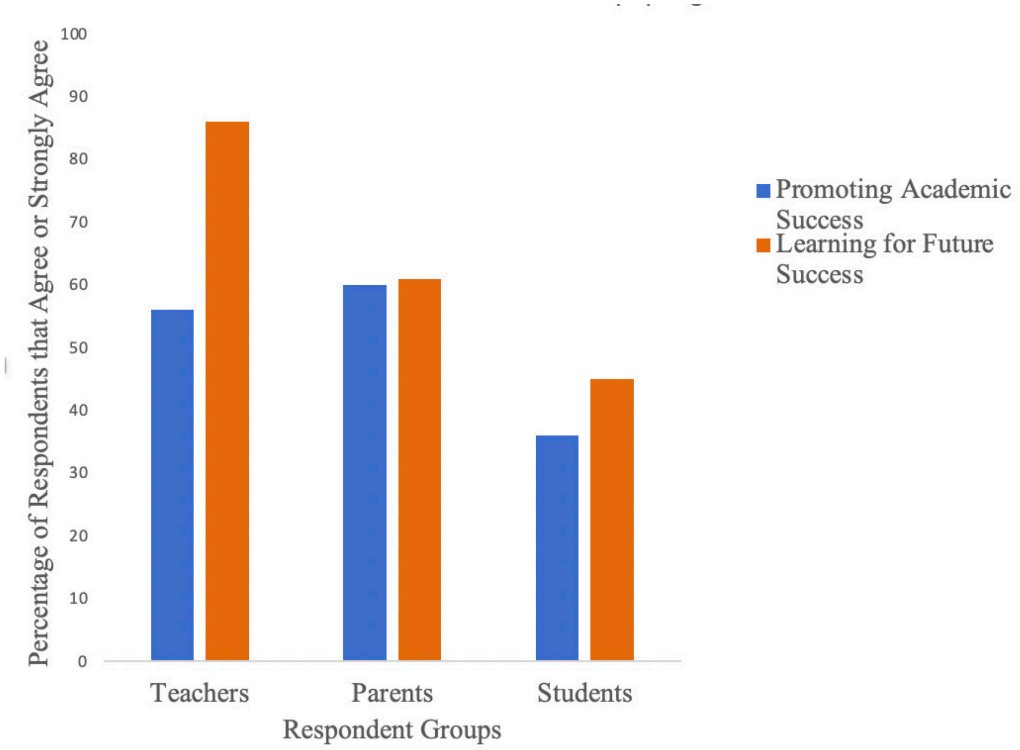

Figure 5. Customer satisfaction survey: Promoting academic success and learning for future success.

or she needs to know for future success, was reported as agree or strongly agree for parents (61%), teachers (86%), and students (45%).

The data analysis indicated that students scored academic success (36%) and future success (45%) the lowest of all three participant groups, which may be attributed to low student self-efficacy or a reality that students understand but of which adults are not aware. When the data is collapsed for all three respondent groups across categories, 57.3% of participants indicate that they agree or strongly agree that academic and future success is promoted within the school and in the future. This means that over one-third of respondents do not believe that academic and future success is promoted within the school and further points to a misalignment between teaching and learning.

Teacher Interviews

The researcher transcribed the teacher interviews using a deductive coding process, in which themes were developed by the researcher prior to the fieldwork (Miles, Huberman, & Saldana, 2013). Additionally, descriptive coding was used to categorize codes according to nouns or short phrases. Each of the teacher interviews were analyzed according to the themes of EBPs, teacher self-efficacy, and assessment for learning.

Assessment for learning. During the interviews, teachers described the use of a variety of assessments for learning to include thumbs up/thumbs down, checks for understanding, homework, exit tickets, communication, journals, games, centers, quizzes, and tests. It is evident that teachers use a variety of assessments. However, some of the described assessment techniques may actually not provide the teachers with a clear picture of student knowledge. Information from the three teacher interviews will be described to provide clarification on how teachers assess for student learning.

When asked how teachers assess for learning, one teacher explained that she asks students to "stand up if you understand this concept and sit down if you don't." This is problematic because this technique does not truly measure student knowledge. This technique may measure whether or not students think they understand, want to impress their teacher, or simply prefer to move on to a different topic. Another teacher indicated that he assesses for learning by reviewing "what they [district office] kind of tell me I need to look at, which is beginning, middle, and end tests." This technique points to confusion between district level directives and school level practices and indicates the need for PD to clarify best practices for assessing learning in the classroom. A third teacher indicated the use of a system of homework, exit tickets, and end of chapter tests to assess learning, all of which are graded for accuracy. Based on this information, she is able to assess current knowledge and "modify and adjust" instruction accordingly. Therefore, teachers implement a variety of assessments for learning, information from the interviews indicates the need for PD to refine and create a systematic process for increasing teachers' understanding of students' current level of knowledge.

It is evident that, while one teacher utilized a systematic approach for assessing knowledge, two of the teachers did not. The teachers recognized that assessing for learning is important. However, some confusion exists regarding what to assess, how to assess, and how to use the data to inform instruction.

Evidence-Based Practices. During the interviews, teachers indicated that they used a variety of Evidence-Based Practices (EBPs) to include determining prior knowledge, essential questions, lecture, note taking, peer editing, annotations, summarizing, immediate feedback, modifying content, modeling, and repetition. Strategies used most often included matching the instructional level to student need, one-on-one instruction, graphic organizers, and questioning.

Specific anecdotes from each teacher will be discussed related to the EBPs of prior knowledge, one-on-one instruction, and questioning.

One teacher explained that she determined prior knowledge by engaging the students in a class discussion about the topic of interest. She explained that this strategy allows her to know "if the kids are into [the topic], know [the topic], don't know [the topic]." However, a group discussion may not capture the prior knowledge of all students but may only provide information known by just a few students that volunteered to participate in the group discussion. Another teacher indicated that he would prefer to utilize EBPs to a greater extent within the classroom, but "the issue is time." This teacher explained that it is challenging to work one-on-one with students because the time is not available. A third teacher indicated that she does not determine students' prior knowledge but does use questioning and wait time to enable "each student [to] participate." This teacher explained that more effective PD is needed to enable her to utilized instructional strategies to a greater extent in the classroom. While the teachers indicated their use of a variety of EBPs, issues with appropriate implementation of the strategies, time management, and additional training may be necessary.

Although teachers reported the use of a variety of EBPs, improvement with the fidelity of implementation is warranted. Teachers explained that they need additional time and professional development to integrate EBPs to a greater extent in the classroom. Information from the teacher interviews indicate a misalignment between teaching and learning because, although the teachers try to utilize EBPs, they do not always use them appropriately or have the time to incorporate them into instruction. Therefore, a need for professional development exists to provide teachers with a deeper understanding of how to effectively implement EBPs into the classroom.

Self-efficacy. The teachers were interviewed to ascertain their level of self-efficacy with EBPs and using data. During the interviews, teachers were asked to describe their level of confidence with using a variety of EBPs and with using student data (e.g., assessing for learning). Teacher responses revealed definite differences regarding their confidence levels with implementing EBPs and using student data. Insights from the teacher responses will be discussed.

When asked about her level of confidence with using EBPs, one teacher explained that the school's curriculum shows "what students should learn." This response indicated a lack of understanding with incorporating research-based strategies into the classroom. Additionally, when asked about her confidence with using student data, she discussed the need to ensure that the students are in the B and C range, "'cause that's passing." Both responses indicated a low level of self-efficacy with implementing instructional strategies and using student data to provide effective teaching and learning opportunities. A second teacher explained that he was "pretty confident" with using EBPs but wasn't sure if he actually used them. Regarding his self-efficacy with using student data, the teacher explained that he "would have confidence with doing so" but did not use data often. Additionally, he explained that he would love a "good, quick way and training for how to use data efficiently." Another teacher explained that she did not "have a very good level of confidence with using a variety of evidence-based practices." She also indicated the need for PD to assist her with implementing EBPs and using student data. Information gathered from the teacher interviews indicated teachers' either had low self-efficacy with implementing EBPs and using student data or had high self-efficacy but did not utilize EBPs or student data.

Therefore, while one teacher expressed a high level of confidence with implementing EBPs and student data, the other teachers did not. It is possible that a teacher's confidence with implementing EBPs or using student data may be based on a misunderstanding of how to implement EBPs and use student data. Professional Development may mediate this misinformation, and coaching may provide the needed teacher supports throughout the implementation process. Therefore, the misalignment between teaching and learning points to a need for PD regarding EBPs and assessing for learning.

Focus Group

A focus group was conducted in August 2018, which was comprised of five teachers from the middle high school. Follow-up questions were asked of the participants to receive explanatory feedback on data received from the CPIT survey, the customer satisfaction survey, and the teacher interviews. The researcher transcribed the teacher interviews using deductive coding, in which themes were developed prior to the focus group (Miles et al., 2013). Additionally, emergent coding was used to analyze the codes within the themes and assist with interpreting the meaning of the data. Themes included assessment for learning, EBPs, and self-efficacy.

Assessment for learning. According to the focus group, teachers use a variety of assessments to include pre and posttests, exit tickets, thumbs up or down to indicate understanding, partner explanations, quizzes, retakes, and reviews. During the discussion, one teacher indicated that "if they get it, we can move on. If they are not getting it, someone else can help them." However, there was no indication of the criteria necessary to ensure sufficient student learning had occurred or the process that was involved with providing peer assistance. Another teacher indicted that she assessed student learning by doing some kind of activity to "get

a handle" on what the students' know at least every other class period. However, this comment lacked specificity regarding the kinds of activities used for assessment and a criteria for determining whether or not the students' current level of knowledge is sufficient. Although the teachers indicated they had a plethora of different assessments, there was no indication of a systematic approach to when they were used, why they were chosen, or an analysis of the information received to inform further instruction.

Evidence-Based Practices. During the focus group, teachers provided examples of the Evidence-Based Practices (EBPs) typically used in their classrooms. These EBPs included group activities, peer discussions, active student responses, individual study sessions, class discussions, vocabulary lessons, and Kagan structures (e.g., timed pair share, round robin, etc.). The teachers needed EBPs to be defined at the beginning of the discussion. This indicated that, although the teachers were using a variety of instructional practices, they may need clarification on exactly which practices are evidence-based and which practices actually assist them in assessing for learning and making instructional decisions. Additionally, there was a discussion regarding how often each student responds within a class period. The teachers believed that students' responses ranged from one time per class to 25 responses per class. However, it was discovered that the teachers did not have specific data and were truly unsure of the number of responses per student per class period. Additionally, the teachers indicated that, although the students may be responding multiple times throughout the class period, the teachers did not necessarily know which students needed additional assistance and were surprised "every time" at the outcomes of summative assessments.

Self-efficacy. During the focus group, teachers were not specifically asked about their level of confidence with implementing EBPs and using student data. However, teachers that

were perceived as more confident with these practices typically provided lengthier explanations than those that were less-confident. Teachers did indicate the need for PD and coaching to ensure that they were provided with the necessary instruction and support to implement the instructional practices.

Information from the focus group indicates teachers' use of EBPs and assessments for learning is varied. Teachers do not embrace EBPs and assessment for learning, but, instead, provide information that indicates confusion regarding these best practices. In fact, teachers indicate that there is little systematic use of when or why assessments are administered to students. Additionally, although the teachers indicated they were incorporating EBPs, they indicated ambiguity regarding which practices were actually evidence-based. Therefore, the wide variance with which EBPs and assessment for learning are implemented, as well as the confusion regarding how and why to implement these practices, point to a misalignment between teaching and learning.

Discussion

Several possible limitations exist with regard to this needs assessment study. First, the research is situated within one context, including a specific population of teachers and students. Replications will need to be completed within a variety of contexts and populations to determine the generalizability of the findings. It is likely that the findings from this needs assessment will be commensurate with other schools within the same school system. Second, the sample size is relatively small (e.g., 46 teachers), which also creates difficulty with generalizing the findings across populations. Additionally, it is difficult to measure ongoing academic performance. Within the current study, quarterly grade reports are one indicator of academic performance; however, correlations between academic performance and learning are weak.

Needs Assessment Significance

This research is significant because, although associated factors with the misalignment between teaching and learning occur in each of the EST levels, actionable factors occur within the microsystem. Day-to-day educational decisions made by the teacher have a close impact on teaching and learning. The literature clearly states that evidence-based practices (Cooper et al., 2018), assessments for learning (Brink & Bartz, 2017; Cotton, 2017) and teacher self-efficacy (Cleary & Kitsantas, 2017) are important elements in student learning. However, within the current context, the needs assessment indicated that PD and ongoing coaching should be explored related to EBPs, assessment for learning, and teacher self-efficacy. Knowledge of evidence-based practices and assessment for learning does not necessarily increase the quality of instruction. However, an increased understanding of how to implement EBPs may increase teacher self-efficacy and provide a deeper understanding of the misalignment between teaching and learning. Therefore, given the need for increased teacher self-efficacy with implementing EBPs and assessing for learning, it would be important to further study specific EBPs that increases teachers' knowledge of students' current level of understanding with taught information. Therefore, the question of whether the implementation of specific EBPs can mediate the misalignment between teaching and learning must be answered.

Chapter 3

Strategies that Support Teaching and Learning

Throughout developing nations, reading and math scores are used to measure educational outcomes across individuals. In the United States (US), students' reading and math achievement scores are concerning. In 2003, according to the Program for International Student Assessment (PISA), the US was ranked 28th in math and 18th in reading (Organisation for Economic Development, 2004) when compared to other developed countries. In 2018, PISA results ranked the US 13th in reading and 37th in math (Organisation for Economic Development, 2019), which indicates a decline in math and slight improvement in reading over the last fifteen years.

Interestingly, according to the National Center for Education Statistics in 2014, the US was the 4th highest for student expenditures but was ranked well below the top ten countries in math and reading achievement. Since the US is in the top five countries for educational expenditures, reading and math rankings would be expected to be consistently higher. Although the vast majority of the US expenditures in education is related to salaries and benefits for staff (80%), additional monies are utilized to purchase services (11%) to include food, janitorial services, transportation, and teacher Professional Development (PD), and supplies (8%), which contains items such as textbooks and heating oil (National Center for Education Statistics, 2014). According to Baker (2016), "money does matter" (p. 19) in education. When a greater amount of money is available, there is more money to spend on high quality educational opportunities. It begs the question, why does the US have a decline in math and only slight improvement in reading rankings over the past fifteen years when the US is in the top five countries of highest student expenditures?

The Problem: Misalignment Between Teaching and Learning

It is hypothesized that the decreased US achievement score rankings are due to a misalignment between teaching and learning. This misalignment hypothesis is defined as a mismatch between teacher instruction (teaching) and student knowledge (learning; Zhao, 2016). Conditions contributing to misalignment are 1) misidentification of students' prior knowledge (Dávila, 2015; Lee & Chen, 2014; Vygotsky, 1978); 2) instructional tasks mismatched with learner needs (Abrams et al., 2016; LeMire et al., 2012; Wachob, 2015); and 3) assessment results indicating lesson objectives are not being learned (Brink & Bartz, 2017; Cotton, 2017) which suggest a misalignment loop. When assumptions about student prior knowledge are incorrect, instructional tasks, which are designed based on student assessment results, are not aligned to the learner's needs. This lessens the likelihood that the designed lesson objectives will be learned.

Factors: Evidence-Based Practices, Teacher Self-efficacy, Diversity of Learning Needs

As outlined in chapter one, the misalignment between teaching and learning was explored using the Ecological Systems Theory framework (Bronfenbrenner, 1994, 2006) and revealed contributing factors such as the role of evidence-based practices (EBPs), teacher self-efficacy, and diverse student needs. EBPs establish a "relation between specific practices and measured outcomes" (Schalock et al., 2017, p. 115), and teacher self-efficacy is the teacher's perception that they can confidently develop high-quality learning situations (Bandura, 1993). According to the United States Department of Education (2016), student outcomes improve significantly when EBPs are integrated into instruction. Additionally, teachers' perceptions of self-efficacy are necessary for implementing effective teaching practices (Cleary & Kitsantas,

2017). EBPs and high teacher self-efficacy are integral to teaching and learning, and both are affected by diverse student needs.

Over the past 50 years, diverse learners have grown to include students with learning challenges, giftedness, second languages, emotional issues, and behavioral difficulties (Department of Education, 2011). This diversity negatively impacts student engagement (Reschly & Christenson, 2006) and causes additional challenges with matching instructional tasks to specific learning needs (Vygotsky, 1978). Diverse learning needs require teachers to be self-efficacious with integrating effective EBPs to meet a wide range of student needs. When teachers lack self-efficacy with implementing EBPs to meet diverse student needs, a misalignment between teaching and learning can occur.

Evidence of the Problem

A needs assessment, conducted in the spring of 2018, explored the concept of a misalignment between teaching and learning within a K-12 American school. First, mean scores from the Classroom Practices Inventory for Teachers (CPIT; see Appendix E), administered on a 5-point Likert scale ranging from 1 (strongly agree) to 5 (strongly disagree), revealed teachers (N=46) believe they are adept with providing Opportunities to Respond (OTR; M=4.52) but less proficient with integrating Active Student Responses (ASRs; M=3.49). This indicated either a misunderstanding of the relationship between OTR and ASRs or a teacher self-report bias. Second, grade reports revealed that over the three quarters, 25% of secondary students received at least one D or F on their grade report, which suggested that the course content had not been mastered for at least one quarter of students. Third, results of the Preliminary Scholastic Assessment Test/National Merit Scholarship Qualifying Test (PSAT/NMSQT; see Appendices A and B) indicated that students (N=239) had difficulty with meeting both the Evidence-based

Reading and Writing and the math standard. Less than half of the students (42%) met both standards, which pointed to a misalignment between teaching and learning. Fourth, parents (*N*=49), teachers (*N*=30), and students (*N*=42) completed a Customer Satisfaction Survey (see Appendices G, H, and I), which revealed a higher percentage of both parents (60%) and teachers (56%) believed academic success was promoted at school as compared with students (36%). This means that, although the majority of parents and teachers perceived academic success was occurring at the school, the majority of students, who are considered the target population, did not believe they were academically successful. Because the majority of parents and teachers believed academic success was already promoted at the school, the need to improve teaching and learning may be viewed as unimportant. The data gathered by the needs assessment indicated decreased teacher proficiency with ASRs, low student grades, unmet standards on assessments, and student beliefs that academic success was not promoted at the school, which all contribute to the misalignment between teaching and learning.

Additional measures were conducted, using a subset of the teacher population from the CPIT, to include three teacher interviews and a focus group (*n*=6), to further explore the constructs of instructional practices, teacher self-efficacy, and assessment for learning. Concerning instructional practices, teachers explained they were uncertain with identifying EBPs, have no systematic process for determining student prior knowledge, and were "always" surprised with test results. Regarding self-efficacy, teachers indicated ambiguity with how to implement EBPs in their classrooms. Additionally, when investigating assessment for learning, teachers revealed that students are asked to rate their own level of understanding, which may provide false positives or false negatives. Overall, teachers identified uncertainty with implementing EBPs and based assessment for learning on student self-report. Both factors

contribute to the mismatch of objectives to learning needs and provides further evidence of a misalignment between teaching and learning.

When analyzing the needs assessment data, multiple indicators suggest a misalignment between teaching and learning across all grades and contents. These indicators include: 1) student prior knowledge was not systematically identified, 2) teachers were not proficient with implementing ASRs or demonstrated self-report bias on the CPIT, 3) grade reports and PSAT/NMSQT indicated a lack of content mastery, as one-quarter of the students received at least on D or F and over half of the students did not meet the ERW and math benchmarks on the PSAT/NMSQT, 4) the customer satisfaction survey indicated a discrepancy between teacher and student beliefs related to academic success, and 5) teacher ratings were high regarding self-efficacy, EBPs, and assessment for learning, which did not align with the other assessment results. For example, although teachers rated themselves high with self-efficacy and the implementation of EBPs, teacher responses during interviews and the focus group indicated teacher confusion with identifying and implementing EBPs. Additionally, teachers rated themselves high with assessing for learning; however, this rating is not aligned with the percentage of students with low grades and unmet standards on assessments. It was evident that, although teachers rated themselves highly with self-efficacy, EBPs, and assessment for learning on the CPIT, additional data sources provided contradictory information indicating a misalignment between teaching practices and learning outcomes.

The proposed intervention addresses the problem of misalignment by providing teachers with PD and coaching that is focused on integrating two specific EBPs into classroom instruction: ASRs and Spaced Practice (SP). ASRs are defined as questions presented to students throughout a lesson and SP is defined as thoughtfully scheduled assessments to increase

retention of information. Both ASRs and SP were the EBPs chosen to address the needs assessment results that indicated teachers were often surprised that the students had not learned objectives taught in class. The implementation of ASRs and SP strategies will address this gap by providing teachers with better understanding each students' current level of mastery throughout the instructional unit. It is hypothesized that when teachers are provided with the information and support to implement ASRs and SP, their self-efficacy will also be positively impacted. Therefore, the PD and coaching intervention for the implementation of ASRs and SP will provide teachers with information and confidence necessary to better match instructional tasks with learner needs and result in improved student outcomes.

The target population for the proposed intervention is secondary teachers because teachers must ensure that students at the secondary level are prepared to be college and career ready. According to Morgan, Zakhem, & Cooper (2018), students that participate in challenging coursework in high school are more likely to attend, participate, and graduate from college. Therefore, it is imperative that we provide appropriate, challenging learning experiences for all students at the secondary level. To do this, teachers must be able to ascertain the current level of knowledge for each student. This intervention will provide a solution to the problem of the misalignment between teaching and learning by giving teachers a way to appropriately assess content mastery and match instructional objectives to target student learning needs and improve student outcomes.

Conceptual Framework

To explore possible solutions to the problem of misalignment between information taught and knowledge learned, a conceptual framework was hypothesized which draws on three specific concepts; Zone of Proximal Development (ZPD; Vygotsky, 1978), flow theory

(Csikszentmihalyi, 1990), and motivation (Skinner, 1957). Providing a classroom environment with a focus on the ZPD, flow, and motivation is challenging for teachers. However, when instruction is provided within a student's ZPD, a cohesive learning flow is experienced. This flow continues as students are provided appropriately leveled instruction which increases their motivation for learning because they feel successful and are encouraged to keep trying to learn. Each of the three components (e.g., ZPD, flow theory, and motivation) will be defined and discussed in detail in the next section.

Zone of Proximal Development

The first component of this hypothesized framework is based on Vygotsky's (1978) *Zone of Proximal Development (ZPD)* defined as the distance between students' *actual developmental level* whereby they are independent problem solvers and students' *potential developmental level* whereby they need assistance from adults or peers to solve problems (Vygotsky, 1978, p. 86). When students are presented with information or performance demands too far beyond their *potential developmental level* (e.g., information that they cannot reasonably incorporate into their existing knowledge base and/or that they cannot reasonably make use of to meet performance requirements), they become quickly frustrated because the expectations for learning are too advanced for their current level. Additionally, when the students are presented with information at their *actual developmental level* (e.g., information that is already in their existing knowledge base and/or that they cannot reasonably make use of to advance their educational performance), expectations for learning are too low which results in no new knowledge. However, when instructional information and performance demands are situated within the optimal areas of their ZPD, the presented learning opportunities are perceived as attainable (Bachman, 2013).

Vygotsky (1978) explains that when instruction is provided within a student's ZPD and supported through adult assistance and peer collaboration, students' learning increases.

The conceptual framework of the ZPD has also been utilized during the assessment phase of learning (Popa & Pauc, 2015). Rather than only giving students a static test at the end of the unit, teachers can be actively involved in assessing learning throughout the lesson by asking questions. Student responses will provide the teachers with frequent feedback regarding students' actual and potential levels so that instruction can be presented appropriately for each student. Additionally, an accurate understanding of students' prior knowledge is vital to designing lessons and formulating questions appropriate for the students' ZPD (Celik & Güzel, 2017). It is imperative that students are taught within their ZPD so that teaching and learning can be closer aligned through the match of instructional experiences to the needs of the learner. It is hypothesized that a misalignment between teaching and learning occurs when content is presented at students' potential or actual developmental levels rather than within the ZPD.

Flow Theory

It is also hypothesized that, when teacher instruction is situated within the ZPD, the learning process itself is a reinforcing activity, and students are motivated to learn (Brophy, 1999). When learning experiences are cohesively balanced with activities that are not too challenging and not too easy, learners experience a flow (Nakamura & Csikszentmihalyi, 2014). Flow is defined as "a sense that one's skills are adequate to cope with challenges at hand" (Csikszentmihalyi, 1990, p. 71). This flow occurs when learners remain motivated to engage in learning tasks (Meyer, Klingenberg, & Wilde, 2016). Inherent in the concept of flow is minimizing tasks that are perceived as boring, which do not keep a student's attention, and minimizing tasks that are too challenging, which puts the individual in a state of anxiety

(Shernoff, Csikszentmihalyi, Schneider, & Shernoff, 2003). Additionally, a positive learning environment assists students with experiencing flow through the belief that content mastery is attainable (Abuhamdeh & Csikszentmihalyi, 2012). Therefore, it is hypothesized that when instruction is provided within a student's ZPD and ensures the experience of positive flow, the misalignment between teaching and learning is minimized.

Motivation

In addition to targeting a student's ZPD to support them entering a state of flow while learning, it is important to understand how the environment affects a student's motivation to learn. According to Skinner (1957), environmental conditions can alter motivation. One way environmental variables can affect motivation is by either 1) increasing the effectiveness of a reinforcer or 2) decreasing the effectiveness of a reinforcer (Cooper, Heron, & Heward, 2007; Michael, 2004). For example, if students are asked to complete instructional activities within their ZPD and encounter flow, a teacher and the activity for learning is likely to be perceived as reinforcing. However, if students are asked to complete tasks that are too difficult, the teacher and the activity for learning may be viewed as aversive, thereby decreasing the reinforcing value of learning. Therefore, it is imperative that teachers provide appropriately leveled instruction to ensure students are motivated to learn.

Through this proposed conceptual framework, it is hypothesized that when instruction is leveled for each student's ZPD, and learning flow is achieved, students remain motivated to learn (Brophy, 1999). However, when the instruction is perceived as too challenging, learning flow is unattainable, instruction becomes punitive, and motivation to learn decreases (Shernoff et al., 2003). Research suggests a productive struggle provides increased motivation for learning (Dweck, 1986). Productive struggle is defined as the persistence with difficult learning tasks.

This means that, despite the perception that an assignment is challenging, students will continue to try and figure out the correct response, rather than give up. Additionally, the literature reveals that students exhibit increased motivation for tasks in which they have perceived success (Eccles & Wigfield, 2002; Gottfried, 1990). It is hypothesized that motivation is enhanced when there is productive struggle that results in academic success, therefore further providing support for the importance of providing instruction within a student's ZPD. It is hypothesized that the misalignment between teaching and learning can be addressed when instruction is provided within a student's ZPD, allowing students to experience flow, and remain motivated to learn.

Due to the increased complexity of diverse student needs in today's schools, a high level of importance should be placed on the integration of the ZPD, flow, and motivation within the classroom. It is hypothesized that intervening within these areas will improve the alignment between teaching with learning, therefore, it is imperative to train teachers on the implementation of specific EBPs that provide frequent, direct feedback on learning outcomes and allow students to engage in retrieval practice. Two specific EBPs; ASRs and Spaced Practice will provide teachers with a more accurate understanding of each student's ZPD, which allows students to experience a flow to their learning and stay motivated to continue learning. This review will explore Professional Learning (PL) options to assist teachers with providing specific EBPs within the classroom, such as Active Student Responses (ASRs) and Spaced Practice (SP). These strategies will enable teachers to better match instructional content to the learning needs of diverse students to mediate the misalignment between teaching and learning.

Synthesis of Intervention Literature

As argued in chapter one, three primary factors contribute to the misalignment between teaching and learning: 1) a lack of EBPs, 2) low teacher self-efficacy, and 3) the complexity of

meeting the needs of diverse learners. To address these factors, research studies focused on Professional Learning (PL) targeting EBPs to increase teacher self-efficacy and better meet the needs of diverse learners will be reviewed. ASR strategies are defined as the teacher creating opportunities within the class for the student to respond to questions after which the teacher provides feedback (Davis & O'Neall, 2004). ASR strategies were chosen because increasing student responses improves academic skills (Skinner, Fletcher, & Henington, 1996); SP refers to repeated exposure of information which is tested at varying intervals (Cepeda, Vul, Rohrer, Wixted, & Pashler, 2008). SP was chosen because studying information periodically over time promotes remembering of information (Cepeda et al., 2008). Additionally, the provision of PL will increase teachers' self-efficacy with implementing EBPs by providing powerful learning experiences (Tschannen-Moran & Hoy, 2001) that enable teachers to relate the implementation of these EBPs to student learning.

PL targeting EBPs of ASR strategies and SP will be explored to support the learning of a diverse range of students. The PL will assist teachers with providing classroom instruction within the ZPD so students experience flow and remain motivated to learn to better align teaching with learning. First, the literature will be reviewed regarding descriptions of EBPs to include ASRs and SP. Next, the literature regarding PL specifically related to ASR strategies, SP, and teacher self-efficacy will be examined.

Evidence-based Practices

A myriad of Evidence-based Practices (EBPs) are identified in the literature to increase student achievement. These EBPs include structure and predictability, performance feedback, differentiated reinforcement, error corrections, group contingencies, computer-assisted instruction, and the rate of opportunities to respond (Simonsen et al., 2008). This literature

review will focus on two specific EBPs: ASRs and SP. According to the literature, both ASR strategies (Adamson & Lewis, 2017; MacSuga-Gage & Gage, 2015) and SP (Rawson, Dunlosky, & Sciartelli, 2013; Roediger & Butler, 2010) result in improvements on student achievement. As students are required to repeatedly retrieve information, retention of information increases (Hardiman & Whitman, 2013; Roediger & Butler, 2010). Both ASR strategies and SP involve repeated retrieval of information and are proposed as strategies to teach educators to evaluate their impact on improving the misalignment between teaching and learning (see Figure 6).

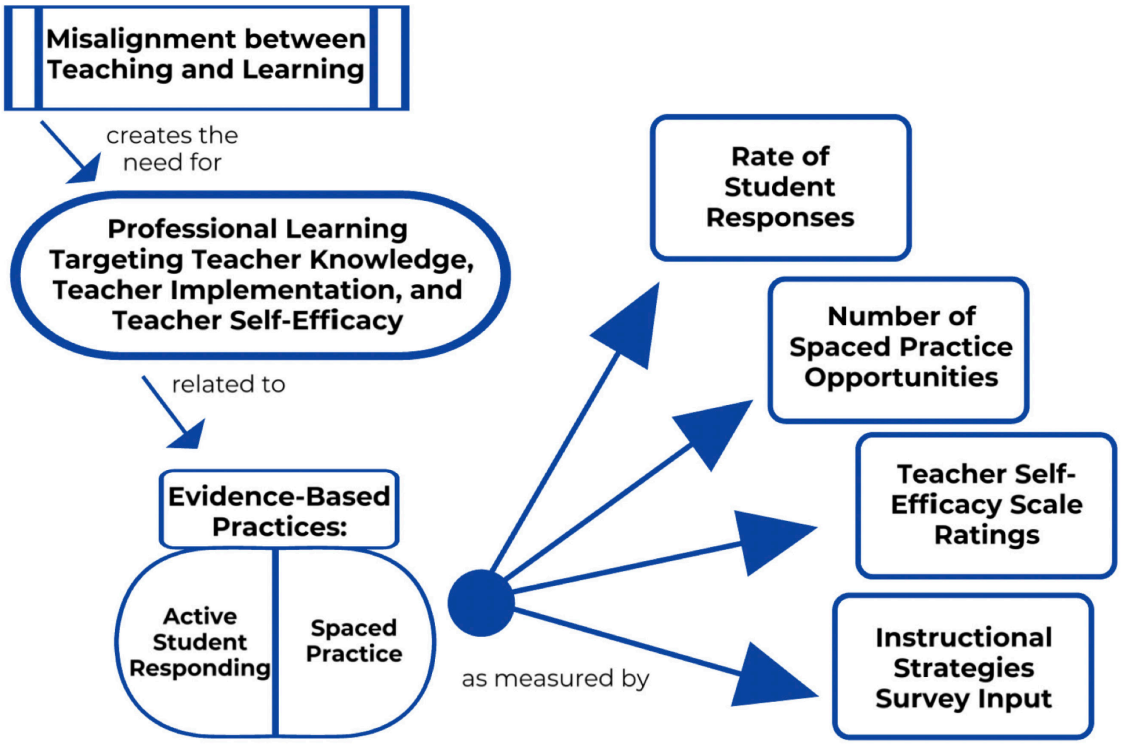

Figure 6. Intervention to address the misalignment between teaching and learning.

Active Student Responses (ASRs). Teachers express their surprise when students do not demonstrate an understanding of taught objectives. By increasing ASRs, teachers will gain a more accurate understanding of each student's current level of knowledge, which will enable instructional tasks to be matched to learner needs and decrease teacher surprise with assessment outcomes. ASRs are associated with increased academic achievement and include such strategies

as guided notes (Adamson & Lewis, 2017), peer tutoring (Adamson & Lewis, 2017), response cards (Adamson & Lewis, 2017; Helf, 2015), written responses (Kern & Clemens, 2007), individual responses (Kern & Clemens, 2007), and choral responses (Haydon, Mancil, & Van Loan, 2009). Student responding can be recorded using whiteboards (MacSuga-Gage & Simonsen, 2015), technology quizzes (Jermone & Barbetta, 2005; Monem, Bennett, & Barbetta, 2018; Salend, 2009), and response cards (Adamson & Lewis, 2017; Helf, 2015). Whiteboards are typically paper-sized boards on which responses can be easily recorded and then quickly erased for the next question. Technology quizzes can take various forms, but typically use an electronic device (e.g., computer, tablet, phone, remote clicker) to ask and answer questions related to the course content. Response cards are created prior to the lesson and allow the teacher to receive relatively quick responses, as the students are required to hold up a card (e.g., True or False; A, B, C, or D; Yes or No) in response to a question posed to the class.

Engaging in ASRs enables students to recognize their level of understanding with instructional concepts. As students develop a deeper knowledge of which content they have and have not learned, they are able to target specific instructional material to relearn. Additionally, ASRs will increase the teacher's knowledge of students' challenges with concepts, which will allow teachers to better meet the needs of diverse learners through the modification of their lessons. In addition to ASRs, Spaced Practice will be reviewed as a possible intervention to modify the misalignment between teaching and learning.

ASRs for secondary students in science. Cavanaugh, Heward, and Donelson (1996) conducted a study to determine the effects of specific study strategies on recall in a secondary earth science classroom. Two different study conditions were compared: 1) students used response cards to answer questions (active condition) and 2) students watched the teacher review

key points from the lesson (passive condition). Participants (*N*=23) were ninth grade students within a large public high school, of which eight students were identified with special needs. The study utilized an alternating treatments design to analyze the effects of each study condition by administering daily and weekly tests. Science lessons were designed to be 30 minutes in length to include three parts: (a) lecture, (b) hands-on activity, and (c) teacher review of the information. Each student participated in either the active or passive condition when reviewing the taught information.

Results of the study indicated that 13 of the 15 regular education students and all eight of the special education students exhibited higher recall during the active condition as compared to the passive condition. The active condition of response cards provided a three-term contingency of 1) an antecedent, 2) active student response, and 3) teacher feedback. However, the passive condition provided only the antecedent without the active student response or teacher feedback. During the active condition, the teacher was provided additional insights into the effectiveness of the lesson as many students did not respond correctly to teacher-presented questions. Although students did not report a preference for active versus passive responding, the teacher described student attentiveness as greater during the active condition. Therefore, the implementation of response cards as an EBP is documented to decrease the misalignment between teaching and learning. As the teacher better understands current levels of student knowledge, teachers can adjust their instruction to better meet the needs of diverse learners.

ASRs for psychology students in higher education. Zayac, Ratkos, Frieder, and Paulk (2015) examined the outcomes of ASRs with college students (*N*=132) in the southeast United States. The authors sought to compare student outcomes of three different ASR conditions: 1) electronic clickers (a handheld remote which allows the student to select their preferred

response), 2) response cards, and 3) hand raising. A control group, which utilized a standard lecture condition, was also included. All participants were enrolled in a General Psychology course, and demographic data (e.g., gender, major, Grade Point Average, etc.) was collected to determine whether or not there were significant differences between groups as random assignment was not possible. The study used an alternating treatment design which rotated between the four conditions of electronic clickers, response cards, hand raising, and control. During the experimental conditions, students were asked to utilize either electronic clickers, response cards, or hand raising to answer 3-4 questions per 50 minute class and 4-6 questions per 75 minute class. The dependent measure was mean exam scores on end of unit tests.

Findings of the study indicated that ASRs were more effective across all experimental groups as compared to the control, and there were no statistical differences between the ASR conditions. Additionally, students reported a preference for electronic clickers as compared to response cards or hand-raising. Students believed that their grades were positively impacted by the implementation of ASRs and preferred that they be integrated into their other classes. Therefore, as there was no statistical difference between ASR modalities, it may be important for teachers to choose ASRs that: 1) are preferred by students, 2) assist with meeting student outcomes, and 3) consider student and course characteristics. The determination of which ASR is most effective could not yet be determined by this study; however, it is imperative that thoughtful considerations be made when determining which ASR would most benefit a particular group of students when learning specific content.

ASRs for social studies students in middle school. Monem et al. (2018) investigated the efficacy of high-tech versus low-tech ASRs for a small group of middle school students of Hispanic ethnicities in the southeast United States. Additionally, the authors sought to determine

student preferences for ASR modalities as related to social studies content. Participants (*N*=7) were selected based on the identification of a learning disability, challenges with reading, difficulties with social studies information, and problems with understanding social studies, content as listed in the students Individualized Education Plan (IEP). Students were trained in each of the three study procedures to include the 1) interactive notebook, 2) technology assessment, and 3) Quizlet. Students completed a 30 question pretest at the beginning of each unit to assess their knowledge of the content. Next, the students were exposed to the content for the first lesson and then randomly assigned to either 1) the ASR using the interactive notebook condition or 2) the ASR using Quizlet condition. Then, the participants took a 10 question post-test to determine whether or not there were learning differences between the two groups.

Findings of the study indicate that the test scores improved for all participants. Five participants scored slightly better during the Quizlet condition, one participant scored significantly better during the Quizlet condition, and one participant score slightly better during the interactive notebook condition. The learning challenges of the students and the limited instructional time with the content may have contributed to the academic difficulties with passing the unit tests. Results of this study indicate that interactive notebooks and review strategies such as Quizlet may assist students with learning social studies content within a middle school context. During the presentation of social studies content, the use of additional EBPs, the integration of direct and implicit instruction, and the incorporation of review sessions may all increase student learning. Therefore, the implementation of ASRs in the classroom support students with learning challenges.

Spaced Practice. According to Hopkins, Lyle, Hieb, & Ralston (2016), "increasing the temporal interval between learning events leads to enhanced retention" (p. 855), and spacing the

retrieval practice throughout the unit allows students to increase their proficiency with remembering previously presented content (Kornell, Eich, Castel, & Bjork, 2010). This means that once a teacher begins a new unit, students should be quizzed on the material periodically, rather than only testing learned information on the summative assessment. Additionally, as teachers review the assessment results throughout the instructional unit, they will obtain a more accurate understanding of the current level of student understanding, enabling them to use this information to plan lessons to target concepts the students have not yet mastered. When students engage in Spaced Practice, student achievement increases, and teacher self-efficacy is positively affected, which directly impacts the ability to meet the diverse student learning needs.

Spaced Practice (SP) is associated with different types of assessments to include repeated practice of low-stakes quizzes, mid-chapter reviews (Hopkins et al., 2016; Karpicke & Roediger, 2008; Monem et al., 2018), and test reviews (Hopkins et al., 2016). Low-stakes quizzes are often given to students either at the end of class or at the beginning of the next class (Danley, McCoy, & Weed, 2016). These quizzes provide rich information regarding the level of understanding of the lesson objectives obtained by the students. Mid-chapter reviews occur at a half-way point in the lesson and provides the teacher with feedback as to whether or not the students are on track to master the unit objectives. The test review also provides the teachers and students with one last opportunity to assess whether or not the taught information has been learned.

The mind needs to review learned materials frequently and over time to ensure that the information “sticks” (Brown, Roediger, & McDaniel, 2014). By periodically requiring students to retrieve information through low-stakes quizzes, mid-chapter reviews, and test reviews, students will increase their ability to remember information presented in the classroom. When students’ knowledge is assessed through SP, the misalignment between teaching and learning is

minimized. As teachers understanding of what students' know and do not know increases, teachers are provided with the information necessary to develop lessons within students' ZPDs.

Spaced Practice within a variety of ages in a variety of contexts. Cepeda et al. (2008) conducted a longitudinal study to determine how the timing of SP affects retention. Participants (*N*=1,354) were drawn from an online research pool and represented individuals of various ages and from different countries. Subjects ranged from 18-72 years of age, and the majority were female (72%). During the study, participants were presented with 32 obscure, trivia facts, and participants were randomly assigned to groups which differed by the interval length between sessions one and two and between sessions two and the final test. During the first session, participants were repeatedly asked questions related to each of the 32 trivia questions until they answered all of the questions correctly, which comprised between 62 and 96 questions. During the second session, the list of questions were presented twice in a randomized order, and the participants' response was followed by a display of the correct answer. During the final session, the questions were asked to the participants twice, once using free recall and once in a multiple-choice format. No corrective feedback was provided during the final session phase.

The findings of the study indicated that as time between intervals increased, so did the gap in participant retention of the facts. The results of this study suggested that the timing of learning sessions strongly affected the participants' retention of the presented information. Additionally, it was evident that the optimal gap in studying should be based on the length of time that remembering is desired. For example, if information is wished to be remembered for a length of years, it should be studied every few months. Within the learning environment, it is important to identify the key concepts to be remembered and to study this information periodically.

Spaced Practice across grade levels and content areas. In this group of four experiments, McDermott, Agarwal, D'Antonio, Roedgier, & McDaniel (2013) sought to examine the effects of SP on learning in a middle and high school. In the first experiment, one hundred forty-one seventh grade students participated in a study to compare the effects of multiple-choice versus short answer quizzes on learning and to examine how exam performance was affected by initial quizzing. The same group of students participated in experiment two, which studied how the conditions of repeated quizzing versus repeated studying affected learning. The third experiment included one hundred fifty-two seventh grade students and was conducted in the same school but in a different school year. This study examined the benefits of quizzing when the wording was changed on successive quizzes. The fourth experiment was conducted with seventy-eight high school 11th and 12th graders to determine how exam performance was affected when initial quizzes were given prior to the final. This final study sought to determine whether the findings from experiment one could be generalized across older students and in a different setting.

Findings from the studies indicate multiple choice and short answer quizzes produced equivalent learning effects, and the type of quiz was inconsequential. This held true for both the seventh grade science students and the eleventh and twelfth grade history students, which demonstrated a generalizability across subjects and settings. Additionally, repeated quizzing was determined to be more effective than repeated studying. Despite the alteration of word choices on successive quizzes, performance on later exams was still enhanced by the quizzing. These findings are important because they highlight the value of actively retrieving previously learned concepts to improve students' retention of information. Additionally, these experiments lend

themselves to an increased understanding of the effectiveness of using SP across middle and high school students within different content areas.

Spaced Practice with memory and induction in younger and older adults. The effects of Spaced versus Massed Practice was studied by Kornell et al. (2010) to determine how aging affects inductive learning, which is defined as learning by examples. Participants included two groups, college students (*N*=64) and older adults (*N*=48). The average age of the college students was 21 years, and the average age of the older adults was 77 years. Both groups were exposed to 72 paintings by 12 different artists. However, one group was shown the paintings in a Massed format, whereby all of the paintings by one artist was shown consecutively. Another group was shown the paintings in a Spaced format, whereby the presentation of the artists' paintings were varied. The next phase of the study included a distractor task followed by a matching task in which participants were asked to correctly label the artist with the painting. Last, the participants were asked whether they believed Massed or SP helped them more and whether or not they were an expert on the subject of art.

Findings of the study indicated that SP was more effective than Massed Practice for younger and older adults. Although the college students outperformed the older adults, the data also indicated the size of the SP was equally effective in both the inductive and repetition conditions. Additionally, the participants of both conditions agreed that Massed Practice was more effective than induction. Also, there was no significant difference between older adults as compared with younger ones. These findings are important because it deepens the understanding that Spaced Practice can be utilized within the arts, outside of the academic environment, and across younger and older populations. Although SP causes challenges such as forgetting, it may

actually improve learning as the brain works harder to remember information that is fading from memory (Brown et al., 2014).

Addressing Misalignment with ASRs and Spaced Practice

The review of the literature indicates that there is an abundance of EBPs that can be utilized within the classroom to address the misalignment between teaching and learning. This literature review explored the use of ASRs and SP to improve learning across grades, contents, and materials. A summary of these findings will be briefly discussed.

ASRs as an effective EBP. As documented in this literature review, ASRs are an effective EBP across grades to include middle school students (Monem et al., 2018), high school students *(*Cavanaugh et al., 1996), and students in higher education (Zayac, Ratkos, Frieder, and Paulk, 2015). ASRs are also effective across specific content areas to include social studies (Monem et al., 2018), science (Cavanaugh et al., 1996), and psychology (Zayac et al., 2015). Additionally, ASRs can be effectively implemented using a variety of materials such as response cards (Cavanaugh et al.,1996; Zayac et al., 2015), electronic clickers (Zayac et al., 2015), hand raising (Zayac et al., 2015), interactive notebooks (Monem et al., 2018), and technology quizzes (Monem et al., 2018).

Additionally, the literature indicates that ASRs are effective for increasing outcomes for students with behavioral disorders at the secondary level (Adamson & Lewis, 2017). However, Adamson and Lewis (2017) suggested further research should explore using "a systematic approach for teaching secondary general education teachers" (p. 50) to provide their students with increased opportunities to respond. Additionally, according to Zayak et al. (2016), there is no statistical differences between different types of ASRs (e.g., clickers, hand raising, response cards).

Although the literature suggests a targeted ASR rate of three per minute, there is great variability depending on the age of the students, individual characteristics of the students, and content. For example, Messenger et al. (2017) indicates an optimal rate of 3.5 opportunities to respond per minute while Gardner, Heward, and Grossi (1994) indicate that a teacher presentation rate of 0.99 per minute improves student outcomes. As indicated by MacSuga-Gage and Simonsen (2015), there is a lack of studies at the secondary level and research has not documented optimal rates for formats and content areas. When using written response rates or clickers, response rates are documented from 0.89-1.2 per minute. So, when using ASRs within a secondary general education classroom setting, appropriate rates may be 1 per minute so that a classroom of students has time to register their written or electronic response. Future research is needed to examine class wide responses across contents and different modalities.

Therefore, it is evident, as indicated by Harbour, Evanovich, Sweigart and Hughes (2015), that increased student responding improves outcomes. However, there is no definitive rate for the appropriate number of questions that should be presented per minute in the secondary classroom (MacSuga-Gage & Simonson, 2015). This is particularly true at the secondary level as much of the research regarding ASRs has been conducted in the elementary school setting. Additionally, there is limited information regarding integrating ASRs across content areas with general education students. Therefore, it is hypothesized that ASRs will be an effective EBP within the researchers current context of a middle high school for students learning various contents (e.g., ELA, science, social studies, math, foreign language) and may be implemented using a variety of materials (e.g., response cards, whiteboards, technology quizzes). As there is currently no specific standard for recommended rate across contents at the secondary level, data

collection of ASR rates will be carefully analyzed to determine appropriate rates within the differing contexts of this study.

Spaced Practice as an effective EBP. As also documented in this literature review, Spaced Practice is an effective EBP across ages to include middle school students (McDermott et al., 2013), high school students (McDermott et al., 2013), college students (Kornell et al., 2010), and adults (Cepeda et al., 2008; Kornell et al., 2010). SP is also effective across specific content areas to include multi-subject trivia questions (Cepeda et al., 2008), science (McDermott et al., 2013), social studies (McDermott et al., 2013), and art (Kornell et al., 2010). Additionally, SP can be effectively implemented using multiple choice questions (Cepeda et al., 2008; McDermott et al., 2013), free response questions (Cepeda et al., 2008; McDermott et al., 2013), and matching tasks (Kornell et al., 2010). Also, the length of the interval in between the learning and the recall phase must be carefully considered because information that is necessary to remember over years should be tested every few months (Cepeda et al., 2008). SP challenges the brain to work to remember previously learned content (Brown et al., 2014) which increases the retention of information (McDermott et al., 2013).

ASRs and SP as effective in the current context. It is hypothesized that ASRs and SP will be effective EBPs within the researchers current context of a middle high school for students learning various contents (e.g., ELA, math, social studies, science, foreign language) and may be implemented using a variety of materials (e.g., response cards, whiteboards, technology quizzes). The implementation of ASRs will provide teachers with the information necessary to provide appropriate learning opportunities for each student within their ZPD. Also, the implementation of SP will not only provide teachers with timely information regarding student mastery of taught concepts, but it will also assist students with improving their learning through retrieval practice.

Therefore, it is hypothesized that training teachers on implementation of specific EBPs; ASRs and SP is an effective way to address the problem of the misalignment between teaching and learning.

Professional Learning to Increase Teacher Self-Efficacy

To provide teachers with the information needed to incorporate ASRs and SP into the classroom, training must be provided. Professional Learning (PL), also referred to as Professional Development (PD), encourages and assists teachers with implementing unfamiliar teaching practices (DeSantis, 2013), and enables teachers to feel more confident with making educational decisions (Lieberman & Wood, 2002). Additionally, increased teacher self-efficacy positively influences student achievement (Althauser, 2015). Different approaches to PL will be discussed to include Desimone's (2009) five characteristics of professional development, the multi-tiered support system suggested by Simonsen et al. (2014), Desimone and Pak's (2017) instructional coaching model, and Guskey's (2002) tiered PD model. Next, research that supports effective PL on teaching EBPs will be explored. Finally, literature regarding the impact of PL on teacher self-efficacy and student outcomes will be examined. Overall, PL and coaching will be the focus of this intervention by training teachers on the implementation of EBPs, increasing teacher self-efficacy with integrating EBPs, and positively affecting student achievement to target the misalignment between what is taught and what is learned in the classroom.

Frameworks of effective PL. When designing PL for teachers, it is necessary to include specific components to ensure the training leads to desired outcomes. Four different PL structures will be explored to include Desimone's (2009) PD framework, Simonsen et al.'s (2014) response to intervention approach, Desimone and Pak's (2017) instructional coaching model, and Guskey's (2002) five levels of PD evaluation. The components of each model will be

discussed and examined in relation to providing high-quality PL to teachers within the context of an educational environment.

Desimone's (2009) PD framework. According to Desimone's (2009) framework, effective PD must include five characteristics; (a) content focus, (b) active learning, (c) coherence, (d) duration, and (e) collective participation. As detailed in Figure 7, the steps in Desimone's model are bidirectional. This means that, while changes in attitudes and beliefs may result in changes in instruction, it also means that a change in instruction may influence changes in attitudes and beliefs. For example, during the PD sessions, teachers' attitudes and beliefs towards implementing EBPs into their classroom may change, resulting in an instructional change. Additionally, as teachers incorporate EBPs into their instruction, their beliefs regarding the effectiveness of specific EBPs may also change. According to Desimone's model, PD is a bidirectional model that targets improvements in student learning.

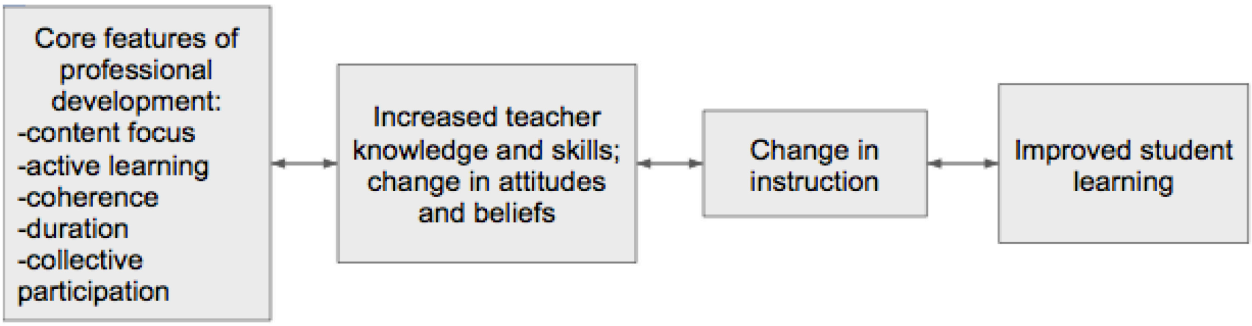

Figure 7. Desimone's (2009) Framework indicating core features of professional development.

Additionally, key features of PD must be incorporated for teacher training to be effective. Desimone (2009) postulates that as core features are incorporated into the design of the PD, teachers' knowledge will increase, resulting in instructional change and improvements to student learning. PD must be *content focused* by incorporating the presented information within the teacher's instructional area (e.g., ELA, math, social studies, science, foreign language), and an *active learning* process should ensure the PD requires the participants to frequently respond

throughout the learning session (Darling-Hammond & Richardson, 2009; Fuller & Dawson, 2017). Active learning can occur utilizing ASRs, which are documented to improve student performance (Gardner et al., 1994; Harbour et al., 2015). PD must also incorporate a *coherence* between the training and teacher beliefs, which may take some time as teachers' beliefs will continue to change as they witness improvements in student performance (Guskey, 2002).

Additionally, the training must be of sufficient *duration* to enable teachers to master the content (Darling-Hammond & Richardson, 2009; Fuller & Dawson, 2017). According to Darling-Hammond, Hyler, and Gardner (2017), there is not a definitive threshold to ensure a sufficient duration. However, it is clear that PD consisting of one or two sessions is not typically robust enough to make lasting changes. While some of the literature indicates that at least 14 hours of PD is necessary to obtain an effective dose (Yoon, Duncan, Lee, Scarloss & Shapley, 2007), other literature has provided effective results for PD with lesser amounts of time, such as five weeks (Yoo, 2016). Last, *collective participation* is necessary to enable teachers to learn from one another and engage in collaborative dialogue. Desimone's framework is valuable because it incorporates core features of effective PD while delineating several bidirectional components that result in student learning.

Simonsen et al.'s (2014) Response to Intervention framework. In addition to Desimone's (2009) PD framework, Simonsen et al. (2014) provides key features of PD utilizing a tiered, Response to Intervention (RtI) approach. This method assists with determining which type of supports teachers need to provide effective instruction. The RtI approach includes: 1) universal training and self-monitoring, 2) walk-through data collection, 3) targeted PD to include self-management, 4) progress monitoring to include walk-throughs and data collection, and 5) intensive data-driven PD. Simonsen et al.'s PD framework can be used to educate teachers by

providing targeted feedback on incorporating appropriate interventions for students in the classroom. For example, all teachers would receive the initial training and walk-through data collection. However, additional PD would be provided for teachers that need additional supports such as self-management, progress monitoring, and additional PD. Simonsen et al.'s framework is valuable because it allows PD to be tailored towards specific needs of the teacher and incorporates mentoring and coaching of the teacher to ensure the objectives of the PD are appropriately implemented into the classroom.

Desimone and Pak's (2017) instructional coaching model. Desimone's (2009) five features of effective PD to include (a) content focus, (b) active learning, (c) coherence, (d) duration, and (e) collective participation (see figure 3) are also applicable to Desimone and Pak's (2017) instructional coaching model. The benefits of incorporating instructional coaching into the PD model are well-documented to include improvements with teacher collaboration (Guiney, 2001), teacher attitudes (Cornett & Knight, 2009), and student outcomes (Mangin & Dunsmore, 2015). Incorporating instructional coaching into PD is particularly helpful as individualized instruction can be collaboratively provided to focus on a specific content area (e.g., math, science, etc.), provide active learning as teachers engage in one-on-one discussions with their coach, and ensure coherence by aligning PD with curriculum. Coaching may also increase the duration of the PD by providing teachers multiple opportunities to engage with the instructor which allows for reflection and growth (Teemant, 2013). Last, collective participation is fostered when small groups of teachers within one content area can collaborate together. Desimone and Pak's (2017) instructional coaching model is advantageous as it provides additional PD opportunities targeted to meet the individualized needs of teachers on an ongoing basis.

Guskey's (2002) Five Levels of Professional Development Evaluation. Similar to Simonsen et al.'s (2014) RtI approach, Guskey's (2002) Five Levels of Professional Development Evaluation is also tiered as it requires success at earlier levels before moving on to later ones. These levels include: 1) ascertaining teachers' perceptions of PD, 2) determining how the teachers learn the information, 3) establishing how the organization aids with the implementation, 4) observing how interventions are utilized in the classroom, and 5) determining how interventions impact student engagement. Success within each level is measured using questionnaires, rubrics, protocols, and field notes. Once the expectations of each level are met, information required to attain success at the next level occurs. For example, once sufficient information has been gathered regarding how teachers perceive PD, the researchers can begin investigating how teachers learn. Guskey's model is valuable because components such as teachers' perceptions and organizational implementation are utilized to tailor the PD for the specific instructional context.

Characteristics of quality PD. Therefore, it is evident that multiple frameworks exist for providing quality PD opportunities to teachers. PD should be developed to ensure research-based features are the foundational components to include elements such as Desimone's (2009) core features of active learning and necessary duration. Additionally, PD should ensure that the information provided to teachers is based on their needs (Simonsen et al., 2014) and incorporate instructional coaching to strengthen the effectiveness and duration of the training sessions (Desimone & Pak, 2017). Last, teacher feedback of the PD opportunities should be thoughtfully considered so instruction is tailored specifically for a particular instructional context (Guskey, 2002). PD should ensure that appropriate elements of specific, research-based frameworks are utilized to meet the needs of the intended audience to maximize teacher and student outcomes.

Research that supports effective PD for EBPs. PD will provide teachers with the essential supports to implement EBPs within the classroom. According to the literature, PD is effective for assisting teachers with incorporating EBPs to include the instructional practices of ASRs (Adamson & Lewis, 2017; Fuller & Dawson, 2017; MacSuga-Gage & Gage, 2015). However, the literature provides scant evidence of the provision of PD for teachers regarding SP (Rawson et al., 2013; Roediger, Agarwal, McDaniel, and McDermott, 2011). ASRs and SP will be discussed in relation to providing teachers with effective PD related to the EBPs of ASRs and SP.

Active student responses. Today's students have a diverse range of strengths and needs, which makes it difficult for teachers to tailor instruction so each student can learn. One way to increase the effectiveness of teaching in the classroom is through ASRs (Jerome & Barbetta, 2005; Messenger et al., 2017; Zayak, Ratkos, Frieder, & Paulk, 2016). As students increase their rate of responding through ASRs, improvements in learning occur, which directly impacts the misalignment between teaching and learning. The literature will be reviewed regarding the implementation of PD to support teachers with implementing ASRs in their classrooms.

PD for ASRs within the middle school context. A study conducted by Fuller and Dawson (2017) incorporated PD for teachers (N=12) to target the implementation of ASRs within middle school classrooms. The focus of the study was on increasing student responses using a Student Response System (SRS), which are electronic clickers that collect formative data using educational technology. The authors utilized an active learning process to provide teachers with the training necessary to incorporate technology (e.g., remote control clicker), which allowed students the opportunity to simultaneously respond to teacher questions. Instructional strategies

emphasized during the PD included pacing of the questions, self-reflection of the students, and tailored student instruction.

Fuller and Dawson (2017) integrated Desimone's (2009) core features of PD to include an active learning process as teachers created and delivered a lesson, a content focus as teachers practiced using ASRs within their subject matter, coherence as PD was aligned to support district standards, duration to include four PD sessions and opportunities for instructional coaching, and collective participation as teachers were provided collaborative opportunities to support and provide feedback to each other. Additionally, four collaborative sessions with additional opportunities for support were provided. Guskey's (2002) Five Levels of Professional Development Evaluation was also incorporated into the PD, with a particular focus on levels four (participants' use of new knowledge) and five (student learning outcomes). After the PD, observations and teacher interviews were conducted to determine the ways that teachers were using SRS for formative assessment. Additionally, observations were conducted to measure the effect of SRS on student engagement. A qualitative research design was used to complete a thematic analysis of the teacher interviews, field notes, and observation rubrics. Additionally, a frequency distribution was created to categorize teachers' level of proficiency (e.g., not evident, emerging, proficient, exemplary) with implementing ASRs and formative assessments.

Findings of this study, as documented on the Direct Observation Rubrics, indicated most teachers were proficient (83.3%) with utilizing ASRs to increase student learning. However, since no direct observation data was available prior to the PD, the only baseline data was teacher interviews. During the pre-observation interviews, teachers reported using SRS primarily for assessments, homework, and questioning, rather than to formatively assess student learning. Additionally, no baseline information related to student engagement was available prior to the

PD sessions. However, during the direct observations, student engagement was observed to include answering questions, charting data, and participating in peer discussions. Therefore, although there is limited pre- and post quantitative data related to the teacher use of ASRs and student engagement, findings from the pre- and post teacher interviews as well as the direct observations of teachers and students indicated that outcomes of the PD included teacher proficiency with formative assessment and increased student engagement.

After reviewing Fuller and Dawson's (2017) study on using SRS for formative assessment, it is apparent that providing PD to teachers targeting the implementation of ASRs is effective for increasing teacher's use of formative assessment and increasing student engagement. While the use of Desimone's (2009) core features of PD and Guskey's (2002) Five Levels of Professional Development were advantageous, it would also be prudent to ensure both pre- and post data measures are utilized to strengthen the results of the experiment outcomes.

PD for ASRs within the elementary school context. Additionally, MacSuga-Gage and Gage (2015) incorporated PL for teachers to provide direction on implementing teacher-directed opportunities to respond, defined as "teacher behaviors that occasion student responses" (p. 274). Since this definition of opportunities to respond meets the definition of ASRs, the review of this study will refer to teacher-directed opportunities to respond as ASRs. The purpose of the study was to determine the relationship between ASRs, student behavior, and academic success. A within-subject research design with an interrupted time series was utilized as repeated measures of teacher and student behaviors were recorded for a period of three months.

During baseline, five elementary school teachers videotaped themselves for the first 15 minutes of a phonics or spelling lesson over a period of five days, and the rate of ASRs were calculated by dividing the number of ASRs by 15. Next, one hour of PD was provided in which

teachers were universally trained on how to implement ASRs into their classroom instruction. After the training, teachers recorded themselves for an additional 21 consecutive days and began self-monitoring the frequency of ASRs in their classroom using a golf counter. The teachers entered the data into an Excel spreadsheet, and the researchers reviewed the information after five days. One teacher was not consistently meeting the threshold of 3.00 ASRs per minute, and additional one-on-one PD and performance feedback was provided to that individual. From that point forward, all teachers met or exceeded the targeted threshold of 3.00 ASRs per minute.

Using the framework suggested by Simonsen et al. (2014), the RtI approach included 1) universal training and self-monitoring, 2) video data collection, 3) targeted PD, 4) progress monitoring, and 5) data-driven PD. First, universal training for one hour detailed how to increase ASRs by defining ASRs, providing types of ASRs, including examples of ASRs, integrating information about the optimal number of ASRs (e.g., 3.0 per minute), and practice opportunities. Second, data was collected through video recordings to determine the rate of ASRs incorporated by each teacher. Third, based on the data collected from the video recordings, targeted PD was provided to one participant to assist her with increasing ASRs to the criterion rate set at three per minute. Fourth, progress was monitored through video data collection and the self-monitoring data recorded on the spreadsheet. Fifth, the universal and individualized PD was intensively data-driven as rates of ASRs were calculated and teachers were provided detailed information regarding how to integrate an optimal number of ASRs in their classrooms.

Data collection during baseline and after the universal PD session included the rates per minute of ASRs, student engagement, and student disruptions. Providing PD to teachers related to the implementation of ASRs increased the mean baseline rate from 2.24 per minute to 3.90 per minute (MacSuga-Gage & Gage, 2015). Findings from this study indicated that the

implementation of ASRs at a rate of 3.00 or above increased students' engagement and decreased students' disruptions. Therefore, ASRs are an effective teaching strategy to improve student outcomes.

The most effective pieces of Simonsen et al.'s (2014) model included the initial universal training of teachers, video recordings, and targeted PD. Although the universal PD was only one hour in length, this was enough time to train four out of five teachers to implement ASRs to the target rate of 3.00 per minute. The video recordings allowed (IOA) agreement to be calculated by two data collectors, and provided the researchers with ongoing information related to the implementation rates of ASRs. Additionally, the researchers provided targeted PD for a participant that demonstrated the need for differentiated instruction to meet the target ASR rate of 3.00 per minute. It is evident that Simonsen et al.'s (2014) model assists with determining the type of supports teachers need to provide effective instruction and provides a framework for PD differentiation.

PD for ASRs within a high school context. In a study conducted by Adamson and Lewis (2017), PD was provided to high school teachers (N=4) regarding the implementation of ASRs in the classroom. The purpose of the study was to compare the effects of three different types of ASRs and to determine the impact of academic engagement and academic performance of students. The three types of ASRs to be compared include guided notes (prepared handouts with blank spaces for active participation in note taking), class wide peer tutoring (students study in pairs while providing feedback to one another), and response cards (small whiteboards, preprinted cards, or blank cards that students use to respond to teacher questions). After baseline ASR data was collected, PD sessions were provided to include information related to lesson planning, necessary features of each ASR type, and materials needed for implementation.

Elements of Desimone's (2009) PL framework to include *active learning* as teachers practiced each using method, *content focus* as the teacher and instructor collaborated to outline a sample lesson, *duration* as the training sessions were 30-45 minutes per method, for a total of 90-135 minutes, and *coherence* as teachers completed the Treatment Acceptability Rating Form (TARF) to determine their level of a) acceptance, b) effectiveness, 3) disruptiveness, and 4) cost. Additionally, portions of Simonsen et al.'s (2014) RtI PD framework were utilized as additional training sessions were provided to teachers if the intervention strategies fell to a threshold of below 80%. Last, instructional coaching (Desimone & Pak, 2017) was provided to teachers to ensure a fidelity with implementation of ASRs within the instructional setting to include weekly observations and ongoing assistance for teachers, if they needed additional instruction to implement ASRs within their classroom. Although a tiered approach was not evident, elements from Guskey's (2002) Five Levels of Professional Development Evaluation were incorporated to include 1) weekly observations regarding how interventions were utilized in the classroom using a treatment integrity form and 2) the impact of ASRs on student engagement.

Student engagement and teachers' acceptance of the intervention were also measured. Data indicated that ASRs increased from 1.24 mean responses during baseline to 4.6 mean responses during the intervention (Adamson and Lewis, 2017). Additionally, during the intervention, teachers implemented Guided Notes and Response Card ASRs at a rate of 3-4 per minute, which lends some credence to 3-4 as a recommended rate. Although the increased ASRs resulted in improved student engagement, an increase in student academic functioning was not documented. This was not surprising as one single EBP is likely to have limited effects on student achievement within the short duration of this study. Therefore, the literature will be reviewed regarding effective PD for a second EBP.

Spaced Practice. In addition to ASRs, another way to increase the effectiveness of teaching and learning is through SP. Spaced Practice refers to repeated exposure of information, tested at varying intervals (Cepeda et al., 2008). According to Hopkins et al. (2016), "increasing the temporal interval between learning events leads to enhanced retention" (p. 855), and spacing the retrieval practice throughout the unit allows students to increase their proficiency with remembering previously presented content (Kornell et al., 2010). To date, limited studies have incorporated PD as an intervention for the implementation of PL to support teachers with implementing SP in their classrooms. Current findings will be reviewed.

Limited PD to implement Spaced Practice. Roediger et al. (2011) sought to examine the effects of SP (e.g., quizzes and tests given periodically over time) on the long-term retrieval of social studies content presented to middle school students with tested, nontested, reading, and self-quizzing conditions. Roediger et al. (2011) completed a series of three different experiments, for which there is no specific mention of PD; this may be due to the routine nature of administering tests and the instructional coaching that occurred through the involvement of a research assistant. The first experiment (N=142) focused on tested versus nontested conditions; a second experiment (N=143) added a reading condition to the tested and nontested conditions; a third experiment (N=132) encouraged students to self-quiz on presented material. Results of the three experiments indicated that SP improved long-term student retention of material and was a more effective study strategy as compared to nontested conditions or rereading content.

The findings of the studies indicated that the use of SP increased the scores of middle school social studies students by one letter grade. Repeated quizzing was a more effective tool for learning retention than repeated readings. The authors concluded that taking quizzes and tests not only assessed learning but also improved retention. Although Roediger et al. (2011) makes

no mention of PD for teachers, it may be important to provide educators PD with a content focus, active learning, coherence, duration, and collective participation regarding this EBP of SP. Because as teachers develop a more accurate understanding of how SP can be incorporated within their content, participate actively in developing assessments and providing feedback, align assessments with standards, attend PD for several sessions, and participate collectively with peers (Desimone, 2009), teachers may change their perceptions of how assessments impact student engagement (Guskey, 2002). When teachers understand the value of SP and how to implement SP within the classroom, it is hypothesized that teachers will better understand what students know, and students will have better retention of taught concepts.

Rawson et al. (2013) conducted two separate experiments to determine the effects of SP on the retention of information for undergraduate students enrolled in an Introductory Psychology class. In the first experiment (N=79), four conditions were included: successive relearning, self-regulated practice, restudy only, and baseline control. On the successive relearning condition, student performance was improved by more than one letter grade; however, on the self-regulated and restudy only conditions, student performance was not meaningful when baseline conditions were compared to practice conditions. The second experiment replicated the findings of the first experiment that successive relearning improves retention by a letter grade when compared to typical learning strategies such as self-regulated practice and restudy.

PD was not documented for these experiments, which is most likely because one of the researchers was the teacher of the college course in which the experiment was conducted. However, the authors do discuss the importance for instructors to teach students about how to effectively use successive relearning within their academic contents. Specific steps regarding how teachers can provide instruction on successive relearning to their students includes 1) direct

instruction on how to use successful relearning, 2) identify materials that can assist with successful relearning (e.g., study guides, note cards), and 3) suggestions for time management (e.g., study schedule). As SP is not a commonly used instructional practice, it seems advantageous for teachers to be provided with PD to further their understanding of this EBP and how implementing SP in the classroom can increase student retention of presented information. Simonsen et al.'s, (2014) RtI framework may be helpful in observing how SP is utilized and impacts student engagement. Additionally, instructional coaching may be necessary (Desimone & Pak, 2017) to provide ongoing feedback to teachers regarding best practices for the implementation of SP in the classroom.

Characteristics of effective PD for EBPs. PD can assist teachers with better meeting the diverse learning needs of students if it collectively engages teachers in an active, coherent learning process that continues over several sessions. A tiered approach can better ensure all teachers have adequate knowledge of ASRs and SP and understand how to implement ASRs and SP; instructional coaching can reinforce the concepts in an authentic context. It is further suggested that effective PD will highlight the importance of understanding the students' current level of mastery concerning taught objectives to enable students to be taught within their ZPD while ensuring students experience flow and are motivated to learn. When using PD as an intervention to target the implementation of ASRs and SP in the classroom, research suggests that the process should include specific core features such as active learning and cohesion (Desimone, 2009), ensure instruction is differentiated to teacher needs (Simonsen et al., 2014), include instructional coaching (Desimone & Pak, 2017), and utilize evaluation techniques to ensure the PL is effectively implemented (Guskey, 2002) to target the diverse learning needs of students.

Research on PD that supports teacher self-efficacy. PD will increase teacher self-efficacy with implementing EBPs within the classroom. According to the literature, PD is effective for assisting teachers with increasing their self-efficacy to improve their teaching practices (Althauser, 2015; Stevens, Aguirre-Munoz, Harris, Higgins, & Liu, 2013; Yoo, 2016). When teacher self-efficacy increases, so does student outcomes. The literature will be reviewed related to PD practices and how PD affects teacher self-efficacy.

PD effective for increasing teacher self-efficacy in an online environment. The aim of Yoo's (2016) study was to determine how PD affected teacher self-efficacy and how teachers interpreted their change in self-efficacy beliefs. Participants (*N*=148) were taking online college level classes and engaged in five weeks of online PL which targeted Bandura's (1997) mastery experiences (effective instructional practices), vicarious experiences (observations of colleagues), social persuasion (encouragement and feedback), and psychological and affective states (chunking of information to decrease anxiety). Teacher self-efficacy was measured through the Teacher Sense of Efficacy Scale (TSES) developed by Tschannen-Moran and Hoy (2001). The TSES is broken down into three subscales to include student engagement, classroom management, and instructional strategies.

The findings indicated a significant difference in pre- and post scores for all three subscales. This led to the conclusion that online PD is effective for increase teacher self-efficacy. Additionally, teachers attributed the change in self-efficacy to include the knowledge that personal goals can be set and then met, a more accurate understanding of what they do and do not know, and the realization of learned helplessness regarding decisions of which they have no control. The findings of the study indicated that the use of PD increased the self-efficacy of teachers in an online learning environment.

PD effective for increasing teacher self-efficacy with mathematics. Stevens et al. (2013) conducted a study to determine if the level of proficiency with mathematics during PD over two summers affected teacher self-efficacy. A master's level math course was provided to middle school teachers (*N*=58) across three regions in Texas over two summers. Most of the participants were women (83.1%), and there was a wide range of teaching experience reported among the teachers with a range between one and 32 years. The participants were divided into two groups based on their level of proficiency with upper level mathematics. At the beginning of the study, the participants' level of proficiency with teaching math was assessed according to the Mathematical Knowledge for Teaching (MKT) scale to control for initial differences in proficiency with mathematical concepts. Additionally, the TSES was completed by the participants at four different points in the study to determine teacher proficiency with instructional practices, engagement, and classroom management.

The findings indicated that teachers who had lower mathematical knowledge at the beginning of the study indicated higher self-efficacy than teacher with higher mathematical knowledge before the PD. However, at the end of the second year, it was evident that the self-efficacy had developed differently for the two groups. The teachers that reported higher mathematical knowledge at baseline demonstrated greater growth with their self-efficacy as compared with teachers who reported lower mathematical knowledge at baseline. However, no statistical difference related to self-efficacy for instruction was found between the two groups, which may mean that, despite differing levels of mathematical knowledge, both groups of teachers felt capable of integrating instructional strategies to provide appropriate content to their students.

These results indicated that, prior to the training, less experienced teachers reported higher self-efficacy than more experienced teachers. However, after training, more experienced teachers demonstrated greater self-efficacy than less experienced teachers. This may be because the more experienced teachers learned to recognize that they were capable of providing high quality instruction to students, which positively affected their self-efficacy. However, less experienced teachers began to realize their limitations with providing high quality student instruction, which negatively affected their self-efficacy. Therefore, it is evident that, as PD is structured to increase teachers' proficiency with the targeted topic, their self-efficacy will be positively impacted.

PD effective for increasing teacher self-efficacy with job-embedded coaching. According to Althauser (2015), the purpose of her study was to positively affect teacher self-efficacy and student achievement through a two year PD program. Participants included 37 teachers across 10 elementary schools with experience ranging from one to 27 years. A committee comprised of administrators, teachers, district personnel, math specialists, and consultants was convened to plan the PD. During the PD, teachers developed mathematics curriculum, performed formative assessment, analyzed data, and examined student responses. These activities assisted the teachers with recognizing the topics that needed additional instructional strategies. Additionally, at the end of each training session, teachers engaged in discussion, which enabled them to reflect on the use of different instructional strategies to teach specific concepts and to provide differentiated instruction to meet the needs of a diverse group of students. The curriculum specialist provided coaching support by observing classroom instruction and assisting teachers with lesson planning. Additionally, the math interventionist monitored changes to classroom instruction, listened to teachers concerns, and provided

individualized instructional support. The Mathematical Teaching Efficacy Beliefs Instrument (MTEBI) was used to measure teachers' self-efficacy with teaching and learning

Findings from the study indicated that both general and personal self-efficacy increased after the PD and coaching. However, general self-efficacy, defined as teachers' beliefs of how students learn math, also predicted student achievement, whereas personal self-efficacy, defined as teachers' level of confidence with instructing students in math, did not. PD and coaching sessions should be well-designed, sustained, collaborative, and focused on content and instructional strategies. A PD plan should be developed which involves all stakeholders such as parents, teachers, administrators, and community members so that efforts are combined to meet the needs of students with mathematical content.

Characteristics of effective PD for self-efficacy. Although specific PD frameworks were not mentioned in the self-efficacy literature, some components were evident in the three studies reviewed. Desimone's (2009) framework emphasizes core features which are also integrated within the self-efficacy studies. Some of these elements include a sustained *duration* from five weeks to two years, a content focus on subject areas, and collective participation of teachers. Additionally, instructional coaching (Desimone & Pak, 2017) was also indicated to be a key component in positively affecting self-efficacy of teachers.

Desimone's (2009) framework will enable teachers to build their self-efficacy with understanding how and when to provide students with increased ASRs and SP assessments. Desimone's model is bidirectional, which means that not only does a change in teachers' beliefs result in a modification of instruction, a change in instruction also affects teachers' beliefs. Additionally, the PL frameworks of Simonsen et al. (2014) and Guskey (2002) are tiered approaches to ensuring teachers have the necessary supports to incorporate increased ASRs for

students. Last, instructional coaching (Desimone & Pak, 2017) allows teachers to receive authentic experiences related to the incorporation of ASRs and SP in the classroom. PD will target an increase in teacher self-efficacy by providing information related to ASRs and SP and instruction on incorporating increased ASRs and SP while providing the supports necessary for teachers to effectively implement these EBPs.

Summary of Proposed Intervention

A review of the relevant literature indicates the impact of the limited use of evidence-based practices, low teacher self-efficacy, and the diversity of learning needs on the problem of misalignment between teaching and learning. Providing teachers with PD on targeted EBPs will positively impact teacher self-efficacy, as teachers are trained to implement research-based strategies for improving learning. When teachers gain knowledge of specific EBPs and integrate EBPs within their lessons, increased information about students' current levels of understanding will be obtained through direct measurement of learning outcomes. This will enable teachers to create instructional opportunities to meet the needs of diverse learners within their ZPD, supporting a learning flow. Finally, when teachers are able to assess learning throughout the unit of instruction, students engage in periodic retrieval practice thereby strengthening students' performance and fostering a motivating educational environment.

Teachers trained with understanding and implementing EBPs in the classroom, will improve confidence with providing classroom instruction, and will positively impact self-efficacy with these practices. When teachers increase the opportunities for student ASRs and implement SP assessments, they are provided with a plethora of information related to student understandings of taught concepts. Additionally, SP increases the retention of presented content for students. These strategies allow teachers to better meet diverse student needs. The

misalignment between teaching and learning can be decreased using EBPs within the classroom setting, specifically by increasing ASRs and providing opportunities for SP.

The intervention proposed will address the misalignment by directly evaluating the use of PD and coaching to increase teachers' knowledge and implementation of ASRs and SP. Additionally, teacher self-efficacy will be measured in relation to teachers' beliefs in their confidence with implementing ASRs and SP to positively affect student outcomes. The literature details the importance of implementing ASRs and SP to improve student outcomes; the research also delineates the significance of increasing teacher self-efficacy when provided with specific training and coaching on the implementation of these instructional practices. Therefore, this intervention will focus on providing PD and coaching to teachers to increase their self-efficacy with providing ASRs and SP opportunities for students.

Chapter 4

Methodology

The decline in student achievement in the United States (US) as compared with other developed countries (Organisation for Economic Development, 2017), indicates a need to address the misalignment between teaching and learning, defined as the mismatch between taught information and learned knowledge (Zhao, 2016). According to the needs assessment conducted by the author, teachers experienced challenges with implementing Evidence-Based Practices (EBPs; e.g., prior knowledge, individualized interventions, ASRs) and expressed confusion regarding how to assess for learning. Teachers' reported levels of self-efficacy with instructional practices and assessing for learning varied; however, teachers with both high and low self-efficacy expressed the need for training for implementing EBPs and assessing for learning. The results of learning assessment outcomes was concerning as more than half of the 8th – 11th grade students did not meet the Evidence-Based Reading and Writing (ERW) and math benchmark standards, and one quarter of all middle high school students received at least one D or F on their quarterly grade reports. Additionally, over one-third of stakeholder respondents on a customer satisfaction survey did not believe that academic and future success was promoted with the school. Due to the results of the needs assessment, the literature was reviewed to determine the impact of EBPs and teacher self-efficacy on student achievement.

This review indicated that a variety of Evidence-Based Practices (EBPs) are associated with student achievement (Simonsen et al., 2008) including ASR strategies (Cavanaugh et al., 1996; Monem et al., 2018; Zayak et al., 2016) and SP (Cepeda et al., 2008; Kornell et al., 2010; McDermott et al., 2013). The literature also revealed that Professional Development, heretofore referred to as Professional Learning (PL), encourages teachers to implement unfamiliar teaching

practices (DeSantis, 2013) and enables them to feel confident with making educational decisions (Lieberman & Wood, 2002), thereby positively impacting teacher self-efficacy. Since the needs assessment revealed challenges with student achievement and indicated teacher concerns with implementing EBPs, assessing for learning, and self-efficacy, and since the literature review revealed EBPs are associated with student achievement, the intervention will train teachers on the implementation of specific EBPs through PL. It was hypothesized that, along with improving student achievement, the PL and coaching sessions would impact teacher self-efficacy by improving teacher confidence with implementing unfamiliar teaching practices.

Purpose of the Study

The purpose of the study was to determine the effectiveness of PL and coaching on teachers' ability to integrate specific EBPs (ASRs and Spaced Practice strategies) into classroom instruction. PL and coaching sessions provided teachers with information regarding when, how, and why to implement ASRs and SP. It was hypothesized that, as teachers increased their understanding of ASRs and SP, their self-efficacy with implementing EBPs would also increase.

Research Questions

To measure the effectiveness of the intervention program, outcome and process evaluation questions were created. The process was evaluated to determine the effectiveness of the implementation of the designed intervention. Outcomes were evaluated to determine the impact of the intervention on specific teacher knowledge, implementation, and efficacy. A focus on key areas of the program occurred through the creation of questions that are answerable, specific, practical, and measurable (Rossi, Lipsey, & Freeman, 2004). These questions included:

Process Research Questions:

RQ1: To what extent were the PL and coaching interventions provided to the intended participants?

RQ1A: To what extent was the project implemented with fidelity to include PL and coaching activities?

RQ1B: To what extent did the participants represent the four content areas (English Language Arts, math, science, social studies)?

RQ2: To what extent were participants engaged during the PL and coaching sessions?

RQ2A: To what extent did the participants perceive themselves as engaged with the content presented in the PL sessions?

RQ2B: To what extent did the participants perceive themselves as engaged in the discussions that occurred during the coaching sessions?

RQ2C: To what extent did the participants complete activities (e.g., creation of sample lesson, provide a lesson demonstration) during PL?

Outcome Research Questions:

RQ3: To what extent did PL and coaching increase teachers' knowledge of ASRs and Spaced Practice in the classroom?

RQ4: To what extent did PL and coaching increase teachers' implementation of ASRs and Spaced Practice in the classroom?

RQ5: To what extent does PL and coaching impact teacher self-efficacy?

Research Design

A mixed method, convergent parallel design evaluated the process and outcomes of the intervention. Incorporating mixed methods into program evaluations strengthens the results

(Bamberger, Tarsilla, & Hesse-Biber, 2016; Smith, Cannata, & Haynes, 2016); the combination of quantitative and qualitative approaches to evaluate outcomes is more effective than each of these approaches on their own (Creswell & Plano Clark, 2018; Mertens, 2018). The mixed methods approach included quantitative data from direct observation, participant self-assessment, checklists, exit tickets, and surveys as well as qualitative data from open-ended exit tickets and survey questions. First, the data strands were analyzed independently. Next, the qualitative and quantitative information were mixed together to obtain an overall interpretation (Creswell & Plano Clark, 2018). This convergent parallel design allowed the data to be analyzed separately and then compared prior to developing an overall interpretation of the findings. The overall interpretation provided information related to the extent that PL and coaching impacted teacher knowledge and implementation of ASRs and SP strategies, as well as the extent that PL and coaching impacted teacher self-efficacy. The logic model illustrates the inputs, outputs (e.g., activities and participation), and short, medium, and long term outcomes of the intervention (see Appendix L). The inputs include intervention resources such as staff, materials, and setting, and the outputs include the PL and coaching activities as well as the target participants of teacher volunteers from the middle high school. Outcomes include knowledge and implementation of ASRs and SP strategies as well as teacher self-efficacy with implementing ASRs and SP.

During implementation, it is important to evaluate the effectiveness of the process and outcomes of the intervention (Rossi et al., 2004). The process evaluation allows stakeholders to assess how the program is functioning and to what extent it is operating as designed; the outcome evaluation allows the researchers to measure the extent to which the intervention resulted in specific outcomes. An overview of the process and outcome evaluations are provided to assess crucial aspects of the program such as whether target participants received the designated

services, whether participants were responsive to the intervention, and how the intervention affect during the PL and coaching interventions, participants' knowledge and implementation of ASRs and SP increased; teacher self-efficacy was also positively affected. Results indicate the intervention was effective at the secondary level, across content areas, and within both remote and in-person environments. Modifications to the PL sessions and repetition of the study during an in-person environment may assist with determining the extent to which PL and coaching sessions effect student outcomes and teacher self-efficacy with implementing ASRs and SP. This process evaluation allowed the researcher to determine to what extent the conclusions of the study were a result of the intervention by assessing crucial aspects of the program.

Process Evaluation

Process evaluation requires components to be identified that correspond to the processes to be assessed (Rossi et al., 2004). Four components were established to include project implementation (Stufflebeam, 2003; Zhang et al., 2011), context (Baranowski & Stables, 2000), participant responsiveness, considered participant engagement, (Dusenbury, Brannigan, Falco, & Hansen, 2003), and initial use (Baranowski & Stables, 2000). Each component is discussed related to a working definition, qualitative and quantitative aspects, and alignment to the theory of treatment and logic model. A process evaluation related to the intervention targeting the misalignment between teaching and learning is also discussed.

Project implementation. According to Baranowski & Stables (2000), project implementation is the "extent to which the program is implemented as designed" (p. 160). Additionally, documentation of the process allowed for periodic review to determine whether program modifications were necessary (Stufflebeam, 2003). Attendance records documented the dates and times participants spent in the PL and coaching sessions and a checklist of intervention

activities documented information was presented as designed to ensure the program was being provided to all participants at the designated times. This intervention aligns with the Theory of Treatment (ToT; see Appendix M) as participants participated in PL and coaching sessions to increase their self-efficacy and knowledge with integrating ASRs and SP into their instruction. Specific inputs and outputs associated with the project implementation include inputs of time spent in PL sessions, data collection forms, PL materials, and outputs of the specific topics of PL sessions, ongoing coaching, and the target population of teacher volunteers. These and other inputs and outputs are detailed on the logic model (see Appendix L).

Context. The second component evaluated was context, defined as "aspects of the environment of an intervention" (Baranowski & Stables, 2000, p. 159). Context is important because it enables assessment of program generalizability (Baranowski & Stables, 2000) by determining within what environments the program can be successfully implemented. The process evaluation defines context as the environment in which the EBPs were implemented across a variety of content areas (e.g., English Language Arts, math, science, social studies, foreign language) taught by each participant. This is aligned with both the ToT (see Appendix M) and the logic model (see Appendix L), as the target population was middle high school teachers from a variety of content areas. The researcher measured the context by obtaining a list of participants and their content areas. Measurement of the independent variable (PL and coaching) across content areas assisted with determining whether the outcome was generalized across subjects.

Participant engagement. Participant engagement provided information regarding the extent of participant engagement and involvement "in the activities and content of the program" (Dusenbury et al., 2003, p. 244). At the end of PL and coaching sessions, participants' level of

engagement was measured using PL and coaching exit tickets (see Appendices P and Q). Both qualitative and quantitative information was obtained through responses on rating scale items and open-ended questions. This information provided additional insights into participant engagement and allowed the researcher to tailor PL and coaching sessions for teachers of specific content areas and with individualized needs. Participant engagement is aligned to both the ToT (see Appendix M) and logic model (see Appendix L) as teacher engagement is an integral component to the intervention activities.

Initial use. Last, initial use is the "extent to which a participant conducted activities specified in the materials" (Baranowski & Stables, 2000, p. 160). Activities integrated within PL sessions provided participants with the opportunity to create and demonstrate sample lessons within their content areas. These activities encouraged participants to integrate EBPs into instruction through discussions and shared experiences with colleagues. Initial use was measured by the percentage of participants which utilized information presented in the PL sessions within their lesson planning and instruction (see Appendix N). Initial use is aligned to the logic model as the specified activities are integrated into sessions three and four of the PL sessions (see Appendix L).

Components to address process evaluation. Project implementation, context, participant engagement, and initial use components assisted the researcher with evaluating the program. Alignment between the ToT and logic model indicate the selected components provided information regarding appropriate implementation of the program. Additionally, the mixed methods design provided cohesive understandings of the process evaluation. By mixing the quantitative and qualitative information together, the design provided an overall interpretation of findings related to the components of the process evaluation.

Outcome Evaluation

As depicted in the logic model, proximal outcomes of increased knowledge with ASRs and SP and teacher self-efficacy were measured through participant exit tickets (see Appendices O and P). The participants' ability to increase the frequency of ASRs and SP within the classroom further signifies the impact of the intervention. The outcome of ASRs implementation was measured by calculating the rate of ASRs during videotaped teacher observations, which also allowed for a second observer to determine IOA. Additionally, the medium outcome of SP was measured weekly using teacher self-monitoring, which caused reliability issues with data reporting. Data collection of ASRs and SP implementation provided the necessary information to accurately answer the outcome research question regarding the implementation of ASRs and SP.

Methods

This section includes a description of the participants, instruments, and procedures. The intervention, data collection, and data analysis procedures are explained in detail. The methods are related to the specification of data sources, data collection tools, and the frequency of data collection (see Appendix Q).

Participants

Participants included middle and high school teacher volunteers in an overseas American school. The sample of teachers included four teachers from English Language Arts (ELA), two math teachers, two science teachers, two social studies teachers, and one foreign language teacher for a total of 11 participants. Each participant was placed into one of three intervention groups (cohorts) depending on the stability of their baseline data. Each group also included teachers of similar content areas, with the exception of foreign language due to only one foreign language teacher participant. Using a multiple baseline design (MBD; Baer, Wolf, & Risley,

1968; Witt, Noell, LaFleur, & Mortensen, 1997), participants served as their own control, and baseline data was collected for each individual to measure the direct impact of the intervention on each participants' practices. The use of an MBD was critical to evaluate within subject outcomes following participants' training on ASRs and SP, through the direct measurement of teachers' implementation of these practices over time after each phase of training (e.g., baseline, Professional Learning, coaching, follow-up). An MBD design was beneficial because it measured participant skills over time and demonstrated effective treatment across settings (classrooms and content areas). This design also provided the opportunity to measure generalization of intervention outcomes across participants and settings. Additionally, visual analysis of the data was monitored throughout the intervention to determine progress and make data-based decisions regarding intervention implementation.

Instruments

Instruments were developed to measure both the process and outcomes of the intervention. During the process evaluation, instruments were used to measure project implementation, context, participant engagement, and initial use. During the outcome evaluation, instruments were used to measure teacher knowledge, strategy use, and self-efficacy. Instruments are discussed related to both the process and outcome evaluations.

Process evaluation instruments. Four instruments were used to assess the process of the intervention. These instruments included an attendance sheet, instructional content record, exit tickets, and checklist of PL activities. The importance of each instrument in evaluating process indicators are discussed in detail.

Attendance sheet. Participant attendance was documented by recording dates and times when participants received PL and coaching to measure the impact of external factors such as

attrition and scheduling. Attendance was quantified as high (attended 95-100% of the time), medium (attended 80-94% of the time), or low (attended 79% or less of the time), to measure the extent the project was implemented as intended. Barriers to participant attendance was documented on the attendance sheet to provide information on barriers to attendance. A simple data collection sheet was utilized to collect this information (see Appendix R).

Instructional content record. The content and grade levels taught by participants was documented on the instructional content record (see Appendix S). This information was obtained using the school's master schedule and each participant's content and grade level was verified at the beginning and end of the study. The researcher utilized the instructional content record to measure the implementation of the intervention and to evaluate generalization of the intervention across different content areas.

Exit ticket. Participant engagement was documented using an exit ticket at the end of each PL (see Appendix O) and coaching session (see Appendix P). Data related to participant engagement was collected through four close-ended responses including: 1) topic relevance, 2) participation in discussions, 3) topic understanding, and 4) attention to materials. Participants responded on a 4-point Likert scale ranging from strongly disagree (1) to strongly agree (4). Additional data was collected through two open-ended responses to include 1) factors which impacted participants' engagement and 2) suggestions to increase participants' level of engagement for future PD sessions. The exit tickets provided both quantitative and qualitative information related to participants' level of engagement in the PL and coaching sessions.

Checklist of intervention activities. The researcher evaluated whether specific intervention activities were presented to and completed by participants within PL and coaching sessions. This was documented after each PL and coaching session by recording the topics

presented to participants and the sample lessons created and presented by participants. Quantitative information was collected through the number of activities presented and completed by participants. Qualitative information was collected through the descriptions of the activities completed by participants. During the intervention, each participant was encouraged to complete at least two activities to include the development of a sample lesson and the demonstration of the lesson to other participants, as documented on the checklist of intervention activities (see Appendix N).

Outcome evaluation instruments. Four instruments were used to assess the extent to which the intervention impacted teacher knowledge, teacher implementation of ASRs and SP and teacher self-efficacy. These instruments include two surveys, the rate of ASRs data sheet, and the frequency of Spaced Practice data sheet. The importance of each instrument in evaluating process indicators is discussed in detail.

Teacher Sense of Efficacy Scale. The Teacher Sense of Efficacy Scale (TSES; Tschannen-Moran & Hoy, 2001), a 24-item instrument designed to measure overall teacher self-efficacy (see Appendix T) was administered to participants during baseline and at the end of the PL and coaching phases. Participants were asked to provide their opinions to the survey questions by marking their responses on a continuum from (1) "None at all" to (5) "A great deal." The TSES is considered to be valid and reliable with Cronbach's Alpha of 0.94 (Tschannen-Moran & Hoy, 2001). Additionally, self-efficacy has been further categorized into three subscales to include instructional strategies, classroom management, and student engagement (see Table 4), which are also considered to be valid and reliable.

Construct validity was ascertained by comparing the TSES with existing measures of self-efficacy to include the Rand measure and the Hoy and Woolfolk adaptation of the Gibson

and Dembo measure. Scores on the TSES were positively related with both Rand items ($r = 0.18$ and 0.53, $p<0.01$), and the Gibson and Dembo measure of both personal teaching efficacy ($r = 0.64$, $p<0.001$) and general teaching efficacy ($r = 0.16$, $p<0.01$). Additionally, high reliability was obtained for each subscale to include instruction (0.91), management (0.90), and engagement (0.87). Therefore, the TSES is considered reasonably valid and reliable for exploring teacher self-efficacy and was administered to participants during baseline and at the end of the PL and coaching phases.

Table 4

Teacher Self-efficacy Scale Factors, Item Numbers, Sample Questions (Tschannen-Moran & Woolfolk Hoy, 2001)

Factor	Item Number	Sample Question
Efficacy for Instructional Strategies	7, 10, 11, 17, 18, 20, 23, 24	To what extent can you gauge student comprehension of what you have taught? 1-8
Efficacy for Classroom Management	3, 5, 8, 13, 15, 16, 19, 21	How well can you establish routines to keep activities running smoothly? 9-16
Efficacy for Student Engagement	1, 2, 4, 6, 9, 12, 14, 22	How much can you do to help your students think critically? 17-24

Instructional strategies survey. As there are no current measures specifically related to teacher self-efficacy with ASRs and SP, the instructional strategies survey was created by the researcher (see Appendix U). This fifteen question survey measured teacher's level of confidence using ASRs and SP. For example, a sample item to determine teacher self-efficacy with using ASRs is "Rate your level of confidence with developing questions to determine student understanding." Additionally, a sample item to determine teacher self-efficacy with using SP was "Rate your level of confidence with giving quizzes at specific times to assist the students with

remembering content." The instructional strategies survey was administered to participants at the end of the PL phase and at the end of the coaching phase. No current information exists regarding validity and reliability for this measure.

Rate of ASRs. Participants implementation of ASRs was measured throughout the study. A participant data sheet created by the researcher documented the start times, stop times, and frequencies of ASRs implemented by each teacher within their classrooms (see Appendix V). Additionally, teachers were asked to record the first 10-minutes of each class period to ensure consistency with time in order to record the frequencies of ASRs across all phases of the study. Frequency of ASR implementation was collected during two to four observations prior to the PL sessions to obtain a baseline rate of ASRs. After baseline, frequency data was collected on ASRs during weekly, videotaped observations of the participants. Frequencies of ASR were calculated and graphed according to rate per minute by dividing the total number of ASRs occurring by total minutes of the observation (count divided by length of time). In order to determine reliability of the direct observations, IOA data was also collected on the frequency of ASRs across all phases of the study. During bi-weekly coaching sessions, the researcher and participants discussed the rates of ASRs, and the researcher provided the participants with ongoing feedback related to the effective use of ASRs in their classrooms.

Frequency of SP. Participants implementation of SP was also measured throughout the study. A participant data sheet enabled self-report on the frequency of SP strategies implemented by each teacher within their classrooms (see Appendix W). Frequency data was collected during two to four different observations prior to the PL sessions to obtain a baseline rate of self-reported SP. Additionally, teachers reported SP implementation throughout the study during the Professional Learning, coaching, and follow-up phases. To obtain this frequency measure, the

researcher periodically asked participants to report their SP activities during phone conversations, online coaching sessions, or via email. During bi-weekly coaching sessions, the researcher and participants discussed the frequency of SP, and the researcher provided the participants with ongoing feedback related to the effective use of SP in their classrooms.

Procedures

This section describes the intervention procedures in detail. Procedures include participant recruitment, baseline data collection, and a timeline of activities. Data collection and data analysis procedures are also discussed.

Participant Recruitment

To recruit participants for the intervention, procedures outlined in the Johns Hopkins School of Education Recruitment and Retention form (see Appendix X) were followed. These procedures included the distribution of a flyer (see Appendix Y) to teachers from a middle high school (grades 6-12) via private (within school Listerv) e-mail. Potential participants indicated preference for participation by responding directly to the e-mail or using voting buttons by responding either “Yes, I would like to be considered for participation.” or “No, I do not want to be considered for participation.” Due to the pandemic, flyers were only provided via email and paper versions were not distributed. Participants were encouraged to contact the researcher regarding questions or concerns about the requirements of the study. The researcher's contact information was provided to include e-mail address and telephone number.

The global coronavirus pandemic resulted in online learning for students from 24 August 2020 until 24 October 2020. During online learning, teachers were provided the option to telework. Some teachers actually worked from locations in different time zones. This made participant recruitment challenging as it was difficult to convince participants to engage in

professional learning and coaching sessions during non-normal work hours. Despite these obstacles, eleven teachers volunteered to participate in the study. The researcher contacted each teacher to provide an overview of the study and participant requirements. The researcher reviewed the consent form with possible participants which included a discussion of the purpose, risks, and benefits of the study and the right to withdraw from the study (see Appendix Z).

Intervention

The intervention directly evaluated the use of PL and coaching to increase teachers' self-efficacy and teachers' knowledge and implementation with ASRs and SP. It was hypothesized that the intervention would increase teacher self-efficacy, teacher knowledge and implementation of ASRs and SP, and positively affect student outcomes. Prior to implementing the intervention, baseline data was collected to measure frequencies of ASRs through video recordings and frequencies of SP through self-report. The PL phase of the intervention included PL sessions, weekly observations, and self-reported frequency of SP. The coaching phase included bi-weekly coaching sessions, weekly observations, and self-reported frequency of SP. Specific instructional activities, as detailed in the logic model, occurred during each PL session (see Appendix L). Participants were actively engaged in the PL process, specifically during sessions three and four in which teachers created a lesson and then presented the lesson while integrating ASRs and SP. Each portion of the intervention is described in the following section, and objectives and descriptions of the PL and coaching sessions are detailed in Appendix AA.

Pre-Session. Prior to beginning the study, volunteers were provided with the participation consent form (see Appendix Z). Once the consent form was signed, each participant completed the TSES (see Appendix T). Additionally, the participants were asked to self-report baseline data by documenting the frequency and type of SP activities in their

classroom. During this period, classroom observations from recorded sessions occurred for each participant to measure the baseline rates of ASRs. The recorded observations provided the opportunity to measure interobserver agreement (IOA) on the frequency of ASRs. Results from the information collected during the pre-session (e.g., participant responses on the TSES survey, rates of ASRs, and frequency and types of SP) served as baseline measures for the study. Due to the pandemic, participants were informed that all PL and coaching sessions would occur via video teleconferencing.

During the baseline phase, the researcher grouped the participants into cohorts based on the stability of their ASR baseline data as well as similarity of taught content (e.g., ELA, math, social studies, science). After week two, baseline data was stable for four teachers from two content areas (ELA and science), and these participants were grouped into cohort 1. After week three, baseline data was stable for three teachers from two content areas (math and foreign language), and these participants were grouped into cohort 2. After week four, baseline data was stable for four teachers from two content areas (ELA and social studies), and these participants were grouped into cohort 3. The creation of three cohorts enabled the researcher to stagger PL and coaching sessions.

Once a stable baseline was achieved for a group of participants, they were placed into a cohort. The researcher tried to include participants of similar contents within the same cohort to enable content-specific collaboration. However, this was not possible for foreign language, as there was only one teacher within this content. The cohort groups attended the PL sessions together, which occurred one time per week for four weeks. During the coaching phase, participants were provided with bi-weekly, one-on-one sessions to provide them with feedback

regarding their current use of ASRs and SP. One month later, the final phase involved follow-up data collection of ASRs and SP.

During week three, cohort 1 engaged in PL session 1, while baseline data collection continued for cohorts 2 and 3. During week four, cohort 1 participated in PL session 2, and cohort 2 participated in PL session 1, while baseline data collection continued for cohort 3. This staggering of PL and coaching sessions occurred from week three to week fourteen of the study, which was valuable for several reasons. First, it supported the multiple baseline design, which allowed participants to serve as their own controls. Second, it enabled participants to receive small group and individualized supports. Third, it allowed the researcher to provide participants with the necessary training and support within the confines of a demanding schedule. Details associated with each of the PL and coaching sessions are described.

PL session 1. The 45-minute session began with the researcher providing an overall schedule of the intervention to include four PL sessions and biweekly coaching sessions. The participant learning objectives included: 1) understanding the results of the needs assessment, 2) learning the conceptual framework to include the ZPD, motivation, and flow theory, and 3) the rationale for the use of ASRs and SP to help solve the problem in the needs assessment. The first group of participants (cohort 1) included two ELA teachers and two science teachers. Next, information was presented to participants using Desimone's (2009) framework of effective PL to include (a) content focus, (b) active learning, (c) coherent focus, (d) duration, and (e) collective participation. The information included the explanation of the needs assessment results and the conceptual framework for the intervention. The rationale for the use of EBPs, specifically related to ASRs and SP was provided to participants.

At the end of each session, the researcher completed a checklist of intervention activities to ensure the project was implemented for each participant (see Appendix N). Additionally, the researcher shared individualized survey links for each participant to complete a PL exit ticket, which provided the researcher with feedback regarding teachers' level of engagement (see Appendix O). Last, participants were encouraged to continue with their weekly self-assessment regarding the frequency of SP activities.

PL session 2. During this 45-minute session, information was provided to participants regarding the knowledge and implementation of ASRs and SP in the classroom. The participant learning objectives included: 1) differentiating between the types of ASRs and SP activities, 2) creating a lesson integrating ASRs and SP strategies, and 3) incorporating ASRs and SP in the classroom. First, the researcher presented three types of ASRs (e.g., technology quizzes, whiteboards, response cards) and three types of SP activities (e.g., quizzes, mid-chapter review, test review). Next, the researcher modeled the creation of a lesson integrating each of the instructional practices. Last, the researcher taught the lesson to the participants while incorporating ASRs and SP.

Participants were encouraged to choose a topic and bring necessary materials to PL session three to practice creating a sample lesson which integrated the taught EBPs. At the end of the session, the participants were provided a link to complete an exit ticket regarding their level of engagement during the session (see Appendix O). Additionally, the researcher completed the checklist of intervention activities (see Appendix N).

PL session 3. Within this 45-minute session, participants were provided with a brief overview of the information presented in the first two sessions. The participant learning objective was to create a sample lesson integrating both ASRs and SP strategies. First, ASRs and SP were

reviewed to provide the participants with an additional exemplar for the integration of the EBPs. Next, the participants were encouraged to create sample lessons, and the researcher was available to answer participants' questions and provide suggestions regarding how to implement the instructional strategies into their lesson plan. Activities completed by the participants were documented (see Appendix N) by the researcher, and the participants' level of engagement was obtained through the exit ticket completed at the end of the session (see Appendix O).

PL session 4. During the 45-minute session, previously taught information about ASRs and SP was reviewed with the teachers. The participant learning objective for this session was gaining practical experience with integrating ASRs and SP strategies while teaching a lesson within their content areas. Each participant was asked to present their sample lesson and receive feedback from the researcher and their peers regarding the process. Activities completed by the participants were documented (see Appendix N) by the researcher, and the researcher explained the process of bi-weekly coaching sessions and data collection (e.g., video observations, self-assessment of SP, completion of surveys) throughout the remainder of the intervention. Additionally, the participants' level of engagement was obtained through the completion of the exit ticket survey at the end of the session (see Appendix O).

At the end of the PL phase, participants were asked to complete the ISS to determine their level of knowledge and implementation of ASRs and SP as well as their level of confidence with integrating both EBPs within the classroom. They were also asked to complete the TSES to determine their level of self-efficacy with student engagement, classroom management, and instructional strategies. Appendix BB provides a detailed

explanation of the timetable for each cohort to include the stage of intervention and data collection.

Coaching sessions. Following each cohort's completion of all four PL sessions, biweekly coaching sessions were implemented. The objective for each coaching session was to refine participants abilities to create and deliver lessons integrating ASRs and SP within their content areas. First, the researcher reviewed recorded data documenting participants' implementation of ASRs, which occurred during the first 10-minutes of one class period each week. Second, individualized coaching session were held in which the participant provided the self-assessment data regarding SP implementation. Third, the researcher shared the rate of ASRs and SP with the participant, as ascertained from the observation and teacher self-assessment. The researcher also answered participant questions regarding instructional practices and provided guidance, modeling, and recommendations to assist with the future implementation of the EBPs. Last, participants' level of engagement was obtained through the completion of the exit ticket survey at the end of the session (see Appendix P).

Participants were provided the opportunity to discuss the implementation of ASRs and SP within individualized bi-weekly coaching sessions for a duration of six weeks. Due to the pandemic, these sessions were conducted virtually. At the end of the coaching phase, participants were asked to complete a follow-up TSES (see Appendix T) and ISS (see Appendix U). Outcomes of the TSES at the end of the coaching phase enabled the researcher to compare teacher self-efficacy ratings across baseline, PL, and coaching phases of the study. Outcomes of the ISS at the end of the coaching phase allowed the

researcher to compare participants' level of knowledge and implementation of ASRs and SP as well as their level of confidence with integrating both EBPs across the PL and coaching phases of the study.

Once cohort 1 completed the first coaching session, the researcher convened the first coaching session for cohort 2 while cohort 1 engaged in a week of data collection only (week 9). During week 10, cohort 1 completed the second coaching session, cohort 3 completed in the first coaching session, and cohort 2 engaged in a week of data collection only. This pattern continued for a total of 7 weeks until all cohorts were provided the opportunity to engage in three coaching sessions. Appendix BB provides a detailed explanation of the timetable for each group to include the stage of intervention and data collection. At the end of each coaching session, the researcher completed the checklist of intervention activities documenting the implementation of coaching session activities (see Appendix N). Additionally, a one-month follow-up was completed to determine whether participants continued to implement ASRs and SP strategies once the intervention was finished.

Follow-up. One month after the completion of the coaching phase, follow-up data was collected to determine the effectiveness of the intervention. Participants were asked to provide the researcher with one video from the first ten minutes of a selected class period. They were also asked to self-report the frequency of SP during the follow-up week. Once this information had been provided to the researcher, participants were informed that the study was complete.

Data Collection

Data was collected throughout the intervention to evaluate all processes and outcome research questions. More specifically, a convergent parallel design allowed both quantitative and qualitative information to be collected concurrently and then analyzed separately (Creswell & Plano Clark, 2018; Mertens, 2018). However, dominance was not given to either the quantitative or qualitative paradigms. First, the data strands were be analyzed independently. Next, the qualitative and quantitative information were mixed together to obtain an overall interpretation (Creswell & Plano Clark, 2018). This convergent parallel design allowed data to be analyzed separately and then compared prior to developing an overall interpretation of the findings, which provided a cohesive understanding of the extent of PL and coaching as related to teacher self-efficacy.

Process evaluation. To complete the process evaluation, data was collected from several sources. At the beginning and end of each PL and coaching session, the researcher took attendance to determine the level of project implementation by evaluating to what extent all 11 participants completed the training sessions. Additionally, barriers that impacted the participants from attending the sessions or parts of the sessions (e.g., conflicts with other school meetings, personal obligations, etc.) were documented. The researcher also obtained a list of the participants and the content areas they teach to determine the context of the process across the content areas (e.g., ELA, science, math, social studies, foreign language). This information was cross referenced with the master schedule for accuracy. At the end of each PL and coaching session, participants completed an exit ticket to provide the researcher with information regarding the level of teacher engagement for each session. Last, the researcher completed a checklist of intervention activities during the PL and coaching sessions to determine the extent to

which the project was implemented appropriately and to determine whether or not the participants were able to actually create and demonstrate a sample lesson.

Outcome evaluation. Outcomes were measured to analyze the impact of the intervention. Responses from the ISS provided the researcher with insights into the extent to which the intervention increased teacher knowledge of ASRs and SP. The frequency of ASRs and SP were documented during the baseline, PL, coaching, and follow-up phases to determine the impact of the intervention on the rate of specific EBPs in the classroom. Additionally, the MBD was used to evaluate direct observation of ASRs.

Regarding evaluation of survey results, participant responses on the TSES (Tschannen-Moran & Hoy, 2001) and the ISS provided data regarding the extent to which the intervention impacted teacher self-efficacy. Data collection prior to and throughout the intervention allowed the researcher to measure the impact of PL and coaching on teacher knowledge. Teacher implementation of ASRs and SP as well as the impact of PL and coaching on teacher self-efficacy was also evaluated.

Data Management

Study records were created, stored, and maintained to protect the confidential research data. Records were kept in a locked file cabinet, stored on a password protected computer, and only those involved in the research process were provided access to the data to include the researcher, advisor, and committee members. Surveys were administered and data collected using Qualtrics. The identities of the participants were protected through the use of code numbers rather than participants' names on data sheets and other information. Therefore, the identity of the participants was kept confidential, and a list of the participants' identifiers corresponding to their true identities was stored in a separate location.

Data Analysis

The data was analyzed to provide information related to the process and outcome evaluation questions. The Statistical Package for the Social Sciences (SPSS) software and excel was used to complete the quantitative data analysis. Quantitative data was analyzed using descriptive statistics and non-parametric tests due to the small sample size. Qualitative data was analyzed using first cycle descriptive coding and second cycle coding to categorize the data into themes and codes. Both quantitative and qualitative data was analyzed separately and then mixed together to obtain an overall interpretation using a convergent parallel design (Creswell & Plano Clark, 2018).

Quantitative data of the process evaluation. Quantitative data pertaining to the process evaluation was analyzed to include attendance, content areas taught by participants, level of participant engagement, and the presentation and completion of PL activities. Descriptive statistics was used to analyze the level of participation and is quantified as high (attended 95-100% of the time), medium (attended 80-94% of the time), or low (attended 79% or less of the time). Descriptive statistics was also used to analyze the number of participants that teach each content area (e.g., the number of participants that teach ELA, math, science, social studies, and foreign language), which assisted with evaluating the generalizability of the intervention across content areas. Additionally, descriptive statistics was used to analyze the level of participant engagement, the number of activities presented to participants, and the number of participants that created and demonstrated a sample lesson on the checklist of intervention activities. The quantitative data analysis allowed the researcher to look for trends within the limited timeframe available to the single researcher (Creswell & Plano Clark, 2018).

Qualitative data of the process evaluation. Qualitative data related to the process evaluation was collected from participant responses to open-ended survey questions. The participants' open-ended responses were descriptively analyzed and then categorized into themes and codes. The themes and codes provided further insights into the extent of participants' attendance, level of engagement, and completion of PL activities. The qualitative design provided the researcher with the in-depth information needed to analyze the indicators associated with the research questions.

Quantitative data of the outcome evaluation. Quantitative data pertaining to the outcome evaluation was analyzed to include teacher knowledge of ASRs and SP, the implementation of ASRs and SP, self-efficacy related to the constructs of Student Engagement (SE), Classroom Management (CM), and Instructional Strategies (IS), and teacher confidence with ASRs and SP. Data from the ISS was analyzed to determine the extent to which the intervention increased teacher knowledge of ASRs and SP as well as teacher confidence with ASRs and Spaced Practice. Data from the TSES was analyzed to determine the extent to which the intervention increased teacher self-efficacy with the constructs of SE, CM, and IS. Additionally, data concerning the rate of ASRs and SP was analyzed to determine the difference between the use of the EBPs from baseline through follow-up.

Due to the small sample size, teacher knowledge of ASRs and SP were analyzed using descriptive statistics and a visual analysis of comparison of means across phases. Nonparametric tests were utilized to analyze the extent to which the intervention increased teacher implementation of ASRs and SP strategies. Additionally, the MBD provided the researcher with the information needed to complete a visual analysis of the rates of ASRs and SP to include trends, levels, and variability of data (Cooper et al., 2007). Evaluation of the results within an

MBD was calculated through the percentage of nonoverlapping data points to further analyze the extent to which the treatment was effective and to demonstrate experimental control (Dallery, Cassidy, & Raiff, 2013). Visual analysis of the outcomes allows for the comparisons between phases across cohorts, providing an indication that the independent variable (PL and coaching) impacted a change in the dependent variable (rate of ASRs and SP in the classroom).

Qualitative data of the outcome evaluation. Qualitative data was analyzed from participant responses on open-ended survey questions from the ISS. After the data was transcribed, the participants' surveys were descriptively analyzed and then categorized into themes and codes. A codebook was created to represent the themes and codes related to teacher knowledge of ASRs and SP and teacher self-efficacy with ASRs and SP. The use of qualitative methods for analyzing teachers' knowledge of ASRs and SP as well as teacher self-efficacy was utilized to thoroughly understand the participants' viewpoints while reflecting on the meaning within the situated context (Creswell & Plano Clark, 2018).

Mixed methods comparison. The convergent parallel design allowed data to be analyzed separately and then compared prior to developing an overall interpretation of the findings, which provided a cohesive understanding of the impact of PL and coaching as related to teacher knowledge of ASRs and SP and teacher self-efficacy. First, the quantitative and qualitative data was independently analyzed according to the approach that best fit the research questions. Next, the data were compared and interpreted to determine a meaningful merging of the data set results. A threat to validity arises if unequal weights are given to different forms of data. Therefore, careful, equal considerations were given to both quantitative and qualitative data (Crewsell & Plano Clark, 2018). Additional threats to internal, construct, and external validity were carefully monitored as the small sample size and restricted settings provides limitations in

this regard (Shaddish, Cook, & Campbell, 2002). Using mixed methods allowed the quantitative and qualitative data to inform the analysis of the other and strengthen the power of the study (Sandelowski, 2000).

Summary matrices. The matrices provide a visual display of the alignment between evaluation questions, indicators and constructs, data source(s), data collection tools, frequency of data collection, and methods of data analysis. The matrices provide snapshots of the process and outcome evaluations as related to the research questions (see Tables 5.1 – 5.5).

Table 5.1

Process Evaluation Summary Matrix: Project Implementation and Context

RQ1: To what extent were the PL and coaching interventions provided to the intended participants?

RQ1A: To what extent was the project implemented with fidelity to include PL and coaching activities?

RQ1B: To what extent did the participants represent the core content areas (English Language Arts, math, science, social studies, foreign language)?

Variable	Instrumentation	Data Collection		Data Analysis
		Source(s)	Frequency	
Project Implementation Match between course design and presentation to attendees	PL and coaching attendance sheets (Appendix R); Checklist of intervention activities (Appendix N)	Teachers Researcher	During each PL and coaching session	Descriptive statistics
Context Teacher participants and the instructional content they teach	Instructional Content record (Appendix S)	Teachers	At the beginning and ending of the program	Descriptive statistics

Table 5.2

Process Evaluation Summary Matrix: Participant Responsiveness and Initial Use

RQ2: To what extent were participants engaged during the PL and coaching sessions?

RQ2A: To what extent did the participants perceive themselves as engaged with the content presented in the PL sessions?

RQ2B: To what extent did the participants perceive themselves as engaged in the discussions that occurred during the coaching sessions?

RQ2C: To what extent did the participants complete activities (e.g., creation of sample lesson, provide a lesson demonstration) during PL?

Variable	Instrumentation	Data Collection		Data Analysis
		Source(s)	Frequency	
Participant Engagement Level of teacher engagement in PL and coaching sessions	Exit ticket (Appendices O and P)	Teachers	At the end of each PL and coaching session	Descriptive statistics; Inductive thematic coding
Initial Use Activities completed during PL sessions three and four	Checklist of intervention activities (Appendix N)	Teachers	At the end of PL sessions three and four	Descriptive statistics

Table 5.3

Outcome Evaluation Summary Matrix: Teachers' Knowledge of Instructional Practices

RQ3: To what extent did PL and coaching increase teachers' knowledge of ASRs and SP in the classroom?

Outcome Variable	Instrumentation	Data Collection		Data Analysis
		Source(s)	Frequency	
Teacher Knowledge of ASRs and SP	Instructional Strategies Survey (Appendix U)	Teachers	At the end of the PL phase, and at the end of the coaching phase	Descriptive statistics; Inductive thematic coding

Table 5.4

Outcome Evaluation Summary Matrix: Teacher Implementation of Instructional Practices

RQ4: To what extent did PL and coaching increase teachers' implementation of ASRs and SP in the classroom?

Outcome Variable	Instrumentation	Data Collection		Data Analysis
		Source(s)	Frequency	
Rate of ASRs and SP	Rate of ASRs data sheet (Appendix V); Weekly Documentation (Appendix W)	Teachers Researcher	Weekly during baseline, PL, and coaching phases; one time during follow-up	Nonparametric test; MBD analysis

Table 5.5

Outcome Evaluation Summary Matrix: Teacher Self-efficacy

RQ5: To what extent does PL and coaching impact teacher self-efficacy?

Outcome Variable	Instrumentation	Data Collection		Data Analysis
		Source(s)	Frequency	
Teacher Self-efficacy related to the constructs of student engagement, classroom management, and instructional strategies	Teacher Sense of Efficacy Scale (Appendix T)	Teachers	Weekly during baseline, at the end of the PL phase, and at the end of the coaching phase	Descriptive statistics
Teacher Self-efficacy with ASRs and SP	Instructional Strategies Survey (Appendix U)	Teachers	At the end of the PL and coaching phases	Descriptive statistics; Inductive thematic coding

Chapter 5

Findings and Discussion

The purpose of the study was to determine the effectiveness of Professional Learning (PL) and coaching with teacher implementation of Active Student Responses (ASRs) and Spaced Practice (SP) to address the misalignment between teaching and learning. Within chapter 5, a summary of the intervention findings, and a discussion of the results are provided. The findings and results are framed by each research question. Additionally, limitations of the study and future implications for practice and research are summarized.

Due to the COVID-19 pandemic, the setting of the intervention was modified. Rather than providing face-to-face PL and coaching, all sessions were completed online. This provided a healthy and safe environment for the researcher and participants. During the weeks preceding the intervention, the researcher created PL materials and ensured data collection procedures were aligned to the research questions. Once the fall semester began, the recruitment flyer was provided to the teachers of core contents (e.g., math, English Language Arts, social studies, science, foreign language) within a middle high school. Teachers volunteers were provided with the consent forms prior to beginning the study.

Eleven middle high school teachers volunteered to participate in the study (see Table 6). The participants included certified teachers from each core content including math (n=2), English Language Arts (n=4), social studies (n=2), science (n=2), and foreign language (n=1). Teachers ranged in ages from 33-59 years and included 9 females and 2 males. Highest degrees held by participants include a bachelor's degree for one teacher, a master's degree for nine teachers, and a doctorate degree for one teacher. All teachers were highly qualified to teach their content area with one exception. The high school math teacher was only qualified to teach up to

eighth grade math but was currently teaching 9th grade math, due to teacher shortages from the pandemic.

As the study sought to examine the efficacy of ASRs and SP within different content areas, it was important to ensure that participants taught a variety of subjects. This allowed the researcher to examine the differences in rates of ASRs and SP across contents and assess generalizability. Since 100% of the core subjects were represented, each cohort included at least two teachers from the same content areas, with the exception of foreign language.

Table 6

Teacher Volunteers by Content

Content	Level	*n*	%
Math	middle school	1	9.1
	high school	1	9.1
English Language Arts	middle school	1	9.1
	high school	3	27.2
Science	middle school	1	9.1
	high school	1	9.1
Social Studies	middle school	1	9.1
	high school	1	9.1
Foreign Language	middle/high school	1	9.1

Findings

The study evaluated the effect of PL and coaching on increasing teachers' use of ASRs and SP within the classroom. Topics of two research questions were related to program implementation, while three additional research questions were associated with outcomes. As previously stated, program and outcome data corresponding to each research question is provided to determine the effectiveness of the intervention (Rossi et al., 2004). The program and outcome questions are evaluated according to the previously mentioned data.

Process Evaluation

To answer the research questions related to the process evaluation, four components will be discussed. They include project implementation (Stufflebeam, 2003; Zhang et al., 2011), context (Baranowski & Stables, 2000), participant engagement, (Dusenbury, Brannigan, Falco, & Hansen, 2003), and initial use (Baranowski & Stables, 2000). Data corresponding to each component is provided and examined in relation to the associated research question. This information assists with determining whether the project was appropriately implemented to target the misalignment between teaching and learning.

RQ 1 results: To what extent were the PL and coaching interventions provided to the intended participants? To evaluate the implementation of the PL and coaching sessions, an intervention checklist was completed by the researcher after each session. The intervention checklist documented participant attendance and ensured participants were provided pertinent information and feedback during each session (see Appendix N). If a participant was absent from the session, the researcher scheduled a make-up session with the participant resulting in 100% attendance for each PL session, 100% for coaching session one, 100% for coaching session two, and 91% for coaching session three (see Figure 8). Participants reported attendance barriers to

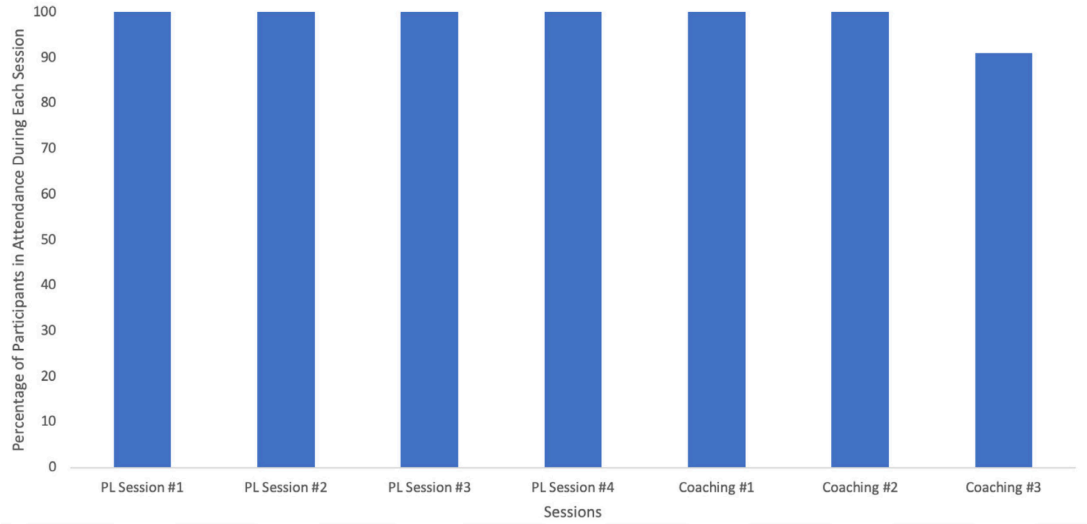

Figure 8. Participant attendance during professional learning and coaching sessions.

to the researcher citing reasons for absences such as "bad day," "family emergency," and "forgot" (see Table 7). As participants attended 100% of PL sessions and 97% of coaching sessions, attendance occurred at a high level (95-100% of the time) across all sessions.

Table 7

Barriers to Attendance

Cohort	PL Sessions	Coaching Sessions
1	difficulty attending at end of day	family emergency
2	bad day	other school obligations no internet parent meeting
3	sick colleague	Forgot meeting conflict

In addition to attendance, findings from the intervention checklists indicate that all necessary information was shared with participants for each session they attended (100% of PL sessions and 97% of coaching sessions). Also, 100% of the core content areas (English Language Arts, math, science, social studies, foreign language) were represented by participants in the study, which reveals a high level of diversification among participants. Therefore, the results of participant attendance, implementation of the intervention checklist, and representation of all core content areas indicates that RQ 1 was addressed, and the PL and coaching interventions were provided to the participants as intended.

RQ 2 results: **To what extent were participants engaged during the PL and coaching sessions?** Participant engagement is integral to ensuring the completion of intervention activities. After each PL session, participants were asked to complete a survey targeting participant engagement (PL Exit Ticket; see Appendix O). Quantitative questions related to session relevancy, participation, understanding, and materials (see Table 8) were provided. Participants rated their engagement on Likert scale from 1 (strongly disagree) to 5 (strongly agree) on four

questions on across a total of 44 PL sessions. The rate of completion for the PL Exit Ticket was 80%.

Table 8

Participant Engagement During PL Sessions

Questions	*M*	*Mdn*	Range	*SD*
The topic of the learning session was relevant to the classes and students that I teach.	4.71	5	2-5	0.75
The information presented in the session caused me to ask questions or participate in class discussions.	4.49	5	3-5	0.66
The activities helped increase my understanding of the topic.	4.51	5	3-5	0.66
The materials presented in the session kept my attention the majority of the time.	4.57	5	2-5	0.81

Information from the surveys indicated that participants believed topics were relevant to the classes and students they teach (M=4.71, SD=0.74). Additionally, the activities helped the participants ask questions or participate in discussions (M=4.49, SD=0.66), increase their understanding of the topic (M=4.51, SD=0.66), and attend to the materials presented (M=4.57, SD=0.81). The majority of participants rated the relevancy, participation, understanding, and attention to materials very highly (Mdn=5) indicating a high level of engagement within the PL sessions for most participants. However, variability across PL sessions was indicated for one participant regarding relevancy of topic (somewhat disagree to strongly agree) and attention to the materials presented (somewhat disagree to strongly agree). Qualitative data provided further information regarding engagement challenges for particular participants.

After each PL session, participants were invited to provide qualitative information regarding their engagement. Two open-ended questions on the PL Exit Ticket provided

participants with an opportunity to share additional insights related to session topic, location, time of day, time of session, length of session, types of activities, as well as provide suggestions for future PL sessions. This information was coded to determine any themes across participants. Additionally, suggestions for improvement were carefully considered by the researcher when planning future sessions.

Qualitative information was analyzed using an inductive process to determine codes expressed by the participants. These codes included time of day, length of session, topics, and activities. The codes were then examined to ascertain patterns from which two themes were generated: *time* (time of day, length of session) and *content* (topics, activities). Both themes and codes are discussed in relation to specific comments and suggestions provided by the participants on the PL Exit Tickets.

Related to the theme of *time*, most participants explained that the time of day was appropriate; however, 27% of the participants explained that it was challenging to pay attention during after school or lunch meetings. One participant commented that the "biggest factor is the time of day for me" and that the "end of the day is always hard." In comparison, another participant stated that "sessions after school are great." Additionally, participants appreciated the 45-minute length of sessions and indicated they were "sufficient" and "appropriate." Therefore, participants reported that the time of day impacted their engagement, but generally understood that there were limited options for scheduling and appreciated the length of the sessions. To address this concern throughout the PL sessions, the researcher asked each cohort which time of day was preferred and attempted to schedule PL sessions at convenient times.

Related to the theme of *content*, most participants explained that session topics were "relevant," "interesting," and "beneficial." However, one participant somewhat disagreed with

the statement that "the topic of the learning session was relevant to the classes and students that I teach" and suggested the need for additional information related to implementing ASRs to synthesize and apply content. Additionally, participants reported that the PL activities were considered "useful" and "highly engaging." However, one participant somewhat disagreed with the statement that "the materials presented in the session kept my attention the majority of the time" and suggested that more content specific ways to use ASRs would be beneficial. Participants indicated the topics of PL sessions were relevant (*M*=4.71), and the activities helped increase their level of understanding (*M*=4.51).

Overall, most participants indicated a high level of engagement regarding relevancy, participation, understanding, and attention to materials during PL. However, one participant discussed the need for additional information with implementing ASRs, particularly related to the application and synthesis of content specific material. Additionally, participants explained that the time of day affected their level of engagement but generally understood that few scheduling options were available. Based on this feedback, the researcher attempted to schedule future PL sessions during the most convenient times for each cohort. Both quantitative and qualitative information indicate participants considered the PL sessions highly engaging.

Additionally, after each coaching session, participants were asked to complete a survey targeting participant engagement (Coaching Exit Ticket; see Appendix P). Quantitative questions were related to session relevancy, participation, understanding, and information (see Table 9). Participants rated their engagement on Likert scale from 1 (strongly disagree) to 5 (strongly agree) on four quantitative questions across a total of 32 coaching sessions. The rate of completion for the Coaching Exit Ticket was 88%.

Information from the surveys indicated that participants believed the topics were relevant to the classes and students they teach (*M*=4.86, *SD*=0.35). Additionally, the activities helped the participants ask questions or participate in discussions (*M*=4.93, *SD*=0.26), increase their

Table 9

Participant Engagement During Coaching Sessions

Questions	*M*	*Mdn*	Range	*SD*
The topic of the learning session was relevant to the classes and students that I teach.	4.86	5	4-5	0.35
The information presented in the session caused me to ask questions or participate in class discussions.	4.93	5	4-5	0.26
The activities helped increase my understanding of the topic.	4.66	5	3-5	0.55
The information presented in the session kept my attention the majority of the time.	4.97	5	4-5	0.19

understanding of the topic (*M*=4.66, *SD*=0.55), and attend to the information presented (*M*=4.97, *SD*=0.19). The majority of participants rated the relevancy, participation, understanding, and attention to the information very highly (*Mdn*=5) indicating a high level of engagement and little variability within the coaching sessions. Qualitative information was utilized to provide further insights into participants' perspectives of their engagement during coaching sessions.

After each coaching session, participants were invited to provide qualitative information regarding their engagement. Two open-ended questions on the Coaching Exit Ticket provided participants with an opportunity to share additional information with the researcher related to the session topic, location, time of day, time of session, length of session, types of activities, as well as to provide suggestions for future coaching sessions. This information was coded to determine

any themes across participants. Additionally, suggestions for improvement were carefully considered by the researcher when planning future sessions.

Qualitative information was analyzed using an inductive process. Codes included time of day, length of session, topics, and activities. The codes were then examined to ascertain patterns from which two themes were generated: *time* (time of day, length of session) and *content* (relevance, participation). Both themes and codes are discussed in relation to specific comments and suggestions provided by the participants on the coaching surveys.

Related to the theme of *time*, participants frequently cited time of day as a factor that influenced their level of engagement. During coaching sessions, participants were provided with several scheduling options and were invited to choose a specific day/time that worked best for their coaching session. Providing a choice regarding day of week and time for the session most likely increased their level of engagement. Participants also indicated that the length of the sessions was appropriate and made no suggestions for improving time of day or length of sessions. Therefore, providing participants' scheduling options as well as limiting sessions to 20 minutes each were key factors in ensuring engagement during coaching sessions.

Related to the theme of *content*, participants indicated session topics were relevant to instruction, teaching methods, and class activities. Participants expressed enjoyment with discussions related to implementation of strategies within their classroom with their students. As one teacher stated, "It was a discussion of my class, how could I not be engaged in that?" Additionally, content of coaching sessions was viewed as particularly meaningful to the participants due to the individualized discussions and performance feedback. For example, during coaching sessions two and three, the researcher presented a graph to participants which visually represented their rate of ASR implementation. Content of coaching sessions was viewed

by participants as "very relevant" and helped teachers "reflect on effectiveness of implementing strategies." Therefore, participants indicated information discussed in the sessions kept their attention the majority of the time (*M*=4.97), and the discussion caused them to ask questions or engage with the facilitator (*M*=4.93).

Overall, participants indicated a high level of engagement during coaching sessions. Based on feedback, the researcher provided participants' with individualized scheduling options. Additionally, content of coaching sessions was individualized for each participant. The differentiation of time and content during coaching sessions most likely contributed to the high level of engagement reported both quantitatively and qualitatively by participants.

While the intervention checklist assisted the researcher with documenting specific elements were integrated into the PL sessions, it also ensured participant involvement. During PL sessions three and four, the researcher recorded data related to the participants' creation and sharing of sample lessons with their cohort. Although each participant did not have a fully completed lesson prepared, every teachers' ideas were explained to their cohort, and feedback was provided by the researcher. Examples topics included the French Revolution, ecosystems, exponents, and vocabulary.

As documented in Figure 9, 55% of participants completed the activities (e.g., creation of sample lesson, providing a lesson demonstration) during the PL sessions. Participants explained they had difficulty with finding time to create the ASR activity prior to the fourth PL session. The time factor may also have been exacerbated by the added pressures of creating digital lessons and assignments to minimize the use of shared materials due to the COVID-19 pandemic. Participants cited time constraints as the primary reason that only a little more than half (55%) of participants completed the lesson demonstration during PL sessions.

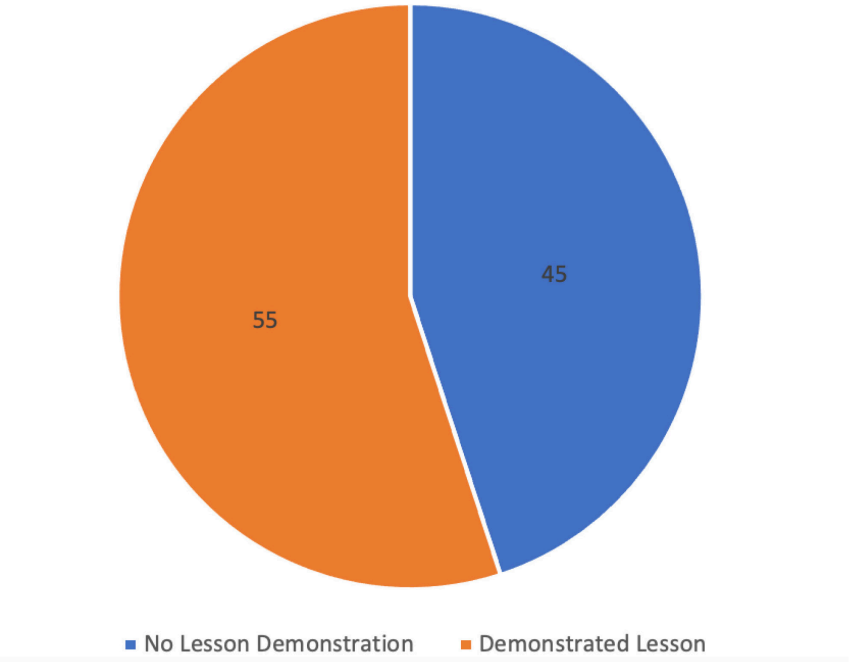

Figure 9. Participant completion of lesson demonstration during PL sessions.

Findings related to RQ 2 indicate that participants believed the PL topics were relevant (*M*=4.71), and activities increased their understanding (*M*=4.51), asked questions or participated in discussions (*M*=4.49) and attended to the materials (*M*=4.57). Participants reported that they appreciated the 45-minute length of the PL sessions but explained that the time of day sometimes negatively impacted their engagement. They also described the content as interesting and beneficial and reported the activities were useful and highly engaging. This information indicates most participants were highly engaged with the presenter and peers during PL sessions.

Additionally, participants reported that coaching session discussions were relevant (*M*=4.86), increased their understanding (*M*=4.66), kept their attention the majority of the time (*M*=4.97), and caused them to ask questions or engage with the facilitator (*M*=4.93). Participants reported that the 20-minute length of the coaching sessions were appropriate and did not have any concerns with the scheduled times. Content of the coaching sessions was perceived as especially meaningful to the participants due to the individualized discussions and performance

feedback. Participants reported that coaching sessions were relevant and helped them reflect on effective implementation. This information indicated participants were highly engaged with the presenter during coaching sessions.

Related to creating a sample lesson and providing a lesson demonstration, 55% of participants completed the activities during the PL sessions three and four. Participants that did not create or provide a lesson demonstration explained they needed additional time to complete the tasks. Constraints placed on teachers time may have been exacerbated due to the time and preparations required for health and safety precautions due to the global pandemic. The data collected provides support to address RQ 2 indicating that most participants were highly engaged with the presenter and peers during the PL sessions, and all participants were highly engaged with the presenter during coaching sessions.

Outcome Evaluation

To answer research questions associated with outcome evaluation, several indicators were explored related to PL and coaching sessions including measures of teacher knowledge of ASRs and SP, teacher implementation of ASRs and SP, and teacher self-efficacy. Data corresponding to each indicator is provided and examined in association with the research questions. This information assists with determining whether the outcomes indicate the intervention decreased the misalignment between teaching and learning.

RQ 3 results: To what extent did PL and coaching increase teachers' knowledge of ASRs and SP in the classroom? Proximal outcomes of increased knowledge with ASRs and SP were measured through the Instructional Strategies Survey (ISS; Appendix U). Participants were asked to complete the ISS two times during the study, once at the at the end of the PL phase and once at the end of the coaching phase. The participant rate of completion was 95%.

The ISS provided participants with one question regarding a self-assessment of their ASR knowledge and one question regarding a self-assessment of their SP knowledge (see Table 10). Participants rated their knowledge of ASRs and SP on a 5-point Likert scale ranging from 1 (not knowledgeable at all) to 5 (extremely knowledgeable). Responses were compared from the PL

Table 10

Participant Knowledge of ASRs and SP

	PL Phase		Coaching Phase	
Questions	Mean	SD	Mean	SD
Rate your current level of knowledge with implementing Active Student Responses in the classroom.	3.90	0.74	4.30	0.48
Rate your current level of knowledge with implementing Spaced Practice in the classroom.	3.80	1.03	4.20	0.79

phase to the coaching phase to determine if there was an increase in teacher knowledge of ASRs and SP. Analysis of participants' (n=10) responses regarding current level of knowledge with implementing ASRs during the PL phase (M=3.90, SD=0.74) compared to the coaching phase (M=4.30, SD=0.48), indicated an increase in perceived knowledge. Participants reported an increase in their current level of knowledge with implementing SP during the PL phase (M=3.80, SD=1.03) as compared to the coaching phase (M=4.20, SD=0.79). During the PL and coaching phases, participant knowledge of ASRs and SP increased, which can be attributed to the presentation of PL information and coaching feedback. Additional insights will be gained by exploring qualitative information concerning participant knowledge of ASRs and SP.

The ISS included opportunities for participants to respond to open-ended questions regarding their knowledge of ASRs and SP. Open-ended questions provided participants an opportunity to explain knowledge about ASRs and SP in their own words. Knowledge was rated

according to a 5-point rubric, which was created from information presented to participants during PL and reinforced during coaching sessions.

A review of open-ended questions was conducted for nine of the 11 participants. One of the participant's responses was excluded from the review due to not completing the ISS during the PL phase. This was problematic because a comparison of this participant's ASR and SP knowledge between PL and coaching phases could not occur. A second participant's open-ended responses were also excluded from the review because their responses appeared to be scripted. A simple google search of terms submitted by the participant indicated the responses were unauthentic as identical information was available on the internet. Responses from both participants were omitted from the data analysis.

Participants (n=9) received points for each portion of the definition contained in their response including 1) teacher created opportunities/questions, 2) student response, 3) improve academic skills/provide feedback, 4) multiple responses, and 5) example. Participant knowledge of SP was analyzed according to a 4-point rubric. Participants (n=9) received points for each portion of the definition contained in their response including 1) review/practice/repeated, 2) varying intervals, 3) increase remembering/knowledge, and 4) example. Scores from the rubrics indicated participants' knowledge of ASRs increased from PL (M=3.11) to coaching phases (M=4.00). Additionally, participants' knowledge of SP increased from PL (M=2.89) to coaching phases (M=3.33). A smaller increase in participants' knowledge of SP when compared to participants' knowledge of ASRs, may be indicative of the larger emphasis placed on ASRs during the PL and coaching sessions. Additionally, the implementation of ASRs included spacing out review questions of previously taught information; suggesting participants may have

experienced less necessity to implement the SP activities (e.g., quizzes, study guides) since they were already implementing ASRs.

In summary, RQ 3 (the extent to which PL and coaching increase teachers' knowledge of ASRs and SP in the classroom) was answered through the findings which indicated participants' knowledge of ASRs increased from the PL phase (*M*=3.90) to the coaching phase (*M*=4.30), and participants' knowledge of SP increased from the PL phase (*M*=3.80) to the coaching phase (*M*=4.20). Additionally, an increase in the participants' knowledge of ASRs was documented in their open-ended responses from the PL phase (*M*=3.11) to the coaching session (*M*=4.00). A small increase in the participants' knowledge of SP was also documented in their open-ended responses from the PL phase (*M*=2.89) to the coaching session (*M*=3.33). Overall, participants indicated a moderate increase in their knowledge of ASRs and SP when comparing information from the PL phase to the coaching phase.

RQ 4 results: To what extent did PL and coaching increase teachers' implementation of ASRs and Spaced Practice in the classroom? Quantitative data was obtained from participants during all four phases (e.g., baseline, PL, coaching, follow-up) to determine the effectiveness of PL and coaching on rates of ASRs and frequency of SP. Rate of ASRs was obtained through weekly 10-minute video recordings of each participants' selected class. Teachers' frequency of SP was obtained through weekly self-report of the number of quizzes, mid-chapter reviews, and unit test reviews integrated into their classroom lessons.

To measure implementation of ASRs in the classroom, participants recorded themselves during remote and in-person instruction. Due to the pandemic, all middle and high school students were learning within a remote setting when the study began. Remote instruction consisted of students receiving 20 minutes per week of synchronous instruction and completing

assigned work asynchronously. This pattern continued for middle school for the first three weeks of the study and then students returned to in-person instruction at the beginning of week four. High school students engaged in remote learning for the first seven weeks of the study and then returned to in-person instruction at the beginning of week eight. Participants were instructed to record the first 10 minutes of instruction whether during remote or in person instruction for the duration of the study.

Procuring one, 10-minute video recording per week from each participant proved challenging. Across 16 weeks of the study, data was recorded 86% of the time. Participants attributed difficulties with submitting videos to technology issues, mandated testing, school holidays, and forgetting. Sessions for which no video was available were disregarded in the data analysis. Across 16 weeks of data collection, videos were not available for every participant every week. An average of 13.82 video were collected for each participant across all phases of the study, which provided the researcher with sufficient information for data analysis regarding teacher implementation of ASRs.

The rate of ASRs was calculated (count divided by length of time) for each recorded session across all participants and compiled across each content area and represented in a bar graph (see Figure 10) and in Table 11. Data analysis indicates that the rate of ASRs increased greatly for ELA content area from baseline (M=0.09) to coaching (M=1.32), math from baseline (M=0.08) to coaching (M=1.35), social studies from baseline (M=0.18) to coaching (M=1.41), and the foreign language from baseline (M=0) to coaching (M=1.4). A moderate increase in the rate of ASRs increased for science teachers from baseline (M=0.55) to coaching (M=1.24). Although increases in rates of ASRs varied somewhat between content areas, a marked difference exists with participant implementation of ASRs between baseline and coaching phases

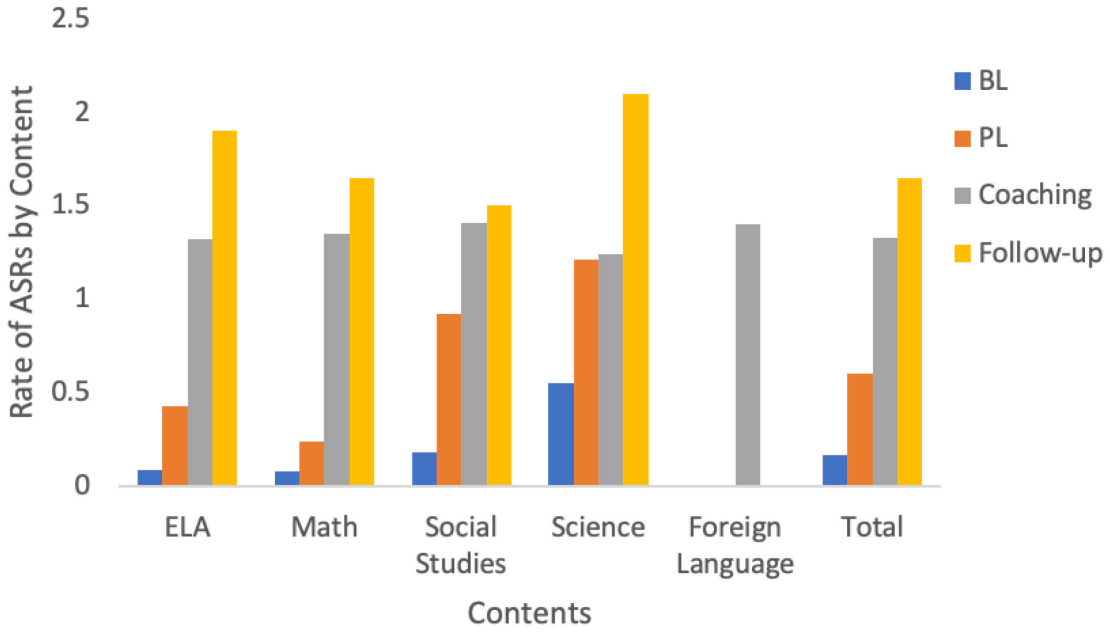

Figure 10. Participant implementation of ASRs across contents and participants.

for each subject. Additionally, data analyzed across all participants, suggested that the rates of ASRs increased greatly from baseline (*M*=0.17) to PL (*M*=0.60) to coaching phases (*M*=1.33).

Table 11

Implementation of ASRs Across Contents

Content	Mean ASRs Implemented			
	BL	PL	Coaching	Follow-up
ELA	0.09	0.43	1.32	1.90
Math	0.08	0.24	1.35	1.65
Social Studies	0.18	0.92	1.41	1.50
Science	0.55	1.21	1.24	2.10
Foreign Language	0	0	1.40	0
Total	0.17	0.60	1.33	1.65

Rate of ASR implementation across phases was also analyzed using the Statistical Package for the Social Sciences (SPSS) using a non-parametric test due to the small sample size.

A non-parametric Friedman test of differences among repeated measures indicated a significant difference across BL, PL, and coaching phases, X^2 (2, N=11) = 17.72, p <0.001. This statistical analysis provides further evidence that the PL and coaching intervention is effective for increasing teachers' implementation of ASRs.

During the one-month follow-up, there is a marked increase with the implementation of ASRs from baseline to follow-up for all contents with the exception of foreign language. It is important to note that the follow-up phase was only one data point, and challenges with the parameters of the video recorded data prohibited the researcher from determining whether students actively responded to the teacher's questions during the foreign language class period. While the foreign language teacher asked over 30 questions, student responses through the video documentation did not meet the researcher's operational definition of ASRs. When analyzing the results of the implementation of ASRs across participants, the data indicates a marked increase from baseline (M=0.17) to follow-up (M=1.65). Overall, there are variable results regarding the extent to which teacher implementation of ASRs increased across content areas; however, there is a marked increase of ASRs implementation from baseline to follow-up phases across all participants.

Additionally, a visual analysis of the implementation of ASRs within a multiple baseline design was completed (see Figure 11). The average rate of responding across cohort 1 (n=4), cohort 2 (n=3), and cohort 3 (n=4) is visually represented on the y-axis. The data indicates a stable baseline with low responding across all 3 cohorts (e.g., cohort 1: M=0.31, range 0.05 to 0.60; cohort 2: M=0.04, range 0 to 0.15; cohort 3: M=0.14, range 0.08 to 0.20). During the PL phase, rates of responding slightly increased (e.g., cohort 1: M=0.70, range 0.08 to 1.26; cohort 2: M=0.18, range 0 to 0.44; cohort 3: M=0.67, range 0.28 to 1.20); while the coaching phase

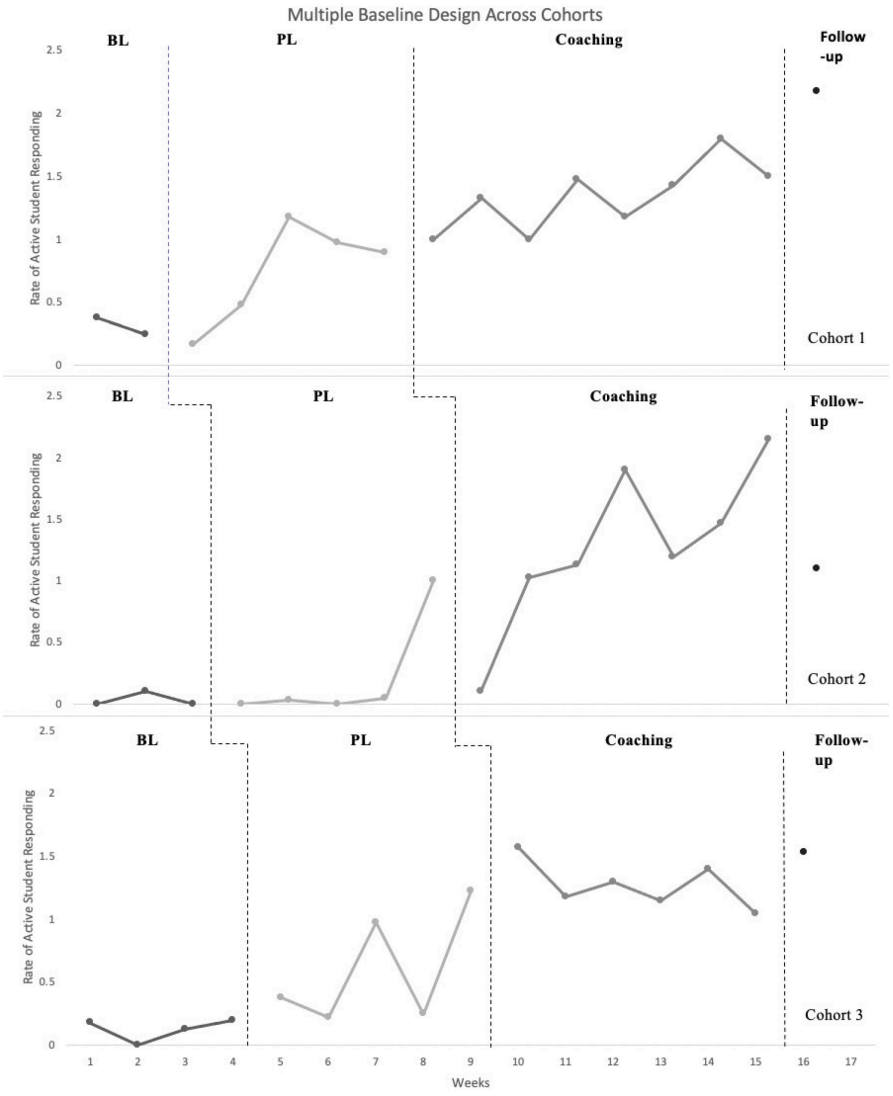

Figure 11. Visual analysis of the implementation of ASRs within MBD.

indicated a high level of responding when compared to baseline (e.g., cohort 1: *M*=1.37, range 1.15 to 1.88; cohort 2: *M*=1.43, range 0.57 to 2.03; cohort 3: *M*=1.25, range 0.85 to 1.60). During the one-month follow-up, each cohort demonstrated a higher mean rate of responding than during either the baseline or PL phases (e.g., cohort 1: *M*=2.18, range 1.90 to 2.60; cohort 2: *M*=1.10, range 0 to 2.90; cohort 3: *M*=1.53, range 0.90 to 2.20). Follow up data indicated the possibility of participants continual implementation (generalization) of ASRs following the intervention of PL and coaching.

Additionally, the MBD provided information needed to complete a visual analysis of the rates of ASRs and SP to include levels, trends, variability of data (Cooper et al., 2007), and overlapping data points (Dallery, Cassidy, & Raiff, 2013) to further analyze intervention effectiveness and demonstrate experimental control. Levels, defined as means of the dependent variable (Ledford, Zimmerman, Schwartz, & Odom, 2018), were calculated across phases for each cohort, which indicated that the level increased between adjacent conditions for cohort 1 (BL *M*=0.31, PL *M*=0.70, coach *M*=1.37), cohort 2 (BL *M*=0.04, PL *M*=0.18, coach *M*=1.10), and cohort 3 (BL *M*=0.14, PL *M*=0.67, coach *M*=1.25). Levels increased across all cohorts from BL to PL to coaching phases. The increase in levels across phases demonstrates a functional relationship between PL and coaching (independent variable) and change in rate of ASRs (dependent variable).

Trends, defined as slope of the dependent variable (Ledford et al., 2018), were calculated across phases for each cohort and characterized as accelerating, decelerating, or zero-celerating (Ledford, Lane, & Severini, 2017). Trends in this study were expected to increase gradually as participants' knowledge and expertise with implementation of ASRs improved over time. Trend data indicated a decelerating condition during BL phase for cohorts 1, a zero-celeration for cohort 2, and a slight acceleration for cohort 3. As BL conditions were determined stable or relatively stable, cohorts transitioned to the PL phase of the intervention. During PL, accelerating trends were evident for all cohorts. During coaching, accelerating trends occurred for cohorts 1 and 2 while a decelerating condition was apparent for cohort 3. The deceleration during the coaching phase for cohort 3 may be impacted by the fewer number of data points when compared to cohorts 1 and 2. Overall, the shift of direction across phases also demonstrates a

functional relationship between PL and coaching (independent variable) and change in rate of ASRs (dependent variable).

Variability, defined as differences in data values across sessions (Ledford et al., 2018), were calculated across phases for each cohort. Data is determined to be stable when 80% of the data points are plus or minus 25% of the median in each condition (Ledford et al., 2017). Data analysis indicated moderate variability across phases for cohort 1 as the percentage of variability across phases ranged from 50% to 63% of data points were plus or minus 25% of the median (BL=50%, PL=40%, coaching=63%). Moderate variability was also demonstrated for cohort 2 as the percentage of variability across phases ranged from 57% to 66% of data points were plus or minus 25% of the median (BL=66%, PL=60%, coaching=57%). Additionally, moderate variability was demonstrated for cohort 3 as the percentage of variability across phases ranged from 20% to 83% of data points were plus or minus the median (BL=75%, PL=20%, coaching=83%). Although moderate variability exists, the stability of the levels and trends lends credence to the relationship between PL and coaching (independent variable) and change in rate of ASRs (dependent variable).

Overlapping data points, defined as the degree of data overlap between phases (Ledford et al., 2018), was calculated across phases for each cohort. Non-overlapping data points demonstrate an effect (Kratochwill et al., 2013) and point to a causation between the independent and dependent variables. Non-overlapping of All Pairs (NAPs) was completed using an online NAP calculator comparing BL and PL phases as well as PL and coaching phases for all 3 cohorts. The NAP analysis indicated limited overlap of data points between adjacent conditions for cohort 1 (BL-PL=80%, PL-coaching=94%), cohort 2 (BL-PL=60%, PL-coaching=97%), and cohort 3 (BL-PL=100%, PL-coaching=90%). As the percentages indicate a high degree of non-

overlapping data, there is increased confidence in a functional relationship between the PL and coaching intervention and the rate of ASRs.

Visual analysis of trend, level, variability, and non-overlapping data points indicated levels increased, trends changed as expected, variability was moderate, and data points had limited overlapping. This is important because several confounding variables (e.g., remote versus in-person learning, technology challenges, illness, etc.) were difficult to control, and the MBD was effective with determining the functional relationship between the intervention and the rate of ASRs, despite these issues. Therefore, the MBD provided further support of the effectiveness of the PL and coaching intervention to increase ASRs through the analysis of trends, level, variability, and non-overlapping data points, thereby supporting this intervention model to increase EBPs.

In order to establish the reliability of measurement, interobserver agreement (IOA) on ASRs was calculated across all phases of the study. Two observers independently observed the video recorded sessions and logged the frequency of ASRs. The total agreement IOA was calculated by dividing the smaller number of agreements/larger number of agreements and multiplying by 100 to obtain percentage of total agreement. Prior to the collection of IOA, the first researcher trained the second observer using previously recorded sessions on the operational definition and frequency data across three different types of ARS including question/answer, kahoot, and whiteboards. The researcher and the second observer discussed the ASR operational definition and reached 100% agreement with data collection procedures across 3 recorded sessions.

To ensure valid and consistent data collection, IOA was conducted for 30% of the BL, PL, coaching, and follow-up sessions (Kazdin, 2011). During baseline sessions, IOA was 39%

across cohort 1, 100% across cohort 2, and 100% across cohort 3. IOA data across all three cohorts during the baseline phase was 78% indicating an acceptable level of agreement. Although an agreement of above 80% is preferred, there were multiple challenges with collecting baseline data during this phase including 1) reliance on teachers to set-up audio and video, 2) technology issues such as limited connectivity and unfamiliarity with platforms, and 3) low rates of ASRs which impacted agreement when there was a discrepancy (e.g., 0/1 x 100 = 0% agreement). During the PL phase, IOA was 100% across cohort 1, 100% across cohort 2, and 89% across cohort 3. IOA data across all three cohorts during the PL phase was 96% indicating a high level of agreement. During the coaching phase, the IOA was 96% across cohort 1, 85% across cohort 2, and 85% across cohort 3. IOA data across all three cohorts during the coaching phase was 89% indicating a high level of agreement. Additionally, during the follow-up phase, the IOA was not collected on cohort 1, 88% across cohort 2, and 71% across cohort 3. IOA data across two cohorts during the follow-up phase was 78% across all participants indicating an acceptable rate of agreement. Despite the challenges with collecting data during a pandemic using recordings within remote and in-person instruction, the mean IOA across the four phases was 85%, indicating a reliable and valid measure of data collection.

SP activities were defined as quizzes, mid-chapter reviews, and unit test reviews. Participants self-reported the frequency of SP to the researcher either verbally or through email. SP information was self-reported by each participant for the duration of the study. Some participants believed that a variety of classroom activities (e.g., end-of-chapter review, essays, homework assignments) should be considered SP. Therefore, the frequency of SP activities should be interpreted with caution due to self-reported data collection and challenges with participants identifying types of classroom tasks which qualified as SP.

The frequency of SP was analyzed across contents and participants. Across differing content areas (see Figure 12), there was a slight increase in the frequency of SP from baseline (*M*=0.5) to coaching phases (*M*=0.63) for the foreign language teacher (*n*=1) as well as a slight increase from baseline (*M*=0.33) to coaching phases (*M*=0.54) for ELA teachers (*n*=4). A moderate increase in frequency of SP from baseline (*M*=0.83) to coaching phases (*M*=1.33) was documented for math teachers (*n*=2). In contrast, there was a slight decrease in frequency of SP from a from baseline (*M*=0.88) to coaching phases (*M*=0.73) for social studies teachers (*n*=2).

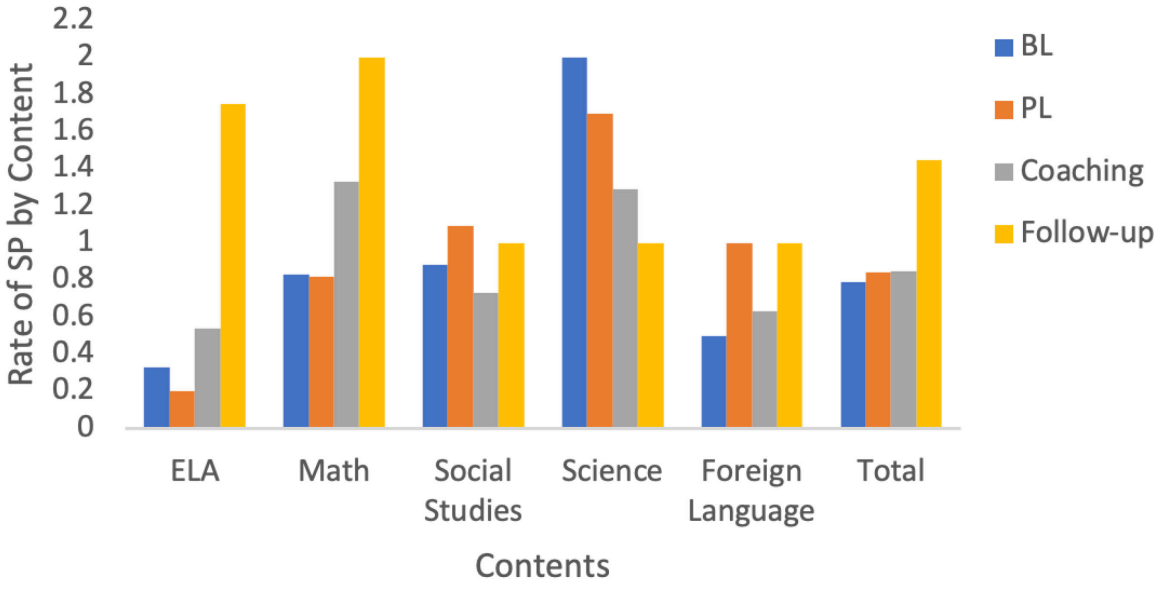

Figure 12. Participant implementation of SP across content and participants.

Additionally, there was a moderate decrease in frequency of SP from baseline (*M*=2) to coaching phases (*M*=1.29) for science teachers (*n*=2). These results should be interpreted with caution due to the small sample size across content areas. When analyzing the results of the implementation of SP across phases for all participants (*N*=11), the data indicates a slight increase from baseline (*M*=0.79) to coaching (*M*=0.85).

Frequency of SP implementation across phases was also analyzed using the Statistical Package for the Social Sciences (SPSS) using a non-parametric test due to the small sample size.

A non-parametric Friedman test of differences among repeated measures indicated no significant difference across BL, PL, and coaching phases, X^2 (3, N=11) = 5.56, $p > .05$. Results of the statistical analysis indicated that, although there was a slight difference in the means of SP between phases, it is not statistically significant.

The greatest increase of SP implementation is evident when comparing baseline to follow-up phases. A slight increase is documented regarding the implementation of SP from baseline (*M*=0.88) to follow-up (*M*=1.0) for social studies teachers and a moderate increase from baseline (*M*=0.5) to follow-up (*M*=1.0) for the foreign language teacher. Additionally, the data indicates a large increase with the implementation of SP from baseline (*M*=0.83) to follow-up (*M*=2.0) for math teachers as well as a large increase from baseline (*M*=0.33) to follow-up (*M*=1.75) for ELA teachers. In contrast, a large decrease from baseline (*M*=2.0) to follow-up (*M*=1.0) for science teachers was documented. The follow-up phase occurred during the week that preceded semester finals. The moderate increase in SP implementation across participants between coaching (*M*=0.85) and follow-up phases (*M*=1.45) may be attributed to participants providing students with unit test reviews (e.g., study guides) during the follow-up week of the study.

Variability between content area teachers may be impacted by instructional differences of remote versus in-person learning. Additional factors influencing the frequency of SP during remote settings include limited time for teachers to create the assessments due to their increased workload, limited time for students to take the assessments due to the majority of instruction occurring asynchronously, and challenges with ensuring student honesty due to the vast use of the internet. Also, it is possible that, as teachers increased their use of ASRs, they were less concerned with providing the students quizzes/reviews due to the SP element of ASRs. When

analyzing the results of the implementation of SP across participants, the data indicates a moderate increase from baseline (*M*=0.79) to follow-up (*M*=1.45). Although there are variable results with teacher implementation of SP across content areas, there is a moderate increase of SP implementation from baseline to follow-up phases across participants.

To address RQ4, To what extent did PL and coaching increase teachers' implementation of ASRs and SP in the classroom?, the findings suggest that PL and coaching intervention greatly increased teachers' implementation of ASRs from BL (*M*=0.18) to PL (*M*=0.6) to coaching phases (*M*=1.33). The findings also indicate the PL and coaching intervention impacted ASR implementation greater within some contents (ELA, social studies, foreign language) as compared to others (math, science), which may be due to challenges with creating and asking content-specific questions in secondary math and science classrooms as compared with ELA, social studies, and foreign language. For example, within an Algebra I classroom, many of the taught concepts require extended time and multiple steps to complete, such as using slope intercept or solving a problem using exponential functions, which may be more time intensive for the teacher to create and ask as well as for the students to answer. However, within a foreign language classroom, there is a strong focus on vocabulary and verb tense, which may be less time intensive for the teacher to create and ask as well as for the student to answer. During the follow-up phase, a higher rate of ASRs was documented across participants (*M*=1.65) than during any of the three previous phases, suggesting participants continued to utilize the strategy after the intervention was complete and indicates sustainability over time.

Additionally, the PL and coaching intervention had a limited effect on teachers' implementation of SP from BL (*M*=0.79) to PL (*M*=0.84) to coaching (*M*=0.85). The findings indicate the PL and coaching intervention did increase SP implementation within some contents

(ELA, math, foreign language) while a decrease in SP implementation was documented in others (social studies, science). During the follow-up phase, a higher rate of SP was documented across participants (M=1.45) than during any of the three previous phases indicating some variability in rates of responding as well as sustainability over time. Overall, PL and coaching resulted in a high increase in participants' implementation of ASRs and had a smaller effect on participants' implementation of SP; however, the findings indicate participants implemented ASRs and SP to a higher rate during follow-up than during the previous phases indicating participants value and sustainability with the EBPs within the classroom. During PL sessions, more time was spent with ASR instruction as compared with SP, which may have influenced the participants to focus on implementing ASRs to a greater extent than SP. Last, participants may have viewed the SP activities as unnecessary due to the formative assessment information already gained through the incorporation of ASRs.

RQ 5 results: To what extent does PL and coaching impact teacher self-efficacy?

Teacher self-efficacy. As previously discussed, teacher self-efficacy is integral to the effective implementation of EBPs (Althauser, 2015; Stevens, Aguirre-Munoz, Harris, Higgins, & Liu, 2013; Yoo, 2016). To investigate the impact of PL and coaching on teacher self-efficacy, data was collected and analyzed from two different sources; TSES and ISS. Quantitative data regarding ***general teacher self-efficacy*** was collected from the TSES, during which mean scores were compared across phases. Additionally, both quantitative and qualitative information regarding ***specific teacher self-efficacy*** related to ASRs and SP implementation was obtained from the Instructional Strategies Survey (ISS). The ISS was completed by participants near the end of the PL and coaching phases. Quantitative and qualitative data were analyzed to determine the extent PL and coaching impacted teacher self-efficacy.

General teacher self-efficacy. During each week of baseline, participants were asked to complete the TSES (see Appendix R), which consisted of 24 questions. On the survey, teachers rated their degree of self-efficacy on a scale of 1 (none at all) to 5 (a great deal). Each question was designed to measure participants' self-efficacy with one of three constructs: Student Engagement (SE), Classroom Management (CM), and Instructional Strategies (IS). Data should be analyzed with caution as reliability of the TSES is based on a 9-point rating scale. However, the TSES provided to teachers only enabled participants to respond on a 5-point rating scale, resulting in reduced sensitivity of responses. All participants completed at least one TSES during baseline, PL, and coaching phases.

Findings from the TSES (see Table 12) indicate an increase in teacher self-efficacy ratings in Student Engagement (SE), Classroom Management (CM), and Instructional Strategies

Table 12

Teacher Self-efficacy by Construct

Content	Student Engagement			Classroom Management			Instructional Strategies		
	BL	PL	Coach	BL	PL	Coach	BL	PL	Coach
ELA	4.03	4.38	4.25	4.53	4.59	4.31	4.11	4.25	4.31
Math	2.83	3.63	4.06	2.86	3.88	4.19	3.21	4.00	4.25
Social Studies	3.97	4.50	4.81	4.53	4.88	4.88	4.21	4.75	4.88
Science	3.56	3.69	3.56	3.91	4.06	4.00	3.59	4.00	4.00
Foreign Language	4.34	4.75	4.38	4.46	5.00	4.75	4.46	5.00	4.75
Total	3.74	4.17	4.20	4.14	4.44	4.51	3.9	4.32	4.39

(IS). The mean score indicates an increase in SE from the baseline (M=3.74) to coaching phases (M=4.20), an increase in CM from the baseline (M=4.46) to coaching phases (M=4.75), and an increase in IS from the baseline (M=3.59) to coaching phases (M=4.00). A greater increase in

teacher self-efficacy exists for each content area between the baseline and PL phases when compared to the increase between the PL and coaching phases (see Figure 13).

This increase may be attributed to the vicarious experiences (modeling) and verbal persuasion (suggestions and feedback) during the PL sessions, and the performance accomplishments (mastery experiences) combined with additional verbal persuasion (individualized feedback) during the coaching sessions. These PL experiences ensured teachers observed ASRs and SP strategies and were provided with suggestions and feedback regarding implementation. Additionally, the coaching experiences enabled teachers to succeed while implementing ASRs and SP strategies as well as to further refine their practices. These findings related to increased teacher self-efficacy are important because teachers with high self-efficacy persevere with teaching challenging concepts and results in improved student outcomes.

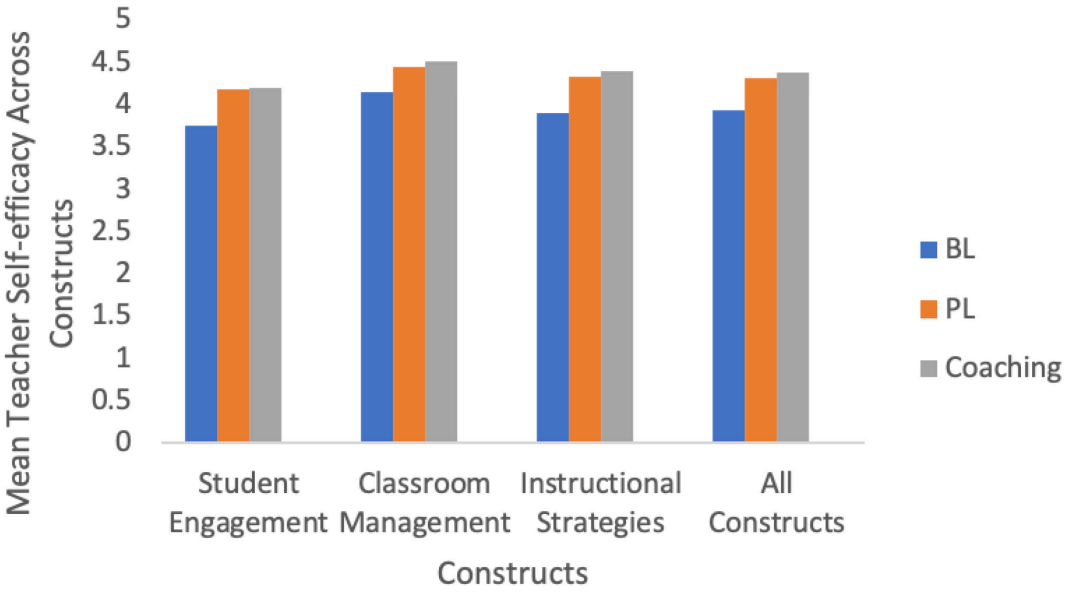

Figure 13. Teacher self-efficacy across constructs.

Upon further data analysis, variability in teacher self-efficacy was also evident across contents areas (e.g., ELA, math, social studies, science, foreign language). Findings indicate the

greatest gains in teacher self-efficacy occurred within the area of Instructional Strategies (IS; see Figure 14). Although there was variability in self-efficacy across constructs, results from the TSES indicated increases from baseline to coaching phases in all content areas with IS, with the greatest increase in math and social studies. Additionally, the smallest increase was documented in ELA. The differences in self-efficacy with IS may be related to challenges with implementing

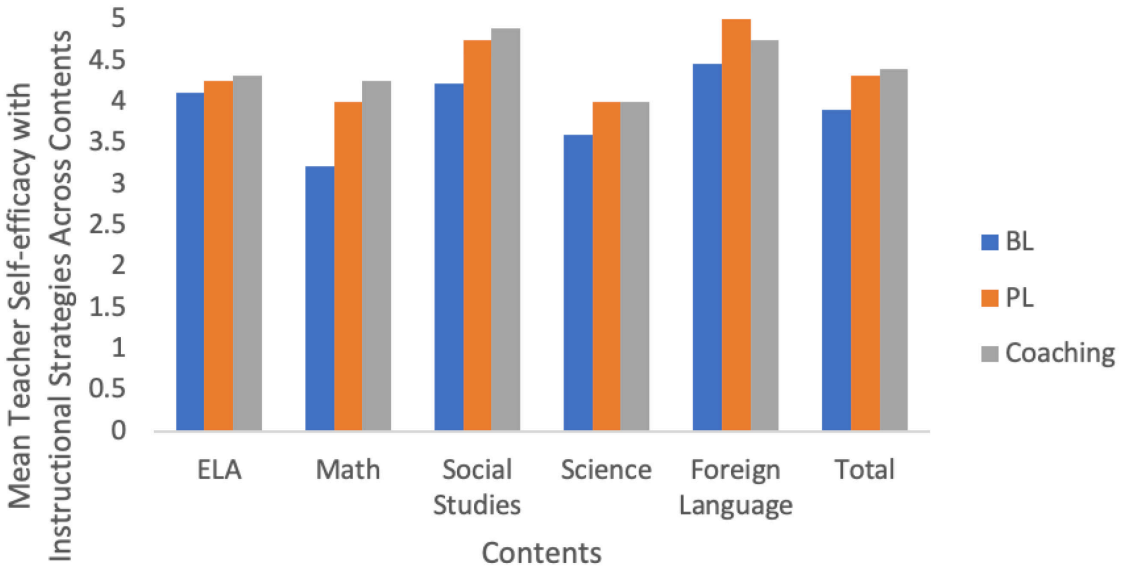

Figure 14. Teacher self-efficacy with instructional strategies.

ASRs and SP within certain contents when compared to others. For example, it may be less challenging to provide several alternatives or different ways to solve a mathematical problem than to adjust ELA lessons by providing curricular materials to students with three-four different reading levels as well as creating application and synthesis questions for students with widely diverse abilities with written language skills. Because specific content areas (e.g., ELA, math, science, social studies, foreign language) require different or more in-depth instructional strategies to meet the needs of diverse student populations, self-efficacy with instructional strategies may differ across subjects, particularly at the secondary level.

Regarding teacher self-efficacy within the construct of Student Engagement (SE; see Figure 15), TSES results indicated increases from baseline to coaching phases in all content areas with the exception of no change in science. When examining the individual scores by science teachers, one teacher reported a small increase in self-efficacy with SE from baseline (*M*=3.75) to coaching (*M*=3.88) while the other science teacher reported a decrease from baseline (*M*=3.38) to coaching (*M*=3.25). While observing the implementation of ASRs, the

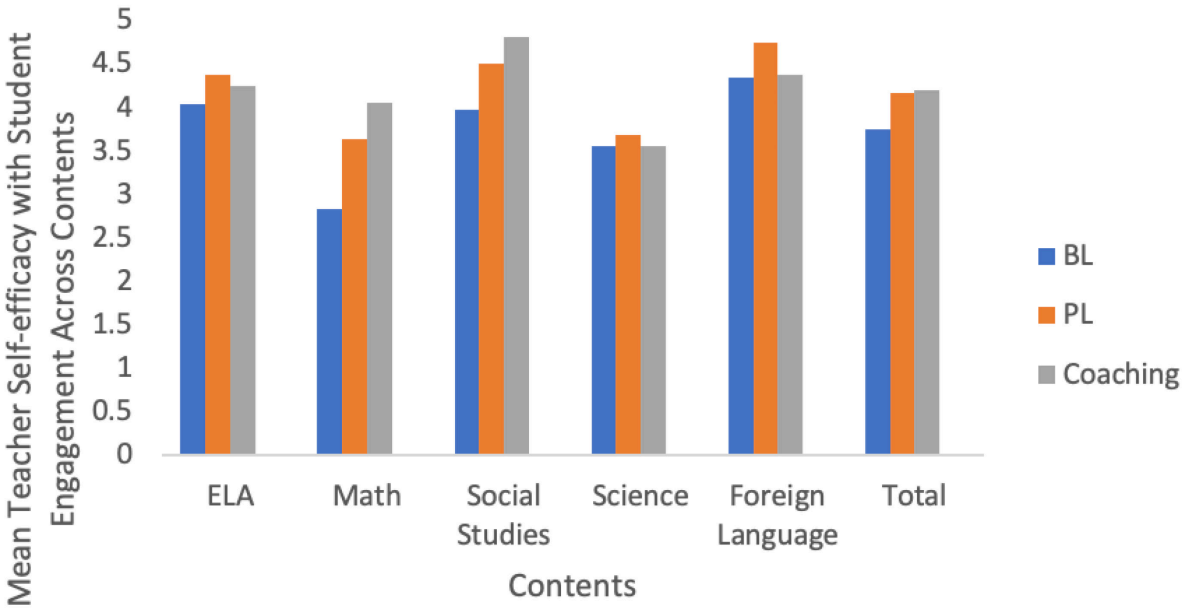

Figure 15. Teacher self-efficacy with student engagement.

researcher often observed a high level of student excitement and participation regarding instructional activities within both science classrooms. However, teacher comments such as "Most of you missed this." and "How come no one got it right?" may be indicative of challenges with learning a difficult subject matter. The decreased TSES rating by one science teacher may reflect discouragement with student mastery of material rather than student engagement.

Results of the TSES also indicated increased teacher self-efficacy with Classroom Management (CM; see Figure 16) from baseline to coaching phases in 80% of the content areas.

Although the greatest increase was evident with math teachers from baseline (*M*=2.86) to coaching (*M*=4.19), social studies, science, and foreign language participants also rated themselves as more self-efficacious with CM. In comparison, a slight decrease in teacher self-efficacy with classroom management is documented in ELA from baseline (*M*=4.53) to coaching (*M*=4.31). However, this outcome should be interpreted with caution as the ELA participants rated themselves higher with self-efficacy during baseline (*M*=4.53) as compared to the mean of all participants (*M*=4.14). The slight decrease in the rating from baseline to coaching phase for ELA teachers may be indicative of the ELA teachers' high self-efficacy ratings with CM prior to the study.

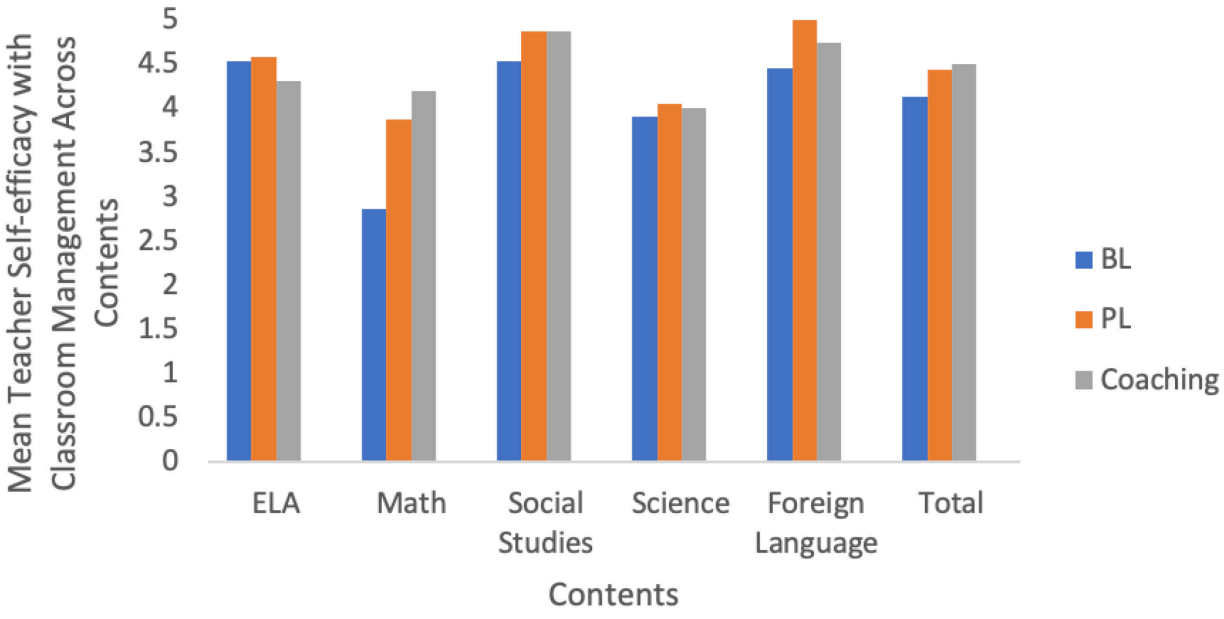

Figure 16. Teacher self-efficacy with classroom management.

Overall, the data analysis suggests that PL and coaching intervention increased the participants' self-efficacy across each construct including SE, CM, and IS (see Figure 15). When the data was analyzed by content areas, some variation existed in the self-efficacy ratings (see Table 13). Responses of the math teachers indicated the greatest increase from baseline (*M*=2.96)

to coaching phases (*M*=4.17) while the responses of ELA teachers showed only a slight increase from baseline (*M*=4.23) to coaching phases (*M*=4.29). An analysis of qualitative data may provide additional insights into the different levels of teacher confidence by content areas.

Table 13

Teacher Self-efficacy Across Contents

Content	Ratings by Study Phase		
	BL	PL	Coaching
ELA	4.23	4.41	4.29
Math	2.96	3.83	4.17
Social Studies	4.23	4.71	4.85
Science	3.69	3.92	3.85
Foreign Language	4.53	4.85	4.67
Total	3.93	4.34	4.37

Specific teacher self-efficacy. Participants' level of confidence with implementing the specific EBPs of ASRs and SP was measured through their responses on the ISS. Data was collected from participants at the end of PL and coaching phases, which provided both quantitative and qualitative information. The completion rate of the ISS was 95%.

Quantitative data was collected by analyzing participants' ratings to three items that included a self-assessment of level of confidence with implementing ASRs and three items that included a self-assessment of level of confidence with implementing SP on a 5-point Likert scale ranging from 1 (not at all confident) to 5 (extremely confident). Responses were compared across content areas from the PL phase to the coaching phase to determine if there was an increase in confidence with implementing ASRs and SP. Qualitative data was collected by analyzing participants' responses related to types of support needed to implement ASRs and SP.

The open-ended responses were analyzed to determine the types of support cited as necessary within each cohort.

Data analysis of the participants' (*N*=10) responses regarding level of confidence with implementing ASRs indicated an increase in mean ratings when comparing the PL phase to the coaching phase (see Figure 17). Related to specific content areas, there was an increase in confidence with implementing ASRs for ELA, math, social studies, and science teachers and a slight decrease for the foreign language teacher. ELA teachers reported the greatest increase in teacher confidence with implementing ASRs from the PL (*M*=3.17) to coaching phase (*M*=4.33), suggesting their increasing confidence implementing ASRs during the study.

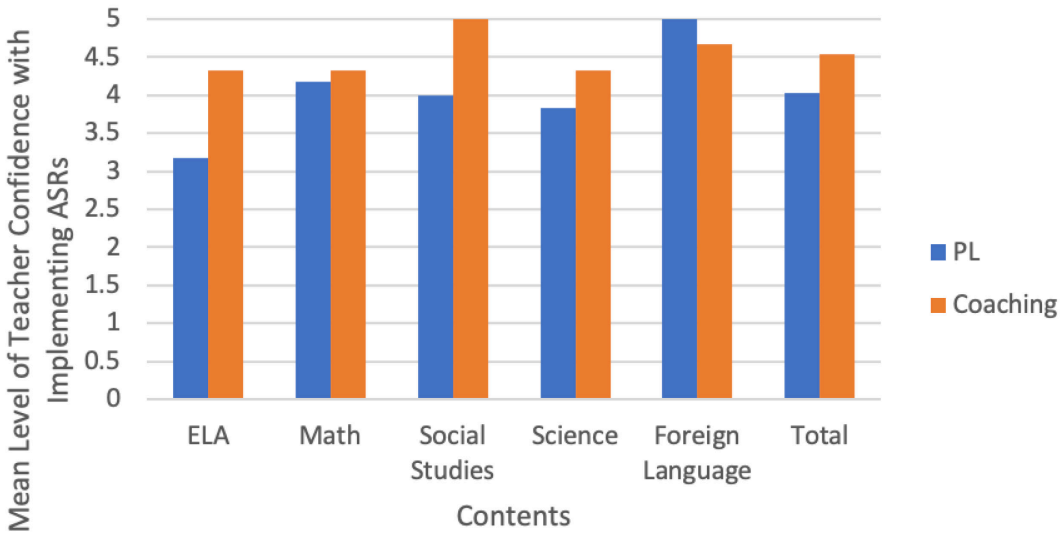

Figure 17. Teacher confidence with implementing ASRs.

Qualitative data collected from the ISS (see Table 14) indicated teachers needed support implementing ASRs including 1) further information, such as assistance with using higher level questioning and suggestions for how to incorporate ASRs throughout the lesson, 2) practice with implementing ASRs, 3) planning time to create questions, 4) technical support with using digital platforms, and 5) assistance with collecting data on student performance. ELA teachers cited the

need for support most often, which may be related to challenges with using ASRs for formative assessment within this content. For example, one ELA teacher explained it was difficult to focus on a "deeper level of knowledge" as well as "application and synthesis" questions within a 10 minute time period at the beginning of class.

Additionally, the technical support concern for math and foreign language teachers may be due to the new technology equipment in the classroom. However, participants proficiency with technology was not measured in this study and should be a consideration for future studies. Time was a concern for many participants, as both ELA and social studies teachers cited the need for additional practice, and additional planning time was a concern for ELA, science, and foreign language teachers. Interestingly, the support requested most often was increased time. Throughout the study, the researcher reviewed the types of support for ASR implementation needed by participants and attempted to meet their individual needs within the confines of the study procedures.

Table 14

Types of Support Needed by Participants to Implement ASRs

Content	Types of Support
ELA	Further Information Opportunities for Practice Additional Planning Time
Math	Tech Support Data collection on student performance
Social Studies	Opportunities for Practice
Science	Additional Planning Time
Foreign Language	Tech Support

The analysis of participants' (*N*=10) responses regarding their confidence implementing SP activities (e.g., low stakes quiz, mid-chapter review, test study guide), the level of confidence increased when comparing the PL to the coaching phase (see Figure 18). Related to content areas, ELA, math, social studies, and science teachers indicated an increase in confidence with implementing SP while the foreign language teacher indicated no change in confidence across phases. ELA teachers indicated the greatest increase in teacher confidence with implementing SP. This indicates that, although some ELA teachers experienced challenges with using SP during the PL phase, they became more confident with integrating low stakes quizzes, mid-chapter reviews, and test study guides by the end of the coaching phase. Anecdotally, additional explanations provided specifically to ELA participants during coaching sessions regarding how and when to implement SP may have positively impacted their confidence. Overall, participants' level of confidence with SP implementation was positively affected by the intervention.

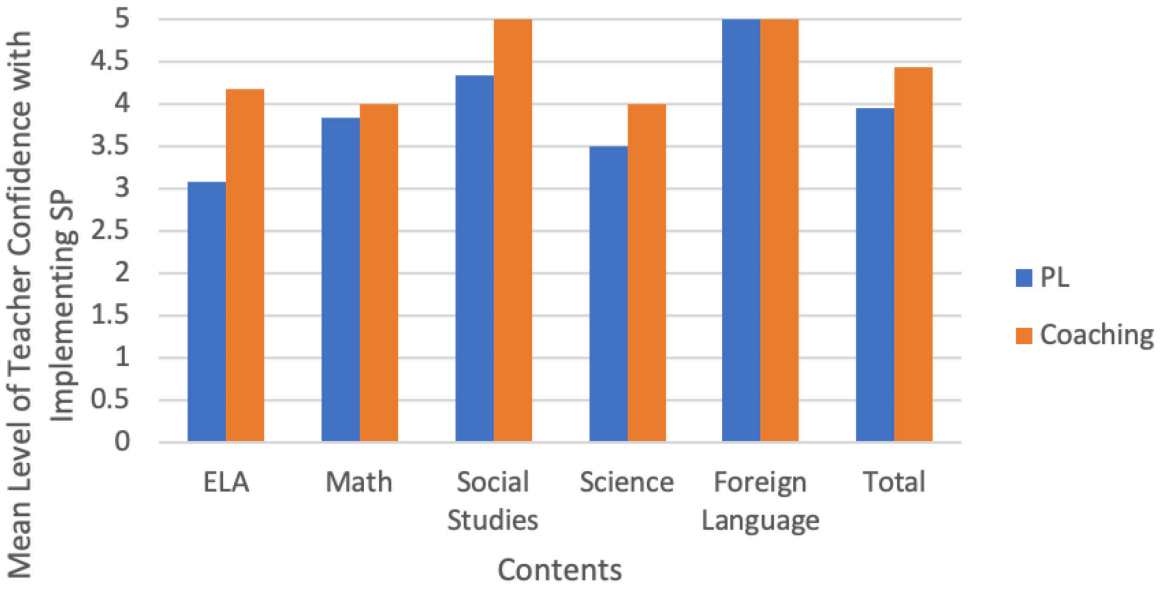

Figure 18. Teacher confidence with implementing SP activities.

According to the qualitative data collected from the ISS (see Table 15), participants explained they needed support to implement SP, including additional planning time, instructional time, and information. Time was the largest concern, mostly related to participants experiencing challenges with finding time to develop questions for quizzes/test reviews. Additionally, teachers described the necessity for additional practice to improve their proficiency with embedding SP activities into instruction. Participants also indicated the need for ideas related to different types of SP activities and additional modeling of the strategy, which could be incorporated by refining the PL activities. The teachers' ability to incorporate SP activities was likely impacted by remote instruction, which occurred through week 7 of the study. Implementation of SP activities were affected by remote instruction because many teachers did not give assessments during remote instruction due to limited oversight with test security.

Table 15

Types of Support Needed by Participants to Implement SP

Content	Types of Support
ELA	Further Information Additional Planning Time Additional Time for Instruction
Math	Additional Planning Time Further Information
Social Studies	Opportunities for Practice
Science	Additional Planning Time
Foreign Language	Additional Planning Time

To address RQ5, To what extent does PL and coaching impact teacher self-efficacy?, findings indicate that participants' general self-efficacy increased from baseline (*M*=3.93) to PL (*M*=4.34) to coaching sessions (*M*=4.37). The PL and coaching intervention increased participants' self-efficacy with the constructs of student engagement, classroom management,

and instructional strategies. When the TSES data was analyzed by content areas, responses of math teachers indicated the greatest increase in overall teacher self-efficacy from baseline (*M*=2.96) to coaching phases (*M*=4.17) while the responses of ELA teachers showed only a slight increase from baseline (*M*=4.23) to coaching phase (*M*=4.29). Therefore, the PL and coaching intervention did increase teacher confidence with implementing ASR and SP to a greater extent in some contents than others.

Findings also indicate participants' specific teacher self-efficacy increased with implementing ASRs from PL (*M*=4.03) to coaching phases (M=4.53) and with implementing SP from PL (*M*=3.95) to coaching phases (*M*=4.34). Teachers reported an increase in their level of confidence with implementing ASRs and SP when comparing their ratings on the ISS from the PL to coaching sessions. However, according to teacher responses on the ISS, ELA rather than math teachers reported the greatest gains in confidence with implementation of ASRs and SP. An analysis of the ISS qualitative data indicated that teachers need additional supports to implement ASRs and SP including additional time, further information, opportunities for practice and technical support. Overall, PL and coaching increased participants' general self-efficacy to some extent as well as increased participants' specific self-efficacy with implementing ASRs and SP.

Discussion

During the intervention, the participants increased their knowledge with ASRs and SP, increased their rate of implementation with ASRs and SP, and increased teacher self-efficacy. As the results indicate, the PL and coaching sessions proved engaging and relevant for participants and were effective for increasing participants' knowledge and implementation of ASRs and SP. PL and coaching sessions positively affected general teacher self-efficacy, related

to student engagement, classroom management, and instructional strategies, and specific self-efficacy, related to ASRs and SP. Additional insights related to the process and outcome evaluations will be discussed specifically related to each research question.

RQ 1: To What Extent Were the PL and Coaching Interventions Provided to the Intended Participants?

Results revealed a high level of participant attendance, implementation of the intervention checklist, and participant representation within all core content areas, which means the PL and coaching interventions were provided to the participants as intended. To ensure participant attendance, the researcher provided make-up opportunities when participants did not attend the originally scheduled sessions, which was integral to ensuring the PL and coaching interventions occurred at a high level (95-100% of the time). Additionally, the intervention checklist was a highly effective tool for ensuring necessary information was shared with each participant. However, although 100% of core content areas (e.g., ELA, math, science, social studies, foreign language) were represented by participants in the study, the number of participants from each content area ranged from 1 (foreign language) to 4 (ELA). The small sample size of participants from each content area may impact the generalizability of the findings. While evidence indicates PL and coaching interventions were provided to intended participants, it is important to understand the generalizability of results may be impacted by the small number of participants from each content area.

RQ 2: **To What Extent Were Participants Engaged During the PL and Coaching Sessions?**

Findings indicated that most participants were highly engaged with the presenter and peers during the PL sessions, and all participants were highly engaged with the presenter during coaching sessions. However, when participants were asked to create a sample lesson during

session three and provide a lesson demonstration during session four, only 55% of participants completed these activities. Possible reasons related to the percentage of participants unable to demonstrate the lesson will be discussed.

Due to the pandemic, PL sessions were provided to participants in an online format. The lack of in-person, peer-to-peer interactions may have negatively impacted support needed by participants to create the sample lesson. Fifteen to twenty minutes was designated during PL session 3 for participant planning of the sample lesson, however, participants explained they needed more time to create the sample lesson. Also, constraints on participants' time were exacerbated due to preparations required for online teaching and health and safety precautions during the global pandemic. The need for quality peer interactions, additional time for planning during PL session 3, and additional constraints on the participants' time due to the pandemic may have contributed to the percentage of participants unable to demonstrate the lesson during the designated PL session.

Participants that were not prepared to demonstrate their lesson during PL session 4 were asked to explain their chosen topic and which type of modality they chose (e.g., kahoot, pear deck, whiteboards, response cards). Participants were then encouraged to complete the sample lesson and contact the researcher for support. Implementation of ASRs may have occurred to a greater extent if participants had completed and received quality feedback on their sample lessons prior to the coaching phase.

However, as indicated by Teemant (2013), the coaching phase increased the duration of PL. This means that teachers were able to receive feedback from the researcher on their creation and demonstration of lessons during the coaching phase. While some participants experienced challenges with completing and demonstrating the sample lesson during the PL phase,

continued feedback was provided to participants during the coaching phase which allowed for continued reflection and growth. While evidence indicates participants were engaged during PL and coaching sessions, it is important to understand the need for increased peer interactions and time constraints may have impacted participants' creation and demonstration of sample lessons during the PL phase which may have negatively impacted the implementation of ASRs.

RQ 3: To What Extent Did PL and Coaching Increase Teachers' Knowledge of ASRs and SP in the Classroom?

Study outcomes indicate teachers' knowledge of ASRs and SP increased through PL and coaching sessions. This is especially meaningful because the intervention of PL and coaching sessions were provided to participants within an online environment. As the PL and coaching interventions resulted in increased participant knowledge of ASRs and SP, there is evidence that online training sessions are effective for educators.

As Yoo (2016) demonstrated, five sessions of PL were effective for increasing teacher self-efficacy within an online environment. Similarly, the current study integrated four sessions of PL and three follow-up, individualized coaching sessions. All PL and coaching sessions occurred within an online environment. Results of the current study expand on Yoo's (2016) findings indicating online PL was effective with increasing self-efficacy to include findings that online PL and coaching increased participant knowledge and implementation of EBPs as well as self-efficacy.

This is particularly important because options for online PL and coaching are imperative for educators due to unexpected challenges, such as global pandemics, and busy schedules, such as home and work obligations. Technology is consistently improving, and opportunities for learning are expanding to include online formats. Therefore, findings from this study indicating

online PL and coaching were effective for educators is extremely powerful and provides increased flexibility to further refine educational practices despite challenging circumstances.

RQ 4: To What Extent Did PL and Coaching Increase Teachers' Implementation of ASRs and SP in the Classroom?

Results of the intervention show that PL and coaching sessions were highly effective for training participants to implement ASRs and somewhat effective for implementing SP in the classroom. During the study, several issues related to ASR and SP implementation arose and will be discussed. They include 1) time needed to implement ASRs and SP, 2) implementation of ASRs and SP across content areas, 3) determining appropriate rates of ASRs, and 4) class schedules to support implementation. Each item will be discussed regarding how it affected the intervention and future implications.

Time. Concerns were noted by participants regarding the need for additional time to plan and practice ASRs and SP. Participants were asked to provide weekly videos and provided direct observation of the implementation of ASRs; however, the requirement for SP documentation was self-report. This means there was less accountability for the SP activities than the incorporation of ASRs, which may have also impacted the lower frequency of SP implementation when compared to ASRs. Direct observation, such as participant submission of SP products (e.g., low-stakes quizzes, mid-chapter reviews, unit test reviews) may have yielded a more reliable measure and should be considered for the future. Additionally, as participants cited time as their biggest concern, it is possible that teachers had difficulty finding additional time to develop and incorporate SP activities into their classroom in addition to the formative assessment of ASRs one time per week. Of course, this challenge with needing additional time

within the educational context is a familiar concern for many teachers. However, due to the pandemic, the support needed for increased time may be especially poignant.

Implementation across content areas. This study provided an exploration of the use of ASRs and SP across different contents within the secondary setting. To assist teachers with utilizing the type of ASR most applicable for their content area (e.g., ELA, math, science, etc.) and environmental setting (remote vs in-person instruction), the researcher explained and modeled how to use several different types of ASRs (e.g., whiteboards, kahoot, pear deck, response cards) during PL sessions. The researcher also explained and modeled how to use SP by asking the participants to complete low-stakes quizzes, mid-chapter reviews, and unit test reviews. Insights regarding the implementation of ASRs and SP across content areas are discussed.

Implementation of ASRs across content areas. According to Cavanaugh et al. (1996), ASRs are effective with increasing recall for secondary students within a science classroom. Additionally, Monem et al., (2018) indicated that ASRs were effective for learning social studies content within a secondary setting. The current study provides documentation that ASRs can be implemented across all core content areas (e.g., ELA, math, science, social studies, foreign language) for secondary students within remote and in-person environments.

During the PL and coaching phases, social studies and science teachers were the most self-sufficient with implementing ASRs. They typically focused on asking the students questions related to understanding of the content and academic vocabulary. Within the content area of math, the middle school teacher chose to use ASRs to assist the students with improving their proficiency with multiplication facts while the high school teacher expressed the need for assistance with using ASRs to complete multi-step, higher-order thinking problems. The two

ELA teachers focused integrating ASRs by asking the students' questions related to vocabulary while two other teachers asked the students questions related to understanding of the content as well as vocabulary. Additionally, one of the ELA teachers felt ASRs may only target surface level recall, so the researcher provided information from the literature, real-life examples, and technology options for how to integrate higher-order questioning using ASRs within ELA content.

Specific training for math and ELA teachers may need to address how to utilize platforms effectively for higher order questioning. While teachers of some contents (science, social studies) had few questions and needed little assistance with implementing ASRs, other content area teachers (ELA, math) had many questions and needed additional information to integrate ASRs into their classrooms. This provides further evidence regarding the importance of coaching sessions to meet individualized needs of participants.

Implementation of SP across content areas. As documented through a series of experiments conducted by McDermott et al., (2013), SP is effective across secondary grades as well as science and history contents. Findings from the current study indicate ELA and math teachers had the greatest increase with implementing SP from baseline to follow-up, while science teachers' frequency of SP decreased. Additionally, one of the science teachers expressed concern with students cheating, as assessments were administered online during the pandemic.

All participants had extensive experience with developing quizzes and review questions, and they asked very few questions regarding how to implement SP in their classrooms. The frequency of SP activities may have been negatively affected due to remote instruction, which created challenges with ensuring test security. SP activities may be negatively affected as the researcher emphasized ASR components to a greater extent than SP components during PL and

coaching sessions. Reliance on self-reported frequency SP data may also have created challenges with ensuring valid data reporting. Implementation of SP within this study may be negatively affected due to instruction within remote and in-person environments, an increased emphasis on ASR implementation as compared to SP during PL sessions, and reliance on participant self-report regarding the frequency of SP implementation.

ASR rates across contents. Rates of ASRs varied across contents and participants with a range from 0.1 to 3.1 responses per minute. Fact-based questions were typically associated with the highest rates of ASRs (e.g., multiplication math facts, academic vocabulary in ELA and social studies) while application questions were related to the lowest rates (e.g., higher order questions in foreign language, math, science). Some of the rates may have differed depending on the types of questions the teacher asked the students that week (fact-based or application-based).

According to the literature, there are vast differences in suggested targeted ASR rates within the secondary learning environment. Messenger et al. (2017) indicates a rate of 3.5 opportunities per minute while Gardner et al., (1994) indicated a presentation rate of 0.99 per minute is sufficient to improve outcomes and Harbour et al., (2015) indicated that increased responses improve outcomes. However, MacSuga-Gage and Simonson (2015) explained that there is no definitive rate for ASR presentations in the secondary classroom.
Although the literature suggests a targeted ASR rate of three per minute, there is great variability depending on the age of the students, individual characteristics of the students, and content.

Findings from the current study indicate a rate from 1.2 to 1.4 ASRs per minute were appropriate across contents at the secondary level to formatively assess for student learning. This rate varied across contents and even participants depending on the type of questions (fact-based

versus application-based) students were asked as well as the modality used (hands-on versus technology-based). Whiteboards and response cards typically utilized less time to implement due to the time needed for students to login to devices and input codes to access technology quizzes. Results from this study indicate ASRs can be utilized effectively across content areas at the secondary level with a rate from 1.2 to 1.4 ASRs per minute to formatively assess what students know and assist teachers with adjusting future instruction.

Class schedules to support implementation. Originally, the intervention was organized to provide teachers with flexibility regarding when to implement ASRs within the class period. However, due to the pandemic, teachers were limited to 20 minutes of synchronous, remote instruction during the first three weeks of the study. To enable teachers to implement ASRs within these parameters, participants were instructed to record the first 10 minutes of each class period and thus continued throughout the remainder of the study regardless of being remote or in person.

Additionally, participants were advised to incorporate SP activities during the last few minutes of the class period. These suggestions are aligned with organizational policies to incorporate formative assessment during lesson openings and utilize review at the end of the period. However, teachers received limited PL regarding how to incorporate appropriate assessment during the beginning and end of class, which may contribute to challenges with implementing ASRs and SP. Future development of PL and coaching should provide a concentrated focus on how to integrate ASRs and SP within lesson openings and closings and may provide participants with the information needed to further support implementation of the EBPs.

RQ 5: To What Extent Does PL and Coaching Impact Teacher Self-efficacy?

Results indicate PL and coaching impacted general and specific teacher self-efficacy. This is important because the implementation of the intervention suggests an increase in participants' general self-efficacy with student engagement (SE), classroom management (CM), and instructional strategies (IS), which are all necessary components of effective learning environments. The intervention also indicated an increase in participants' specific self-efficacy with implementing ASRs and SP strategies, which were identified as EBPs needed to improve instructional processes within the current educational context. As findings of the study reveal increased general and specific participant self-efficacy, there is evidence that suggests PL and coaching interventions are effective for improving teacher self-efficacy.

As Yoo (2016) demonstrated, PL was effective for increasing teacher self-efficacy by targeting Bandura's (1977) mastery experiences (effective instructional practices), vicarious experiences (observations of colleagues), social persuasion (encouragement and feedback), and psychological and affective states (chunking of information to decrease anxiety). Similarly, the current study integrated vicarious experiences (modeling) and verbal persuasion (suggestions and feedback) during the PL sessions, and the performance accomplishments (mastery experiences) combined with additional verbal persuasion (individualized feedback) during the coaching sessions. Results of the current study expand on Yoo's (2016) findings by demonstrating PL and coaching interventions were effective with increasing both general self-efficacy related to SE, CM, and IS, as well as specific self-efficacy related to the implementation of ASRs and SP strategies. Providing PL and coaching experiences for the participants increased teachers' self-efficacy, which enabled teachers to relate implementing ASRs and SP strategies to student learning.

The positive impact of PL and coaching on teacher self-efficacy is particularly important because teachers with high self-efficacy have confidence in their ability to ensure students learn information presented in the classroom. Students will experience challenges with learning academic concepts. Thus, it is imperative that teachers are self-efficacious with providing students with learning experiences and EBPs to ensure students stay motivated to learn.

Limitations

A significant limitation of the study was related to COVID-19. Due to the pandemic, the school year began remotely, meaning that for the first three weeks of the study, data was collected within the remote learning environment for middle schoolers. Additionally, for the first seven weeks, data was collected within the remote learning environment for high schoolers. Once students returned to brick-and-mortar instruction, an increased use of technology was utilized within many classrooms to ensure social distancing and limit the use of shared materials for health and safety reasons. The environment could not be held constant because once students returned to brick-and-mortar school, confounding variables related to the transition between remote and in person instruction were unavoidable.

A second limitation of the intervention was related to technology. Teachers were required to problem-solve video conferencing issues, integrate ASRs using unfamiliar platforms, use low-tech materials for ASRs due to health and safety mitigations, and hold synchronous sessions with limited connectivity for students and teachers. So, although teachers attempted to provide ASRs and SP within the remote and brick-and-mortar learning environments, various challenges existed.

A third limitation involved the data collection process. Concerning ASRs, teachers were asked to take a 10-minute video during their lesson opening. While many teachers were

successful with videotaping, some participants experienced problems with the quality of the recording (e.g., low volume, directionality of camera, etc.). For example, in some videos, the recording device was not close enough to hear the teacher's voice clearly. In other videos, the camera was not positioned to capture a visual of the ASR implementation. These technical difficulties contributed to problems with ensuring high accuracy when recording ASR rates and also affected percentage of IOA.

Regarding collecting SP data, teachers were asked to self-report the frequency of SP, defined as low stakes quizzes, mid-chapter reviews, or end of unit tests. It was difficult to ensure valid data collection because the researcher had to rely on teacher self-report which can be biased. Some teachers may have included classroom tasks into their self-reported data collection that were not defined by the researcher as SP. For instance, essays and end-of-chapter questions may have been included by some teachers even though they are not included in the operational definition of SP. Therefore, collecting data for both ASRs and SP proved difficult.

A fourth limitation involves the possibility that the implementation of ASRs actually limited the use of SP activities. The intervention focused on incorporating the EBPs of both ASRs and SP. However, asking teachers to change their classroom instruction by modifying it two times per week (one time for ASRs and one time for SP) may have been too difficult for some teachers. Modifying PL sessions to include an increased focus with the SP strategy as well as providing targeted instruction with integrating ASRs and SP within existing class structures (e.g., opening, instruction, closing) may mediate this issue.

Therefore, limitations of the study included a variety of issues due to the global pandemic, technology difficulties, inconsistencies with videotaped observations, and self-reported SP information, and the incorporation of ASRs and SP interventions simultaneously.

While implementing this intervention during a pandemic was challenging in a variety of ways, teaching and learning is a process which invites constant intervention and improvement. One such improvement was the opportunity to implement ASRs and SP within a remote learning environment, which is a way to improve learning in the future. The intervention is versatile and can be implemented across different teaching modalities. Despite difficulties due to current pandemic, this intervention has contributed to better alignment of teaching with learning.

Future Implications

The outcomes of this study have important implications for the future of educational practices for secondary teachers and students. Limited information exists in the literature regarding the appropriate rate of ASRs within the secondary setting (MacSuga-Gage & Simonson, 2015). Additionally, studies integrating ASRs typically focus on specific subjects such as science (Cavanaugh et al., 1996), psychology (Zayac et al., 2015), and social studies (Monem et al., 2018) rather than integrating ASRs across content areas. However, the current study explored appropriate rates of ASRs across a variety of content areas.

Outcomes indicate that within general education classrooms for secondary students, appropriate rates of ASR implementation range from 1.2-1.4 per minute across content areas. This rate is variable depending on the type of questions (fact-based versus application-based) and modality (whiteboards and response cards versus technology quizzes). ASRs integrating fact-based questions enable a higher rate of responding than application-based questions. Also, whiteboards and response cards took less time to implement than technology quizzes due to students needing to login to devices and input program codes. Results from this study indicate that ASR rates of 1.2-1.4 per minute will provide teachers with necessary information to formatively assess learning and modify future lessons to target student needs.

In addition to implications for ASR implementation, there are also considerations related to the SP strategy. Limited information exists in the literature regarding the implementation of SP strategy in conjunction with additional EBPs. For example, McDermott et al. (2013) conducted a series of experiments across secondary grades and content areas; however, the SP strategy was not implemented in conjunction with any other strategies. This is understandable because the amount of time needed to provide PL and coaching for more than one EBP is extensive. The current study provided 4 PL sessions and 3 bi-weekly coaching sessions to participants, but additional time was needed to ensure participants were able to sufficiently implement the strategies. The findings indicate that, when providing PL and coaching to participants for more than one EBP, an increased amount of time is needed for PL and coaching.

Results of this study suggest that PL and coaching was an effective intervention for increasing teacher use of ASRs and SP. Additionally, participants demonstrated that ASRs and SP can be implemented within remote and in-person educational environments, which provides teachers flexibility with providing instruction across different settings. Additionally, the results indicated that ASRs and SP can be effectively implemented across a variety of core content areas (e.g., ELA, math, social studies, science, foreign language) with a rate of between 1.2-1.4 responses per minute across subjects. The implementation of these practices should be further examined in relation to the effect of ASRs and SP on student outcomes, improvements to the PL sessions, and repetition of the current study without the confines of a global pandemic.

This 19-week study provided the measurement of short-term and medium-term outcomes. According to the logic model (see Appendix L), decreasing the gap between teaching and learning, as measured by increased accuracy on end-of-unit assessments, is a long-term outcome of the intervention. Increasing the length of the study may allow for achievement data to be

analyzed in relation to the effectiveness with implementing ASRs and SP strategies. To further study the impact of training teachers in order to decrease the misalignment between teaching and learning, future studies should also measure student outcomes. For example, weekly tests (Cavanaugh et al., 1996), unit tests (Zayac et al., 2015), and pre and post tests (Monem et al., 2018) would be helpful to measure the effectiveness of implementing ASRs, and scores on unit tests (McDerott et al., 2013) may be used to measure the effectiveness of implementing SP.

The results of this study also suggest some improvement to the PL and coaching sessions. For example, specific to PL sessions improvements should include additional time as well as expanded targeted objectives. Additional time for planning and creating sample lessons will allow participants to engage in collaborative discussions with same content area teachers while providing one another with meaningful feedback. This will assist participants with ensuring a comprehensive understanding of the discussed strategies. The results of the current study suggest that allowing for additional time to practice and get feedback prior to completing specific EBPs independently would positively impact teacher self-efficacy related to implementing ASRs and SP. Additional time spent on implementing SP may also be valuable and communicate the importance of this EBP to the participants.

PL sessions should expand targeted objectives to include integrating ASRs and SP within existing class structures (e.g., opening, instruction, closing) and using results of ASRs and SP to inform and adjust future instructional opportunities. Additionally, teachers should be provided with information regarding how ASRs and SP maximize instructional time. As students engage in the review of learned material, it strengthens their understanding, providing foundational knowledge for future learning experiences. As teachers realize the implementation of ASRs and

SP positively affect student learning, their motivation for integrating these EBPs into their planning and instruction may increase.

This intervention occurred within the confines of a global pandemic. Due to health and safety mitigations related to the pandemic, the study began within a remote learning environment and concluded within an in-person learning environment. Despite changes in instructional delivery (e.g., online versus in-person), PL and coaching sessions were effective with increasing teacher knowledge and implementation of ASRs and SP and with improving teacher self-efficacy. Repeating the study during an entirely in-person learning environment may provide increased insights into the effect of ASRs and SP on improving the misalignment between teaching and learning.

The study addressed the misalignment between teaching and learning by providing participants with PL and coaching to increase their knowledge and implementation of ASRs and SP as well as positively affect their self-efficacy. During the needs assessment, respondents expressed they were surprised with student outcomes on unit tests "every time." The current intervention increased the alignment between teaching and learning by training teachers to implement ASRs and SP strategies to increase their understanding of students' concept mastery (ASRs) as well as assist students with retaining learned information (SP). Self-efficacy was also positively affected as participants implemented masterful experiences, engaged in discussions, and received feedback regarding the integration of EBPs. Overall, results indicate the intervention was effective at the secondary level, across content areas, and within both remote and in-person environments. Modifications to the PL sessions, repetition of the study during an in-person environment and integrating student outcome measures may further impact the misalignment between teaching and learning.

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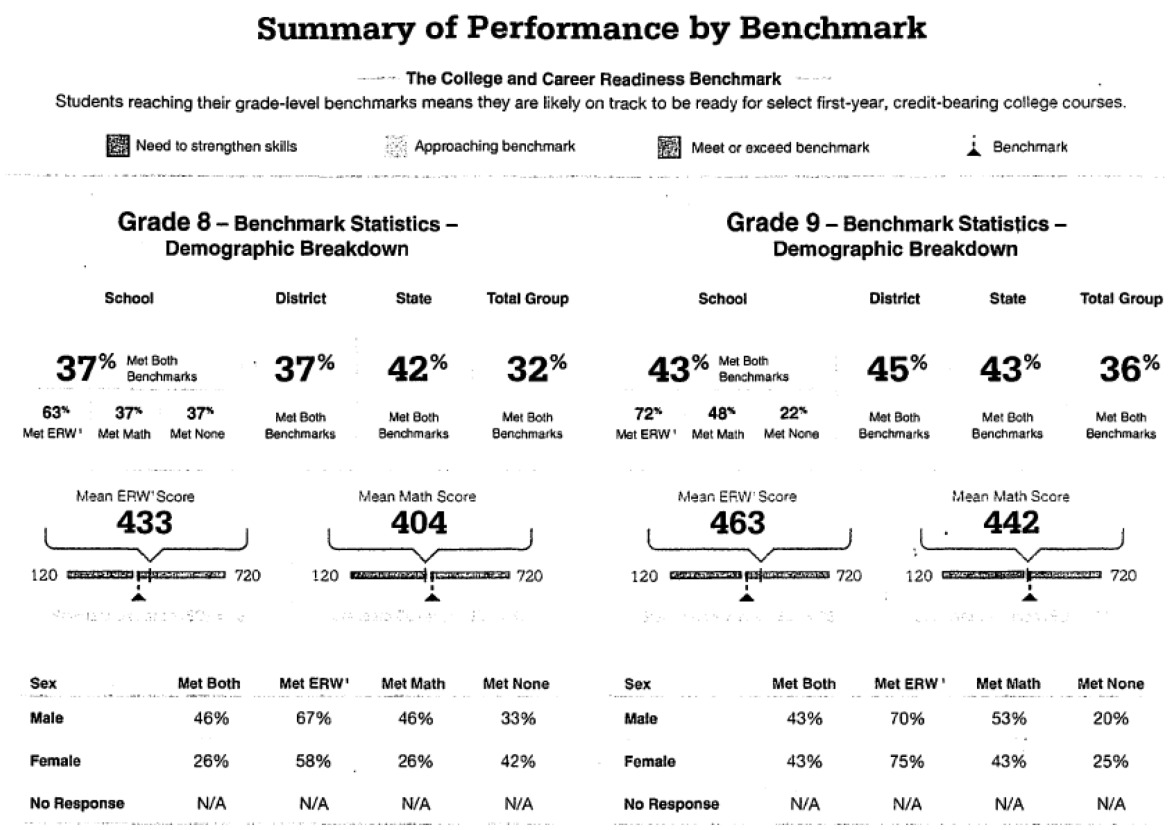
Appendix A

PSAT 8/9 Educator Summary Report

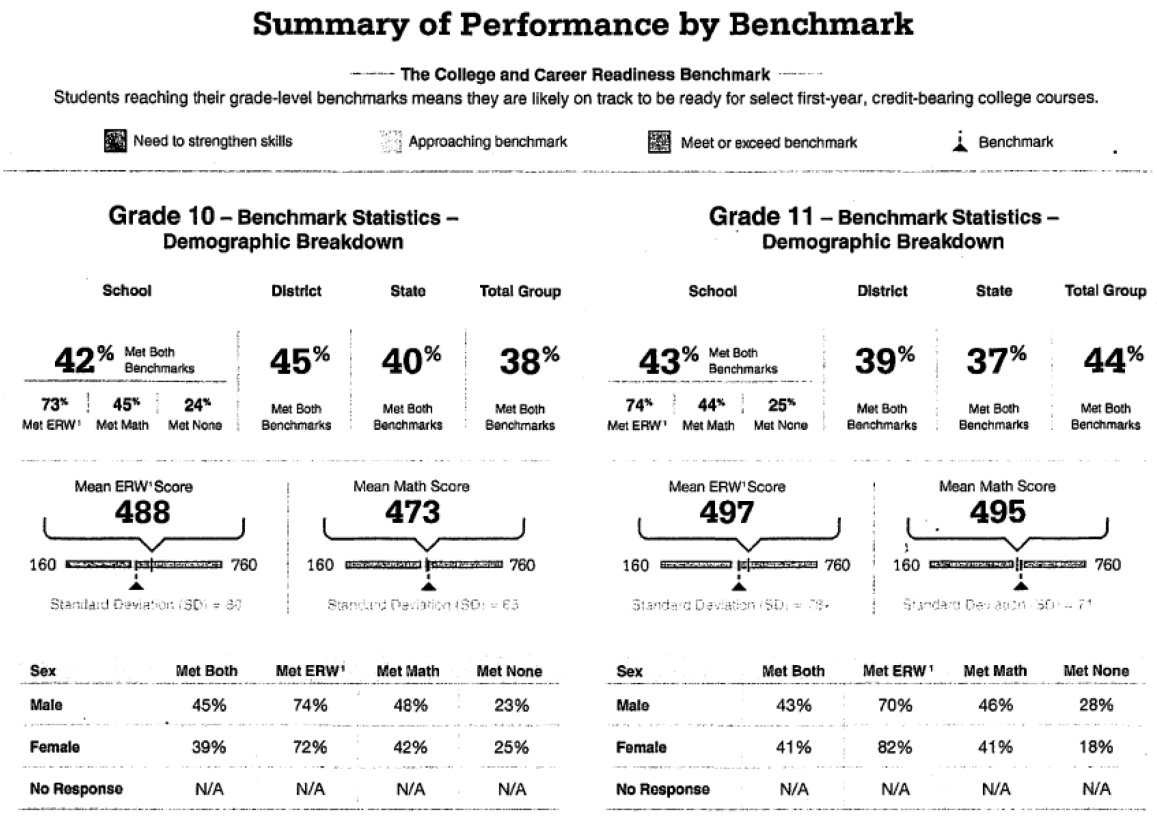


Sex	Met Both	Met ERW¹	Met Math	Met None
Male	46%	67%	46%	33%
Female	26%	58%	26%	42%
No Response	N/A	N/A	N/A	N/A

Sex	Met Both	Met ERW¹	Met Math	Met None
Male	43%	70%	53%	20%
Female	43%	75%	43%	25%
No Response	N/A	N/A	N/A	N/A

Appendix B

PSAT/NMSQT 10/11 Educator Summary Report



Summary of Performance by Benchmark

The College and Career Readiness Benchmark

Students reaching their grade-level benchmarks means they are likely on track to be ready for select first-year, credit-bearing college courses.

Need to strengthen skills | Approaching benchmark | Meet or exceed benchmark | Benchmark

Grade 10 – Benchmark Statistics – Demographic Breakdown

School	District	State	Total Group
42% Met Both Benchmarks	45%	40%	38%
73% Met ERW[1] · 45% Met Math · 24% Met None	Met Both Benchmarks	Met Both Benchmarks	Met Both Benchmarks

Mean ERW[1] Score: 488 (160 – 760)

Mean Math Score: 473 (160 – 760)

Sex	Met Both	Met ERW[1]	Met Math	Met None
Male	45%	74%	48%	23%
Female	39%	72%	42%	25%
No Response	N/A	N/A	N/A	N/A

Grade 11 – Benchmark Statistics – Demographic Breakdown

School	District	State	Total Group
43% Met Both Benchmarks	39%	37%	44%
74% Met ERW[1] · 44% Met Math · 25% Met None	Met Both Benchmarks	Met Both Benchmarks	Met Both Benchmarks

Mean ERW[1] Score: 497 (160 – 760)

Mean Math Score: 495 (160 – 760)

Sex	Met Both	Met ERW[1]	Met Math	Met None
Male	43%	70%	46%	28%
Female	41%	82%	41%	18%
No Response	N/A	N/A	N/A	N/A

Appendix C

Constructs, Definitions, Indicators, and Citations for Empirical Analysis of the Misalignment Between Teaching and Learning

Construct	Definition	Indicator	Citations
Instructional Practices	Integrating sound, available evidence, professional discernment, and student values and setting to create learning opportunities	The Classroom Practices Inventory for Teachers; Teacher Interviews	Ficarra & Quinn, 2014; Spencer, Detrich, & Slocum, 2012)
Teacher Self-efficacy	Teachers who trust their ability to create masterful learning opportunities needed to inform and design instruction for students (Bandura, 1993)	The Classroom Practices Inventory for Teachers; Teacher Interviews; Customer Satisfaction Survey	Balcikanli, 2011; Bandura, 1993; Ficarra & Quinn, 2014; Tschannen-Moran & Hoy, 2001
Assessment for Learning	incorporating checking techniques (i.e., active student responding, questioning) to determine student challenges and make instructional decisions for future teaching opportunities	The Classroom Practices Inventory for Teachers; Teacher Interviews; Classroom assessment, End of quarter grades; PSAT/NMSQT	Carpenter et al., 2016; Dixson & Worrell, 2016; Reeves, 2017
Misalignment	Mismatch between the instruction provided and the knowledge learned (Zhao, 2016)	Classroom Practices Inventory for Teachers; Teacher Interviews; Customer Satisfaction Survey; End of quarter grades; PSAT/NMSQT	Balcikanli, 2011; Ficarra & Quinn, 2014; Tschannen-Moran & Hoy, 2001; Zhao, 2016

Appendix D

Informed Consent Letter
Johns Hopkins University
Homewood Institutional Review Board (HIRB)

Informed Consent Form	
Title:	Doctor of Education Needs Assessment for Research Methods and Systematic Inquiry I Course and Dissertation Research
Principal Investigator:	Dr. Camille Bryant, Associate Professor, JHU, SOE
Date:	February 27, 2018

PURPOSE OF RESEARCH STUDY:

The purpose of this research study is to examine an educational problem within an educational context to determine the salient factors contributing to this problem. The ultimate use of the data gathered will or may become part of the student researchers' dissertation research study.

PROCEDURES:

The student researcher will ask adult participants to complete educational surveys (10-15 minutes), participate in observations (45 minutes to 1 hour), interviews (45 minutes to 1 hour), and/or focus groups (45 minutes to 1 hour) to examine an educational problem within an educational context.

The student researcher will also collect pre-existing de-identified student educational data.

RISKS/DISCOMFORTS:

The risks associated with participation in this study are no greater than those encountered in daily life.

BENEFITS:

The research projects will help the student researcher to better understand the salient factors that are contributing to a problem within their educational organizations. This knowledge will help to develop informed interventions that will address these contributing factors.

VOLUNTARY PARTICIPATION AND RIGHT TO WITHDRAW:

Your participation in this study is entirely voluntary: You choose whether to participate. If you decide not to participate, there are no penalties, and you will not lose any benefits to which you would otherwise be entitled. If you choose to participate in the study, you can stop your participation at any time, without any penalty or loss of benefits. If you want to withdraw from the study, please email (student investigator name and JHU e-mail), Dr. Camille Bryant, at cbryan16@jhu.edu or Dr. Stephen Pape at stephen.pape@jhu.edu explicitly stating your intention.

If we learn any new information during the study that could affect whether you want to continue participating, we will discuss this information with you.

CIRCUMSTANCES THAT COULD LEAD US TO END YOUR PARTICIPATION:

There are circumstances for which the researcher may decide to end your participation before completing the study. If you are no longer an employee within the organization, your participation within the study will be terminated.

CONFIDENTIALITY:

Any study records that identify you will be kept confidential to the extent possible by law. The records from your participation may be reviewed by people responsible for making sure that research is done properly, including members of the Johns Hopkins University Homewood Institutional Review Board and officials from government agencies such as the National Institutes of Health and the Office for Human Research Protections. All of these people are required to keep your identity confidential. Otherwise, records that identify you will be available only to people working on the study, unless you give permission for other people to see the records.

Surveys collected in electronic format will be stored on a password protected computer. All paper documents will be kept in a locked file that is only accessible to the student researcher. Finally, all files will be erased and paper documents shredded seven years after collection.

COMPENSATION:

You will not receive any payment or other compensation for participating in this study.

IF YOU HAVE QUESTIONS OR CONCERNS:

You can ask questions about this research study now or at any time during the study, by talking to the JHU faculty member working with you or by contacting (name and JHU email of student), Dr. Camille Bryant via e-mail at cbryan16@jhu.edu or Dr. Stephen Pape at stephen.pape@jhu.edu.

If you have questions about your rights as a research participant or feel that you have not been treated fairly, please call the Homewood Institutional Review Board at Johns Hopkins University at (410) 516-6580.

SIGNATURES

WHAT YOUR SIGNATURE MEANS:

Your signature below means that you understand the information in this consent form. Your signature also means that you agree to participate in the study.

By signing this consent form, you have not waived any legal rights you otherwise would have as a participant in a research study.

Participant's Signature **Date**

Signature of Person Obtaining Consent (Investigator or HIRB Approved Designee) **Date**

Appendix E

Classroom Practices Inventory for Teachers

Welcome to the Classroom Practices Inventory for Teachers!

Thank you for agreeing to participate in this survey measuring classroom practices. The purpose of the survey is to determine whether or not the use of instructional practices contribute to a misalignment between information that is taught and knowledge that is learned. The survey should take no more than 10 minutes to complete. Please understand that your answers will be kept completely anonymous. By completing this survey, you are consenting to be in the research study. Your participation is voluntary, and you can stop at any time.

Part A: Read each statement and respond according to the following rating scale:

1= Strongly Disagree 2=Disagree 3=Neutral 4=Agree 5=Strongly Agree

Item	Rating
1. I determine students' prior knowledge before instruction.	**1 2 3 4 5**
2. I am confident with using individual student data to inform my instructional planning.	**1 2 3 4 5**
3. I employ guided notes (e.g., notes with fill-in-the-blanks) to the students during lectures.	**1 2 3 4 5**
4. During the instructional period, I regularly ask higher-order questions to determine the students' level of understanding.	**1 2 3 4 5**
5. When students give an incorrect response, I provide the correct response and repeat the question to ensure understanding.	**1 2 3 4 5**
6. Based on data collection, I identify one or more students for individualized intervention on a regular basis (e.g., at least one time per week).	**1 2 3 4 5**
7. I utilize active student responding (e.g., whiteboards, smart response clickers, etc.) to increase my understanding of student learning.	**1 2 3 4 5**
8. I feel capable with designing different practice activities (e.g., homework, classwork, projects) depending on the situation.	**1 2 3 4 5**
9. I provide multiple opportunities for my students to respond within each class period.	**1 2 3 4 5**
10. I measure growth in students' performance on a weekly basis.	**1 2 3 4 5**
11. I consider myself proficient with identifying reasons for poor student performance and modifying instructional practices based on that knowledge.	**1 2 3 4 5**
12. I provide performance feedback to students on a regular, ongoing basis to ensure student understanding of the lesson objectives.	**1 2 3 4 5**
13. I feel confident about my ability to use a variety of evidence-based practices within the classroom.	**1 2 3 4 5**

Part B: Read each statement and carefully respond.

14. Which is most important to your instructional planning? Rate each item from least important (1) to most important (5).

___ Standards
___ Formative Assessment (ongoing feedback to inform instruction)
___ Curriculum
___ Evidence-based Practices
___ Standardized Assessment

15. What percentage of instructional time do you devote to the following? Must add up to 100%.

___ Lecture
___ Class Discussion
___ Classroom Management
___ Independent Practice
___ Group Work
___ Other: _____

Appendix F

Instruments, Constructs, Scales, Number of Items, Participants, and Sample Questions

for the Classroom Practices Inventory for Teachers

Instrument	Constructs	Scale	Items	Participants	Sample Question
The Classroom Practices Inventory for Teachers	Assessment for Learning; Evidence-based Practices; Self-efficacy; Misalignment	5-point Likert scale	15	K-12 Teachers	I utilize active student responding (e.g., whiteboards, smart response clickers, etc.) to increase my understanding of student learning.
Preliminary Scholastic Assessment Test/National Merit Scholarship Qualifying Test	Assessment Scores for Evidence-based Reading and Writing; Assessment Scores for Math	120-720 (8th-9th); 160-760 (10th-11th grades)	120 (8th-9th); 139 (10th-11th)	8th-11th grade students	Which choice provides the best evidence for the answer to the previous question? A) Lines 31-37 ("The 'magic' ... does") B) Lines 43-45 ("If ... rotation") C) Lines 47-49 ("This ... absence") D) Lines 51-53 ("The point ... rotating")
Quarterly Grade Report	Academic Performance	D or F	NA	Middle High Students	NA
Customer Satisfaction Survey	Self-efficacy; Misalignment	5-point Likert scale	Approx. 35	Parents; Students; Teachers	This school promotes academic success for all students.
Interview	Assessment for Learning; Evidence-based Practices; Self-efficacy; Misalignment	Emergent Coding	10 Questions	Teachers	Created from data analysis of previously administered instruments

Appendix G

Teacher Interview

A. How long have you worked in education?

1. How long have you worked at your current school?

2. What subjects/classes do you currently teach?

B. What types of instructional strategies do you utilize in the classroom? How would you describe the effectiveness of those strategies?

1. How do the instructional strategies support teaching and learning?

2. What could assist you with utilizing instructional strategies to a greater extent within the classroom?

C. How is learning measured within your classroom? Please provide some feedback on the effectiveness of each learning measure.

1. How do the assessments support teaching and learning?

2. What could assist you with utilizing assessment to a greater extent within the classroom?

D. Describe your level of confidence with using a variety of evidence-based practices within the classroom.

1. How do you **determine students' prior knowledge** before teaching an instructional unit?

2. How do you **match instructional tasks with individual student needs?**

E. Describe your level of confidence with using individual student data to inform instructional planning?

1. How do you **determine which types of practice activities** (e.g., homework, classwork, projects) to provide for your students?

2. How do you determine whether or not students have **mastered lesson objectives?**

Appendix H

Focus Group Questions

1. What are some ways that you use meaningful assessment or you've seen meaningful assessment used and performance feedback in the classroom?

2. On the survey, many respondents agreed that they provided multiple opportunities for students to respond during each class period. During your class, how many times does each student respond within a class period?

3. Describe your use of higher order questions to determine students' level of understanding.

4. How do you use active student responding in your class to increase your understanding of student learning?

5. After you give a summative assessment, are you ever surprised that the students do not know information that you thought that they had learned?

6. Tell me about the process of how you identify students that need individual intervention. How do you identify reasons for poor student performance?

7. How do you design practice activities like homework, classwork, or projects?

8. How do you measure growth in student performance, and how often do you measure it?

9. Tell me about the evidence-based practices that you use and the frequency with which you use it or them.

10. How do you plan an instructional unit?

Appendix I

Customer Satisfaction Survey Results (Parents)

SY 2016-17 Customer Satisfaction Survey Results (Full Report)

Bahrain Elementary/High School Results

Response Rates: (A hyphen "-" indicates fewer than 20 responses)
- Parents/Sponsors: 47 (9 %)

Academic

	Parents/ Sponsors
1. My child is learning what he or she needs to know to succeed in later grades or after graduating from high school.	
Strongly agree	23 %
Agree	38 %
Neutral	11 %
Disagree	11 %
Strongly disagree	17 %
2. This school promotes academic success for ALL students.	
Strongly agree	26 %
Agree	34 %
Neutral	6 %
Disagree	19 %
Strongly disagree	15 %
3. I am satisfied with my child's opportunities to use computers at school.	
Strongly agree	9 %
Agree	26 %
Neutral	26 %
Disagree	15 %
Strongly disagree	26 %

Communication/Environment

	Parents/ Sponsors
4. My child's teachers keep me informed about my child's progress in school.	
Strongly agree	28 %
Agree	23 %
Neutral	19 %
Disagree	17 %
Strongly disagree	13 %
5. This school does a good job of getting important school information to parents.	
Strongly agree	28 %
Agree	26 %
Neutral	11 %
Disagree	19 %
Strongly disagree	17 %

6. The principal at this school promptly responds to my phone calls, messages, or emails.	
Strongly agree	15 %
Agree	21 %
Neutral	34 %
Disagree	6 %
Strongly disagree	23 %
7. The teachers at this school promptly respond to my phone calls, messages, or emails.	
Strongly agree	36 %
Agree	32 %
Neutral	11 %
Disagree	11 %
Strongly disagree	11 %
8. Parent involvement in this school is welcome and encouraged.	
Strongly agree	38 %
Agree	34 %
Neutral	9 %
Disagree	9 %
Strongly disagree	11 %
9. The adults at this school treat all students with respect.	
Strongly agree	19 %
Agree	30 %
Neutral	17 %
Disagree	21 %
Strongly disagree	13 %
10. This school provides opportunities for parents to be involved in school improvement.	
Strongly agree	23 %
Agree	32 %
Neutral	15 %
Disagree	17 %
Strongly disagree	13 %
11. This school has adults that really care about students.	
Strongly agree	30 %
Agree	36 %
Neutral	19 %
Disagree	9 %
Strongly disagree	6 %

School Safety

	Parents/ Sponsors
12. This school is a safe place for my child.	
Strongly agree	23 %
Agree	47 %
Neutral	11 %

Disagree	11 %
Strongly disagree	9 %
13. In this school, students teasing my child is a problem.	
Strongly agree	13 %
Agree	28 %
Neutral	13 %
Disagree	34 %
Strongly disagree	13 %
14. In this school, students bullying other students is a problem.	
Strongly agree	19 %
Agree	26 %
Neutral	17 %
Disagree	23 %
Strongly disagree	15 %

High School (11-12 Only)

	Parents/ Sponsors
15. This school encourages all students to enroll in challenging courses regardless of their race, ethnicity, or nationality.	
Strongly agree	-
Agree	-
Neutral	-
Disagree	-
Strongly disagree	-
16. I feel well-informed about what is required for my child to graduate from high school.	
Strongly agree	-
Agree	-
Neutral	-
Disagree	-
Strongly disagree	-
17. This school has helped me understand what's required for the college application process.	
Strongly agree	-
Agree	-
Neutral	-
Disagree	-
Strongly disagree	-
18. This school has helped my child explore which college and career options best fit their interests and goals.	
Strongly agree	-
Agree	-
Neutral	-
Disagree	-
Strongly disagree	-
19. This school has helped my child apply for college.	

Strongly agree	-
Agree	-
Neutral	-
Disagree	-
Strongly disagree	-
20. This school has helped my child find and apply for scholarships to college.	
Strongly agree	-
Agree	-
Neutral	-
Disagree	-
Strongly disagree	-

Overall

	Parents/ Sponsors
21. If I had to give the DoD schools a grade, I would give them... (Percent responding A or B)	64 %
22. If I had to give this school a grade, I would give it... (Percent responding A or B)	49 %
23. This school understands military families.	
Strongly agree	19 %
Agree	36 %
Neutral	11 %
Disagree	13 %
Strongly disagree	21 %

Appendix J

Customer Satisfaction Survey Results (Students)

SY 2016-17 Customer Satisfaction Survey Results (Full Report)

Bahrain Elementary/High School Results

Response Rates: (A hyphen "-" indicates fewer than 20 responses)
- Students (Middle/High): 42 (10 %)

Academic

	Students (Middle/High)
1. I think I am learning what I need to know to succeed in later grades or after graduating from high school.	
Strongly agree	14 %
Agree	31 %
Neutral	29 %
Disagree	14 %
Strongly disagree	12 %
2. My teachers have high expectations for me to do well in school– they push me to do my best.	
Strongly agree	21 %
Agree	31 %
Neutral	29 %
Disagree	14 %
Strongly disagree	5 %
3. My teachers have the same expectations for all the students in their class.	
Strongly agree	10 %
Agree	26 %
Neutral	17 %
Disagree	29 %
Strongly disagree	19 %
4. My teachers tell me how I do on my classroom assignments, tests, and homework assignments.	
Strongly agree	14 %
Agree	38 %
Neutral	29 %
Disagree	17 %
Strongly disagree	2 %
5. My teachers help me when I don't understand my schoolwork.	
Strongly agree	12 %
Agree	45 %
Neutral	29 %
Disagree	10 %
Strongly disagree	5 %

Communication/Environment

	Students (Middle/High)

Customer Satisfaction Survey Results (Students)

6. The principal at this school promptly responds to my phone calls, messages, or emails.	
Strongly agree	5 %
Agree	19 %
Neutral	29 %
Disagree	14 %
Strongly disagree	33 %
7. The teachers at this school promptly respond to my phone calls, messages, or emails.	
Strongly agree	7 %
Agree	36 %
Neutral	29 %
Disagree	21 %
Strongly disagree	7 %
8. Adults at this school treat all students with respect.	
Strongly agree	19 %
Agree	24 %
Neutral	19 %
Disagree	19 %
Strongly disagree	19 %
9. I felt welcomed when I came to this school.	
Strongly agree	21 %
Agree	29 %
Neutral	24 %
Disagree	14 %
Strongly disagree	12 %
10. I feel close to people at this school.	
Strongly agree	24 %
Agree	33 %
Neutral	12 %
Disagree	14 %
Strongly disagree	17 %
11. I am happy to be at this school.	
Strongly agree	19 %
Agree	17 %
Neutral	31 %
Disagree	7 %
Strongly disagree	26 %
12. I feel like I am part of this school.	
Strongly agree	14 %
Agree	26 %
Neutral	26 %
Disagree	19 %
Strongly disagree	14 %
13. At this school, there are adults that really care about me.	
Strongly agree	24 %

Agree	36 %
Neutral	26 %
Disagree	7 %
Strongly disagree	7 %
14. At my school there is a teacher or adult who tells me when I do a good job.	
Strongly agree	36 %
Agree	40 %
Neutral	10 %
Disagree	12 %
Strongly disagree	2 %
15. At my school there is a teacher or adult who listens to me when I have something to say.	
Strongly agree	29 %
Agree	40 %
Neutral	17 %
Disagree	12 %
Strongly disagree	2 %
16. At my school there is a teacher or adult who believes I will be a success.	
Strongly agree	38 %
Agree	38 %
Neutral	17 %
Disagree	2 %
Strongly disagree	5 %

Well Being

	Students (Middle/High)
17. In the last 30 days, how often did you feel happy?	
None of the time	14 %
A little of the time	17 %
Some of the time	33 %
Most of the time	26 %
All of the time	10 %
18. In the last 30 days, how often did you feel like nothing makes you happy?	
None of the time	31 %
A little of the time	36 %
Some of the time	17 %
Most of the time	7 %
All of the time	10 %
19. In the last 30 days, how often did you feel good about life?	
None of the time	5 %
A little of the time	17 %
Some of the time	21 %
Most of the time	36 %
All of the time	21 %

20. In the last 30 days, how often did you feel that you do not have much hope?	
None of the time	43 %
A little of the time	29 %
Some of the time	21 %
Most of the time	0 %
All of the time	7 %

School Safety

	Students (Middle/High)
21. This school is a safe place.	
Strongly agree	24 %
Agree	26 %
Neutral	29 %
Disagree	7 %
Strongly disagree	14 %
22. During the past 12 months, how many times on school property have you	
Been in a physical fight?	
0 times	95 %
1 time	5 %
2 or 3 times	0 %
4 or more times	0 %
Been pushed, shoved, slapped, hit, or kicked by someone who wasn't just kidding around?	
0 times	76 %
1 time	14 %
2 or 3 times	0 %
4 or more times	10 %
Had mean rumors or lies spread about you?	
0 times	48 %
1 time	17 %
2 or 3 times	10 %
4 or more times	26 %
Been made fun of because of your looks or the way you talk?	
0 times	52 %
1 time	21 %
2 or 3 times	2 %
4 or more times	24 %
Had something stolen or damaged such as your clothing or books?	
0 times	64 %
1 time	17 %
2 or 3 times	12 %
4 or more times	7 %
Been made fun of for the color of your skin, origin, or your religion?	
0 times	64 %

1 time	14 %
2 or 3 times	10 %
4 or more times	12 %
Received insulting messages through the internet (email, Facebook) or on your cell phone?	
0 times	83 %
1 time	7 %
2 or 3 times	2 %
4 or more times	7 %
Missed school because you were afraid that someone would hurt you at school or on your way to school?	
0 times	93 %
1 time	5 %
2 or 3 times	2 %
4 or more times	0 %

High School (11-12 Only)

	Students (Middle/High)
23. This school encourages all students to enroll in challenging courses regardless of their race, ethnicity, or nationality.	
Strongly agree	-
Agree	-
Neutral	-
Disagree	-
Strongly disagree	-
24. I know what is required for me to graduate from high school.	
Strongly agree	-
Agree	-
Neutral	-
Disagree	-
Strongly disagree	-
25. My school has helped me understand what's required for the college application process.	
Strongly agree	-
Agree	-
Neutral	-
Disagree	-
Strongly disagree	-
26. This school has helped me explore which college and career options best fit my interests and goals.	
Strongly agree	-
Agree	-
Neutral	-
Disagree	-
Strongly disagree	-
27. Someone at my school has helped me apply for college.	
Strongly agree	-

Agree	-
Neutral	-
Disagree	-
Strongly disagree	-
28. Someone at my school has helped me find and apply for scholarships to college.	
Strongly agree	-
Agree	-
Neutral	-
Disagree	-
Strongly disagree	-

Overall

	Students (Middle/High)
29. If I had to give the DoD schools a grade, I would give them... (Percent responding A or B)	55 %
30. If I had to give my school a grade, I would give it... (Percent responding A or B)	43 %
31. This school understands military families.	
Strongly agree	14 %
Agree	31 %
Neutral	33 %
Disagree	7 %
Strongly disagree	14 %

Appendix K

Customer Satisfaction Survey Results (Teachers)

SY 2016-17 Customer Satisfaction Survey Results (Full Report)

Bahrain Elementary/High School Results

Response Rates: (A hyphen "-" indicates fewer than 20 responses)
- Teachers: 30 (41 %)

Academic

	Teachers
1. Students in this school are learning what they need to know to succeed in later grades or after graduating from high school.	
Strongly agree	23 %
Agree	63 %
Neutral	7 %
Disagree	7 %
Strongly disagree	0 %
2. This school sets high standards for academic performance for ALL students.	
Strongly agree	17 %
Agree	50 %
Neutral	17 %
Disagree	10 %
Strongly disagree	7 %
3. This school promotes academic success for ALL students.	
Strongly agree	23 %
Agree	33 %
Neutral	20 %
Disagree	23 %
Strongly disagree	0 %
4. This school emphasizes helping students academically when they need it.	
Strongly agree	20 %
Agree	63 %
Neutral	10 %
Disagree	7 %
Strongly disagree	0 %

Communication/Environment

	Teachers
5. This school keeps parents informed about their child's progress in school.	
Strongly agree	37 %
Agree	57 %
Neutral	3 %
Disagree	3 %
Strongly disagree	0 %
6. This school does a good job of getting important school information to parents.	

Strongly agree	43 %
Agree	40 %
Neutral	10 %
Disagree	3 %
Strongly disagree	3 %
7. The principal at this school promptly responds to students and parents phone calls, messages, or emails.	
Strongly agree	17 %
Agree	43 %
Neutral	30 %
Disagree	10 %
Strongly disagree	0 %
8. Teachers at this school promptly respond to students' and parents' phone calls, messages, or emails.	
Strongly agree	27 %
Agree	50 %
Neutral	20 %
Disagree	3 %
Strongly disagree	0 %
9. This school is welcoming to and facilitates parent involvement.	
Strongly agree	30 %
Agree	53 %
Neutral	10 %
Disagree	7 %
Strongly disagree	0 %
10. Adults at this school treat every student with respect.	
Strongly agree	13 %
Agree	50 %
Neutral	13 %
Disagree	23 %
Strongly disagree	0 %
11. This school provides opportunities for parents to be involved in school improvement.	
Strongly agree	40 %
Agree	40 %
Neutral	7 %
Disagree	13 %
Strongly disagree	0 %
12. This school is a supportive and inviting place for staff to work.	
Strongly agree	7 %
Agree	27 %
Neutral	20 %
Disagree	27 %
Strongly disagree	20 %
13. This school promotes trust and collegiality among staff.	
Strongly agree	0 %
Agree	33 %

Neutral	20 %
Disagree	20 %
Strongly disagree	27 %
14. This school promotes personnel participation in decision-making that affects school practices and policies.	
Strongly agree	0 %
Agree	30 %
Neutral	3 %
Disagree	30 %
Strongly disagree	37 %
15. Adults at this school really care about every student.	
Strongly agree	20 %
Agree	53 %
Neutral	20 %
Disagree	7 %
Strongly disagree	0 %
16. Teachers and adults at this school listen to what students have to say.	
Strongly agree	17 %
Agree	60 %
Neutral	17 %
Disagree	7 %
Strongly disagree	0 %
17. Teachers and adults at this school believe that every student can be a success.	
Strongly agree	17 %
Agree	60 %
Neutral	10 %
Disagree	13 %
Strongly disagree	0 %

School Safety

	Teachers
18. This school is a safe place for students.	
Strongly agree	30 %
Agree	57 %
Neutral	10 %
Disagree	3 %
Strongly disagree	0 %
19. How much of a problem at this school is	
Harassment or bullying among students?	
Insignificant problem	30 %
Mild problem	43 %
Moderate problem	20 %
Severe problem	7 %
Physical fighting between students?	
Insignificant problem	73 %

Mild problem	27 %
Moderate problem	0 %
Severe problem	0 %
Disruptive student behavior?	
Insignificant problem	10 %
Mild problem	37 %
Moderate problem	43 %
Severe problem	10 %
Racial/ethnic conflict among students?	
Insignificant problem	43 %
Mild problem	40 %
Moderate problem	13 %
Severe problem	3 %
Theft?	
Insignificant problem	37 %
Mild problem	43 %
Moderate problem	17 %
Severe problem	3 %

High School (11-12 Only)

	Teachers
20. This school encourages students to enroll in rigorous courses (such as honors and AP), regardless of their race, ethnicity, or nationality.	
Strongly agree	57 %
Agree	37 %
Neutral	3 %
Disagree	3 %
Strongly disagree	0 %
21. This school makes sure that all students and parents know what is required for them to graduate from high school.	
Strongly agree	50 %
Agree	30 %
Neutral	7 %
Disagree	13 %
Strongly disagree	0 %
22. This school helps students understand what's required for the college application process.	
Strongly agree	20 %
Agree	57 %
Neutral	7 %
Disagree	17 %
Strongly disagree	0 %
23. This school helps students explore which college and career options best fit their interests and goals.	
Strongly agree	33 %
Agree	20 %

Neutral	23 %
Disagree	20 %
Strongly disagree	3 %
24. This school helps students apply for college.	
Strongly agree	23 %
Agree	37 %
Neutral	30 %
Disagree	7 %
Strongly disagree	3 %
25. This school helps students find and apply for scholarships to college.	
Strongly agree	7 %
Agree	30 %
Neutral	43 %
Disagree	13 %
Strongly disagree	7 %

Overall

	Teachers
26. If I had to give the DoD schools a grade, I would give them... (Percent responding A or B)	70 %
27. If I had to give this school a grade, I would give it... (Percent responding A or B)	47 %
28. This school understands military families.	
Strongly agree	17 %
Agree	60 %
Neutral	10 %
Disagree	7 %
Strongly disagree	7 %

Professional Development

	Teachers
31. This school provides the materials, resources, and training needed to do your job effectively.	
Strongly agree	7 %
Agree	30 %
Neutral	10 %
Disagree	33 %
Strongly disagree	20 %
32. This school takes steps to minimize paper work.	
Strongly agree	3 %
Agree	37 %
Neutral	33 %
Disagree	17 %
Strongly disagree	10 %
33. This school provides relevant training for paraprofessionals.	
Strongly agree	0 %

Agree	10 %
Neutral	43 %
Disagree	27 %
Strongly disagree	20 %
34. This school is a place where teachers feel supported by the parents and the community.	
Strongly agree	3 %
Agree	37 %
Neutral	27 %
Disagree	17 %
Strongly disagree	17 %
35. This school is a place where the administration is supportive of teachers.	
Strongly agree	3 %
Agree	27 %
Neutral	30 %
Disagree	13 %
Strongly disagree	27 %
36. This school is a place where teachers are encouraged to speak up/voice concerns.	
Strongly agree	3 %
Agree	27 %
Neutral	17 %
Disagree	17 %
Strongly disagree	37 %
37. This school is a place where classroom instruction is prioritized over paperwork.	
Strongly agree	7 %
Agree	37 %
Neutral	30 %
Disagree	27 %
Strongly disagree	0 %
38. This school is a place where educational decisions drive technology decisions.	
Strongly agree	0 %
Agree	17 %
Neutral	30 %
Disagree	27 %
Strongly disagree	27 %
39. This school is a place where there is sufficient training and support for technology integration.	
Strongly agree	0 %
Agree	23 %
Neutral	7 %
Disagree	37 %
Strongly disagree	33 %

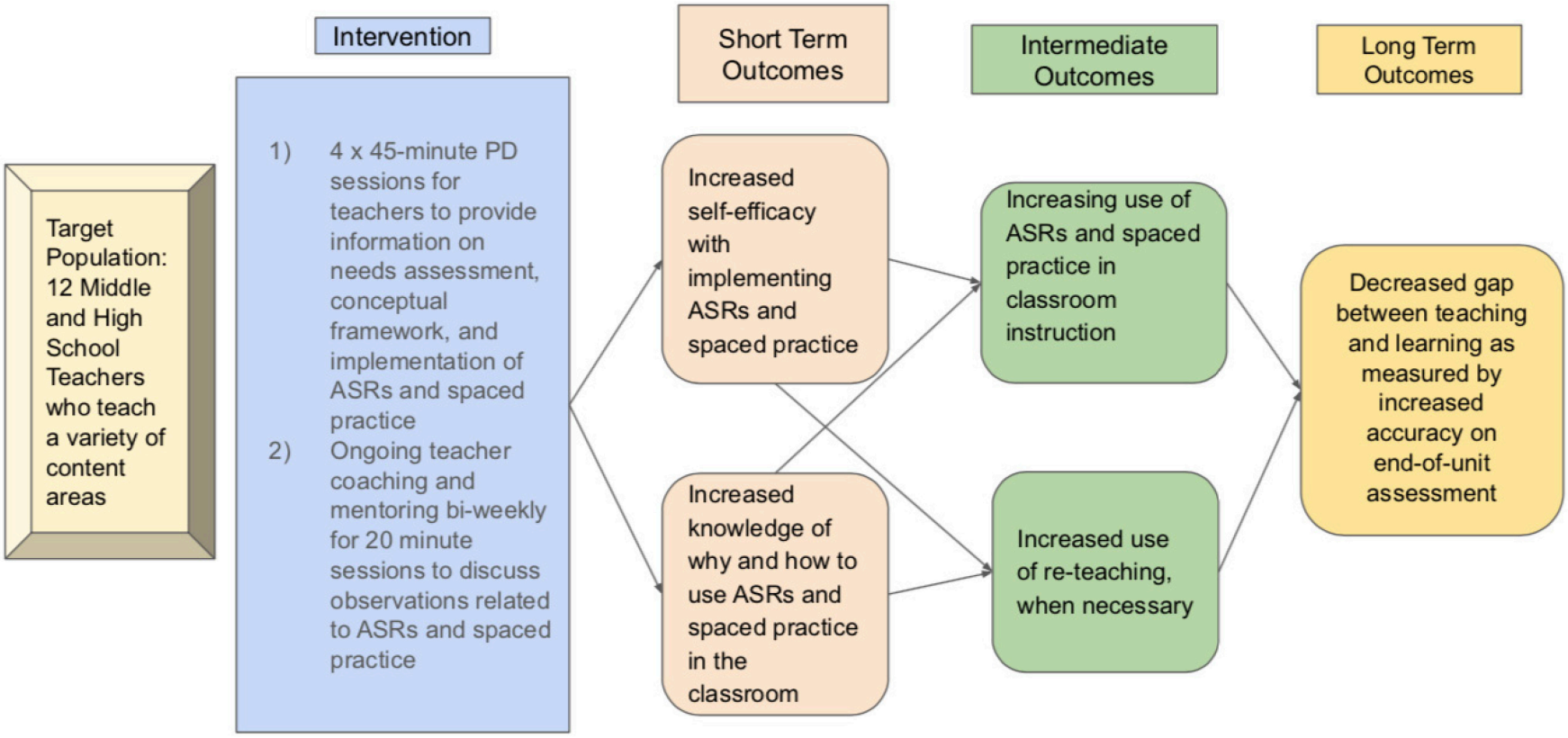
Appendix L

Misalignment Between Teaching and Learning: A Logic Model

Inputs	Outputs		Outcomes -- Impact		
	Activities	*Participation*	*Short*	*Medium*	*Long*
Resources: **Staff-**Experienced PD provider **Participants-**Teacher volunteers **Time-**Baseline data collection in classrooms; Weekly PD sessions; Data collection following PD intervention; Teacher consultations **Materials-**PD Handouts; Data collection forms **Equipment-**Technology to include computer, projector, internet **Setting-**Meeting space for PD and follow-up consultations **Approval-**Administration support for setting, time, and teacher participation	**Processes:** **PD Sessions-**Conduct 4 PD sessions for 45 min 1) Discuss with the teachers needs assessment results and the conceptual framework; Explain rational for use of EBPs in relation to ASRs and explain Spaced Practice 2) Review models of ASRs and Spaced Practice; Practice using ASRs and Spaced Practice; Model a lesson for participants with ASRs and Spaced Practice 3) Participants create a sample lesson to share integrating ASRs and Spaced Practice 4) Teachers practice giving their lesson with the group infused with ASRs and Spaced Practice **Ongoing coaching and mentoring-**Every two weeks coach meets with teacher for 20 minutes to discuss observation related to ASRs and Spaced Practice	**Target Population:** **Teachers-**12 teacher volunteers from middle and high school *Three teachers from each content area: math, science, social studies) *Teachers will participate in three waves. Each group will be exposed to the PD 4-6 weeks apart.	**Teacher Related** Increased self-efficacy with implementing EBPs Increase knowledge of why and how to use ASRs and Spaced Practice in the classroom	**Teacher Related** Increasing use of ASRs and Spaced Practice in classroom instruction Increased use of re-teaching, when necessary	**Teacher Related** Increased sharing of EBPs with colleagues **Student Related** Decreasing gap between teaching and learning as measured by increased accuracy on end-of-unit assessments **Organization-Related** Improved school climate Increased number of teacher leaders

Appendix M

Theory of Treatment for the Misalignment Between Teaching and Learning



Appendix N

Checklist of Intervention Activities

Directions: Record the date and mark whether each activity was Complete (C) or Incomplete (I). During sessions three and four, provide information regarding the topic of the lesson and feedback provided to the participant.

PD Session1 Date: _____ C/I		PD Session 2 Date: _____ C/I		PD Session 3 Date: _____ C/I		PD Session 4 Date: _____ C/I	
Researcher shared needs assessment results		Researcher shared types of ASRs and SP		Participants created sample lessons integrating ASRs and SP within their content areas		Participants delivered a lesson within their content area while incorporating ASRs and SP	
Researcher shared conceptual framework		Researcher shared how to create a lesson integrating ASRs and SP		Topic of lesson:		Topic of lesson:	
Researcher shared rational for ASRs and SP		Researcher shared how to incorporate ASRs and SP into lesson delivery		Feedback provided to participant:		Feedback provided to participant:	

Date	Coaching Session 1 C/I		Coaching Session 2 C/I		Coaching Session 3 C/I		Coaching Session 4 C/I	
	The researcher provided feedback to the participant regarding rate of ASRs		The researcher provided feedback to the participant regarding rate of ASRs		The researcher provided feedback to the participant regarding rate of ASRs		The researcher provided feedback to the participant regarding rate of ASRs	
	The researcher provided feedback to the participant regarding use of SP		The researcher provided feedback to the participant regarding use of SP		The researcher provided feedback to the participant regarding use of SP		The researcher provided feedback to the participant regarding use of SP	
	The researcher provided guidance to the participants regarding the future implementation of ASRs and SP		The researcher provided guidance to the participants regarding the future implementation of ASRs and SP		The researcher provided guidance to the participants regarding the future implementation of ASRs and SP		The researcher provided guidance to the participants regarding the future implementation of ASRs and SP	

Appendix O

Professional Learning Exit Ticket: Survey Control Number:

What is your participant identifier?

Participant Engagement

Please circle the number that corresponds most closely with your level of engagement (the degree to which you were interested and involved) during the session today. Then, provide additional insights by answering the related questions. Your responses will be kept confidential.

The topic of the learning session was relevant to the classes and students that I teach.

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

The information presented in the session caused me to ask questions or participate in class discussions.

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

The activities helped increase my understanding of the topic.

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

The materials presented in the session kept my attention the majority of the time.

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

What factors influenced your level of engagement in this Professional Learning session (e.g., topic, location, time of day, time of session, length of session, types of activities, etc.)?

What suggestions do you have for future Professional Learning sessions?

Appendix P

Coaching Exit Ticket: Survey Control Number:

What is your participant identifier?

Participant Engagement

Please select the number that corresponds most closely with your level of engagement (the degree to which you were interested and involved) during the session today. Then, provide additional insights by answering the related questions. Your responses will be kept confidential.

The discussion was relevant to the classes and students that I teach.

○ Strongly disagree

- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

The discussion caused me to ask questions or engage with the facilitator.

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

The coaching session helped increase my understanding of the topic.

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

The information discussed in the session kept my attention the majority of the time.

- ○ Strongly disagree
- ○ Somewhat disagree
- ○ Neither agree nor disagree
- ○ Somewhat agree
- ○ Strongly agree

What factors influenced your level of engagement in this Coaching session (e.g., topic, location, time of day, time of session, length of session, types of activities, etc.)?

What suggestions do you have for future Coaching sessions?

Appendix Q

Process and Outcome Data Collection Matrices

Process Evaluation Question	**Process Evaluation Indicator(s)**	**Data Source**	**Data Collection Tool**	**Frequency**	**Data Analysis**
1A) To what extent was the project implemented with fidelity to include PL and coaching activities?	Attendance in PL and coaching sessions	Teachers	The researcher will take attendance on PL and coaching **Attendance Sheets** (Appendix R) The researcher will complete a **Checklist of Intervention Activities** (Appendix N)	Attendance and the Checklist of Intervention Activities will be completed for each PL and coaching session	Descriptive statistics will be used to analyze the level of participation of the attendees. Descriptive statistics will also be used to determine the fidelity of project implementation during PL and coaching sessions.
1B) To what extent did the participants represent the four content areas (English Language Arts, math, science, social studies)?	Teacher participants and the instructional content that they teach	Teachers	The researcher will obtain a list of teacher participants and the content areas they teach on the **Instructional Content Record** (Appendix S) A	Content areas of teachers will be ascertained at the beginning and ending of the program	Descriptive statistics will be used to analyze the number of participants that teach each content area (e.g., the number of participants that teach English Language Arts, math, science, and social studies), which will assist with evaluating the generalizability of the intervention across content areas.
2A) To what extent did the participants perceive themselves	Level of teacher engagement	Teachers	**PL Exit Ticket** will obtain quantitative and qualitative information	Participants will complete an exit ticket at the end	Quantitative data will be analyzed using descriptive statistics to determine the extent

as engaged with the content presented in the PL sessions?	in PL sessions		from participants regarding their level of engagement (Appendix O)	of each PL session	of participant engagement. Qualitative data will be analyzed using descriptive coding. Quantitative and qualitative findings will be compared to develop an overall interpretation of the extent of participant engagement.
2B) To what extent did the participants perceive themselves as engaged in the discussions that occurred during the coaching sessions?	Level of teacher engagement in coaching sessions	Teachers	A **Coaching Exit Ticket** will obtain quantitative and qualitative information from participants regarding their level of engagement (Appendix P)	Participants will complete an exit ticket at the end of each coaching session	Quantitative data will be analyzed using descriptive statistics to determine the extent of participant engagement. Qualitative data will be analyzed using descriptive coding. Quantitative and qualitative findings will be compared to develop an overall interpretation of the extent of participant engagement.
2C) To what extent did the participants complete the activities (e.g., creation of sample lesson, provide a lesson demonstration) during PL and coaching?	Activities completed during PL and coaching sessions	Teachers	**Checklist of PL and Coaching Activities** (Appendix N)	Checklist will be completed by the researcher at the end of each PL and coaching session	Descriptive statistics will be used to determine the number of participants that completed the activities during PL and coaching sessions.

Outcome Evaluation Question	Construct	Data Source	Data Collection Tool	Frequency	Data Analysis
3) To what extent did PL and coaching increase teachers' knowledge of ASRs and Spaced Practice?	Teacher knowledge of ASRs and Spaced Practice	Teachers	**Instructional Strategies Survey:** (Appendix U) Sample Items: 1) Rate your current level of knowledge with implementing ASRs in the classroom. 2) Provide an example of how you implemented ASRs this week. 3) Rate your current level of knowledge with implementing Spaced Practice in the classroom. 4) Provide an example of how you implemented Spaced Practice this week.	Prior to the first PL session, prior to the first coaching session, and prior to the last coaching session	Due to the small sample size, a nonparametric test will be used to analyze the data. The open-ended survey questions will be analyzed using descriptive coding. Quantitative and qualitative findings will be compared to develop an overall interpretation of the extent the program increased teacher knowledge with ASRs and SP.
4) To what extent did PL and coaching increase teachers' implementation of ASRs and Spaced Practice in the	Rate of ASRs and Spaced Practice	Teachers	**Observation Protocol** data sheet (Appendix V) **Weekly Documentation** data sheet (Appendix W)	Three-five times prior to the first PL session and during each biweekly coaching session	Due to the small sample size, a nonparametric test will be used to analyze the rates of ASRs and SP. Quantitative findings will be compared to qualitative

classroom? 5) To what extent did the program increase general teacher self-efficacy as well as efficacy with implementing Active Student Responses (ASRs) and Spaced Practice?	General teacher self-efficacy Teacher self-efficacy with ASRs and Spaced Practice	Teachers	**Teacher Sense of Efficacy Scale** (TSES; Appendix T) Sample Item: * How much can you gauge student comprehension of what you have taught? **Instructional Strategies Survey**: (Appendix U) Sample Items: 1) Rate your level of confidence with developing questions to determine student understanding. 2) Rate your level of confidence with giving quizzes at specific times to assist the students with remembering content.	During the two weeks prior to the first PL and during classroom instruction after the fourth PL session is complete Prior to the first PL session, prior to the first coaching session, and prior to the last coaching session	information regarding teachers' implementation of ASRs and SP strategies. Due to the small sample size, a nonparametric test will be used to analyze the data. The open-ended survey questions will be analyzed using descriptive coding. Quantitative and qualitative findings will be compared to develop an overall interpretation of the extent the program increased general teacher self-efficacy as well as efficacy with implementing ASRs and SP.

Appendix R

Attendance Sheet
Professional Development & Coaching Sessions-Instructional Opportunities

Date	Session Start/Stop Times	Sign-in Time	Participant's Identifier	Title of Session	Sign-out Time	Barriers to Attendance

Appendix S

Instructional Content Record

Date	Participant's Identifier	Instructional Content	Grade(s)

Appendix T

Teacher Self-Efficacy Scale: Survey Control Number:

What is your participant identifier?

Teacher Self-Efficacy

Please indicate your opinion about each of the questions below by considering the combination of your current ability, resources, and opportunity to do each of the following in your current position. Your responses will be kept confidential.

How much can you do to get through to the most difficult students?

- ○ None at all
- ○ Very Little

- ○ Some Degree
- ○ Quite A Bit
- ○ A Great Deal

How much can you do to help your students think critically?

- ○ None at all
- ○ Very Little
- ○ Some Degree
- ○ Quite A Bit
- ○ A Great Deal

How much can you do to control disruptive behavior in the classroom?

- ○ None at all
- ○ Very Little
- ○ Some Degree
- ○ Quite A Bit
- ○ A Great Deal

How much can you do to motivate students who show low interest in school work?

- ○ None at all
- ○ Very Little
- ○ Some Degree
- ○ Quite A Bit
- ○ A Great Deal

To what extent can you make your expectations clear about student behavior?

- ○ None at all
- ○ Very Little
- ○ Some Degree
- ○ Quite A Bit
- ○ A Great Deal

How much can you do to get students to believe they can do well in school work?

- ○ None at all
- ○ Very Little
- ○ Some Degree
- ○ Quite A Bit
- ○ A Great Deal

How well can you respond to difficult questions from your

students?

- ○ None at all
- ○ Very Little
- ○ Some Degree
- ○ Quite A Bit
- ○ A Great Deal

How much can you gauge student comprehension of what you have taught?

- ○ None at all
- ○ Very Little
- ○ Some Degree
- ○ Quite A Bit
- ○ A Great Deal

How well can you establish routines to keep activities running smoothly?

- ○ None at all
- ○ Very Little
- ○ Some Degree
- ○ Quite A Bit
- ○ A Great Deal

To what extent can you craft good questions for your students?

- ○ None at all
- ○ Very Little
- ○ Some Degree
- ○ Quite A Bit
- ○ A Great Deal

How much can you do to help your students value learning?

- ○ None at all
- ○ Very Little
- ○ Some Degree
- ○ Quite A Bit
- ○ A Great Deal

How much can you do to foster student creativity?

- ○ None at all
- ○ Very Little
- ○ Some Degree
- ○ Quite A Bit
- ○ A Great Deal

How much can you do to get children to follow classroom rules?

- ○ None at all
- ○ Very Little
- ○ Some Degree
- ○ Quite A Bit
- ○ A Great Deal

How much can you do to improve the understanding of a student who is failing?

- ○ None at all
- ○ Very Little
- ○ Some Degree
- ○ Quite A Bit
- ○ A Great Deal

How much can you do to calm a student who is disruptive or noisy?

- ○ None at all
- ○ Very Little
- ○ Some Degree
- ○ Quite A Bit
- ○ A Great Deal

How well can you establish a classroom management system with each group of students?

- ○ None at all
- ○ Very Little
- ○ Some Degree
- ○ Quite A Bit
- ○ A Great Deal

How much can you do to adjust your lessons to the proper level for individual students?

- ○ None at all
- ○ Very Little
- ○ Some Degree
- ○ Quite A Bit
- ○ A Great Deal

How much can you use a variety of assessment strategies?

- ○ None at all
- ○ Very Little
- ○ Some Degree
- ○ Quite A Bit
- ○ A Great Deal

How well can you keep a few problem students from ruining an entire lesson?

- None at all
- Very Little
- Some Degree
- Quite A Bit
- A Great Deal

To what extent can you provide an alternative explanation or example when students are confused?

- None at all
- Very Little
- Some Degree
- Quite A Bit
- A Great Deal

How well can you respond to defiant students?

- None at all
- Very Little
- Some Degree
- Quite A Bit
- A Great Deal

How much can you assist families in helping their children do well in school?

- None at all
- Very Little
- Some Degree
- Quite A Bit
- A Great Deal

How well can you implement alternative strategies in your classroom?

- None at all
- Very Little
- Some Degree
- Quite A Bit
- A Great Deal

How well can you provide appropriate challenges for very capable students?

- None at all
- Very Little
- Some Degree
- Quite A Bit
- A Great Deal

Appendix U

Instructional Strategies Survey: Survey Control Number:

What is your participant identifier?

Active Student Responses

Please select the choice that corresponds most closely with your level of knowledge and degree of confidence with using Active Student Responses strategies. Then, provide additional insights by answering the related questions. Your responses will be kept confidential.

Rate your current level of knowledge with implementing Active Student Responses in the classroom.

○ Not knowledgeable at all

- ○ Slightly knowledgeable
- ○ Moderately knowledgeable
- ○ Very knowledgeable
- ○ Extremely knowledgeable

Rate your current level of confidence with...

	Not at all confident	Slightly confident	Moderately confident	Very confident	Extremely confident
...developing questions to determine student understanding	○	○	○	○	○
...asking at least 3 questions per minute during instruction	○	○	○	○	○
...using materials (e.g., whiteboards, technology quizzes, response cards) to obtain ASRs from students	○	○	○	○	○

Explain what you know about the instructional strategy of Active Student Responding.

Provide an example of how you implemented Active Student Responding this week.

What additional support(s) would assist you with increasing your level of confidence with implementing Active Student Responding?

Spaced Practice

Please select the choice that corresponds most closely with your level of knowledge and degree of confidence with using Spaced Practice strategies. Then, provide additional insights by answering the related questions. Your responses will be kept confidential.

Rate your current level of knowledge with implementing Spaced Practice in the classroom.

- ○ Not knowledgeable at all
- ○ Slightly knowledgeable
- ○ Moderately knowledgeable
- ○ Very knowledgeable
- ○ Extremely knowledgeable

Rate your current level of confidence with...

	Not at all confident	Slightly confident	Moderately confident	Very confident	Extremely confident
...creating quizzes for students to review information	○	○	○	○	○
...giving quizzes at specific times to assist the students with remembering information	○	○	○	○	○
...using a variety of activities (e.g., quizzes, mid-chapter review, test review) for Spaced Practice	○	○	○	○	○

Explain what you know about the instructional strategy of Spaced Practice.

Provide an example of how you implemented Spaced Practice this week.

What additional support(s) would assist you with increasing your level of confidence with implementing Spaced Practice?

Questions/Concerns

Please list any additional questions or concerns. Your responses will be kept confidential.

What questions or concerns do you have related to the instructional strategies of Active Student Responding and/or Spaced Practice?

Appendix V

Observation Protocol

An **Active Student Response** is defined as any instance of the teacher posing a question/statement requiring a response (e.g., verbal, response cards (whiteboards, pre-printed cards), mediated interface (Kahoot, peardeck)) related to academic content from **more than one student**. Non-examples would include a teacher response request directed to only one student at a time (e.g., Karen, what is the first step of the scientific method) and non-content specific response requests (e.g., "Any questions?") during a 10 minute classroom observation. **ONLY** teacher behavior is recorded.

Observation Protocol:

1) Record the participant's identifier and week of recording.
2) Set the timer for 10 minutes and record the start time.
3) Place one tally mark in the Freq of ASRs section for each instance the teacher poses a question/statement requiring more than one student response during the 10 minute interval. Also, record which ASR modality was used by the participant.
4) Once 10 minutes has elapsed, record the stop time.
5) Calculate and record the rate of ASRs. (Freq of ASRs/10 min= Rate of ASRs)

Participant's Identifier: _____

Week of Recording	Start Time	Stop Time	Class/Topic	Freq of ASRs	Rate of ASRs	Response Cards	Kahoot	Peardeck	Other

Appendix W

Weekly Documentation

	Video	ASR Data	SP-Quiz	SP-Review	Instr Strat	Coaching	Prof Learn	TSES	PL #1	PL #2	PL #3	PL #4
Week 1												
Week 2												
Week 3												
Week 4												
Week 5												
Week 6												
Week 7												
Week 8												
Week 9												
Week 10												
Week 11												
Week 12												
Week 13												
Week 14												
Week 15												
Week 19												

Appendix X

Evaluation of Education Programs and Policies
Recruitment and Retention Template

Recruitment and Participants:
Answer the following questions. Be succinct and clear in your responses. If a question does not apply to your intervention/evaluation please state.

1.0 Who will recruit participants for this study?
Check all that apply.

- ☐ **PI**
- X **Study Team Member(s)**
- ☐ **No recruitment (Data analysis of existing data ONLY)**
- ☐ **Other**

2.0 Will you be specifically recruiting ANY of the following populations?
Check all that apply.

- ☐ **Children (individuals under 18 years of age)**
- ☐ **JHU Students (all at least 18 years old. If you are unsure if all students will be 18, please select 'Children' as well)**
- ☐ **Johns Hopkins Employees**
- ☐ **Non-English Speakers**
- ☐ **Emancipated Minors**
- ☐ **Wards of the State**
- ☐ **Cognitively Impaired/Impaired Decision Making Capacity**
- ☐ **Pregnant Women**
- ☐ **Critically Ill or Injured Patients**
- ☐ **Prisoners**
- ☐ **Homeless or Economically Disadvantaged**
- X **None**

3.0 Choose one of the following that applies to your research as it relates to children if you selected Children above in #2.0.

- ☐ **The research presents no greater than minimal risk.**
- ☐ **The research presents greater than minimal risk but presents the prospect of direct benefit to the individual participants.**
- ☐ **The research presents greater than minimal risk and no prospect of direct benefit to the individual participants, but likely to yield generalizable knowledge about the participant's disorder or condition.**

4.0 Sex of participants

X Male

X Female

5.0 Describe your participant population and how you will recruit them for the study. The participant population will include teachers from a middle high school (grades 6-12). Participants will be recruited using a flyer distributed via private (within school Listserv) e-mail. Potential participants will signify whether or not they prefer to participate by responding directly to the e-mail or using the voting buttons by responding either "Yes, I would like to be considered for participation." or "No, I do not want to be considered for participation." Flyers will also be handed out in faculty meetings, posted on bulletin boards around the school, put in faculty mailboxes, and posted in the staff lounge.

6.0 Provide the maximum number of participants to be enrolled. Twelve

6.1 Provide justification for recruiting the above number of participants. Twelve participants will enable intervention, implementation, and data collection across an even representative group of teachers per academic content area. For example, twelve participants will enable a representations of a minimum of three teachers per content area (e.g. three teachers for English Language Arts, three teachers for math, three teachers for social studies, three teachers for science).

7.0 Describe measures that will be implemented to avoid participant coercion or undue influence. No incentives will be provided for participation.

8.0 List the criteria participants must meet to be included in the study. Please describe how you will verify that participants meet this criteria and how this will be documented in your study files. Since the participation is voluntary, individuals must be employed as a teacher at the middle high school level in a core content area. This information will be verified by a comparison with the master schedule and will be documented on the Instructional Content Record.

9.0 List the criteria for excluding individuals from the study. Participants will be excluded if they are K-5 or a middle high school teacher of other content areas besides ELA, science, social studies, and math (e.g., health, art, computer programming, etc.).

10.0 If the participant is responsible for any research-related costs, identify and estimate the dollar amount. N/A

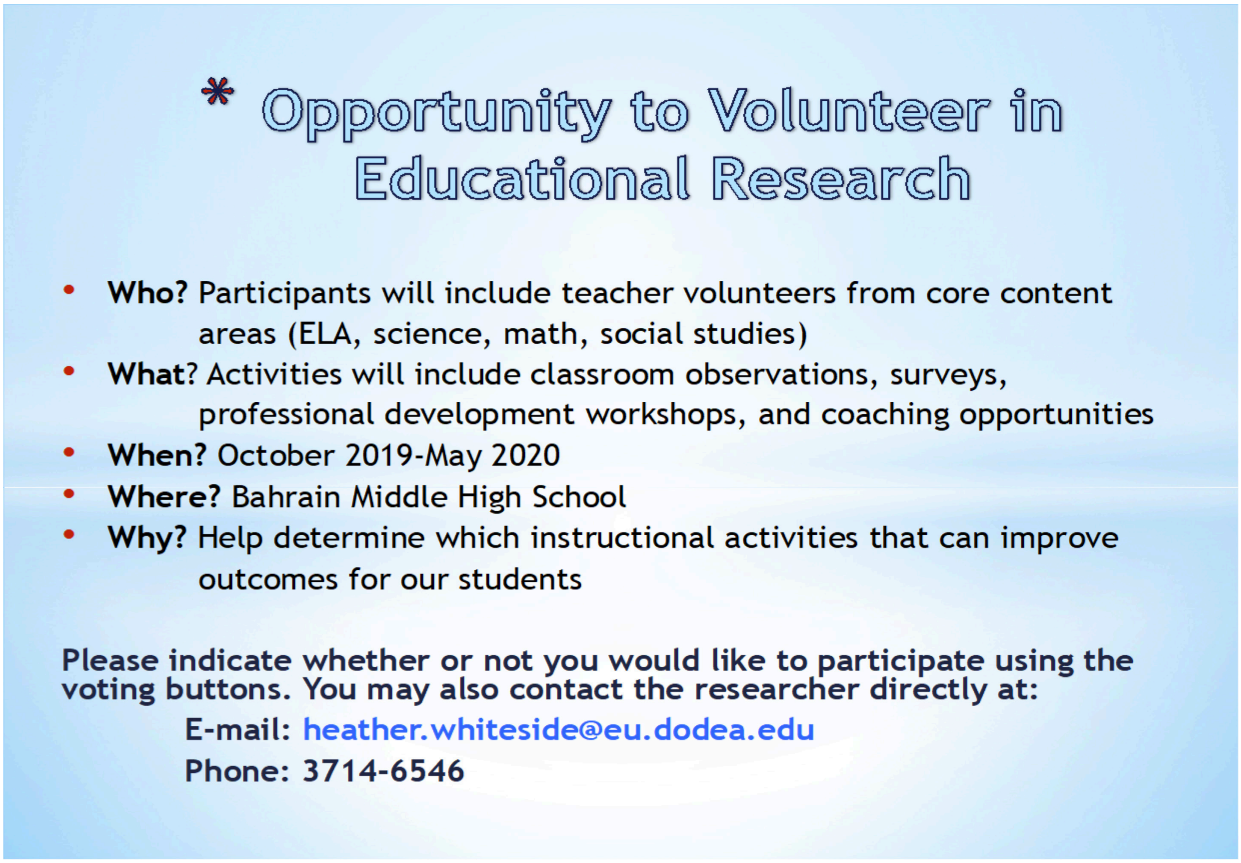
11.0 Will participants receive payment (money, gift certificates, coupons, etc.) or be offered incentives (entered into a drawing, class credit) for their participation in this research? No

12.0 Describe payment and/or incentives to participants. None

13.0 Are you using recruitment materials/scripts? Yes, a flyer will be e-mailed to prospective participants titled, "Opportunity to Volunteer in Educational Research.

Appendix Y

Flyer to Volunteer for Educational Research



Appendix Z

Informed Consent Form

Johns Hopkins University
Homewood Institutional Review Board (HIRB)

Informed Consent Form

Title:	Implementing Evidence-Based Practices in the Classroom
Principal Investigator:	Tamara Marder, Ph.D., BCBA-D, Associate Professor, JHU
Date:	March 22, 2019

PURPOSE OF RESEARCH STUDY:

The purpose of this research study is to determine how teachers use Evidence-Based Practices (EBPs) in the classroom to differentiate instruction and to examine the effects on student achievement. We anticipate that approximately twelve people will participate in this study.

PROCEDURES:

Participants will be asked to complete brief surveys related to instructional strategies. Additionally, participants will be presented with four Professional Development (PD) workshops, 45 minutes each, that focus on instructional practices in the classroom. Observations of teaching practices will be conducted prior to and after the PD workshops. Coaching sessions, 20 minutes each, will be provided every two weeks to discuss observations related to the implementation of instructional practices. The entire study will last no longer than 20 weeks.

RISKS/DISCOMFORTS:

The risks associated with participation in this study are no greater than those encountered in daily life.

BENEFITS:

This study may benefit society if the results lead to a better understanding of the implementation of instructional practices, which may lead to an increased alignment between information taught and knowledge learned. Implementation of coaching and mentoring with classroom teachers may provide an increased understanding of the necessity for differentiation within the classroom resulting in increased student achievement.

VOLUNTARY PARTICIPATION AND RIGHT TO WITHDRAW:

Your participation in this study is entirely voluntary: You choose whether to participate. If you decide not to participate, there are no penalties, and you will not lose any benefits to which you would otherwise be entitled.

If you choose to participate in the study, you can stop your participation at any time, without any penalty or loss of benefits. If you want to withdraw from the study, please contact the researcher directly or in writing. Observations will not be included or shared outside of this project or have any impact on teacher evaluations.

CONFIDENTIALITY:

Any study records that identify you will be kept confidential to the extent possible by law. The records from your participation may be reviewed by people responsible for making sure that research is done properly, including members of the Johns Hopkins University Homewood Institutional Review Board and officials from government agencies such as the National Institutes of Health and the Office for Human Research Protections. (All of these people are required to keep your identity confidential.) Otherwise, records that identify you will be available only to people working on the study, unless you give permission for other people to see the records.

Study records will be created, stored, and maintained to protect confidential information through the use of code numbers rather than participants' names on data sheets and other information. Records will be kept in a locked file cabinet and stored on a password protected computer. There will be no identification on stored data related to the identity of the participants.

IF YOU HAVE QUESTIONS OR CONCERNS:

You can ask questions about this research study now or at any time during the study, by talking to the researcher(s) working with you or by calling Heather Whiteside, student researcher, at 3714-6546. If you have questions about your rights as a research participant or feel that you have not been treated fairly, please call the Homewood Institutional Review Board at Johns Hopkins University at (410) 516-6580.

SIGNATURES

WHAT YOUR SIGNATURE MEANS:
Your signature below means that you understand the information in this consent form. Your signature also means that you agree to participate in the study. By signing this consent form, you have not waived any legal rights you otherwise would have as a participant in a research study.

Participant's Signature	**Date**
Signature of Person Obtaining Consent (Investigator or HIRB Approved Designee)	**Date**

Appendix AA

Objectives and Descriptions for PD and Coaching Sessions: ASRs and SP

Session1	Session 2	Session 3	Session 4	Coaching
Objectives: Participants learned: 1) needs assessment results 2) conceptual framework 3) rationale for ASRs and SP	**Objectives:** Participants learned to: 1) differentiate between the types of ASRs and SP 2) how to create a lesson integrating ASRs and SP 3) how to incorporate ASRs and SP into lesson delivery	**Objective:** Participants learned to: 1) create a sample lesson integrating ASRs and SP within their content areas	**Objective:** Participants learned to: 1) integrate ASRs and SP while teaching a lesson within their content areas	**Objective:** Participants refined their ability based on feedback from observations: 1) to create and deliver lessons which integrated ASRs and SP to their students
Description: Needs assessment results assisted participants with understanding the problem while the conceptual framework helped them understand the importance of matching learner needs to lesson objectives. The rational for ASRs and SP allowed the participants to realize that these instructional strategies may help them match student needs with lesson objectives.	**Description:** The presentation of different types of ASRs and SP strategies assisted the participants with understanding techniques to include during lesson planning. Specifics regarding how to incorporate ASRs and SP provided participants with the information needed to begin utilizing these instructional practices.	**Description:** After a review of the different types of ASRs and SP strategies, the participants were provided with 15-30 minutes to create a lesson within their content integrating the instructional strategies. The researcher was available to provide suggestions and answer questions.	**Description:** Each participant presented a sample lesson from their content while incorporating ASRs and SP strategies. Both researcher and peer feedback were provided to participants.	**Description:** The researcher observed the participant while collecting data on ASRs in the classroom. The self-assessment of SP was reviewed. The researcher provided recommendations.

Appendix BB

Timetable for Intervention and Data Collection

Time Frame	Cohort	Phase/ Activity	Data Collection
Wk 1	1	Baseline	Rate of ASRs, Rate of Spaced Practice (SP), Teacher Self-Efficacy Survey (TSES)
	2	Baseline	Rate of ASRs, Rate of SP, TSES
	3	Baseline	Rate of ASRs, Rate of SP, TSES
Wk 2	1	Baseline	Rate of ASRs, Rate of SP, TSES
	2	Baseline	Rate of ASRs, Rate of SP, TSES
	3	Baseline	Rate of ASRs, Rate of SP, TSES
Wk 3	1	Session 1	Rate of ASRs. Rate of SP, Attendance, Professional Learning (PL) Exit Ticket, Intervention Checklist
	2	Baseline	Rate of ASRs, Rate of SP, TSES
	3	Baseline	Rate of ASRs, Rate of SP, TSES
Wk 4	1	Session 2	Rate of ASRs, Rate of SP, Attendance, PL Exit Ticket, Intervention Checklist
	2	Session 1	Rate of ASRs, Rate of SP, Attendance, PL Exit Ticket, Intervention Checklist
	3	Baseline	Rate of ASRs, Rate of SP, TSES
Wk 5	1	Session 3	Rate of ASRs, Rate of SP, Attendance, PL Exit Ticket, Intervention Checklist
	2	Session 2	Rate of ASRs, Rate of SP, Attendance, PL Exit Ticket, Intervention Checklist
	3	Session 1	Rate of ASRs, Rate of SP, Attendance, PL Exit Ticket, Intervention Checklist
Wk 6	1	Session 4	Rate of ASRs. Rate of SP, Attendance, PL Exit Ticket, Intervention Checklist
	2	Session 3	Rate of ASRs. Rate of SP, Attendance, PL Exit Ticket, Intervention Checklist
	3	Session 2	Rate of ASRs. Rate of SP, Attendance, PL Exit Ticket, Intervention Checklist
Wk 7	1	No Session	Rate of ASRs, Rate of SP, TSES, Instructional Strategies Survey (ISS)
	2	Session 4	Rate of ASRs. Rate of SP, Attendance, PL Exit Ticket, Intervention Checklist
	3	Session 3	Rate of ASRs. Rate of SP, Attendance, PL Exit Ticket, Intervention Checklist

Wk 8	1	Coaching 1	Rate of ASRs, Rate of SP, Attendance, Intervention Checklist, Coaching Session and Exit Ticket
	2	No Session	Rate of ASRs, Rate of SP, TSES, ISS
	3	Session 4	Rate of ASRs. Rate of SP, Attendance, PL Exit Ticket, Intervention Checklist
Wk 9	1	Coaching	Rate of ASRs, Rate of SP
	2	Coaching 1	Rate of ASRs, Rate of SP, Attendance, Intervention Checklist, Coaching Session and Exit Ticket
	3	No Session	Rate of ASRs, Rate of SP, TSES, ISS
Wk 10	1	Coaching 2	Rate of ASRs, Rate of SP, Attendance, Intervention Checklist, Coaching Session and Exit Ticket
	2	Coaching	Rate of ASRs, Rate of SP
	3	Coaching 1	Rate of ASRs, Rate of SP, Attendance, Intervention Checklist, Coaching Session and Exit Ticket
Wk 11	1	Coaching	Rate of ASRs, Rate of SP
	2	Coaching 2	Rate of ASRs, Rate of SP, Attendance, Intervention Checklist, Coaching Session and Exit Ticket
	3	Coaching	Rate of ASRs, Rate of SP
Wk 12	1	Coaching 3	Rate of ASRs, Rate of SP, Attendance, Intervention Checklist, Coaching Session and Exit Ticket
	2	Coaching	Rate of ASRs, Rate of SP
	3	Coaching 2	Rate of ASRs, Rate of SP, Attendance, Intervention Checklist, Coaching Session and Exit Ticket
Wk 13	1	Coaching	Rate of ASRs, Rate of SP
	2	Coaching 3	Rate of ASRs, Rate of SP, Attendance, Intervention Checklist, Coaching Session and Exit Ticket
	3	Coaching	Rate of ASRs, Rate of SP
Wk 14	1	Coaching	Rate of ASRs, Rate of SP, TSES
	2	Coaching	Rate of ASRs, Rate of SP, TSES
	3	Coaching 3	Rate of ASRs, Rate of SP, Attendance, Intervention Checklist, Coaching Session and Exit Ticket, TSES
Wk 15	1	Coaching	Rate of ASRs, Rate of SP, ISS
	2	Coaching	Rate of ASRs, Rate of SP, ISS
	3	Coaching	Rate of ASRs, Rate of SP, ISS
Follow-up	1	Follow-up	Rate of ASRs, Rate of SP
	2	Follow-up	Rate of ASRs, Rate of SP
	3	Follow-up	Rate of ASRs, Rate of SP

Curriculum Vitae

Heather Lee Whiteside
PSC 851 BOX 69064 • FPO AE 09834
+973 3714-6546 (c) • +973 1772-7828 (w) • heatherleewhiteside@gmail.com

PROFILE

An enthusiastic, caring individual dedicated to educate, engage, and empower students. Adept at supporting and collaborating with parents/professionals to provide a continuity of programming within the community. Excellent verbal and written skills. Experienced with interventions to promote student success. Proficient with assessment and accountability within schools and districts.

EDUCATION

Johns Hopkins University, Baltimore, Maryland
Specialty: Mind, Brain, and Teaching
Doctorate, May 2021

Framingham State University, Framingham, Massachusetts
Masters of Educational Leadership, 21 Credits Completed, Expected Graduation, August 2021

Florida Institute of Technology, Melbourne, Florida
Board Certified Behavior Analyst Certification, October 2013

Stephen F. Austin State University, Nacogdoches, Texas
Major: Educational Leadership
Principal Certification, September 2010

Johns Hopkins University, Baltimore, Maryland
Major: Special Education, Concentration: Severe Disabilities
Masters of Science, January 2002

McDaniel College, Westminster, Maryland
Major: Psychology, Minor: Sociology
Bachelor of Arts, May 1997

EXPERIENCE

Teacher of Students with Mild-Moderate Disabilities at Middle High School; Special Education Assessor, August 2018-Present.

Taught a middle/high school inclusive program for students with mild/moderate disabilities. Provided leadership in designing/implementing guidance to school staff and administration on curriculum, teaching strategies, online learning, motivation, data-collection, and accommodations to ensure appropriate educational opportunities. Developed standards-based lessons on the College Career Ready Standards for Literacy and Mathematics. Ensured activities were incorporated into motivating lessons and commended students on increasing proficiency with academic skills. Assessed students and partnered with parents/colleagues to determine learning supports and resolve special education program issues with effective oral/written communication. Collaborated with supply, administration, and district level personnel to procure budgetary resources for academic instruction. Conducted intensive reading and math programs while incorporating rewards-based programming. Advised and trained administration to implement and evaluate comprehensive assessments. Collaborated with district personnel and advised administration and school leaders on revisions to the School Assessment Plan. Trained teachers on evidence-based practices through professional learning and coaching that led to increased student performance. Modeled best instructional practices for the Special Education

program to staff within the community. Developed a data management tool, created presentations, and trained staff and administration to interpret and use assessment results to improve student outcomes. Advised administration on policy, interpretation of data, and necessary revisions to district and school assessment plans. Analyzed special education data to assess special education program needs. Chaired committees, served as special education chairperson, selected for teacher leader position, and advocated for increased availability of technology in the school and in the organization by appointment to technology workforce group.

***Teacher of Students with Moderate-Severe Disabilities at Elementary Middle School*,** April 2016 to August 2018

Taught students with moderate to severe disabilities in an elementary/middle school. Conducted intensive reading programs while incorporating rewards-based programming. Trained staff on curriculum, teaching strategies, data-collection, and accommodations to ensure appropriate educational opportunities for students. Developed standards-based lessons on the College Career Ready Standards for Literacy and Mathematics while integrating Individualized Education Program goals/objectives for reading, writing, math, social skills, and communication. Ensured activities were incorporated into motivating lessons and commended students on their increasing proficiency with academic skills.

***Teacher of Students with Moderate-Severe Disabilities at Middle High School*,** August 2014 to April 2016

Taught students with moderate to severe disabilities in a middle high school. Conducted in-depth Functional Behavior Assessments and developed corresponding Behavior Intervention Plans and safety plans. Trained staff on appropriate techniques and strategies to utilize with the students. Utilized technology for teaching, learning, and data-keeping. Developed high-quality lessons while integrating the Unique Curriculum and utilized applied behavior analysis strategies embedded in the Rethink Curriculum. Integrated a community-based curriculum to provide appropriate instruction for students with moderate-severe disabilities and enable them to be college and career ready. Increased learning opportunities for students by increasing their ability to read, write, calculate, socialize, and communicate. Served as the Data Chairperson for Continuous School Improvement and integrated a school-wide system of data collection.

Teacher of Students with Emotional Impairments at Elementary School, September 2013 to July 2014

Taught students with emotional impairments in an elementary school. Provided training for staff and modeled appropriate behavioral interventions to ensure a downward trend in inappropriate behaviors across all students. Utilized graphs to visually analyze data and utilized results to plan appropriate lessons based conjointly on standards and IEP objectives. Differentiated reading instruction to increase reading scores across all students within a 4-month period. Observed students/educators and provided individualized, classroom-based coaching to increase the effectiveness of instructional programming. Engaged colleagues in problem-solving dialogues to enhance academic and behavioral programming within a 21st century framework. Integrated blended learning and inquiry-based instruction across grade levels and subject areas.

Teacher of Students with Mild-Moderate Disabilities at Middle High School, August 2010 to August 2013.

Taught students with mild-moderate disabilities in a middle/high school. Offered inclusion/ resource services to students while modeling best practices, which resulted in over 70% of students to earn honor roll awards. Served as special education chairperson and collaboratively conducted over 250 special education meetings while ensuring timelines were met. Conducted community training and provided instruction to educators regarding Non-Violent Crisis Intervention to ensure de-escalation techniques were employed. Increased the Independent Reading Level of 30 special education students

by 1.2 Grade Levels during a 7-month period through analysis of Scholastic Reader Inventory data. Served in leadership role to evaluate smart goals and developed educational interventions. Collaborated with teachers to integrate best practices through modifying the adopted curriculum/materials. Differentiated instruction for students utilizing blended learning, cooperative grouping, and project-based learning.

Autism Instructional Support Specialist, August 2008 to August 2010.

Observed students with disabilities and evaluated special education programming within the school district. Recommended educational strategies and provided support to administrators and district-level personnel regarding special education placements. Developed standards and operating guidelines for special education preschool and autism classrooms to ensure student-centered programming. Completed district-wide purchase of curriculum/materials. Contracted with trainers to complete in-service training in Applied Behavior Analysis, Handwriting Without Tears, Play-Skills, and Brigance Assessment, which benefitted over 1,000 students. Provided learning opportunities for parents, including the creation of an Autism Library and the coordination of Home Based Training. Appointed manager of a technology grant in which students mastered over 300 skills in a district of over 50 elementary, middle, and high schools. Completed daily visits to campus' to ensure the implementation of best practices by modeling strategies and monitoring program implementation.

District Assessor, August 2006 to August 2008.

Completed educational testing for students with Dyslexia and gifted abilities and audited confidential folders for English Language Learners. Collaborated with administration concerning test results and audit information to improve teaching and learning. Developed and presented staff trainings on K-2 reading assessments to target curriculum needs. Provided lesson demonstration regarding best practices for teaching students with reading disabilities.

Behavior Management Specialist, September 2003 to June 2005.

Taught social skills through the use of instructional technologies to students with emotional/behavioral impairments in grades pre-k through 12. Collaborated and participated in Admission Review Dismissal meetings. Conducted functional behavior analyses and devised behavior improvement plans (BIP's). Modeled the implementation and data collection procedures of BIP's for staff/parents. Identified and provided BIP training based on the needs of the employees.

Teacher of Students with Autism in Elementary Schools, August 1999 to October 2002.

Taught in self-contained classrooms for students with autism in grades pre-K through 5. Implemented academic/social skills lessons aligned with the regular education curriculum. Utilized task analysis, social stories, and behavior management techniques. Conducted educational assessments to determine appropriate programming. Effectively managed professionals within the classroom to provide cohesive educational programming for students. Modeled analysis of student data to colleagues to increase student achievement. Served on School Improvement Team to improve educational programming.

CERTIFICATION

Texas Standard Certificate, Valid through July 2028.

Classroom Teacher, Special Education, Grades EC-12.
Principal, Grades EC-12

Board Certified Behavior Analyst, Valid until October 2022.

Qualified to develop educational programming by systematically applying interventions based on the principles of learning theory.

JOB RELATED SKILLS

Utilizing educational software such as Microsoft office, Smart notebook, Adobe, Google
Incorporates multiple technologies into lesson planning (i.e., Smart notebook, PowerPoint, video clips, Google classroom, Pear Deck, Kahoot, nearpod, response cards, whiteboards, etc.)
Differentiating and modifying for all students while ensuring data-driven decision making
Devising behavior plans, collecting data, and modifying as appropriate
Collaborating with students, parents, and colleagues to increase instructional opportunities
Providing training to staff/parents on behavior management and computer-based instruction
Training personnel district-wide on Crisis Intervention, Reading Assessment, behavior management, differentiating instruction for students with special needs, teaching strategies
Assigning work while ensuring appropriate resources
Creating multi-disciplinary teams to ensure balanced educational programming for students
Chairing Case Study Committee team while fostering a collaborative team culture
Leading a team of professionals by ensuring the strengths of each team member are utilized
Incorporating Applied Behavior Analysis/Instructional Technologies into learning opportunities
Creatively procuring resources
Building capacity of educators through targeted instruction and positive school climate

JOB RELATED HONORS, AWARDS, AND SPECIAL ACCOMPLISHMENTS

School Improvement Team, 2001-2002, 2003-2005, 2014-16, 2020.
Supervisor's Cash Awards, 2004, 2005, 2012, 2015, 2016, 2017, 2018, 2019.
Secured grant for early childhood students to learn with technology, 2008.
Directed programming for 9 different classrooms of students with autism, 2008-2010.
Orchestrated district-wide curriculum purchases, 2009.
Secured and managed technology grant program enabling student mastery of over 300 skills, 2009.
Trained Educators in Non-Violent Physical Crisis Intervention, 2009-2013.
Rated as 'Clearly Outstanding' in all job-related competencies, 2007-2010.
Case Study Committee Chairperson, 2010-2013, 2019-2020.
Certified as Board Certified Behavior Analyst, 2013-Present.
Rate as 'Expert' in all areas of the Defense Competency Assessment Tool by supervisor, 2016.
Selected as Continuous School Improvement Data Chair, 2014-2016, 2020-21.
Elected Labor Union President, Bahrain Schools, 2018-21.
Defense Competency Assessment System Accommodations Coordinator, 2019-21,
Rated as 'Outstanding' with Curriculum, Instruction, and Management for Effective Learning, 2019.
Rated as 'Outstanding' with Mastering Content and Curriculum, Presenting Organized Instruction, Managing for Effective Learning, Case Management of Assessment Process, Assessments and Reports, 2020.
Selected to represent Bahrain School in technology workforce group for organization, 2020.
Team Leader for Special Education, 2018-21.
Developed Student Information Database and trained staff to make data-based decisions, 2020.
Developed Professional Learning targeting increasing Evidence-Based Practices in the classroom; provided training and instructional coaching to staff members, 2020-21.
Awarded Grant of over $3,000 to train teachers to implement Evidence-Based Practices, 2021-22.

Additional references available upon request.