The complex realities of educational stakeholder collaboration in Mathematics education at an international K12 American institution: A qualitative case study

by

Rebecca Altidor

B.S., Delaware State University, 2019
M.Ed., Delaware State University, 2021
M.A., Delaware State University, 2021

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

DOCTOR OF PHILOSOPHY

Department of Curriculum and Instruction
College of Education

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Abstract

Math education continues to face challenges with curriculum alignment, equality of instruction, and equitable student support. This study is grounded in constructionism (Crotty, 1998) which views knowledge as socially fabricated and influenced by hierarchical power dynamics, and Apple (2019) and Ayers (2009) contend that institutions reinforce ideologies, control what knowledge is, and who is allowed access to it. This study examines the impact that collaboration between educational stakeholders has on enacting math curriculum to meet students learning needs at an international K12 American institution. I conducted a qualitative case study utilizing a survey and semi-structured interviews with math teachers, instructional coaches, curriculum coaches, principals, and directors. Findings highlight how instrumental institutional support is in shaping instructional practices, challenges faced in implementing instructional strategies, and how inconsistencies in administrative support impact curriculum implementation. Conclusions underscore the need for stronger institutional coherence through math curriculum alignment and collaborative teaching opportunities in the classroom. Future research should examine how senior leadership stakeholders at international K12 American institutions without a background in math develop instructional polices to evaluate curriculum effectiveness.

Keywords: math curriculum, educational stakeholders, international K12 American institution, instructional practices, student learning, collaboration

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Dedication

This dissertation is dedicated to my Home Team. Thank you for always being there for me. Mom and dad, thank you for never telling me that any dream of mine was too big. I have completed this journey with the loudest cheering section behind me.

This dissertation is dedicated to every woman who has poured words of encouragement over me on this journey. Thank you for taking the time to remind me of the power that education provides.

This dissertation is dedicated to my ancestors who fought for freedoms they would never see. Your marches, protests, and sacrifices paved the way for the education I and countless others have received.

While thank you hardly captures the depth of my gratitude, I am sincerely appreciative for all of the support and encouragement that has been sent my way. It truly means more than I can ever express.

Chapter 1 - Introduction

Research Context and Background

At the core of educational improvement lies the recognition that current efforts to address and fulfill students' learning needs are insufficient. Math curriculum often neglect to integrate researched instructional design and delivery principles that cater to the learning requirements of students with exceptionalities in mathematics or those at risk of developing such difficulties (Doabler et al., 2018; Rivera & Bryant, 1992; Siregar et al., 2020). Students and teachers heavily rely on formal curriculum as a guiding framework for identifying yearly topics and standards to be taught. As an already contentious process within the academic institution, explicit conversations are integral to delineate the intricate responsibilities associated with curriculum design and decision making to identify what best supports teachers in their implementation and evaluation of mathematics curriculum (Apple, 2019).

Tachie (2022) found that to address the shortage of global teaching skills in early childhood mathematics, it was essential for mathematics teachers to collaborate. The need for collaboration and communication extends beyond the confines of early mathematics, transcending grade levels (Allexsaht-Snider & Hart, 2001; Harper & Crespo, 2020; Horn, 2012; Sheldon et al., 2010). Proficiency in meeting curriculum and grade-level mathematics standards is contingent upon consistent collaboration and communication among educators (Idol & West, 1991; Strahan, 2003; Wheelan & Kesselring, 2005). This consistency ensures alignment in teaching strategies and fosters an environment where teachers possess comprehensive insights into what is being taught and how it is being presented to all students in the classroom. The collaborative efforts among teachers pave the way for the uniform application of effective

instructional strategies and assuring that there is curricular alignment across school grade levels and divisions.

Researchers observed impacts on student achievement regarding teachers' content knowledge and their implementation of modifications to support students' learning needs (Polly et al., 2015). The importance of comprehending the curriculum, ensuring its comprehensive implementation, and receiving support from institutional stakeholders must be considered to support students and teachers across grade levels, consistently meeting students' academic learning needs within mathematics classrooms. Moreover, a nuanced understanding of the curriculum and effective implementation strategies contribute significantly to teachers feeling supported enough to meet the diverse learning requirements of students across various grade levels. Furthermore, support from institutional stakeholders fortifies the educational framework, emphasizing the collaborative efforts needed to support students throughout their academic journey in mathematics classrooms (Heaton et al., 2009; Peter-Koop, 2003; Saka, 2021; Tachie, 2022).

However, if teachers are expected to engage in collaborative endeavors, it is equally essential for institutional stakeholders to participate in analogous and prominent curricular conversations that seek to support teachers and students. This sets the stage for a comprehensive examination of the roles played by institutional stakeholders who, entrusted with decision-making, shape the curriculum, provide essential resources for its implementation, and facilitate adjustments to reach students' learning needs effectively. Further, these discussions should encompass a holistic understanding of students' needs, the provision of necessary teacher support, and the seamless implementation of the curriculum, thereby reinforcing a cohesive and supportive educational framework inclusive of diverse educational stakeholders. Peter-Koop

(2003) ascertained that the collaborative efforts of K12 educational stakeholders are integral components of professional development, aiming to attain grade-level proficiency in mathematics as a shared objective. The alignment of teachers' understanding, instructional practices, and institutional support creates a cohesive educational environment that fosters sustained academic growth in mathematics for students with exceptionalities and underserved students throughout their academic journey.

K12 academic institutions offer math classes for students of all grade levels, and teachers create lessons aligned to math curriculum to support students in attaining and/maintaining mathematical proficiency. Consequently, it is worth considering, however, are teachers meeting the needs of the students in their classroom? How are these needs being decided, and what "meeting" those needs or earning proficiency looks like? How does the institution evaluate the process to determine if students are becoming proficient in mathematics? How are teachers supported to ensure they can support their students: general education students, students with exceptionalities, and underserved students? What institutional processes are in place to meet teachers' needs? How is the institution revisiting those processes to ensure that teachers have all the necessary resources? These questions highlight the complexity of addressing diverse student needs in mathematics education and underscore the critical role of institutional practices and teacher support in achieving student proficiency. This study seeks to examine the challenges and gaps in these areas across an international K12 American institution.

Statement of the Problem

At the beginning of each academic year, teachers take time getting to know their students personally and academically. It does not take long for mathematics teachers to identify which students are not ready to learn the concepts and skills required for that math course (Jilk, 2016;

Kilday et al., 2011). At that time, those math teachers must make decisions around not only how to support students not "meeting" prescriptive benchmarks, but also what those "benchmarks" look like within and beyond their classrooms – whether teachers enact or adjust their curriculum to fit their students or vice versa (Sullivan & Gunningham, 2011). What does the support look like? Is the support what that teacher needs to meet the needs of the student(s) in their classroom? What happens when the support provided is not meeting the teachers needs and therefore not meeting the student(s) learning needs? These questions illuminate the relationship between teacher support, curriculum adaptation, and student learning outcomes, emphasizing the need to evaluate how well institutional practices align with the realities of classroom instruction and meeting the diverse needs of students.

Math teachers understand that for students to be successful in future math classes, students need to have solid understandings of the current curriculum that is being taught along with a strong mathematics foundation. When students do not have a strong foundation, they have difficulties understanding the content and oftentimes turn to guessing to merely "get through" math (Phonapichat et al., 2014). While there is research that have found different learning interventions to be effective in decreasing student underachievement (Gersten & Carnine, 1984; Wadlington & Wadlington, 2008; You et al., 2021); the need for further research on this topic remains prevalent; especially related to supporting mathematics teachers' collaborative pedagogical strategies in international K12 American institutions (Stoeger & Ziegler, 2005). It is important to contribute to ongoing research conversations focusing on supporting students' mathematical skills and concepts (Marita & Hord, 2016), teachers' sense-making and enactment of curricula, and how institutions shape stakeholder collaboration to maintain academic support. Maccini and colleagues (2007) found that consistent mathematics interventions significantly

benefit secondary students with learning disabilities. Even though students with exceptionalities and underserved students have always been a part of the learning environment, there is currently not much research on how educators are enacting classroom instruction in a way that meets the students where they are while also supporting their academic growth in attaining grade level proficiency in math classes (Van Es & Conroy, 2009).

Purpose Statement

This dissertation research is a qualitative case study employing a phenomenological analysis technique that examined how an international K12 American institution supports its teachers with the implementation of the mathematics curriculum through institutional collaboration with educational stakeholders to meet the mathematical learning needs of students. First, through exploring the intricate intersections among various educational stakeholders such as: directors, principals, teachers, and coaches at an international K12 American curriculum institution, this dissertation outlines a comprehensive understanding of how the institutions' key players collaborate to identify and address student learning needs effectively. Understanding how teachers across elementary, middle, and high school adjust their teaching practices across distinct understandings of curriculum is a key part of this research, focusing on exploring the instructional strategies employed to meet the diverse learning requirements of underserved students and students with exceptionalities. Secondly, the study illuminates the collaborative efforts focused on providing robust curricular support for teachers and ensuring the successful implementation of mathematics curriculum. Anticipating mathematics teachers needs is a key aspect of this research, and the study examines the strategies employed in how K12 coaches, principals, and directors support teachers to meet the diverse learning requirements of all the students in their classrooms.

Research Questions

This research study focuses on the following questions:

1. How does an international K12 American institution support mathematics teachers in addressing the learning needs of underserved students and students with exceptionalities?
    a. How do mathematics teachers across grade levels perceive the institutional support in addressing the learning needs of underserved students and students with exceptionalities?
2. What complexities shape the experiences of educational stakeholders' and their collaboration at an international K12 American institution?
    a. What are the roles and responsibilities of institutional educational stakeholders involved in the curriculum selection process?

I am not confining myself to only answer these questions in the order they are laid out, so while I am using the widely accepted terminology of research questions, a more accurate description would be research guideposts that inform my line of inquiry. They were designed to ensure that my research focus remains focused in addition to allowing me the freedom to explore emergent themes. These research guideposts suggest several intersecting factors related to mathematics curriculum and instruction. Firstly, the questions will examine instructional methodologies and how they are implemented to address the diverse learning needs of students. Secondly, the questions emphasize addressing what supports math teachers are receiving to address the learning needs of the students in their classrooms; and how stakeholder collaboration shapes and is shaped by the process of addressing students' math needs. The questions will guide the research towards practical insights into instructional practices that are currently provided to

mathematics teachers to positively impact the mathematics learning experiences of diverse student populations in an international K12 American institution setting.

Rationale and Significance of the Study

It is important to understand what the objective of international K12 American institutions are first. Then, apply that objective to math need to create a more inclusive educational environment for all students to be able to access and excel in the mathematics curriculum (Jorgensen & Niesche, 2008; Karp & Voltz, 2000; Marishane et al., 2015; Rimpola, 2014). A robust connection between instructional methods and improved proficiency in math must be established, in addition to stakeholder support for increased attention in the goal to support mathematics teachers in their pursuits to address the learning needs of their students (Blazar, 2015). The objective of inclusive education is to create a space in classrooms where all students are given the opportunity to learn (Rivera and Bryant, 1992). To be in alignment with that objective, a robust connection between instructional methods and consistent, ongoing support for teachers must be provided. Students learn best when collaborative policies are implemented to improve instructional practices and student performance simultaneously (García-Martínez et al., 2021). The role of educators as key agents is to create more inclusive and supporting learning environments and maintain a shared understanding that all educational stakeholders should contribute to the broader discourse on equitable access to quality math education for all students (Jones & Clemens, 2022). However, the institutional support also needs to be inclusive of teachers in that overarching aim. The knowledge that teachers possess about curriculum, math, and best learning practices is often the overlap that is missing from increasing support to meeting student learning needs (Cooper et al., 2006; Krainer, 2014; McClain & Cobb, 2004).

Therefore, the study recognizes the role of educators as critical agents in creating a more inclusive and supportive learning environment. This research aims to contribute to the broader discourse on equitable access to quality math education for all students; and to emphasize the importance of collaborative support in which mathematics teachers can and should be invited to participate. This research is important because if students are not becoming proficient at the math that they are learning, they will struggle to feel and be successful in the math classroom (Kalogeropoulos et al., 2023). Further, this research acknowledges the understanding that mathematics teachers can only support their students based on what support that the academic institution values and provides support to those mathematics teachers (Clark & Clark, 2002; Rigelman & Ruben, 2012; Toropova et al., 2019; Weddle et al., 2019). By understanding and implementing effective instructional strategies and collaborative institutional structures, educational stakeholders can make a positive impact on student mathematical proficiency. In conclusion, this research is a critical step toward improving math instruction and outcomes for students with exceptionalities and underserved students in international K12 American institutions.

The issue of how an institution collaborates with its educational stakeholders to meet the learning needs of its students is important. If institutions are not reflective in their policies, systems, and approaches to learning, they become complacent and students get the "short end" of the learning stick (LePage et al., 2001; Slavit et al., 2011). Conversely, when schools are open to different collaborative instructional approaches about what are the best ways to support the learning needs of the students they serve, there is growth on all fronts, students and educational stakeholders (Bature & Atweh, 2019; Ginsburg-Block & Fantuzzo, 1998; Goddard et al., 2010; Hallinger & Heck, 2010; Saka, 2021). This research adds to the ongoing scholarship examining

the intersection between institutional collaboration and math teaching and learning. Muckenthaler and colleagues (2020) found that through intentional and strategic collaboration at school student focus improved, Weddle and colleagues (2020) found that collaboration positively impacted student learning and increased student achievement. At the same time, many other academic researchers have called for additional studies to be conducted in mathematics education research to contribute to improving and supporting mathematics instruction for all students and teachers, respectively (Civil, 2006; Cobb et al., 2016; Putnam et al., 1990). Although, I am proud of the work accomplished in this dissertation study, this study also speaks to the importance of continued research focused on intersections between the quality and caliber of collaboration towards the approach and improvement of mathematics instruction.

Research Approach Overview

Constructionism

Crotty (1998) outlines constructionism as the construction of knowledge through interactions between people and their world(s); emphasizing individualized meaning-making from relationships with others and their environment (Jha, 2012; Kynigos, 2015). Constructionism has positively contributed to educational research agendas to improve the quality of teaching and learning through emphasizing collaborative learning, incorporating technology in the classroom, and dedicated time to allow students to build on their prior knowledge (Alanazi, 2016; Hyde, 2020; Rob & Rob, 2018). The constructionist approach represented an appropriate research paradigm due to the desire to examine educational stakeholders' individualized understandings of what supporting students meant and looked like in practice, and what supports students and teachers needed in their classrooms. During the interviews I asked (1) each mathematics teacher to share what support they have received in the

past (interactions with other institutional stakeholders), and (2) institutional stakeholders how they supported the mathematics teachers to meet students learning needs. Constructionism is useful to help shed light on specific issues through its all-inclusive approach to better understand layered, intersecting dimensions of the social world (Goldberg, 2003), and in this case, dimensions related to individual and collective understandings of math curriculum, pedagogy, and institutional support.

Curriculum

The concept of curriculum has been examined for years through copious interpretations; this dissertation will be highlighting and unpacking two as they concurrently appear in an American international school: the role of "hidden curriculum" in shaping educational goals, practices, to maintain educational, social, and cultural proliferation (Apple, 2019); and curriculum as an instrument to support students in unlocking their potential to disrupt existing structures of power (Ayers, 1986). Apple (2019) argues that the impact of the "hidden curriculum" shapes educational goals, norms, and values that are implicitly and explicitly but effectively taught in schools. These are not items that have entire lessons dedicated to them and then assessed at the end of a unit: but rather, dimensions of the "hidden curriculum" manifest in the conversations that educational stakeholders have with one another, with students, and their families (Apple, 2002); or in the agreed-upon policies and procedures that seem true and common sense. Ayer's (1986; 2001) believes that curriculum should be grounded in the needs of each student, engaging to push them to explore the depths of their knowledge; both inside and outside of the classroom. For international institutions, it is important that the institution's values are clearly communicated to community members, prospective and current staff; this aligns with Apple's perspective, broadening the idea that the "hidden curriculum" extends beyond students

and what they might learn in each content area. Prescriptive definitions and enactments of "curriculum" rub against constructionist approaches; as we often think curriculum as something decided upon by others either inside or outside of the institution, and as larger scripts that constrain students, teachers, and institutions. It was important to offer a scholarly examination of curriculum, as this research focuses on a particular content area, and how individuals understand themselves in relation to im/explicit curricula in supporting students and teachers.

Qualitative Research

As previously mentioned, this dissertation utilized a qualitative research approach to examine the experiences of individual educational stakeholders and how they understand and implement their roles within an international K12 American institution (Awasthy, 2019). Through an inductive, flexible, and non-linear process (Frankel & Devers, 2000), qualitative research was most appropriate for this study to answer the questions of why collaborative practices, policies, and support were or were not present and focus on complex interventions required for institutional improvement (Busetto et al., 2020). The educational stakeholders at this international K12 American institution shared their stories on their perspectives of students' need that are present in classrooms, which internal support structures they utilize for support, and frustrations about the realities of their experiences. It would be impossible for me to complete this study without the collaboration and vulnerability of these stakeholders. Through the binding of this case as a deep dive into an international K12 American institutions' approach to utilizing the expertise of its educational stakeholders to collaborate to meet the learning needs of both students with exceptionalities and underserved students in mathematics curriculum and their teachers. I have strategically combined all facets of this studies framework, literature, and

purpose (Creswell, 1998) to contribute to the distinctive and vigorous approach of qualitative research design.

Researcher Positionality

Power and Privilege

My outlook on power and privilege both within and beyond educational institutions has changed tremendously since I moved out of the United States of America (U.S.). Living abroad has opened my eyes to the benefits of being a first generation Black, Haitian American woman. One of the biggest powers that I carry is having a U.S. passport. I lived in the U.S. from the day that I was born until I was twenty-three years old, during which I did not think about how much privilege that little blue book carried until I found myself thrust in the world of expatriates discussing salaries, travel locations, and new job opportunities. I realized that the U.S. passport that I and countless others carried was linked to how much money one gets offered when they receive a job offer (Ong, 2003; Vega & Pozos, 2022). For example, in many American international schools, if there are two candidates with the same qualifications and the same educational background who apply for the same job—and one of them is from the U.S.—the American applicant receives a higher salary offer. When I first learned about this, I did not like that idea at all, without initially realizing that I am a beneficiary of that process.

Even though I have done nothing to earn that privilege; I did not choose to be born in the U.S.; I did not put the salary and passport link into play; it works in my favor. Even though I disagree with it morally, my displeasure does not remove this privilege, either. That guides me to work harder to be in positions where I can ensure that people are paid appropriately according to their educational background and professional history, regardless of nationality. Salaries and

passports are just some of the many privileges that are more recognizable since I have transitioned from being an American living in the U.S. to an American living abroad:

1) I am a U.S. passport holder which allows me to move throughout the globe with little to no limitations.
2) I am the deciding factor of the jobs that I accept and places I live because I am only responsible for myself; I do not have a partner or children to take into consideration.
3) Because I am a young professional, my earning potential throughout the course of my career is enough to provide a return on the investment of my education.

Since I cannot disentangle who I am from the power and privileges I hold, I must be able to identify when my power works in my favor. I have enough social awareness and professional confidence to feel comfortable to ask questions and have "tough conversations" around power and privilege, it has opened the door for me to learn more about other people's social, cultural, and personal stories. I am always asking questions about my experiences, the experiences of others, and identifying parallels and discrepancies. I can cultivate a space where people feel safe to share and express their joys, frustrations, successes, and failures within the context of how their power and privilege may have or sometimes did play a role, acknowledgements that inform my roles as practitioner and scholar.

Understanding all that I bring to the proverbial inquiry "table", I know that I have a unique perspective as it relates to my research; I am both an insider (an employee at the institution) and an outsider (the researcher from abroad). I am an employee at the academic institution where I am conducting my research. I am both the researcher and a participant. I completed the survey and interview as all other participants did. Because I am a member of both the high school mathematics department and the learning support department, I see where the

other high school math teachers go above and beyond to meet the needs of the learners in their classroom. As an employee of the academic institution, I am included in conversations about mathematics and our students on a regular basis. Professionally, I am in the best position to ask these research questions because I have cultivated a safe space allowing others (my colleagues) to trust me with their experiences as either mathematics teachers or other educational stakeholders at an international academic institution. My colleagues were willing to share what they are seeing and have seen in their classrooms, what support they need from the institutions' educational stakeholders to be supported. The other institutional stakeholders shared their day-to-day realities with me, their philosophies for supporting teachers, and how they all work together to ensure that students are receiving high quality education that is also meeting their various learning needs.

During interviews, many colleagues provided historical contexts that I was not privy to, raw emotions based on their experiences at the institution, and they posed questions that led to digging deeper and seeking clarifications from other stakeholders. This research would not have been possible without them and their vulnerabilities. I am grateful for the time and energy they allocated for me to be successful. I am in a position where my participants' lived experiences will be very different from mine. My participants have more years of experience teaching than I do, more international experience than I do, more leadership experience than I do; I will have access to someone who has not lived the same life as me, who has traveled and lived in places that I have not, seen and heard different mathematical phenomena, and interpreted all their life experiences differently than I would have. However, navigating both insider and outsider responsibilities represents a delicate, complicated dance negotiating my institutional employment, my employment visa, housing, and additional benefits linked to the place where I

conduct this work. As for boundaries that I see within my own experiences in relation to speaking and writing about other people's human, social, and cultural stories I would say when it comes to my limited exposure with different cultures, understanding its dynamics, and knowing when I should add input or just listen. As the sole researcher, I am in a space of listening and trying my best to learn as much as I can from everyone around me. Also realizing that while their input may not be related to the topics of this research, that does not mean that their insight will not help me learn and grow as a global citizen and qualitative inquirer. I want to be someone who carries a wealth of knowledge within herself, cultural knowledge, pedagogical knowledge, and content area educational knowledge. Learning more will happen as I expose myself to different cultures through work, travel, and listening. My position influences the focus of my research, how I build my research, how I collect my data, how I analyze and interpret my data, and how I present my findings. Everything that I do is impacted by who I am, and who I am is impacted by the power and privilege that I have, both earned and unearned. To remain true to all facets of my life, I must be willing and okay with stating what my power and privilege is and sharing them with others.

Operational Definitions

This dissertation operates on the following definitions and conceptualizations of the words and phrases listed below:

- Advanced Placement – a program that offers undergraduate university level curricula to high school students
- American institution – an academic educational environment utilizing endorsed American curricula and standards

- Case – a detailed study of a specific subject, program, process, individual, and/or group
- Curriculum coordinator – a stakeholder responsible for supporting staff in curriculum implementation
- Differentiation - learning experiences in which the approach or method of learning is adjusted to meet the needs of individual students, focusing on the 'how' of personalized learning
- Director – a stakeholder responsible for leading K12 faculty and staff of a specific department
- Institution – an academic educational environment
- Instructional Coach – a stakeholder responsible for supporting staff with instructional practices and strategies required to implement curriculum
- Integrated Mathematics – a program that integrates mathematics topics consecutively throughout secondary years
- International Baccalaureate – an internationally recognized academic program for students, aged 3 to 19
- International School – an academic institution that operates outside the U.S.
- Learning support – a program designed to provide specialized intervention and high-quality instruction to students requiring ongoing academic and/or behavioral assistance or who are eligible for special education support
- Principal – an administrative stakeholder; a principal or assistant principal
- Scaffolding - a teaching method that provides temporary support to learners as they develop new skills

- Students with exceptionalities – students with a diagnosed learning disability
- Teacher – a math classroom teacher in either elementary, middle, or high school
- Underserved students – students without a diagnosed learning disability who are historically not meeting grade level expectations

Dissertation Overview

This chapter introduces this dissertation as a qualitative case study that is bounded by the international K12 American institution where the study was conducted. This study examined the complexities inherent in the experiences of educational stakeholders' collaboration to identify and support students with exceptionalities and underserved students, inclusive of the designing, tailoring, and enacting of mathematics curriculum at an international K12 American institution.

Chapter 2 represents a cohesive literature review of key organizational structures that support effective teaching and learning through collective teams, curriculum planning, and curriculum integration. Chapter 2 also addresses an analysis and reflection on instructional efficacy and decision-making processes that collaborate to support teachers in their management of instructional experiences for student success in the mathematics classroom.

Chapter 3 describes the research design, methodology, data gathering and analysis methods, and ethical considerations and strategies employed to ensure trustworthiness. Chapter 3 describes the survey and interview protocol and the epistemological orientation underscoring these research decisions.

Chapter 4 particularizes the experiences of educational stakeholders across the institution and ultimately, the analysis of instructional practices and strategies highlights the significance that diverse pedagogical approaches have on fostering procedural and conceptual mastery in mathematics. Chapter 4 describes participants' experiences with supporting the learning needs of

students in math through providing support to mathematics teachers and the realities of institutional collaboration at an international academic institution.

Chapter 5 situates findings within current scholarly conversations and literature, representing an analytical interpretation of findings. Chapter 5 discusses the topics that need to be addressed to improve these challenges are addressing the insufficient time, lack of additional staff, and financial restraints to allow for consistent application of meaningful instructional strategies and practices.

Chapter 6 offers study conclusions and implications of future research related to examine the complexities inherent in the experiences of educational stakeholders' collaboration to identify and support students with exceptionalities and underserved students, inclusive of the designing, tailoring, and enacting of mathematics curriculum at an international K12 American institution. Chapter 6 reiterates the importance of addressing these challenges through a concerted effort at the institutional senior leadership stakeholder level to provide resources, time, and support needed to meet the diverse needs of the students and teachers across the institution effectively.

Chapter 2 - Literature Review

Introduction

The purpose of this qualitative case study employing a phenomenological analysis technique was to examine how an international K12 American institution supports its teachers with the implementation of the mathematics curriculum through institutional collaboration with educational stakeholders to meet the mathematical learning needs of students. To begin my literature review process, I identified three categories to support the various stages of inquiry. The purpose of this literature review was to explore existing research related to the intersection of special education, math instructional strategies, and curriculum as a sticky gatekeeper/sanction/authorization of knowledge; specifically looking at enhancing the effectiveness of K12 educational stakeholders' collaboration and their fostering of inclusive learning environments at an international K12 American institution. Special education instructional strategies directly align with the study's focus by addressing how tailored approaches can meet the unique needs of in the math classroom. Understanding effective practices in this domain ensures that educators are equipped to design and implement mathematics curriculum that foster equity and access. Similarly, math instructional strategies are central to this study as they explore pedagogical approaches that enhance student engagement, understanding, and confidence in mathematics, particularly for diverse learners. Finally, institutional approaches to teacher collaboration emphasize the role of structured, intentional teamwork among educational stakeholders in creating inclusive learning environments. By examining how collaboration can bridge gaps in expertise and foster a shared vision, this study seeks to identify practical methods for enhancing curriculum development and instructional delivery.

This review reflects a comprehensive framework for examining the intersection of special education, math instructional strategies, and stakeholder collaboration; with each category further explored in detail. I developed guiding statements to structure and organize the research within the literature review. These guiding statements serve as focal points for analyzing how tailored instructional strategies, effective collaboration, and equitable curriculum design can collectively enhance the support for students with exceptionalities. They provide a clear roadmap for synthesizing existing research and identifying key insights relevant to fostering inclusive learning environments. The guiding statements are as follows:

- Understand the history of international K12 American curriculum schools and with scholarly support to conceptualize their statuses as institutions;
- Conceptualize curriculum as an imperfect umbrella encompassing more than just academic knowledge;
- Explore mathematics instruction through prescribed American learning and content standards for student success;
- Determine the instructional frameworks for teaching special education and underserved students to support their development and mastery of mathematics skills and concepts;
- Examine the described supports for the professional development of general education teachers in enhancing their knowledge of identifying students' needs and for implementing successful math curriculum accommodations and modifications; and
- Explore the strategies for facilitation and collaboration among stakeholders to align the institution towards a shared objective of students achieving grade-level mathematical proficiency

Together, these statements underscore the rationale of this dissertation: an examination of how a cohesive and inclusive approach to curriculum and collaboration can transform mathematics instruction and support systems for all learners, particularly those with exceptionalities. The literature review synthesizes and critiques current research, offering insights into how these interrelated domains can strengthen the capacity of international K12 American institutions to create equitable and effective educational experiences. To fully understand the context within which these categories and guiding statements are explored, it is essential to first examine the historical development and unique characteristics of international American schools. This foundational understanding provides critical insight into the institutional structures, cultural dynamics, and curricular frameworks that shape collaboration and instructional practices in these settings.

A Brief History of International American Schools

Before we can begin to look at how an international American institution supports its stakeholders to support its students, we need to explore at the history of international American schools and why I have chosen to label them as "institutions" for the context of this research study. Unlike the historical beginnings of the American school system, which was created with an identity based in religion, nationalism, civil rights, and the relationship between school and the workplace (Spring, 2005); the history of international American schools has been complexly shaped by global events, evolving demographics, and social pressure to serve the educational needs of American families living abroad (Brooks, 1961; Gillies, 2001; Hayden, 2006; 2011; Hayden & Thompson, 2008; Mallinson & Jonetz, 1991; Pearce, 2013; Willis & Enloe, 1990). While international American schools were established solely to meet the educational learning needs of American students abroad, today, those same schools now serve a multinational student,

family, and staff demographic (Gillies, 2001; Terwilliger, 1972). However, even though the student and family community has diversified across international American schools, many still adhere to American curriculum learning and content standards and still receive financial support from the United States Department of State (Gillies, 2001).

Due to its calculated development, it is important to understand that international American schools were created to resolve a need (American families living outside of the continental United States); and the solutions (international American schools) have expanded in size, demographic, and location (Lillie, 2022). That expansion has also resulted in the services that international schools provide, including but not limited to housing, visas, and other benefits. Oftentimes international education and international schools are used synonymously but that is not always accurate or made apparent to stakeholders (Hayden & Thompson, 1995). The experiences that international schools provide both for its students and staff surpass more than just an education (Wilson, 1993); international schools provide different cultural experiences, intercultural awareness, opportunities to live in different countries, travel opportunities, and significant salary increases (Anderson, 2021; Hayden et al., 2000; Savva, 2013; Sedláková & Košatka, 2022; Zilber, 2005). Consequently, it is paramount to understand that international schools function as far more than just a school building where learning and working takes place; international schools are equally an exhibition of social, political, and economic power structures (Hamre, 2015). Those various power structures are not all negative nor do they always lie in the same hands. Parents, students, teachers, and administrators all have different opportunities to flex their power muscles; but the important aspect is how those different relationships (Hamilton, 2015) work together to meet the learning needs of students. While there are a lot of positives that

come with international education and schools, there are aspects that if not addressed and tended to regularly can result in negative student academic growth (Potter et al., 2017).

American International Schools as Closed Institutions

The concept of a "total institution" was defined by Erving Goffman (1961), as organizations that exert control over the daily lives of its inhabitants (Becker, 2003; McEwen, 1980; Pfautz & Goffman, 1961; Vienne, 2010; Wiggins & Langenbach, 1975).When Goffman (1961) coined the phrase "total institution," he was referring to asylums, mental hospitals, and prisons; however, he did vaguely include other closed environments (such as schools that can function as isolated environments that have the capacity to socialize its members through repeated and prolonged exposure) that significantly reorganize subjects and their social relationships with/in/to their environment. While international K12 American institutions do not have a history of shutting their educational stakeholders and community members away from the world, international K12 American schools do resocialize and exert strong influence over the lives of its students and staff. Particularly through their ability to foster knowledge and understanding while concurrently limiting the authority their members have over their own personal experiences (Benelli, 2014; Finnan, 2020; Fitz Gibbon et al., 1999; Guigue & Boulin, 2016; Scott, 2011). Consequently, international K12 American institutions have been identified as resembling total institutions due to their extended influence over behaviors, activities, duties and requirements of their students' and staff (Ignatieff, 1983). While international schools offer numerous benefits to their students, families, and staff; including a multicultural environment prioritizing the enhancement of cultural awareness and the promotion of open-mindedness among its constituents (Perry, 2016); international American institutions function as *closed* environments for the community that they serve. Their status as closed environments radically

shape the way staff members are hired and socialized to ensure alignment to the institution's mission and vision and the way that families and students are interviewed to ensure the institution is the most suitable learning placement (Gillies, 2001; Hayden & Thompson, 2008; Savva, 2013). Simultaneously, there is a level of community and authority that is exerted by these institutions over its various stakeholders through various forms of control; one of which rests in the curriculum.

Curriculum: A Powerful, "Sticky" Authorization of Knowledge

International American institutions typically follow American educational standards and curricula to mirror the education that students would receive if they attended an institution in the U.S., under the pretense of maintaining consistency with educational experiences for students, families, and educational stakeholders (Gillies, 2001; Grimshaw & Sears, 2008). To ensure that the school as an institution is appropriately utilizing American-affiliated knowledge framing, curricular vision and alignment from all stakeholders is necessary. Prior to enforcing a curricular vision upon constituents, a shared understanding of what curriculum is and what it will do is necessary for the international American institution. Curriculum is a multidimensional educational model that holds the sequences of student learning experiences through planned instruction (Gazibara, 2020). Curriculum is often framed as a guide for students, teachers, and institutions by defining learning objectives, recommending teaching methodology, and ways to assess student understanding, but ultimately curriculum illustrates tensions in educational stakeholder power and authority. (Apple, 2006). The definition of curriculum has evolved over time, from a focus on content delivery to a more comprehensive educational and instructional approach that encompasses various ways of knowing within countless educational environments (El-Astal, 2023). However, curriculum also shapes and redefines stakeholder relationships to the

school, to education, and what knowledge is deemed necessary and valuable. Two contrasting views of curriculum have emerged: one emphasizing content and achievement outcomes, and the other prioritizing learner needs and classroom processes.

The Im/Explicit Curriculum: "Hidden" Control or Conduit for Criticality?

The "hidden curriculum" in many international K12 American institutions often involves the subtle development and strengthening of superficial intercultural awareness into a more meaningful and nuanced intercultural comprehension (Savva, 2013), increasingly underscored by the American "title" in the institution's name. This unspoken process reflects the implicit values and priorities often premised on individualism, self-reliance, and narrow success measures that guide interactions, teaching practices, and institutional culture (Apple, 2019). While these approaches may seem beneficial on the surface, the im/explicit enactment of these approaches warrants critical examination. For instance, what mechanisms are in place to ensure that this intercultural growth moves beyond surface-level understanding? How are the members of the school community—students, families, faculty, and staff—actively engaged throughout this process, and how are their diverse perspectives integrated into the institutions approach?

Similarly, by adhering to American educational standards, many international K12 American institutions subtly promote their educational philosophies and beliefs to their stakeholders—students, families, faculty, and staff—often without these groups being fully involved or even aware of the ideological underpinnings of the im/explicit American-focused curriculum and educational ethos (Gillies, 2001). This raises important questions about agency and inclusivity. Are these educational philosophies presented as adaptable frameworks that consider the cultural contexts of the host country, or are they imposed as fixed norms? Furthermore, how does this practice shape the institutional identity of these schools and

influence the way educational stakeholders perceive their roles within the learning community? Both aspects—the hidden curriculum and the exportation of American educational philosophies—are central to understanding the dynamics of international K12 American institutions. They highlight the need for critical reflection on how implicit and explicit messages shape the experiences of all stakeholders, particularly in relation to collaboration and inclusivity, which are central to this study.

If all educational stakeholders are not fully aware of the institution's "hidden curriculum" (Apple, 2019) it becomes problematic not because the institution cannot create or disseminate teaching practices and curricula that align with larger contextual factors, but because it risks enforcing a singular, unexamined definition of progress. This hidden curriculum operates as a mechanism of alignment—covertly shaping stakeholders to adopt the institution's version of progress while silencing dissent or alternative perspectives. It reflects an implicit "are you one of us?" mentality, where those who do not initially align with the institution's values or practices are, in effect, reformed into compliance. This process is particularly insidious, as stakeholders may unknowingly internalize and perpetuate institutional ideologies without critically questioning their own autonomy or the broader implications of this enforced uniformity.

Curriculum as Critical and Collaborative

The second concept of curriculum represents Ayers (1986; 2001) criticism of the notion that curriculum should be this set parameters from which teachers and students never stray. Curriculum should be relevant to the lives of the teachers and students, while also challenging them to become strong critical thinkers who care and question the world around them (Ladson-Billings, 2016). Supporting students on their journey to unlock their knowledge and power is part of the responsibility of the institution and its educational stakeholders (Ayers, 1986). For

international American institutions, this is not an incomprehensible concept. The educational and professional experiences that international schools provide both for its students and staff surpass more than just a traditional stateside American education (Wilson, 1993); international schools provide different cultural experiences, intercultural awareness, opportunities to live in different countries, travel opportunities, and generous compensation (Anderson, 2021; Hayden et al., 2000; Savva, 2013; Sedláková & Košatka, 2022; Zilber, 2005). It is also paramount to understand that international schools function as far more than just a school building where learning and working takes place; international schools are equally an exhibition of social, political, and economic power structures that should explicitly intersect with formal educational curriculum (Hamre, 2015). The institution has access to students, parents, teachers, and leaders from all over the world and they all have individual knowledge that they bring with them; but the important aspect is how those different relationships (Hamilton, 2015) work together to meet the learning needs of the students through the collaboration and shared belief of education of the institutions' stakeholders. This section has explored how institutions define themselves and how their implicit and explicit curricula reflect and reinforce those definitions.

By conceptualizing curriculum as an entity that is both intentional and "hidden" in shaping beliefs and practices, institutions might strive to align their educational philosophies with broader goals of progress and inclusion. However, this hybrid definition of curriculum is not purely theoretical; its implications are most intensely observed within and beyond specific content areas and classrooms to shape is stakeholders and their relationships with each other and with the institution itself. With this foundation, the focus now shifts to mathematics as a critical content area where these curricular dynamics are enacted. Mathematics serves as a particularly revealing lens through which to examine the interplay of institutional values, instructional

practices, and stakeholder collaboration. By zeroing in on math education, this study will analyze how the relationships between curriculum design, pedagogical strategies, and the needs of diverse learners converge to shape educational experiences and student learning outcomes.

Analyzing [American] Mathematics Content and Standards

Research highlights the importance of analyzing mathematics content through standards to improve student success (Koestler et al., 2013). Methodical analysis of curricular standards significantly contributes to mathematics education research and plays a role in how society forms their opinion on the matter (Amidon & Trevathan, 2015; Brahier et al., 2014; Gningue et al., 2013; Tran et al., 2016). This is not a new topic of conversation either; Lappan (1999) discusses the importance of a revitalization and refocus to update mathematics standards to guide curriculum development to produce excellent instructional education programs. There have been numerous analyses of approaching math education through mastering standards rather than completing different math skills throughout the school year, and the approach of mastering standards has shown meaningfully higher mathematics achievement for students (Baroody et al., 2004; Bleiler & Thompson, 2012; Kilpatrick, 2007; Reys et al., 2003; Tarr et al., 2013). Starting with the fundamental understanding that mathematics standards are essential for academic institutions, two key considerations arise: (1) effectively integrating mathematics standards with the content we teach, and (2) enhancing the understanding of educational stakeholders regarding research-based math instructional practices. These considerations become particularly relevant when considering the context of international K12 American schools, many of which adopt Common Core standards which were developed and initially implemented in the U.S. While this alignment helps guide the development of mathematics instruction to meet the needs of diverse

student populations, it similarly illustrates the overwhelming U.S. presence governing such institutions and their stakeholders.

Common Core State Standards for Mathematics (CCSSM)

The Common Core State Standards for Mathematics (CCSSM) were created and implemented in the United States to be in alignment with higher education expectations and provide thorough content and showcase students' ability to apply their mathematical knowledge (Kim, 2011). The CCSSM identified mathematics topic coverage, identified by grade level (Dingman et al., 2013). The CCSSM were intended to serve as a guide for educational stakeholders to effectively address and improve math education and instruction (Bleiler & Thompson, 2012; Koestler et al., 2013). By focusing on key concepts and skills, the CCSSM aims to prepare students for real-world problem-solving, regardless of students' geographical location. However, utilization of the CCSSM alone does not correlate to students becoming masters of mathematical content; when there is a lack of intentionality behind the curriculum that is chosen to meet the mathematics content needs, it shows through students' level of understanding the material, and teachers' familiarity with applying the material (Latterell, 2007). There is a demand for constant reevaluation of the mathematics instruction that students are receiving to ensure that students learning needs are being met and that the instruction is aligned with proper math standards and content enmeshment and that those instructional and educational practices are working to improve students' educational outcomes.

One argument for addressing the underperformance of students in mathematics education is to support teachers in their implementation of the content and standards (Fernandez & Jones, 2006; Little, 2009; Schmidt, 2012; Stein et al., 2009). Teachers complete a variety of coursework throughout their undergraduate and graduate education careers to learn best practices (Lubinski

& Otto, 2004), but there is more to effective teaching than just providing educators with a job and resources. It is about the ongoing support teachers receive to successfully implement instruction (Amidon & Trevathan, 2015; Hudson & Miller, 2005). Teachers need the support of educational stakeholders to facilitate conversations around the alignment of mathematics standards, the content they are teaching, and the assessments used to gauge student progress (Kulm et al., 2005). While it is one thing to implement instruction, it is another to assess whether students are mastering the content. This process is complex and requires collaboration among educational stakeholders to ensure that students' needs are met and that teachers receive the support they need to continue supporting student learning (Amidon & Trevathan, 2015; Schoenfeld, 2002). Despite the challenges, the Common Core State Standards for Mathematics (CCSSM) continue to thrive nationwide in the U.S., representing the standard by which many international K12 American institutions assess student learning in mathematics. This reflects the broader role of curriculum as both a guiding force in instructional practices and as an institutional structure that shapes how schools support both teachers and students. As we move forward, we must explore instructional frameworks that actively support the mastery of these mathematical skills and concepts, ensuring that students not only meet standards but also develop a deep understanding of the material.

Instructional Frameworks for Mastery of Mathematic Skills and Concepts

The successful implementation of instructional frameworks involves establishing an initial level of understanding, followed by the introduction and monitoring of the intervention, and, ultimately, assessing its effectiveness after a designated period. Throughout their educational teaching journey, teachers invest an extensive amount of time in classrooms, planning lessons, executing lessons, all through the lens that meeting students' learning needs is

most important (Anfara & Angelle, 2007). Anfara and Angelle (2007) also acknowledge that teachers should play an essential role in educational settings, emphasizing organizational structures that promote teaching, learning, and meaningful relationships. It is important to recognize that instructional frameworks are not one-size-fits-all solutions and should not be universally applied to every student. Instructional frameworks must be tailored to meet individual needs and capabilities. Teachers must assess each student's abilities to determine the most appropriate instructional framework to ensure optimal educational outcomes. While providing uniform interventions might seem convenient, this approach is unrealistic and unlikely to lead to meaningful progress.

Instructional frameworks are widely implemented in American schools as part of a broader effort to support diverse learners, including those with varying academic abilities and learning needs. Research highlights that differentiated instruction and scaffolding, key components of these frameworks, are essential for addressing the individual needs of students and equitable access to the curriculum (Tomlinson, 2001). Given the influence of American educational practices, these frameworks are also commonly adopted in American international schools, where educators aim to provide inclusive learning environments for a global student population amid deeply contextualized, localized, trends and social factors. Many students in math classrooms, even those without a diagnosed learning disability, require additional support to achieve mastery of the content and standards. To foster student independence, this support should decrease gradually as students demonstrate mastery of a skill, concept, or standard (Anghileri, 2006). When schools ask teachers to implement instructional frameworks for mastering mathematical skills and concepts, the goal is not for teachers to reinvent the wheel. Rather, schools should provide teachers with the necessary support, equipping them with the

most effective strategies and tools for integrating into mathematics lessons to improve student outcomes. This approach builds greater student access to the curriculum, fostering a more inclusive learning environment.

Differentiation in Math Instruction: Definition, Implementation, and Challenges

Gregory and Chapman (2012) define differentiation as doing what is fair for students, an integral part of fostering a more inclusive learning environment. Differentiation involves tailoring instruction to meet students' diverse learning needs, without altering the expectations of what students should learn. Aldridge (2010) emphasized that differentiation should not change the content but should focus on how it is taught. To effectively differentiate, teachers must understand their students' learning profiles, interests, and abilities (Gheyssens et al., 2020), adjusting instruction as needed throughout the lesson (Parsons et al., 2013). Differentiated instruction has been shown to improve student engagement, learning, and retention across various grade levels (Hamad, 2020). Studies by Ismajli and Imami-Morina (2018) and Chamberlin and Powers (2010) highlight that differentiation enhances mathematical understanding from elementary school to college level coursework. However, its success depends on teachers' ability to assess students accurately and apply the right type of differentiation. While flexible groups have been found effective in meeting student needs (Sizemore, 2015), the challenge lies in consistently implementing differentiation, particularly in the face of curricular and institutional constraints. As Pozas and colleagues (2023) note, differentiation alone does not guarantee success for all students, especially when it cannot address the fundamental issue of curriculum inaccessibility – for students and teachers.

While differentiation is a common practice in American institutions, including international K12 American institutions, it is not a cure-all for educational inequities. Teachers

must be supported in implementing these instructional frameworks (Marishane et al., 2015), and differentiation should not be seen as a standalone strategy but part of a broader approach to teaching (Tomlinson & Imbeau, 2013). The accessibility of the math curriculum remains a significant barrier to many students and addressing this requires examining long-term solutions beyond differentiation (Pozas et al., 2023). The challenge also lies in the need for more flexible, student-centered curricular approaches that are often constrained by institutional practices. While differentiation tailors' instruction to students' diverse needs, scaffolding provides the necessary support to ensure that students can achieve mastery. This next section will explore how scaffolding complements differentiation in creating an inclusive and supportive learning environment.

Scaffolding in Math Instruction: Conceptualizations, Tensions, and Institutional Implications

Scaffolding is a key instructional strategy that involves providing temporary support to students and gradually removing that support as students become more independent in their learning (Van De Pol et al., 2010). In the context of mathematics, scaffolding helps address conceptual gaps by supporting students as they transition from what they already know to what they are capable of understanding with additional guidance (Vygotsky, 1978; Utomo & Santoso, 2021). It has been shown to improve student achievement in mathematics (Abdu et al., 2015; Amiripour, 2012; Anghileri, 2006; Moschkovich, 2015) and helps teachers provide high-quality instruction (Bature & Jibrin, 2015). Scaffolding works by identifying the Zone of Proximal Development, where students can move from independent thinking to reaching their full potential with support. This approach is beneficial for all students, regardless of their level of

conceptual understanding, and encourages active participation in the learning process (Blanton et al., 2003; Bikmaz et al., 2010; Khusna, 2021).

While scaffolding is effective across various areas of mathematics, it is not a one-size-fits-all solution for individual students or for singular institutions (Bakker et al., 2015). For scaffolding to be impactful, teachers must know how, when, and where to implement it (Goos, 2009). Scaffolding has proven to be particularly effective in helping students struggling with problem-solving skills and mathematical reasoning, allowing them to draw on prior knowledge and use different strategies to solve math problems (Arifin et al., 2020; Basir & Wijayanti, 2020). Teachers can also use scaffolding methods such as providing step-by-step examples or offering one-on-one support to help students identify errors and better understand their work (Tropper et al., 2015; Bikmaz et al., 2010). However, while scaffolding is valuable, it may not always meet the full spectrum of students' needs, especially when additional support is required beyond what teachers are equipped to offer (Pfister et al., 2015). This highlights the importance of ongoing training for teachers in various instructional frameworks and the involvement of other stakeholders, such as parents and peers, in the learning process (Mahharrini et al., 2020; Speer & Wagner, 2009). Though scaffolding can be highly effective, its success relies on the teacher's ability to decrease their level of support as students gain independence, requiring ongoing professional development and collaborative efforts from all educational stakeholders (Murdiyani, 2013). Building on the support structures provided by scaffolding, cooperative learning offers another dynamic approach to engaging students in mathematics, fostering collaboration and shared responsibility in the learning process.

Cooperative Learning in Math Instruction: Conceptualizations and Implementation

Cooperative learning is defined by Slavin (1980) as a change in the interpersonal reward structure in the classroom, where students of all ability levels work together to strengthen their understanding of mathematical content. This instructional framework encourages students to work in intentionally selected small groups to maximize everyone's understanding of a particular concept, skill, or standard (Johnson & Johnson, 2019; Maier & Keenan, 1994; Smith, 1996; Woods & Chen, 2011). It is grounded in the belief that learning should not be an isolated experience; when students collaborate to solve math problems and support each other with learning gaps, they become more confident and self-assured in their mathemtic abilities (Dansereau, 1988; Davidson, 1990; Slavin, 1987). Cooperative learning promotes group learning, exchanges of thought processes and opinions, critical thinking skills development, and improved student learning outcomes (Gillies, 2014, 2016; Leon & Tai, 2004; Nolinske & Millis, 1999; Serrano & Pons, 2014; Thakral, 2017). A study conducted in a 4th-grade mathematics classroom found that students who engaged in cooperative learning scored higher on posttest assessments than those who experienced direct instruction (Karali & Ahadi, 2018). It is important to note that while cooperative learning is a common practice in both U.S. schools and international K12 American institutions, it is not a common practice within global educational systems. Highlighting that cooperative learning can potentially rub against certain educational and cultural norms.

Cooperative learning benefits students' understanding of mathematical concepts while simultaneously building their self-confidence (Slavin, 1996). Students are often aware of their relative strengths and weaknesses compared to their peers, and sometimes the best support comes from classmates rather than teachers (Chan & Idris, 2017; Slavin, 2014). To maximize these

benefits, teachers must pre-select groups with a diverse range of abilities, ensuring that students with lower conceptual understanding can learn from peers who possess stronger foundations, while high-achieving students work on refining their explanations and listening to different problem-solving approaches (Cook, 1991; Lin, 2006; R. Gillies, 2016; Thakral, 2017). The resulting confidence boosts student engagement, which leads to a higher success rate in understanding the material simply due to increased participation (Prabawanto, 2018).

Cooperative learning can transform the classroom into a space where all students eagerly engage in learning (Steiner et al., 1999). It has been proven to improve students' academic progress by creating positive group dynamics, fostering collaborative interaction, ensuring individual accountability, and encouraging both individual and group processing (Sofendi, 2014). This instructional framework also emphasizes the importance of how students process information and the various strategies they can use to solve math problems (Dansereau, 1988). However, while students need to be continually assessed on what they are learning, the method of learning also requires attention – from both the student themselves and the teachers in the classrooms. Goos and Galbraith (1996) found that metacognitive approaches alone are not sufficient for success in mathematics learning. Teaching students how to think mathematically is valuable, but students must also be given a variety of instructional strategies to help them connect new concepts with prior knowledge, successfully apply strategies, and eventually become independent problem-solvers. While research supports cooperative learning and its widely implemented in both U.S. international K12 American institutions, it continues to remain less prevalent in many global education systems; underscoring how cooperative learning may sometimes challenge established educational and cultural traditions. Although cooperative learning effectively supports students' academic growth and engagement, its success in the

classroom is often influenced by the broader context of school structures and the involvement of various stakeholders. This brings us to the critical role of collaboration among educators, parents, and other stakeholders in fostering an environment where mathematics education can thrive within international K12 American institutions.

Stakeholder Collaboration for Mathematics in K12 Institutions

Student Collaboration in the Math Classroom

The literature reiterates how important the role that educational stakeholder collaboration plays on improving students mathematical understanding and achievement. When students are aware that educational stakeholders regularly collaborate with each other to become better mathematicians and educational practitioners, it pushes them to also want to collaborate with their classmates to become better mathematicians (Di Fatta et al., 2009; Harper & Crespo, 2020; Horn, 2012; P. E. Johnson & Harris, 1998). Similarly, when students are given the opportunity to consistently work collaboratively in math class, their conceptual understanding of mathematics content, problem solving abilities, and self-academic motivation increases (Ginsburg-Block & Fantuzzo, 1998; Putnam et al., 1990). Still, knowing the benefits of collaboration in the mathematics classroom and school at-large, it not just as easy as telling students to work together. Mathematics teachers and institutional stakeholders need to explicitly model for their students what good collaboration looks like in pairs, teams, and whole groups (Walker, 2007). This allows students to see multiple ways of thinking about math, getting the solution through different pathways, and developing richer academic language (Allexsaht-Snider & Hart, 2001; Di Fatta et al., 2009; Trafton, 1984). As student collaboration enhances learning outcomes through peer support and shared problem-solving, equally important is the collaboration between

teachers, specifically general education and special education educators, to address the diverse needs of students in the mathematics classroom.

Teacher and Co-Teacher Collaboration in Mathematics Classrooms

Teacher and co-teacher collaboration plays a crucial role in creating an inclusive and effective mathematics classroom, transcending institution types and locations (Visone et al., 2022). Collaboration between general education mathematics teachers and special education teachers is essential for addressing the diverse learning needs of students. Teachers must first understand their students' academic levels to determine the areas in which they require support (Casale-Giannola, 2012; Jilk, 2016; Kilday et al., 2011; Maamin et al., 2020). While crafting effective lessons and providing professional development for educators are important, these efforts will not be successful if students are unable to access and learn from the curriculum. General education mathematics teachers must assess students' mastery of concepts to make informed instructional decisions and effectively address their needs (Casale-Giannola, 2012; Jilk, 2016).

To create a comprehensive mathematics program, teachers need to offer a range of mathematical learning experiences and employ various instructional interventions (Montague et al., 2011). Special education teachers typically possess strong pedagogical knowledge for supporting diverse learners, though they may be limited in expertise of higher-level mathematics content (Maccini & Gagnon, 2006; Ekstam et al., 2018). Therefore, general education teachers must integrate diverse instructional strategies to meet the individual needs of students, especially as most mathematics curriculum fail to include elements specifically designed to support all learners (Doabler et al., 2018; Karp & Voltz, 2000). A sound mathematics program requires strategies that resonate with diverse learners, creating a more inclusive and effective learning

environment. Teachers must tailor their methods to accommodate the varied learning styles within their classrooms (Rivera & Bryant, 1992). By offering diverse learning opportunities and implementing various instructional interventions, educators can foster a deeper understanding of mathematical concepts and address the unique needs of individual students.

One way that general education and special education mathematics teachers can collaborate is through direct instruction, which meets the learning needs of both groups of students (Kroesbergen & Van Luit, 2003; Milo et al., 2005). Explicit instruction is another useful approach, as general education teachers can outline expectations while special education teachers provide additional examples and strategies (Doabler et al., 2012; Strickland & Maccini, 2010). When teachers have time to meet regularly, they can combine their areas of expertise to brainstorm strategies for supporting students (Hunt et al., 2015; Maccini et al., 2007; Miller, 1996). The collaboration between general education and special education teachers has been shown to improve student achievement and performance (Barrett et al., 2013; Egodawatte et al., 2011; Hassidov & Ilany, 2018; Kazemi & Franke, 2004; Ronfeldt et al., 2015; Saka, 2021). Fostering collaboration between special education and mathematics teachers is particularly instrumental in supporting struggling learners (Van Garderen et al., 2008). By working together, teachers can design and implement strategies tailored to the unique needs of students with varying levels of conceptual understanding. This cooperative effort leads to the development of inclusive and effective instructional approaches that cater to diverse learning styles and abilities. Through joint planning and execution, teachers can identify and implement interventions that specifically address students' challenges in understanding mathematical concepts.

Collaboration between general education mathematics teachers and special education teachers is vital for creating an inclusive and responsive learning environment. By utilizing

various instructional frameworks and empowering both teachers to collaborate, schools can better meet the diverse instructional needs of learners (Van Garderen et al., 2012). Building upon the collaborative efforts between teachers in the mathematics classroom, it is equally crucial to expand the scope of collaboration to include other educational stakeholders. When teachers, parents, and school principals work together, they can create a more holistic support system that enhances student learning and success. This collaborative approach, involving all educational stakeholders, plays a pivotal role in fostering an inclusive and effective learning environment for students in mathematics and beyond.

Enacting Institutional Educational Stakeholder Collaboration

Collaboration in education is defined as the process of participants working together to address challenges and improve student learning (Montiel-Overall, 2005). It focuses on the ongoing effort to create a shared space where educators engage in collective understandings and joint problem-solving (Baker, 2015). Unlike cooperation or coordination, collaboration requires a sustained, active engagement in shared thinking, planning, and the creation of integrated instruction (Montiel-Overall, 2005). For collaboration to be successful, it must be underpinned by qualities such as collegiality, respect, and trust (Montiel-Overall, 2005). These key elements foster an environment where ideas can be exchanged freely, and educational goals can be aligned to improve teaching and learning outcomes.

The benefits of collaboration are wide-ranging. Consistent use of collaborative modalities within a school can help improve teacher practices, student retention, and overall student learning (García-Martínez et al., 2021; Haycock, 2001; Kain, 1996; Killion, 2015; Muckenthaler et al., 2020). When educationals stakeholders work together, they can foster an environment where teachers are supported in developing their classroom agency and personal teaching

identities (Park et al., 2020). This collaborative approach also strengthens the connection between individual classroom efforts and larger institutional goals, ensuring that all members of the educational community are aligned in their focus on student success (Kinzie et al., 2019; Leonard & Leonard, 2003; Schneider & Kipp, 2015). Additionally, collaboration among educational stakeholders allows for productive discussions about the teaching and learning taking place, giving teachers opportunities for feedback and continuous professional growth (Santagata & Guarino, 2012; Saunders et al., 2009).

However, implementing collaboration within schools does come with challenges. One of the key barriers is the ability to create a school culture that supports and values collaboration. Effective collaboration requires time, trust, and institutional support, which may not always be readily available (Gajda & Koliba, 2008). School leadership plays a crucial role in fostering this environment. Principals who focus on instructional improvement and prioritize creating spaces for teachers to collaborate have been found to be the most effective in improving student learning outcomes (Hallinger & Heck, 2010; Y. L. Goddard et al., 2010). When principals and teachers work collaboratively on instructional decisions, student achievement improves significantly (Garten & Valentine, 1989). However, institutional and curricular constraints may challenge collaboration, as not all schools have the infrastructure or time for effective collaboration across all levels. Educational practices are shaped by the cultural norms that are socially acceptable in the region. These can create tension with/in/between educational stakeholders based on how the individual envisions the institution and its aim.

In the mathematics classroom, collaboration among teachers and other educational stakeholders is critical in addressing the diverse learning needs of students. Mathematics instruction, when supported by collaborative efforts, benefits from a range of strategies and

perspectives that improve both teacher effectiveness and student understanding. Collaborative teams with teachers can develop more responsive instruction that is tailored to the needs of students, promoting deeper engagement and understanding. However, the success of collaboration in the math classroom is influenced by how well the curriculum and institutional practices support collaborative efforts. If the institutional structures, including time for meetings, professional development, and alignment with the curriculum, do not prioritize collaboration, it may be difficult for collaborative teaching practices to reach their full potential. The exploration of collaboration within mathematics education highlights its pivotal role in shaping effective instructional practices and fostering a supportive learning environment. As these themes continue to unfold, it is essential to consider how the collective findings of this review contribute to the ongoing evolution of teaching and learning strategies in mathematics.

Conclusion

International K12 American institutions hold a responsibility to develop and facilitate a teaching and learning environment that supports all students, teachers, and stakeholders. While there are additional steps that need to be taken to ensure that students with exceptionalities and underserved students are also getting their learning needs met (such as tiered mathematical instruction through differentiated and scaffolded lessons crafted to target and meet students where they are conceptually and teacher collaboration in the classroom to provide targeted support to students); it is not an impossible task to successfully accomplish—in the U.S. or internationally (Brahier at al., 2014; Hayden & Thompson, 2008). Research stresses the importance of institutions explicitly communicating their approaches to curriculum and supporting student learning needs (Egan, 1978; El-Astal, 2023), while also fostering an environment of collaboration between its educational stakeholders (Bay-Williams & Speer,

2012; Krainer, 2014; Marshall et al., 2023). Students need their teachers to be equally equipped and supported consistently with their methodologies to enhance student learning.

The purpose of this qualitative case study employing a phenomenological analysis technique was to examine how an international K12 American institution supports its teachers with the implementation of the mathematics curriculum through institutional collaboration with educational stakeholders to meet the mathematical learning needs of students. This literature review highlighted the complexities and intersections of students with exceptionalities, underserved students, mathematics curriculum, and educational stakeholder collaboration in both U.S. and international K12 American institutions. This qualitative case study addresses a gap in examining the nature of students' needs and how educational stakeholders can work together to provide a comprehensive math education that is meeting those needs. It is problematic and contentious to generalize and present curriculum, collaboration, and institution-wide "best practices" as one-size-fits-all, framings that often obscure other social and cultural dimensions. Chapter 3 will discuss the study's qualitative case study research design, detailing the methodological approach used to examine how an international K12 American institution supports its teachers with the implementation of the mathematics curriculum through institutional collaboration with educational stakeholders to meet the mathematical learning needs of students.

Chapter 3 - Methodology

Introduction

The purpose of this qualitative case study employing a phenomenological analysis technique was to examine how an international K12 American institution supports its teachers with the implementation of the mathematics curriculum through institutional collaboration with educational stakeholders to meet the mathematical learning needs of students. This qualitative case study seeks to answer the following research questions:

1. How does the international K12 American institution support mathematics teachers in addressing the learning needs of underserved students and students with exceptionalities?
    a. How do mathematics teachers across grade levels perceive the institutional support in addressing the learning needs of underserved students and students with exceptionalities?
2. What complexities shape the experiences of educational stakeholders' and their collaboration at an international K12 American institution?
    a. What are the roles and responsibilities of institutional educational stakeholders involved in the curriculum selection process?

This methodology chapter outlines the research approach, methodology, methods, and steps taken to address ethical implementation and trustworthiness of research conducted at an international K12 American institution. This chapter builds upon the insights garnered from an extensive literature review, which explores intersections of students with exceptionalities, underserved students, mathematics curriculum, and educational stakeholder collaboration is still relatively new and because of the nature of students' needs and how educational stakeholders can

work together to provide an education that is meeting the learning, curricular, and instructional needs of their students.

Pilot Study

During the second year (2022) of my doctoral program, I conducted a qualitative pilot study at the same institution where my dissertation research took place. The pilot study examined students who entered the math classroom without the background knowledge required to engage in a mainstream math course successfully. The research question that guides this study was "What high impact instructional strategies provide the differentiation and scaffolding necessary to meet the various needs of underserved students and students with exceptionalities?" The study utilized a constructivist grounded theory approach, incorporating data collection methods such as qualitative rating scale surveys and semi-structured interviews with students in grades nine through 12 who were enrolled in alternative math classes. The findings revealed three major categories: Student critique, student view, and teachers; with subcategories highlighting students' struggles with math, critiques of instruction, and positive experiences with small group settings. Participants shared how early difficulties in math led to disengagement and a lack of foundational skills, but they also emphasized the confidence-building impact of small group instruction and math classes tailored to their needs.

These findings underscored the critical role that differentiation and scaffolding play in addressing the learning needs of underserved students and those with exceptionalities. The pilot study shaped the focus of my dissertation by highlighting the importance of understanding how institutional stakeholders can and should implement differentiation and scaffolding to improve students' access to the curriculum and their mastery of foundational mathematical concepts. Rather than treating these as isolated instructional strategies, my dissertation frames

differentiation and scaffolding as dimensions worth exploring due to their potential to transform learning experiences and outcomes for marginalized student and teacher populations. This refined focus allowed me to analyze the systemic and instructional factors contributing to equitable math instruction within this specific institutional context.

Conceptual Framework

Constructionism

Crotty (1998) defines constructionism as the view that knowledge is an entity of power contingent upon social interactions between human beings and their world. Constructionism leaves room for different perspectives and realities to be true at the same time, because of the shared understanding across various social contexts and how they shape our approach of making sense of the current reality (Jha, 2012). Constructionism prioritizes the understanding that knowledge is not constructed in isolation by an individual's interaction with their experiences, but rather, that knowledge is co-created through interactions with others within social spaces (Floridi, 2011; Jha, 2012; Kynigos, 2015; Oakley, 1974). As a result, constructionism understands knowledge as shaping—and as shaped by—dimensions of power.

Curriculum

Curriculum at this institution is framed a possession that educational stakeholders either act upon in accordance with the institution, or that they deviate from. Except, this is not how Apple or Ayers view curriculum. Apple (1993; 2006; 2014; 2019) drives the idea that curriculum creation, selection, and implementation is a political act, and it is one the educational stakeholders need to constantly reexamine to ensure they are aware of who is in control of the knowledge that is being disseminated and through that circle of voice who is being amplified and who is being silenced. Ayers (2009; 2010; 2017) envisions curriculum as an energetic process

with students placed firmly in the center of all decision making and also endorses teachers as forces to resist oppressive curriculum decisions. The framing of curriculum at this institution is the complete opposite of both Apple (1993; 2006; 2014; 2019) and Ayers (2009; 2010; 2017). The institution posits curriculum as merely a plan that people either follow or stray from. Institutional stakeholders struggle with their personal ideologies that there is no in-between with curricular competency, instructional execution, and student learning needs. Conversations discussing how knowing/knowledge is a practice is nonexistent. This qualitative case study unites constructionism which views knowledge as a dimension of power and curriculum as a political act where power over curriculum needs to be distributed among educational stakeholders with the focus set on all students at all times.

Qualitative Case Study

This dissertation is a qualitative case study employing a phenomenological analysis technique was to examine how an international K12 American institution supports its teachers with the implementation of the mathematics curriculum through institutional collaboration with educational stakeholders to meet the mathematical learning needs of students. Qualitative research works with human experiences and the processes through which individuals interpret and derive significance from those experiences (Awasthy, 2019; Bhattacharya, 2017; Jackson & Mazzei, 2022; Mills & Birks, 2014; Mistry, 2012). Utilizing various data collection methods focused on exploring the how and why of innumerable phenomena. Qualitative research reflects a constructionist orientation through its focus on humans create meaning and understanding of their world (Bhattacharya, 2017; Crotty, 1998).

This case was bounded by the international K12 American institution where this study was conducted. Stake (1995) defines cases as “bounded systems” (p. 2) to be inquired into. My

understanding that knowledge is constructed rather than discovered informed my decision to select the institution as a case. The layered and contextualized factors shaping social and educational processes warrant a larger examination of the educational institution as a (re)organizing and (re)socializing force. Therefore, I am approaching this study with the intention to be a listener of the multiple perspectives presented to me by my participants and construct my interpretations solely from their lived experiences. The convergence of constructionism, curriculum, and qualitative case study research best suit this dissertation because the purpose of this qualitative case study employing a phenomenological analysis technique was to examine how an international K12 American institution supports its teachers with the implementation of the mathematics curriculum through institutional collaboration with educational stakeholders to meet the mathematical learning needs of students.

Methodological Approach

Qualitative Case Study

As mentioned, this research study employed a qualitative research approach to capture the everyday encounters and experiences with/in the social world: namely, those experiences of individuals engaged in instructing students, engaging with educational content, making decisions regarding curriculum, and fostering dialogues among faculty members at an international K12 American institution (Awasthy, 2019). Schwandt (2015) defines methodology as a way of thinking and research methods as procedures and techniques. Fahy and Harrison (2005) describe qualitative research to be the most suitable methodology when examining human emotions, behaviors, and values. Qualitative research is particularly well-suited for investigating the reasons behind observations that either participants share or that the researcher can identify or the lack thereof in certain observations, evaluating intricate interventions with multiple

components, and concentrating on enhancing interventions (Busetto et al., 2020). In my approach of this research methodology, I will be looking specifically for teacher instructional observations, teacher curriculum feedback, the coaches' methods of support, and how principals and directors roll out the divisional/school wide approaches to meet students and teacher needs.

Considering that an international American institution represents the case, this study examines the complex and integrated parts they have in place to function as working systems to meet the needs of teachers in the classroom to enable them to meet the various learning needs of the students in their classrooms, and how these layered working systems implicate enactment and conceptualization of im/explicit "curriculum." The defining characteristics of this case study are twofold, holistically and emphatically (Yazan, 2015). The holistic element speaks to the examination of how educational stakeholders at an international American institution collaborate to meet the learning needs of students with exceptionalities and underserved students within individual classrooms and within the institution. The emphatic element means examining individualized perspectives of participants, while acknowledging a shared or common understanding. Yazan (2015) defines the emphatic definition as reflecting on the vicarious experiences of the subject in an emic perspective; so, as an employee of the institution, this emic perspective means I am privy to shared institutional curricular and educational understandings and practices. Now, I have taken some creative liberty with the definition of emic because Merriam-Webster defines emic as "the analysis of cultural phenomena from the perspective of one who participates in the culture being studied" (*Emic Definition & Meaning - Merriam-Webster*, n.d.). I am understanding and approaching culture through the institution's culture and because I am an employee of the institution, I am one who participates in the culture that is being

studied. I will share more about my relationship to the institution and how it impacts my role as a researcher later in this chapter.

Hermeneutic Phenomenological Fore-sight

Heidegger and Dahlstrom (2005) define hermeneutic phenomenology as a philosophy that explores how people make sense of their everyday world. While this study is not phenomenological, the use of hermeneutic fore-sight is particularly important due to my emic perspective as an employee of the institution. Further, I am operating from a scholarly understanding that that institutional math curriculum has historically been designed without fully considering the needs of students requiring differentiation and scaffolding, positionalities that could influence how I interpret educational stakeholders' responses about their experiences. Heidegger and Dahlstrom (2005) define that preconceived knowledge about a phenomenon as foresight; as preconceived knowledge about a phenomenon (Peoples, 2020). While I am conducting this study, I am also a current employee at the institution and a member of the high school math and learning support departments. Therefore, I have a unique lens through which I viewed, conducted, and engaged with this research because I have preconceived knowledge about the case that I am studying. I have insight into the needs of teachers for more professional development and support (because I am one currently), the needs of students for curriculum that is appropriately meeting their learning needs (because I teach and work with high school students), and the structures in place institutionally to attempt to meet those various needs (because I am an employee of the institution). I am aware that because of the different dimensions of my positionality and my phenomenological foresight, there was no point where I would have been able to set aside the preconceived knowledge that I had. Consequently,

this dissertation is possible because it stems from how I am entangled within the foresight and existing dynamics occurring at the institution around me.

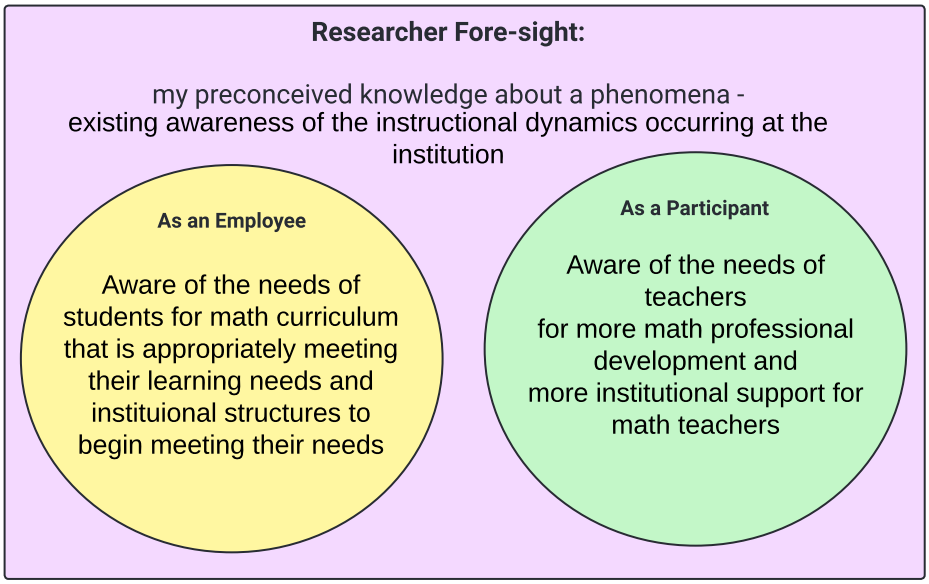

Figure 3.1 Hermeneutic Phenomenological Fore-sight

Researcher Role

In this qualitative case study, my role is complex; I am operating as the researcher, an observer, and a participant. As the researcher, I examined participants' teaching practices and, from their perspectives, how those practices intersected with the larger context of the school as a progressive and rigorous international K12 American institution. As an observer, I am a member of the school community. In my day-to-day professional obligations, I teach math to high school students, observe and adhere to students' needs, engage in conversations about what we (as math teachers) see our students need and what we need to support their learning. As a study participant, I completed the survey and reflective interview with honesty regarding what instruction looks like in my classroom, what I am un/able to do within the institution, and what additional support I need to enhance students' mathematical proficiency.

My role as a researcher-participant within the study consequently informed my inclusion of hermeneutic phenomenological fore-sight – and the inclusion of this dimension in data analysis – stemming from my belief that multiple realities and truths can exist simultaneously (Chessick, 2003). As a researcher I continuously processed my understanding through the knowledge that participants share with me (Laverty, 2003). As an employee at the institution and research site, I was privy to the shared institutional practices at and history of the institution. As a high school math teacher and a member of the learning support department, I was constantly in conversations about the needs of the students and what instructional practices would best be implemented to support their evolving learning needs. I could not remove these intersecting dimensions that inform how I choose to approach this research. However, what I did was ground my role as a researcher in understanding what participants make explicitly clear to me and run everything through the hermeneutic circle, grounded on the idea that interpretation is an act of revision (Richardson, 1979).

Research Setting

This qualitative case study was conducted on the campus of an international K12 American institution. This institution services students in kindergarten through grade 12 and states that it promotes a whole-child approach to learning. The institutions mission and vision statements (see Appendix L.) emphasize its aim to foster a compassionate, student-centered community that empowers and inspires learners to shape their futures through engagement, service, and global citizenship. This institution prides itself on having a long-standing commitment to fostering academic excellence, cultural diversity, and holistic development. In practice, this means delivering a rigorous, standards-based curriculum that emphasizes not only academics but also extracurricular opportunities in arts, athletics, and community service. The

institution prioritizes creating a supportive and inclusive environment, where students are encouraged to actively participate in their learning, develop critical thinking skills, and engage in meaningful service and leadership opportunities. With its focus on global citizenship, the institution likely incorporates international perspectives and collaborative projects that prepare students to navigate and contribute to a complex, interconnected world.

Category	Position	Nationality	Gender	Number
Administration	Assistant Principal	33% American 67% Canadian	67% Female 33% Male	3
Administration	Principal	67% American 33% Canadian	67% Female 33% Male	3
Administration	Director	58% American 42% Other Nationalities	75% Female 25% Male	12
Administration	Assistant Superintendent	100% American	100% Male	1
Administration	Superintendent	100% American	100% Female	1
Coach	Instructional	100% American	100% Female	1
Coach	Curriculum	100% American	100% Male	1
Coach	Technology	50% American 50% Canadian	100% Female	2
Teachers	Elementary School	-	-	52
Teachers	Middle School	-	-	27
Teachers	High School	-	-	48
Students	Elementary School	-	-	608
Students	Middle School	-	-	290
Students	High School	-	-	449

Table 3.1 Institution Demographics

Division	Pathway	Math Course
Middle School		Grade 6 Math
		Grade 7 Math
		Grade 8 Math OR Integrated Math I
High School	Integrated Math Pathway	Integrated Math I
		Integrated Math II
		Integrated Math III
		Pre-Calculus
	Advanced Placement Pathway	AP Statistics
		AP Calculus

	International Baccalaureate Pathway	IB Applications & Interpretations SL
		IB Applications & Interpretations HL
		IB Analysis & Approaches SL
		IB Analysis & Approaches HL

Table 3.2 Secondary Math Course Offerings

Participant Recruitment and Sample Selection

Participants included those who are currently employed at the international K12 American institution where this study is taking place. Participants in this study were selected using the following criteria: no teacher involved in this study was a first-year teacher at this institution; however, due to their roles coaches and other stakeholders could be in their first year of employment at the institution. The rationale for that decision was in the interview there is a section where participants compared their current students learning needs to those taught in the past (at this institution), and how, if at all learning needs have evolved. Consequently, first year teachers at this institution would not be able to provide that comparison. I sent out an email to classroom teachers across all divisions (elementary, middle, and high school), the instructional coach, the curriculum coordinator, principals across all divisions (elementary, middle, and high school), the director of student support, and the director of teaching and learning. The sample of participants represented a variety of K12 institutional stakeholders selected to provide insight into their interactions with students, math curriculum, and share in detail how they navigate meeting students daily. A broad participant list was selected to identify what the institutions approach is to identify and meet the learning needs of students to enhance their proficiency in foundational mathematical concepts across divisions and senior leadership hierarchy.

Choosing to include teachers across all divisions was also intentional because as a high school math teacher, I am privy to the needs of students and frustrations of colleagues around

curriculum; but that perception does not extend to elementary or middle school, nor can I speak on behalf of the other high school math teachers. Choosing to include the instructional coach was another purposeful decision because I knew that the elementary school was in the process of adopting a new curriculum and I wanted to hear their perspective on how the curriculum selection process goes, what voices are included in the process, and ultimately, how a final decision was made through the lived experience of someone who has a unique position where they are sometimes in the classrooms with teachers and get to see in real time what the learning needs of the students are and is also in rooms with the institutions' educational stakeholders advocating for resources to meet those needs. Choosing the curriculum coordinator was also purposeful because the coach currently operates in both the capacity of an instructional coach and curriculum coordinator, and I wanted to learn more about how support is provided based on the needs of students and teachers. Finally, inviting principals across all divisions was also purposeful because each division has its own unique needs that the principals must address alongside receiving support and foresight from the director of student support and the director of teaching and learning (see Appendices N-S.).

Participants received an initial email detailing the purpose of the research study, the research questions, and what their involvement as a participant will entail (completing a survey and a one-on-one interview). The email included a link for participants to opt-in to the study via a Google form that collected their name and asked if they would or would not like to be a participant in this study. 16 participants were invited to participate in the study and all 16 were involved. After each participant opted in to the study, they received a second email which included a PDF of the Informed Consent Form for participants to sign and return to me as well as the link to access and complete the pre-interview survey. Participants had one month to submit

their survey response; each participant completed the survey. One month after the survey email was sent, participants received an email inviting them to schedule their one-on-one interview with me. The time allotted for each interview was one hour; however, there were some interviews that were completed in 30 minutes, but most, ranged between 45 and 60 minutes. I provided a variety of dates and times for participants to choose from; each participant completed an interview. All interviews were conducted after contracted school hours and virtually via Google Meet in my home office. After data collection was completed, I followed up with three institutional stakeholders to gather specific institutional and role-based insights to strengthen the rationale for participant selection and triangulate findings in the dissertation. Additionally, the information helped define key frameworks and responsibilities within the institution to ensure alignment with educational expectations and practices.

Data Collection

The instruments used to collect data for this qualitative case study with a hermeneutic phenomenological data analysis approach included a survey and then a semi-structured one-on-one interview. The survey via Google form for participants to complete and submit represented their opt-in to the study. Afterward, participants completed a pre-interview survey via Qualtrics. The third data collection instrument was the semi-structured one-on-one interview conducted via Google Meet and recorded using Otterai. For the Google form that participants submitted, I created a separate research email address to house all dissertation research information. For the Qualtrics pre-interview survey that participants completed, I created a separate Qualtrics account that housed only this survey for organizational purposes. Participants were prompted to complete all questions included in the survey and could only submit one survey response, unable to edit

their initial responses after submission. I waited for all survey responses to be collected before commencing data analysis. Participants had one month to complete the survey.

After all survey responses were submitted, participants received an email to book their one-on-one interview with me. Participants had a variety of days and times spanning over eight weeks to book an interview. These interviews were conducted via Google Meet, recorded and transcribed using Otterai. Otterai transcribes and records the interviews in real time and transcripts are ready a few minutes after the Google Meet ends. However, given the evolving nature of AI, I subsequently reviewed all interview transcripts after Otterai's development for errors in participants' words, and for idiosyncrasies such as pauses, laughs, filler words (such as "um," or "uh,"), hesitations, and silences. After each interview, I expressed gratitude to the participants for their involvement in my study and informed them that I would share the finalized and published dissertation with them, allowing them to see the outcomes their contributions helped create.

Qualtrics Pre-Interview Surveys

The design of this qualitative case study with a hermeneutic phenomenological data analysis approach is broken into two phases: a pre-interview survey via Qualtrics and then a one-on-one interview via Google meet. The purpose of sharing out the survey prior to the interview was to allow the participants to share in-depth responses in eight categories: demographics, differentiation and scaffolding, implementation of strategies, effectiveness, impact on proficiency, institutional challenges and support, efficacy assessment, and a section for open ended comments. The eight survey categories were designed to align directly with the research questions and the study's purpose, systematically exploring the complexities of stakeholder collaboration, institutional support, and the design and implementation of mathematics

instruction. Demographics established participants' backgrounds, such as education level, teaching experience, and current roles, providing essential context for interpreting their perspectives and analyzing how professional experience influenced their engagement with curriculum and instructional strategies. Differentiation and scaffolding assessed familiarity and specific strategies used by participants, directly addressing the study's focus on how instructional approaches were tailored to meet diverse learning needs, as outlined in research question two. The implementation of strategies category examined how these methods were enacted in practice, offering insights into the challenges and methods that shaped the design and delivery of differentiation and scaffolding efforts.

The effectiveness category explored participants' perceptions of how well these strategies met students' needs, aligning with the study's goal of understanding the outcomes of institutional support and collaboration. Similarly, impact on proficiency investigated the tangible results of these strategies, focusing on their influence on improving foundational mathematical concepts, further connecting to research question one. Institutional challenges and support delved into the broader systemic factors that facilitated or hindered effective collaboration, addressing research question two by examining the roles, responsibilities, and institutional structures that influenced stakeholders' efforts. Efficacy assessment prompted participants to evaluate the success of strategies and initiatives, shedding light on how institutional collaboration translated into meaningful instructional outcomes. Finally, the open-ended comments section provided participants with the opportunity to share unstructured insights, enriching the hermeneutic phenomenological approach by revealing nuances and perspectives not captured in structured responses. Together, these categories provided a comprehensive framework for analyzing how

institutional collaboration and instructional practices addressed the learning needs of underserved students and those with exceptionalities.

The purpose of these survey categories was to establish a foundational understanding of participants' experiences, perspectives, and practices related to stakeholder collaboration and instructional support for underserved students and students with exceptionalities. The insights gathered through the survey provided essential context for tailoring the subsequent interview phase, allowed for deeper exploration of themes and patterns that emerged. By using the survey responses to inform the interview questions, the study ensured that the interviews could delve into specific areas of interest, clarify ambiguities, and uncover more nuanced perspectives on the institutional practices and challenges identified. This progression from survey to interview facilitated a comprehensive examination of the complexities at the core of the research questions.

Semi-Structured One-On-One Interviews

The second part of the data collection process involved a singular semi-structured one-on-one virtual interview with me, and each participant scheduled for one hour. While a few interviews were completed in 30 minutes, the majority typically ranged from 45 to 60 minutes in duration. The purpose of conducting one-on-one interviews with each participant was to engage more deeply with their lived experiences and perspectives regarding math instruction within the institution. Understanding that the lived experiences of elementary teachers will be different from high school teachers; instructional coaches will have a different approach to supporting teachers than principals; and so on for all participants included in this qualitative case study. I created five different sets of interview questions (see Appendices C. – G.): interview questions for classroom teachers, interview questions for instructional coaches, interview questions for principals and assistant principals, interview questions for the director of student support, and

interview questions for the director of teaching and learning. The intention behind including their lived experiences is to be able to tell an accurate story about what their experiences with how an international K12 American institution supports its teachers with the implementation of the mathematics curriculum through institutional collaboration with educational stakeholders to meet the mathematical learning needs of students. While I created the survey and interview questions, I had a printed copy of the purpose and research questions of this study visible and asked myself how the questions I created would support my journey to address my research question. By carefully aligning each survey and interview question with the overarching research questions and purpose, I ensured that the data collection instruments would provide meaningful insights into the institutional collaboration dynamics and support mechanisms for students with exceptionalities.

However, I made space for follow-up questions to probe participants' responses – hence the semi-structured interview format. The developed questions strategically targeted understanding the complex roles of educational stakeholders and exploring the nuanced approaches to curriculum design and implementation that address diverse learning needs across the mathematics education landscape. The semi-structured interview questions for classroom teachers aim gathered information about the current math classes taught, the nature of math instruction in the classroom, and the identification processes for students with exceptionalities and underserved students. The questions delved into the number of students with exceptionalities and underserved students, the existing and lacking support provided, and the specific needs requiring attention. Additionally, the interview explored the historical context by comparing past and present students' foundational math skills, understanding trends, and assessing their impact on curriculum progression. Lastly, I included an explicit focus of student guardians, seeking their

perspectives on concerns about math instruction and strategies for supporting their children in addressing educational gaps. By systematically exploring these dimensions through targeted questioning, I sought to comprehensively understand the institutional dynamics that shape curriculum design, implementation, and student support from several perspectives. These interview categories collectively aimed to generate nuanced, multi-stakeholder insights into the identification, addressing, and bridging of educational gaps for underserved and exceptional students within the mathematics learning environment within a singular institution.

The semi-structured interview questions for instructional coaches explored the participants role in supporting teachers in implementing differentiation and scaffolding strategies in math instruction for underserved students and those with exceptionalities. The questions investigated their collaboration with teachers, the use of technology for differentiation, and examples of successful strategies that enhance proficiency in foundational mathematical concepts. Additionally, the interview sought insight into how the institution assessed the efficacy of these practices, the role of instructional and curriculum coaches, what/if any was the reporting progress to school principals, collaboration with the Director of Teaching and Learning, and questioned protocols that ensured alignment with best practices and emerging trends in education, especially in special education and supporting underserved students.

The semi-structured interview questions for principals sought to understand how the participant ensures effective implementation of differentiation and scaffolding strategies in math instruction for underserved students and those with exceptionalities. The questions explored the principal's role in supporting and monitoring teachers, fostering collaboration among various stakeholders, and ensuring alignment in curriculum and materials to support differentiation. Additionally, the interview aimed to gather insights into observed or initiated practices that

positively impact students' proficiency, data collection methods for assessing efficacy, successful professional development initiatives, steps to secure support from relevant parties, addressing challenges, and the role of ongoing communication and feedback in adapting to evolving needs in math instruction.

The semi-structured interview questions for the director of student support and the director of teaching and learning aimed to gather information about the institution's strategies for addressing the learning needs of students with exceptionalities and underserved students in math instruction. They explored how the institution ensures effective differentiation and scaffolding, including professional development programs and support initiatives for teachers. The questions inquired about the contributions of instructional and curriculum coaches, the involvement of principals in promoting these practices, and the data and assessment methods used to measure their efficacy. Additionally, the interview questions insights into ongoing research or initiatives for continuous improvement and collaboration with external partners, such as content and instructional consultants.

Data Analysis

This qualitative case study with a hermeneutic phenomenological analysis approach aimed to accomplish three main tasks: within the boundary of this international American institution, I wanted to explore the perspectives of institutional K12 stakeholders as it relates to how they approach math instruction to meet the needs of their learners, to examine the different approaches that teachers, curriculum coordinators, instructional coaches, principals, and directors implemented to provide a variety of differentiated and scaffolded instruction, and to understand the areas of need that were present and required attention to improve teacher instruction which would directly impact student learning outcomes in mathematics. In hermeneutic

phenomenological data analysis, the focus is between the interactions of the researcher and the data (Peoples, 2020). I engaged in a process of understanding participants' experiences by examining these individually and across participant accounts, thus elucidating my understanding of how the educational stakeholders of the institution (the case) collaborates to support its students in math. This process unfolds within the hermeneutic circle, characterized by a continual refinement of understanding through iterative analysis (see Figure 3.1).

For hermeneutic phenomenological data analysis to be successful, a two-step process was implemented. The first step was understanding that my analysis process would not be linear or cut and dry. It was a constant spiral of understanding the small pieces I was analyzing and asking myself how they fit into the bigger picture of my research questions. I had to understand that my analysis would always change when new data pieces were introduced (Peoples, 2020). The second step was understanding that my interpretation of the data would always be in a revision cycle. In the same way, my analysis was constantly changing, and my understanding of the phenomena that was observed in my case study (which was bounded as the institution) was also constantly changing. Heidegger defined the two-step process as the hermeneutic circle; the less prominent research influences the more prominent parts of research, and the more prominent parts of research influence the less prominent parts. As Heidegger and Hofstadter (1988) explains, there will always be change from the phenomena that were identified to be understood, what the researcher understood from the phenomena, and then to start that loop all over again. Heidegger's framework centered on illuminating how individuals construct meaning and interpret their existence within the world. (For a more detailed graphic with steps, please see Appendix V.)

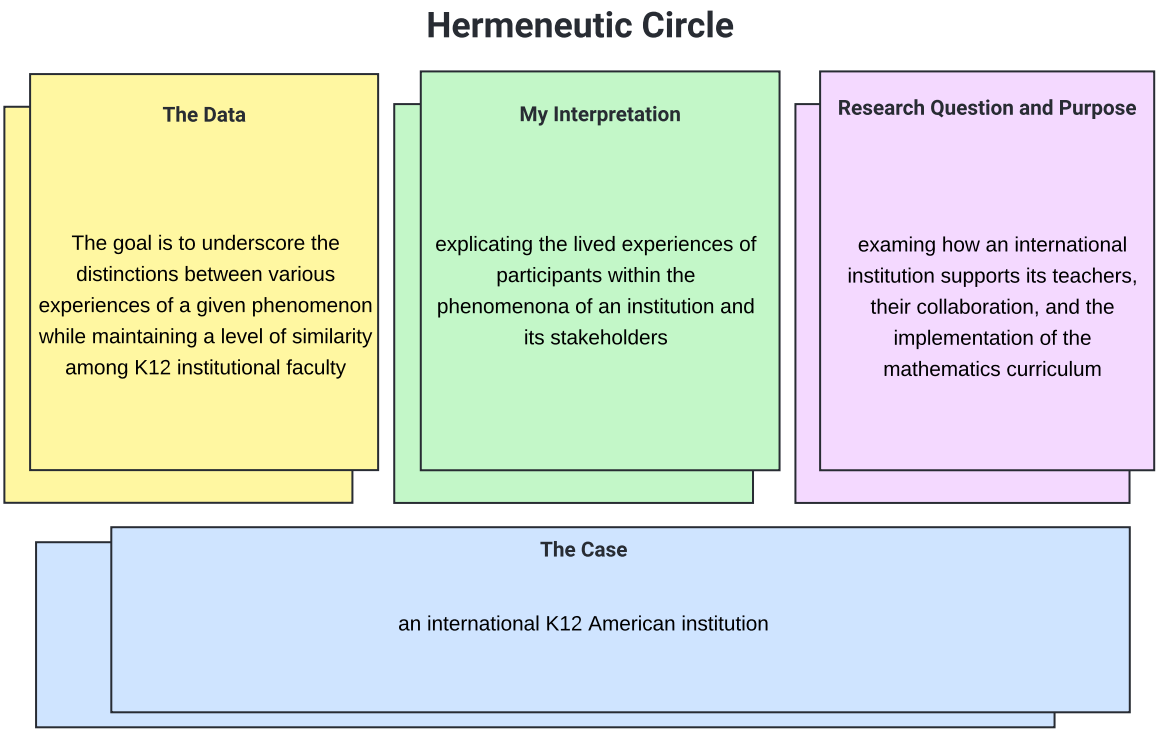

Figure 3.2 Hermenutic Circle for Data Analysis

It is essential to interpret participants' statements within their context and reality/ies while remaining open to revising current understandings, as misinterpretations can arise from personal biases or misperceptions. Ultimately, my commitment to methodological rigor and reflexivity ensured a nuanced and comprehensive understanding of the phenomenon under investigation. The data analysis conducted in hermeneutic phenomenology is based on the idea that phenomenological inquiry is rooted in seeking to understand a phenomenon (Peoples, 2020). Revisiting the hermeneutic circle was integral to appropriately conducting a hermeneutic phenomenological data analysis. Within the hermeneutic circle, the belief is that the parts inform the whole and the whole informs the parts (Peoples, 2020). Recognizing that the goal of phenomenological research is to clarify participants' lived experiences of a particular phenomenon, it follows that the approach to data analysis must remain dynamic and continuously evolving. Data analysis is not viewed as an isolated event where data is collected

and then analyzed independently, rather hermeneutic data analysis is much better defined as explication. Explication is one such term, which means an "investigation of the constituents of a phenomenon while keeping the context of the whole" (Hycner, 1999 p.161). Explication in my data analysis process involved unpacking and interpreting participants' data to reveal themes and patterns. This process involved coding and categorizing both survey and interview data to construct an exhaustive understanding of participants' experiences. My first coding cycle combined open coding, to identify emerging themes and patterns, and in vivo coding, to preserve participants voices by using some of their own words as codes (Braun & Clarke, 2022; Saldaña, 2021). By continuously refining interpretations and situating findings within my conceptual framework and literature, explication ensured that my analysis remained grounded in participants' perspectives while contributing to the broader purpose of this qualitative case study.

Steps for Hermeneutic Phenomenological Analysis

The objective of phenomenological data analysis or more appropriately termed data explication is to explicate the experiences within a phenomenon (in this case, within an international K12 American institution) by articulating a comprehensive and recognizable description of the participants' experience through the reoccurring and essential themes (Peoples, 2020; Von Herrmann, 2013). This was made evident by the data's evolutionary changes throughout the analytical process. Phenomenological data explication seeks to ensure clarity and identifiability for individuals who have encountered the same phenomenon to understand the nuances. This qualitative case study sought to ensure clarity and distinctiveness, allowing K12 institutional faculty who have encountered a particular experience (differentiating and scaffolding math instruction to meet diverse student learning needs) to readily comprehend its nuances (teachers, coaches, principals, and directors have different perspectives and

understandings). The overarching goal was to underscore the distinctions between various experiences of a given phenomenon while maintaining a level of similarity. All participants believed that students need to learn and enhance their proficiency in foundational mathematical concepts however, their belief of what the key factors of implementation and efficacy, regarding differentiation and scaffolding in math instruction at an international K12 American institution to address the learning needs of underserved students and students with exceptionalities may vary.

The phenomenological data analysis or explication process comprises six sequential steps (Peoples, 2020). In the first step, the researcher thoroughly examines the entire transcript and removes any irrelevant language to place the focus solely on the content related to the study. For the second step, preliminary meaning units are generated, holding closely to the research topic. Each unit summarizing a distinctive aspect or characteristic of the phenomenon under scrutiny. Some examples of my meaning units are: assessment review practices, collected data, now what?, external data to drive differentiation, and only teaching what's absolutely necessary. In the third step, the primary meaning units are refined into final meaning units, or themes, for each interview or survey question, informed by a deepened understanding of each participant's narrative. The themes I identified became the section headings for my findings chapter. For the fourth step, I then synthesized the themes into situated narratives, organizing specific details and experiences thematically under the relevant interview or survey questions. I focused on both the explicit feedback shared by participants and the notable omissions in their responses. In this step, each participants' story was reiterated and highlighted from direct quotes pulled from their interviews or survey responses. In step five, I generated universal narratives from the situated narratives I identified. These narratives became the research story I tell in my discussions of findings chapter. This brought me to the sixth and final step, merging those universal narratives

and to unify and consolidate all participants accounts. This is how I brought the entire research study together to form my conclusions and implications. This process enabled me to construct a general description to effectively encompass all major themes, while also accounting for any nuanced meanings derived from participants' experiences. (For a more detailed graphic with steps, please see Appendix W.)

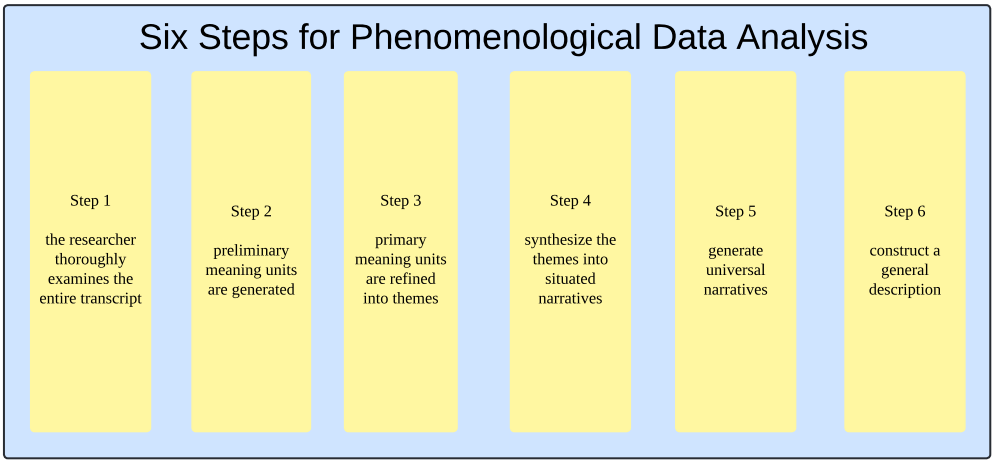

Figure 3.3 Six Steps for Phenomenological Data Analysis

Ethical Considerations

One of the areas that I, as the researcher, had to delicately navigate was balancing my researcher role with my professional collegial role. I was not an outsider coming to the institution because they were seeking my perspective on how to improve their mathematics instruction. I was—and still am—a hired employee seeking to examine scholarly questions about how we (the institution) can address pedagogical tensions that seems to befall the high school math department. Even though I obtained all the necessary approvals, both from the institution (my employer) and the Kansas State University Institutional Review Board, I knew that I had to navigate a fine occupational and scholarly line while conducting this research. When I contacted

colleagues across all divisions to for potential study recruitment, everyone I asked agreed to be a participant because they shared how much they wanted to help me on doctoral journey.

My process in which I began participants recruitment at the start of receiving IRB approval was identified current faculty members who were math teachers, coaches, principals, and directors. I sent out an email to classroom teachers across all divisions (elementary, middle, and high school), the elementary instructional coach, the secondary instructional and curriculum coach, principals across all divisions (elementary, middle, and high school), the director of student support, and the director of teaching and learning. Participants received an email detailing the purpose of the research study, the research questions, and what their potential participation would entail (completing a survey and a one-on-one interview. I made it clear at each step of participants' involvement that I would be operating outside of my daily role as a high school math teacher; because while I hold my role as the researcher, I am not a part of the school community.

I explained to participants via email and face-to-face when we conducted the interviews that confidentiality remains at the top of my priority list and anything that they shared with me was for the researcher side of me not the teacher side. Measures I implemented to minimize risks and protect subjects from anticipated risks was meeting with participants for one-on-one virtual interviews. I provided participants with the opportunity to opt out at any point or choose to not answer a question if they felt uncomfortable. Electronic copies of participants survey responses were collected. Audio recordings of the interviews were also collected. The audio recordings were transcribed into text that was be accessed electronically. The data was stored on an external hard drive that was password protected. This external hard drive did not go onto campus; it remained in my home office. While the anticipated length of this study was seven to nine

months; the study spanned over a year and a half. After the study was finalized, the findings were identified, and my dissertation has been defended, all electronic copies will be deleted from the hard drive and the hard drive will be factory reset. Any hardcopies of surveys, interviews, and data analysis will also be destroyed.

My level of intimacy with the institution and my research was the driving force to make this study a qualitative case study with a hermeneutic phenomenological data analysis approach. In hermeneutic phenomenology, the understanding is that biases cannot be set aside and therefore they need to be recognized (Peoples, 2020). The pilot study I conducted a year before my dissertation study focused on the student perspective of their math experiences, and from my findings I focused my qualitative case study research on how an international K12 American institution supports its teachers with the implementation of the mathematics curriculum through institutional collaboration with educational stakeholders to meet the mathematical learning needs of students. Another concern of mine throughout conducting this study was how I would maintain and address the different dimensions of my positionality throughout this research study. There is a lot of information that I know about this institution, its approach to math curriculum and instruction, the reality of math instruction, the support provided, (or lack thereof, as some participants noted). I knew that I would not be able to operate as if I am completely unaware of anything related to the participants, math instruction, or the institution throughout my interactions with participant survey responses, interviews, or through the data analysis process. The way that I distinguished between my two roles of researcher and participant was that I completed all participant obligations before I began any data analysis as a researcher. After creating the surveys and interview questions, I completed them as a participant and did not look at them again until I began coding and analyzing my data as the researcher.

Strategies to Ensure Trustworthiness

The study recognized the role of educational stakeholders as key agents in creating a more inclusive and supportive learning environment and is designed to contribute to the broader discourse on equitable access to quality math education for all students. By understanding and implementing effective instructional strategies, stakeholders can make a positive impact on student proficiency outcomes in math classrooms. Lincoln and Guba (1985) separate strategies of trustworthiness of qualitative research into four categories: credibility, dependability, transferability, and confirmability. These four categories ensure that researchers evaluate their study methods, analysis, level of transparency, and reflexivity throughout the research process. For the first category, credibility is based on whether a phenomenon and its data were accurately recorded and analyzed (Lincoln & Guba, 1985). The way that I ensured that my study was credible from beginning to end was through triangulation. Patton (1999) and Fox & Denzin (1979) identified that there are four types of triangulations, and for my qualitative case study I utilized two of them: methodological triangulation and data source triangulation. Triangulation should not be viewed to validate the data that was collected, but rather, a practice to ensure that the data that was collected is inclusive and vigorous.

Credibility

Patton (1999) and Fox & Denzin (1979) defined methodological triangulation as using different methods of data collection to generate findings; and data source triangulation represents the use of different data collection sources to examine the consistency of the research topic. Reviewing the survey responses from K12 institutional stakeholders before conducting interviews allowed for an initial identification of emerging themes grounded in participant perspectives. The subsequent interviews provided an opportunity for participants to elaborate on

their instructional approaches, the rationale behind their pedagogical decisions, the ways in which their students' needs influenced their instructional practices, and the strategies they employed to support their diverse learners. By employing methodological triangulation, integrating both surveys and interviews, I ensured that the study was informed by participants' experiences rather than my interpretations. This approach allowed for a comprehensive understanding of how teachers conceptualized differentiation, scaffolding, efficacy, proficiency assessment, student learning needs, their own professional development, and the institutions' role in supporting these various elements through collaboration.

Additionally, the use of multiple data sources allowed for the development of a thick description of participants' experiences within the institution. Teachers consistently described their understanding of math instruction at the institution in isolation, highlighting a lack of collaboration across grade levels. While faculty across different divisions shared their approaches to supporting students and teachers in math, there was little evidence of institutional coherence, particularly in the form of vertical alignment conversations shaping curricular improvements. Through data source triangulation, incorporating perspectives from participants in various occupational roles, I was able to discern how different institutional stakeholders engaged with mathematics instruction at their respective levels, yet the absence of a unified institutional approach remained a key finding that emerged from participants' narratives.

Dependability and Transferability

For the second category in strategies of trustworthiness of qualitative research, dependability is defined as the stability of the research findings over time as evident through repeatability (Korstjens & Moser, 2018). I have provided each step of my research process, reasoning, data collection, and analysis methodology throughout this dissertation, where

researchers looking to complete this study would be able to do so in their respective contexts. I also conducted member checking by sending follow-up emails to select participants throughout the coding and analysis process, seeking clarification on responses and interpretations that required further elaboration. This process allowed participants to confirm, refine, and/or expand on their previous statements; ensuring that the findings remained representative of their experiences and perspectives. I allowed the participants data to create narratives and descriptions about institutional roles and frameworks and then I reached out to the stakeholders at the institution to provide the institutions definitions of those same roles and frameworks provided in future chapters. To adhere to transferability, I provided clear descriptions within contexts and procedures for this study so that other researchers can conduct this study and reach their own conclusions at another institution to gain clarity on the understanding of how an international K12 American institution can supports its teachers with the implementation of the any curriculum through institutional collaboration with educational stakeholders to meet the learning needs of its students; even if they do not carry the same dual role as me, both employee and researcher.

Confirmability

Finally, confirmability is the extent to which a study's findings are shaped by the participants and not the researcher or their bias (Lincoln & Guba, 1985). Throughout this research study I made sure to be clear about the intersection of my role as an employee at this institution, my role as a participant, and my role as the researcher conducting this study – both within the written dissertation and to participants. While I occupy both roles, their purposes are very different. As an employee at the institution, my job is to teach math to high school students, meet their various learning needs, collaborate with my colleagues to refine my teaching

practices, and to share major academic concerns with the proper stakeholders. As a researcher I frame the institution as the boundaries of my study to examine institution-wide instruction, stakeholder collaboration, and support of diverse learners. The study's findings section represents participants' experiences with math instruction at and with the institution broadly. Their ideas, concerns, and perspectives are what is included in the story being told.

Additionally, throughout my hermeneutic phenomenological data analysis, I completed journal memos after coding each individual piece of data (Saldaña, 2021). Through journaling I was constantly detailing my experiences, assumptions, and interpretations to the data and allowing space for my personal bias to be revised based on my new understanding through the hermeneutic circle (Peoples, 2020). The goal with data analysis was for me to remain immersed in the totality of the lived experiences of my participants at the institution instead of hyper focusing on isolated experiences. The journal memos allowed me to detach my personal reactions to the data for the analysis and findings portions of the research and ensure equitable participant representation and that their words remained their own in the findings (Saldaña, 2021). I also referred to my journal memos to provide me with a certain frame of reference for my thinking when I was writing my implications and conclusion chapter.

Limitations

My proximity to the participants and the institution in which I conducted the research represented a limitation existing before I began this research study. I am aware that my role, presence, and position as an employee of the institution could implicate the research context and participants' responses. I worried that because I am an employee at the institution and a member of the high school math and learning support department, my occupational situatedness would appear inappropriate and hinder the capacity for rapport with colleague- participants. It is true

that while I have a passion for improving math education for students and stakeholders, it is because of the access and insight that I have at work that I narrowed down my research focus so specifically on the international K12 American institution. Colleague-participants were aware of my ongoing research and were supportive. As discussed earlier in the chapter, I shared with them the steps that I would be taken to mitigate my occupational positionality, and the steps taken to and ensure that the findings presented are directly reflective of the information they shared through the interviews and survey data through the hermeneutic circle.

Delimitations

Removing myself from the institution was not an option; instead, I focused within the institution itself. The only requirement that I had of teachers who would be invited to participate in my study was that they could not be first year teachers at this institution. The reason that I implemented this barrier was because part of the interview process would require participants to compare their current students' mathematical foundational skills at the beginning of the year to the mathematical foundational skills of students they have taught at the institution in the past. Based on my insight in the day-to-day responsibilities of coaches at this institution, I decided to not make the first-year barrier applicable to coaches, principals, or directors. Although one of the coaches and principals who participated in the study were new faculty members in the institution, their role involves supporting teachers and working with administration, rather than any face-to-face instruction with students, so I chose to include them as participants.

Another delimitation for this study was how I chose to bind the case. This research was bounded as an international K12 American institution, specifically how an international K12 American institution supports its teachers with the implementation of the mathematics curriculum through institutional collaboration with educational stakeholders to meet the

mathematical learning needs of students. Explicitly analyzing dimensions of the institution remained integral to the purpose of the study; to better understand the current complex and integrated systems to meet the needs of teachers in the classroom to consequently enable teachers to meet the various learning needs of the students in their classrooms.

Study Overview

The purpose of this qualitative case study employing a phenomenological analysis technique was to examine how an international K12 American institution supports its teachers with the implementation of the mathematics curriculum through institutional collaboration with educational stakeholders to meet the mathematical learning needs of students. Through utilizing surveys and interviews, with educational stakeholders at an international K12 American institution, this study explored the following research questions:

1. How does the international K12 American institution support mathematics teachers in addressing the learning needs of underserved students and students with exceptionalities?
    a. How do mathematics teachers across grade levels perceive the institutional support in addressing the learning needs of underserved students and students with exceptionalities?
2. What complexities shape the experiences of educational stakeholders' and their collaboration at an international K12 American institution?
    a. What are the roles and responsibilities of institutional educational stakeholders involved in the curriculum selection process?

This chapter provided a comprehensive overview of the research design and methodology employed in the study, offering a detailed explanation of each step in the process. By presenting the context and significance of the study, my conceptual framework outlined the principles

underpinning the research. Insights from my pilot study conducted at the same institution were shared to illustrate how initial findings informed the current study's research design. The methodology section detailed the qualitative case study approach, including the methodological approach rooted in hermeneutic phenomenology, which shaped the data analysis process. I provided insight to the researcher role, which situated the researcher (me) within the study, and outlined the criteria and process for participant selection. My data collection methods, began with utilizing a survey as a preliminary tool for gathering baseline information, followed by interviews that provided in-depth participant insights. The process of data analysis gave an account of how themes were extracted to address the research questions. The chapter concludes with evidence of the steps that were taken to ensure transparency and rigor throughout the research process. The detailed methodology outlined in this chapter provided the foundation for the subsequent presentation and analysis of findings, where the voices of participants and the themes derived from the data clarified the complexities central to this study.

Chapter 4 - Findings

The purpose of this qualitative case study employing a phenomenological analysis technique was to examine how an international K12 American institution supports its teachers with the implementation of the mathematics curriculum through institutional collaboration with educational stakeholders to meet the mathematical learning needs of students. This study examines emphasizes the in-depth exploration of how various educational stakeholders at an international institution (teachers, coaches, principals, and directors) approach their individual and collective educational and professional practice to provide students with an educational experience that both meets their learning needs and extends on their current mathematical understanding (Peoples, 2020; Priya, 2021). A survey and one-on-one semi-structured interviews served as the data collection methods for this qualitative case study, because they provided multiple perspectives on the phenomena of collaboration that was investigated (Crowe et al., 2011; Peoples, 2020). Throughout the use of the hermeneutic circle, my goal was to better understand the curricular, pedagogical, and individual layers to supporting students within the international K12 American institution – of which I am an employee. Hycner (1999) defined hermeneutical data analysis as an "investigation of the constituents of a phenomenon while keeping the context of the whole" (p. 161). The ultimate objective with phenomenological data analysis to present a narrative of the overarching themes in a manner that is accessible and recognizable to those who have also engaged in or been a part of that institution-as-case – me included – as an employee, participant, and researcher. The findings provide a comprehensive account of supporting students through collaboration with educational stakeholders within the institution- the case.

Participants discussed how the international K12 American institution is currently striving to implement progressive teaching practices but is hindered by systemic challenges. Participants highlighted how both institutional leadership (coaches, principals, and directors) and classroom teachers navigate these constraints, the institutions' efforts to use data and innovation, and ultimately how these dynamics impact student learning outcomes in math. Additionally, participants shared experiences ranging from the broader institutional environment to specific divisional and classroom instructional practices. The themes, ideas, challenges, tensions, and successes that emerged from participants' experiences shaped the narrative of this chapter, guiding the analysis of their perspectives on mathematics instruction, institutional support, and collaborative efforts within the institution. The chapter is organized by the following evidence categories that were presented by the participants: curriculum and pedagogy, student needs and classroom environments, instructional practices and strategies, differentiation and scaffolding, challenges in implementation, assessment and data-driven instruction, teacher roles and challenges, and institutional and administrative support. The names or specific grade levels of participants will not be provided as to protect their anonymity; however, participants will be referred to by their job title (elementary/middle/high school teacher, instructional coach, curriculum coordinator, principal, or director). A math teacher at this institution is a classroom teacher in either elementary, middle, or high school. An instructional coach at this institution is responsible for supporting staff with instructional practices and strategies required to implement curriculum. A curriculum coordinator at this institution is responsible for supporting staff in curriculum implementation. A principal at this institution is a member of the school administration; a principal or assistant principal of a division (elementary, middle, or high

school). A director is a person responsible for leading K12 faculty and staff of a specific department.

Institutional Layers of Support

Coaches, principals, and directors highlighted the overarching structures and supports that shape teaching and learning across the institution; providing a necessary foundation for understanding the broader educational environment explored in the following findings sections. The instructional coach noted the layers of support for both students and teachers, and how coaches fit into those layers. Additionally, a director noted another source of teacher support—the assessment coordinator—who ensures that teachers are executing exams so that "the institution [can] look at trend data…against other comparable international schools and for teachers to use to support their instruction, arguing "you need to use data that is provided to you." However, throughout conversations about the data that is collected with the instructional coach, curriculum coordinator, and directors, no one explained the process of implementing that data from assessment scores back into the classroom to improve students' mathematical understanding or inform teachers curriculum implementation. While a director shared that "As an institution, our aim is to use the data that informs us about where a student is instructionally and identify suggested steps of what skills students need and are developmentally ready to learn"; insight on what that process of using data to inform instruction looks like – or if it even exists. A principal communicated that "The goal is that as an institution we are aiming to ensure that when we make decisions that impact student learning needs, we are making data-driven decisions." Yet during interviews with teachers, their (teacher) perspectives diverged and reflected different viewpoints and interpretations about how the institution utilizes data to make informed decisions.

At the elementary school level, students receive instruction based on their grade level and the understanding is that teachers are meeting the learning needs of their students through instructional strategies while navigating through the provided curriculum. A principal explained that after math curriculum and classroom resources are selected, as grade level team they "then classroom observations are conducted on a need to basis by the administrative team and coaches to ensure that various instructional strategies are effectively being implemented to address student learning needs." However, something that was not mentioned was what specifically those stakeholders are looking for when they enter the classroom. While no participant mentioned what administrative stakeholders are looking for during observations, the directors and principals discussed larger strategic efforts aimed at getting everyone acclimated to what is expected in observations. A director articulated that "for students who are struggling in general we -the institution- refers to the strategic plan (see Appendix K.). It was created in part to meet the unique needs of learners requiring additional support." They continued: "while those are not goals specifically crafted for mathematics, the institution has historically provided training for teachers in assorted areas of providing instruction for learners." Access to professional development is a key benefit that the institution promotes throughout its hiring and onboarding process. I know because when I was interviewing for the institution and throughout the first few weeks when I started, professional development was constantly referred to and toted as an elite institutional support available to teachers. A principal extended the director's assertion and stated "Previously, the institution had a two-and-a-half-year contractual relationship with an offsite math consultant that would visit periodically and provide onsite training to teachers that would address concepts pertaining to meeting the learning needs of all students, not necessarily only the students who had learning needs." However, something that was not mentioned in any data

collection method was the role that curricular vertical alignment plays in conversations that take place institutionally. The various layers of institutional support highlight the staff structures that are in place and simultaneously underscore the challenges that shape math teaching and learning across the institutional, providing a foundation for understanding the broader educational environment.

Instructional Practices and Strategies

Teacher and coach participants across the institution discussed how they incorporate the eight mathematical practices adopted by the institution (see Appendix M.) to align with the U.S. national mathematical standards to cultivate and increase foundational understanding. The eight mathematical practice standards from Common Core emphasize problem-solving, abstract and quantitative reasoning, constructing and critiquing arguments, modeling with mathematics, strategic use of tools, precision, recognizing structure, and identifying patterns in repeated reasoning to develop deep mathematical understanding and competence (*Standards for Mathematical Practice | Common Core State Standards Initiative*, n.d.). A coach noted mathematical practices remained a "big focus," beyond "just the math standards" incorporated into instruction and "conversations in the classroom." Additionally, elementary teachers highlighted the collective importance of equipping their learners with a variety of tools to approach mathematical situations. At the elementary division, teachers present students with a variety of opportunities to process information in mathematics. An elementary teacher shared that "We have done the work to reimagine how teachers can present and delivery mathematics content. Through incorporating the mathematical practices and providing visual aids, teachers note that these supports have allowed for students to justify, critique, understand, and persevere while concurrently building students confidence in themselves as mathematicians."

Educational stakeholders at the institution recognize the positive impact of effective instructional support. A principal highlighted "Positive impact students that they have observed are an increase their math confidence, academic performance and, sometimes, they are able to advance their course of study." Providing students with well-implemented instructional practices and strategies allows them to have options in their current and future math learning journey. An elementary teacher shared "By building their confidence, students form a new relationship with math." Similarly, a high school teacher stated, "When their (students') math confidence grows, they are more willing to try harder and unfamiliar math problems and share out loud when they do not understand a concept." Through examining the core pedagogical approaches and instructional strategies that are being implemented in classrooms to support mathematical learning, participants reflected on practices and strategies that they utilize during math instruction. Other elementary teachers discussed how students "employ hands-on mathematical activities, daily practice of problem solving through real world scenarios, and emphasizing teaching students' multiple strategies to approach mathematics all with the goal of enhancing students' comprehension and engagement." Participants in various roles across the institution emphasized that the implementation of instructional strategies are essential for promoting both procedural and conceptual mastery to ensure that students can apply their learning across different contexts.

Co-Teaching and Co-Facilitating

Building on the foundation of instructional strategies, participants also spoke about collaborative dynamics of co-teaching and co-facilitating in the classroom to support students in mathematics. Teachers across the institution recognized a growing need among students to enhance the impact of learning, leading to a shift in instructional approaches. Based on

conversations with educators their feedback on student reflections, the observed instructional improvements are attributed to changes in task design, multiple guided opportunities, and the integration of collaborative teaching strategies. All educational stakeholders that are actively engaged in high school spoke of the success of implementing and utilizing a co-teaching classroom model. High school teachers shared in their interviews that their departmental focus for the current school year was to create opportunities for co-teaching and co-facilitating in various math classes by giving up some of their prep periods. This initiative aimed to implement a well-researched instructional strategy that would both address students' learning needs and foster professional growth through collaborative support.

This division (high school) identified research driven instructional practices to address how they can better support students in math classrooms. The model was established to support struggling math students, hoping to analyze pedagogical practices to elevate students' learning. Numerically, having additional support in the classroom provided students with more opportunities to ask questions and receive answers. Holistically, the model exposed students to different teaching styles and methods of questioning and problem-solving. High school mathematics teachers shared the success they and students have experienced in classes where there were two teachers present, and how the model elevated their teaching practices individually and across the department. One high school math teacher shared, "When I observe another teacher, there is always something for me to pick up and implement in my own classrooms immediately. Whether it is the way that other teacher has their classroom is set up, the way that they explain a concept, or the way they interact with their students." Another high school teacher noted how in the past, teachers who were new to the institution were often paired with another teacher to further support struggling students in their courses.

However, another teacher asserted the difficulties of supporting students without an extra teacher present: “it is nearly impossible to reach all students in a timely manner when there is only teacher in the classroom because navigating the demands of students varying ability levels becomes a complex process.” These high school teachers shared how challenging it is to meet those same needs when they are the only teacher in the classroom, speaking to the significance of implementing a co-teaching and co-facilitating model. It was not only the teachers who understood the benefits of co-teaching and having multiple teachers in the classroom. A director asserted how “co-teaching and in-class support” represents “an institutional support that is most helpful in effectively meeting students instructional and curricular needs.” Both principals and directors noted that teachers themselves “have indicated that having a co-teacher has been helpful.” Implementing co-teaching and co-facilitating in the classroom allowed the high school stakeholders to see improvements in more students meeting the learning targets and obtaining proficiency around mathematical standards.

Differentiation, Scaffolding, and Student Perceptions of Math

Building on the collaborative dynamics of co-teaching, participants also discussed how differentiation and scaffolding strategies have also been implemented to meet diverse learning needs. Participants across groups noted a shared institutional understanding of the importance of implementing various instructional strategies in math classrooms to address student perceptions of and confidence in math. A high school teacher communicated “planning to allocate resources towards mathematics instructional materials and resources is that much harder when you have a large group of students across all mathematical content areas.” Another high school teacher expressed that “While growing a mathematics pathway was enough to meet the learning needs of students several years ago, now the high school is at the point where they need to think about

how they support those students, because as the volume of student enrollment has continued to increase so has the curricular needs that students are entering the classroom with." All math teachers noted that something that needs to be present every day is the intentional structure of the lessons to meet the two spectrums of students; an elementary teacher described them as "students who are performing below course standards and students who are exceeding above course standards." However, at the high school, there is also language diversity that teachers suggested they needed to consider, as well. A high school math teacher said "There are students who are second or third language learners. Those students are processing at a much slower speed than our other students who are native English speakers and have been enrolled in an English speaking school for their entire education." Then there is a diversity in mathematical ability and mathematical understanding. Conversely, principals did not speak on about the needs of students in the classrooms, instead they lauded the institutions' hiring practices and their ability to find great teachers who have experience teaching all over the world.

There are students who are really struggling because they do not have the math foundation they need and there are students who are really strong mathematically or they are coming from other institutions very strong program. "These are the students who are looking for challenge, but they are not getting that because they are not able to work with other students who are at their mathematical level and be challenged by them", explained an elementary teacher. Broadly, students in math classrooms across the institution are not receiving instruction to that has been tailored to meet them where they are. While addressing the diverse learning needs of all students remains a challenge, a critical focus lies in understanding and supporting those students who are currently and have historically performed below grade level or course standards. Additionally, teachers also noted that students' broader perceptions of math were largely

negative. An elementary teacher presented data that their team collected noting that "70% of students in the grade level do not feel like they are people who are or can be good at mathematics; further, those students also shared that they 'hate' math." However, a principal noted the frequency they "have observed students who receive regular differentiation or scaffolding be able to increase their math confidence, and academic performance and, sometimes, advance their course of study." A high school teacher concurred: "Differentiation provides opportunities to each individual student to achieve their personal goals in math and feel more confident."

However, there were conflicting ideas about when to phase out scaffolding, specifically, due to the nuance of instructional design and how teachers need to balance providing support while maintaining student academic independence. An elementary teacher conveyed that "It is a challenge to determine the appropriate level of support, manage individualized guidance within limited time constraints, address varying student needs effectively, and ensure ongoing assessment and feedback to facilitate skill progression while fostering independence." Another area of struggle was differentiation and how to execute it in a manner that meets students at their readiness levels because stakeholders conveyed that individualized student support is the driving force behind selecting and tailoring strategies every day. In elementary school, teachers argued that small group practice has made a big impact on students who are performing below grade level. An elementary teacher expressed "When a student is missing foundational skills having access to grade level math conversations are incredibly difficult. To meet those needs, each grade level is partnered with a learning support teacher." Another teacher explained the process which is "The general education and learning support teacher collect data to look at trends and needs of students within that grade level. Then, they look at their students and what they need across the

board. Together they decide which strategies they will implement to meet those identified needs." Additionally, "For some students, the decision that is made is for them to receive pullout instruction targeting the mathematical skills identified in the data. For the students who do not receive pullout instruction, they are placed in similar ability groups to have the opportunity to work with students at their level." A director confirmed that the process explained that the above-mentioned process is accurate and that "the common understand institution wide is the belief that there needs to be systems in place to identify those students who are consistently not meeting course standards, but where there are discrepancies is choosing, implementing, assessing, and reevaluating the best instructional practices to meet their needs."

An elementary teacher shared that "The goal is to not hold [students] back but instead the focus is on giving students a next step to access the lesson." The instructional coach noted the steps preceding student removal: "After a teacher has collected data there is a meeting scheduled for the two of us to analyze the data and create an action plan for how those students' learning needs are going to be addressed." While participants noted how educational stakeholders need to meet them where they are and provide the appropriate supports to get them to where they need to be; others explained that "sometimes the decisions are made is to pull those students away from current classroom learning expectations and then give them an opportunity for more practice. That opportunity is presented in the form of working in a smaller group or one on one with the teacher on a specific learning target." Elementary teachers highlighted that certain grade level teams have identified that "because math is a skill-based discipline and practice is paramount to success; teachers will look through the lesson and adjust current learning objects to mirror where a student or students are currently struggling." While both middle and high school divisions have learning support teachers, the indepth nature of the support they provide does not look like the

elementary schools' at all. Participants across the institution additionally emphasized the significance of making sure that every student, regardless of their ability level, receives support that is appropriately meeting their current needs.

Curriculum Alignment

High School Math Course Overhaul

A few years ago, in the high school they overhauled the mathematics pathway for students (see Appendix J.) because the math department identified that the current math pathway was not meeting the learning needs of students. The course offerings at that time for grade nine and 10 students were grade nine math and grade 10 math, respectively: with the opportunity for students to take an honors track of their respective grade level course. From there, the only options they have were to enter the International Baccalaureate (IB) program for grades 11 and 12; there were no other options. A principal shared that in their division, they established a common belief that it was important to allow students in grades eight through twelve to be able to access the mathematics course that they needed based on their proficiency level, rather than their grade level. The principal continued to explain that while enrollment increased and students began presenting with more pronounced learning needs in mathematics, high school restructured their course offerings to move to an Integrated Mathematics Pathway – Integrated Mathematics I,II, and III – Pre-Calculus, Advanced Placement (AP) Statistics, AP Calculus, IB Applications and Interpretations Standard Level, IB Applications and Interpretations Higher Level, IB Analysis and Approaches Standard Level, IB Analysis and Approaches Higher Level, Applied Mathematics Financial Literacy, and Applied Mathematics Data Science. While the high school course overhaul marked a significant shift in its curriculum structure, at the time, ensuring alignment across all grades at the institution was a finding of high priority for some participants.

Institutional Curriculum Alignment

Participants shared their experiences with how curriculum design and pedagogical strategies shaped the overall learning experience. A director explained that "the curriculum that the institution endorses, purchases, and implements plays a critical role in their pedagogical philosophy in how various instructional practices are implemented." Given that is an international K12 American institution, math curriculum falls into one of three buckets: alignment with common core state standards, International Baccalaureate (IB), or Advanced Placement (AP). The instructional coach in explained that the process for selecting the most recent math curriculum that was adopted was "We look at data and we make sure that they are the programs where the resource that we are using is aligned to the standards that we are teaching and that we are reporting on." The instructional coach continued "we knew that we need to make sure that we were looking at a resource that was going to be the right fit for our students at our school. The right fit for teachers at our school so that it was being implemented with efficacy." No further details about what the curriculum selection process entails for other divisions was provided. Teacher and coach participants described curricular alignment as "necessary," "important," and as "beginning with the end in mind."

An elementary teacher shared that the way their team approaches which mathematical skills need to be specifically targeted in their grade level is by "knowing our goals and what the next school year will cover. Also, we know that in kindergarten, some of our goals are only taught in kindergarten and those are extra important." A principal revealed that,

> …across all grade levels throughout elementary there is a standard for what our beliefs are about mathematics and established supports to reframe mathematics to

be reinforce the philosophy that students going in-depth in the curriculum is more important than the speed at which they move through the curriculum.

Members of the elementary division maintained the shared belief that any student can learn mathematics, regardless of grade level; but argued that the importance rests not in pacing, but rather, based on meeting students where they are.

However, when another principal was asked what are the steps they take to foster collaboration and communication between instructional and curriculum coaches, teachers, and the Director of Teaching and Learning to ensure alignment in supporting math instruction; the principal noted this remained an area of growth. They stated "I think it is an area that there needs to be some greater harmony around. There is a lot of work to do to make sure there is that vertical articulation conversation happening." So, while they aspired for everyone to seek curricular alignment, the principal noted this remained difficult to achieve due to missing "harmony." Another principal in a different division echoed this same sentiment, noting a pervasive "disconnect" across the three divisions at the institution. While hoping to ensure alignment in supporting math instruction, a principal noted the "disconnect when it comes to [the] elementary school. We have done a decent job, in grades six through twelve, but that's where we could do some more together because they (the Office of Learning) hold the K12 picture. And so, we could, benefit from that." As a result, some principals noted glimmers of success, while others spoke to challenges around stakeholder "harmony" and the "disconnect" between them that remained.

While participants touched on some institutional importance placed on alignment, they framed this importance as mostly discursive by highlighting how the enactment of curricular alignment on the ground remained uneven. A shared frustration among principals and teachers

was the discussion of—but also lack of follow-through—around vertical alignment. A principal discussed their hidden frustration around the lack of vertical alignment they and their administrative colleagues have expressed: “at a K12 institution, a reasonable expectation is that each previous grade level is meeting the curricular needs to students to be successful in the next grade level.” A high school teacher reported that “Our number one current need is to have a conversation vertically. Because it is really hard to figure out from year to year where kids are at coming in and what they have been exposed to” and another high school teacher expressed the same need and said, “It is one thing to know what students know and where they are coming from (regarding their mathematical understanding), but it is an entirely different conversation to have about how do get students where they need to go within the mathematical pathway.” Overall, participants discussed the importance of curricular alignment as a general institutional and pedagogical practice and policy.

Math Curriculum Misalignment

Despite continuous conversations about K12 math curriculum alignment, questions simultaneously arose about what actually happens during mathematics instruction in practice, and what stakeholders each believed successful math instruction to be. Teachers, the instructional coach, and the curriculum coordinator highlighted the disconnect of institutional understanding regarding mathematical pathways, emphasizing that students' progression across grade levels and into high school does not follow a strictly linear trajectory as depicted in the official math pathways model (see Appendix J.). A principal discussed the initial aims to foster collaboration and communication between instructional and curriculum coaches, teachers, and the vision of the Office of Teaching and Learning; alongside the challenges of potential “misalignment” and subsequent necessary steps:

> The standards are the foundational pieces. We look at the curriculum, we look at the standards, we look at our assessment pieces, and what we do is we make sure that all of those things are measuring the standards that we are addressing. So, if there are misalignments then we go back and review what our what our purpose is, what are we supposed to be focused on? And then we look at data with our students, about our students, and then make instructional choices after that. In theory, now, sometimes, we don't have time for all of that. But you know, in practice, we do the best we can, because we're not just looking at math as a team. And finding the balance and all of those is tough.

This perspective reflected the institution's commitment to aligning standards, curriculum, and assessment in instructional decision-making. However, despite the emphasis on intentional alignment, time constraints and competing instructional priorities present challenges in fully implementing this process for teachers. While the difficulty of maintaining consistency across subject areas while striving to make data-informed instructional choices was acknowledged, it was not evident in other conversations with participants that the institution as whole understood the daily realities of these challenges.

Other teachers framed this misalignment through their observations of students' lack of preparation. A middle school teacher echoed the challenges related to both alignment and potential pedagogical and subsequent student earning gaps: "a trend is that the math foundational skills that students walk into the classroom with at the beginning of the year have they have gotten worse throughout their tenure at the institution." Meaning that students who have been at the institution the longest, are often the ones who are most behind mathematically. Another teacher stated that "because certain mathematics skills are not being assessed, that also means

they are not being taught, but that does not mean that the students have mastered that skill." Together, teacher participants across all grade levels voiced the same frustrations, the curriculum and content that students are taught from one grade level to the next is extremely misaligned. Similarly, what students are not taught in one grade, is sometimes the foundation of math success in the next grade. Another teacher noted how if students are "unprepared" on the first day of class, "they are already behind." A collateral and unintended consequence of that shared experiences is that to address that, a high school teacher shared that "I have removed anything at all that that I would say is not absolutely mandatory to move on to the next course. So, I have pared down I am one to the absolute basics." Augmenting these challenges, middle and high school teacher participants each discussed the pressure mounting for students to move through mathematical content and standards and how that pressure begins to limit the opportunities for teachers to provide different instructional practices, specifically emphasizing differentiation and scaffolding, even if students require additional instructional support.

Time and [External] Assessments

Another challenge that teachers shared that they face when implementing strategies in mathematics instruction was the difficulty to implement more than one strategy at a time due to the fact that it would not be helping the wide range of learners present in the class. One principal articulated that "heterogenous classes that are large can make scaffolding and implementing other instructional strategies to meet students' learning needs more difficult." They continued to express that "It does not require any major stretch of the imagination to understand that class size, heterogenous classes, transient student population, instructional hours, and frequency of class meetings all play a role in the how well math teachers are able to meet the needs of their students." A teacher concurred, by sharing that, "I think they (institutional administration) need

to understand the reality of our diverse population. We (the institution in totality) are not understanding the mathematical pathway sequencing for students." While elementary teachers often have more students in each class compared to middle and high school teachers, they conveyed that they also experience having a lack of time; however, their lack of time focuses on different needs than the secondary mathematics teachers. In elementary, it is the lack of time to gather so many different materials for the diverse learning needs takes time and foresight to knowing what students need as the challenges may they face when implementing differentiation strategies in math instruction. An elementary teacher communicated that "the challenges in implementing differentiation strategies in math instruction include time constraints, limited resources, classroom management complexities, difficulty in assessing and tracking individual progress." A principal shared that "Time is what is most needed to evaluate students equitably when students are being presented with different instructional strategies to have data to pin-point specifically how much students know versus how much supports have they received." Determining appropriate strategies for elementary mathematics instruction and concurrently determining the appropriate level of support, managing individualized guidance within limited time constraints were salient issues for teachers; alongside the efforts toward addressing varying student needs effectively, and ensuring ongoing assessment and feedback to facilitate skill progression while fostering independence.

Various participants across all positions at the institution conveyed the importance of curriculum alignment consistent with U.S. national and international mathematical standards; however, participants also stressed the importance of broader understanding of the disconnect between idealized teaching methods and daily classroom realities. An elementary teacher expressed "Taking an assessment from our math program and translating it into reporting grades

or student progress is difficult and even though we receive additional support from an instructional coach; it is still nearly impossible. High school teachers who teach math class with an external exam also expressed concerns about undermining long term learning by prioritizing short term performance on internal and external assessments. One teacher said, “Ultimately in any course that has an end of the year or end of a two-year, cumulative test, you are always teaching to the test.” Another teacher echoed this sentiment: “I am trying but I know that I cannot stop because I need to cover the material to be able to make sure that they are ready for the external examinations, it is difficult.” The teacher participants presented a unified understanding that they should try to help different learners with different strategies, but having only 75 mins for instruction four days a week is not enough for appropriate and meaningful implementation. A middle school teacher revealed that “The reality for secondary mathematics teachers is that keeping all students engaged for a 75-minute class period is difficult because of the varying learning needs in the classroom and how it presents a challenge for teacher to be able to plan ahead.” For secondary teachers, it appeared to be more than just a blanket response of class sizes and instructional time. Teachers are having to pare down their mathematics instruction to include only the absolute basics that students need to be able to move onto the next course in the progression. This is not because students are not able to learn the material, but more so because they are not enrolled in a mathematics class that is appropriate to or in alignment with their current level of mathematical proficiency. While institutional aims remain high for students to achieve, external assessment requirements and limited course options for students place the challenge on teachers to navigate the daily realities of teaching students who are often not ready to develop a strong conceptual understanding of the mathematical content for the grade level or course they are in.

Assessment and Data-Driven Instruction

A director disclosed that in the area of using assessments to make data-driven decisions that impact instruction, they believed that strongest arguments for evidence was elementary school. The director described that "They (elementary) are grouping students based on ability levels, every couple of days they are looking at data, they are constantly giving of formative assessments, and regrouping students based on the formative data." The elementary division has taken a collaborative teaching approach where teachers are working together to identify the skills that students need, organize them into small groups, and provide more direct instruction so that students can have multiple opportunities to master the content or can extend their understanding when they are ready for additional material. While each grade level is using their own data metrics; there is not a finalized or official institution metric that is utilized. Middle school also engages in their own data practice to provide students with the opportunity to take a different mathematics course in grade eight; either grade eight math or Integrated Mathematics I. A middle school teacher explained "This allows students to be in a class that is more closely aligned to their learning needs and opens up more potential pathways in high school." However, high school teachers communicated that these practices in elementary and middle school are no longer positively affecting students when they get to high school. One high school teacher said "I think that allowing kids to skip classes is insane. And that has just gotten out of control. There has not been a no given. So that is frustrating." As a result of allowing students to skip with little to no data present, a high teacher said "It is slowing my classes down immensely and now I am more focused on concepts and procedures than I am the big picture of can you talk about mathematics? Can you apply mathematics? Now it is just trying to get them (students) to get the basic math concepts."

Assessing and tracking student progress is one aspect of data-driven instruction, as made evident by how much the secondary mathematics teachers discussed how they use formative assessments to drive classroom conversations and adjust their teaching practices. One high school teacher shared "I start observing them and collect data through formatives, check the formatives and, and see what I can do. An elementary teachers highlighted that "We use external assessment data alongside internal assessment data to inform the differentiation and scaffolding strategies we choose to implement." However, another elementary teacher said "Our own teacher judgement and qualitative data seems to be used more than quantitative data. The coaches, principals, and directors revealed how the inclusion of internal and data drive the strategies the institutions' commitments time and money into to better meet student's and teacher's needs at the elementary and middle school divisions. Specifically, whether that be time or money that is needed and how it will be allocated. Still, there are prominent gaps in data collection and the use of external data to drive decision making in the high school division.

Math Competency Influencing the Execution of Instructional Strategies

While curriculum constraints highlighted the challenges participants at this institution have faced, the competencies required to navigate these obstacles also play a key role in shaping the execution of the mathematics curriculum. Areas that participants identified as having an impact to students' needs and classroom environments are students' mathematics retention and mathematical application. Since mathematics is a content area that builds on prior knowledge, when skills are missing, it makes math classes immensely more complicated for both students and teachers. As high school teachers collectively identified "students progressing from sequentially from one course to another are forgetting; it is not that they skipped a class and did not show mastery before, it is that these students took Integrated Math III last school year and are

now enrolled in IB Applications and Interpretations HL, and they have forgotten mathematical skills and concepts. A high school mathematics teacher affirmed that "in terms of what supports they have found that their students need, but are not able to provide, sometimes it is linked directly to what they (teachers) are teaching." A principal expressed frustration about the lack of classroom discussions as a pedagogical strategy in math classes: "students throughout their educational career have to continue going up the vertical ladder with solving math problems but not really having the opportunity to talk about how they solve math problems." A middle school math teacher echoed the same concern: "Providing opportunities for students to talk about math and show different ways of their reasoning is a challenge." However, other stakeholders spoke of the need to ensure students understood more basic concepts as the primary concern: "While I can identify some of the basic skills that students are lacking for example: fraction work, integer work, and number sense, those are also areas that they (students) should be coming into high school with a proficient in those skills." When it comes to high school mathematics teachers addressing those gaps in curricular skills, once again, they have created courses for students to have the opportunity to close the content gaps and set students up for success either in the next iteration of a mathematics course or success on an external exam. Participants asserted the need for consistent instructional strategies alongside vertical math curricular alignment, to create a universal mathematics learning experience K12 to allow for students to experience success.

Student Learning and Achievement

Student mathematics retention and application was another concern teachers raised. A high school teacher who has taught the same students in an Integrated Mathematics course and an IB course back to back shared "they (students) have just forgotten. So, it is a retention problem. Abig one." A middle school teacher said, "The vast majority of students who struggle

in math is because they cannot take in new information and use it quickly." Teachers shared what strategies they were using to ensure students' retention and ability to apply mathematical concepts across multiple scenarios. An elementary teacher shared their process for supporting the learners in their classroom "Providing introductory tasks for foundational understanding, intermediate tasks for moderate challenges, and advanced tasks for deeper exploration and application." Another elementary teacher admitted that "students in the younger years are being asked to verbally explain their reasoning." They continued to say that "We have seen an increase in student efficiency within problem solving and student made connections through using the numerous concepts to layer and strengthen their understanding." Teachers found that by providing students with talking stems and opportunities to discuss with partners have helped combat the dip in student mathematical retention and application. However, the factor of student populations in classrooms indicated that large classroom enrollment sizes and diverse ability levels limit the extend of how much individualized support can be provided in the classroom.

Addressing the diverse student needs was another central theme that participants conveyed, specifically around exploring how the classroom environments influence student learning outcomes. Teachers across grade levels spoke of reteaching content that students have already been introduced to throughout elementary and middle school; noting that sometimes it is as if students are seeing and learning the content, skill, or standard for the first time. When asked to compare their current students' mathematical foundational skills to those they have taught in the past at the institution, a significant majority of teachers either said that either the foundational skills of students has remained stagnant or declined, because in years past students were also not entering the classroom with the mastery of the prerequisite content. A high school teacher explained "if this phenomenon has not been isolated to specific classes or divisions and

that it does not appear to be an institutional secret because provisional arrangements have been made either within grade levels or divisions." In high school a course titled Foundation of Algebra was created to meet the needs of students who were not ready for Integrated Math I in grade nine. Students enrolled in the course were identified as struggling with number sense, fractions, decimals, solving one step equations. They were not coming in to high school ready for Integrated Math I. The trend the middle school and high school teachers discussed was that as the mathematical foundational skills at the beginning of the year decreased, teachers' mathematics instruction needed to change. A high school teacher articulated "Comparing my students this year to what who I have taught in the past, I would say that their mathematical foundational skills have gotten worse." As a result, teachers began the year covering algebraic basics because they noticed that students lacked an understanding of fractions, integers, solving equations, or graphing.

While a principal praised that "those courses have been evaluated as meeting the learning needs for the students enrolled in those courses," many high school teachers pointed out that there are still students that are placed in the current mathematics pathway but that is not the most appropriate placement for them. A high school math teacher said, "I think the school has done a good job by creating a foundations class and applied math class for those kids who would not necessarily meet what we would consider like the traditional math course pathway." But another high school teacher noted that even year 12 students would benefit from an accessible course offering—not just early high school students: "I would also like my principals to be open to looking at the current math pathway and creating an opportunity for students in grades eleven and twelve that is not just IB, AP, or Applied Math for learning support students."

Students Performing Above and Exceeding Course Standards

In conversations with teacher participants, they mentioned also struggling to support those students who were meeting and exceeding the standards for the grade level (elementary and middle school) or math course (high school) they were enrolled in. A high school teacher highlighted that "A common misconception is that when educators talk about students that need more, the assumption is always that those students are struggling to keep up with the curriculum." Another high school teacher shared that "especially in the higher-level mathematics courses, there are students enrolled that are needing more from the curriculum and their teachers to provide a truly challenging and engaging instructional experience." They went on to elaborate "I am having to provide students with more advanced material while teaching the rest of the class. Luckily, these students have the self-study skills and discipline required to successfully complete the additional advanced material." However, it was noted that in elementary school there are no opportunities for students to move along through curriculum even if the data is showing that they are ready for more challenging concepts. In elementary, there is a teacher currently operating as an upper interventionist. They explained that "I have two students who have mastered all of the curriculum for that grade level, and now I am working to create the extension curriculum." These accounts underscore the importance of proactive instructional planning by teachers to address the needs of students who surpass grade-level expectations and educator intervention in facilitating meaningful learning experiences beyond the prescribed curriculum. A coach shared "The reality is that differentiating for the student who is preforming at and exceeding course standards has a positive impact during math class. These students are thrilled to have a challenge." However, this is not something that is as easy a fix as providing students with a harder mathematics problem. As an elementary teacher stated, "Appropriately

engaging students at a higher level requires time, planning, and sometimes creating the materials needed to challenge students in mathematics instruction." To ensure all students are appropriately supported, the role of administrative and institutional for stakeholders become pivotal, as explored in the next section.

Administrative and Institutional Support

Participants discussed the role of institutional collaboration, namely the positive departmental and cross departmental teamwork to foster a more integrated approach to mathematics instruction. Unfortunately, many teachers shared that there is a lack of consistent administrative presence, and it leaves teachers feeling isolated and without the guidance they need to implement differentiation, scaffolding, and many other instructional strategies effectively.

Administrative Presence

When participants were asked what supports their principals are providing that is enabling them to continue their work, a high school teachers shared "Our principals listened when the department proposed that there needed to be a new mathematics course created for students who were not successful in the traditional pathway or were taking math classes online independently." An principal shared "members of the high school administrative team were heavily involved when the institution made the transition to Integrated Mathematics. We conducted parent education conversations and supported the mathematics department in selecting the curriculum resource that would be used starting in grades eight continuing through high school." Another high school teacher highlighted that "I do feel like if I go to a principal, one on one with a student and I describe what is happening with that student, or I describe for them what is happening in the class, I usually get a positive response." Teachers do believe that their

principals are supportive in how they (teachers) choose to handle classroom behaviors. Another high school teacher revealed that "The high school administrative team have been quick to jump in for various circumstances and offer to go into the classroom and have a conversation with that student, or conduct an unofficial classroom observation to identify behavior, or most commonly, agree with the course of action the teacher has shared with them."

In middle school, one member of the administrative team was a former math and shared that "We (the institution) were making a shift in the program at the high school and decided that the mathematics pathway would open for students in the middle school, and I worked passionately with the middle school mathematics department to support them with those changes." They (principal) attend planning meetings, participates in conversations about unit planning, students' assessments, and is in the mathematics classroom when achievable. Their support to the middle school mathematics department is through setting up protocols to look at assessments, moderate them with each other, and give feedback to each other. Collectively engaging in conversations about different students and how the team wants to approach the support they provide to students to ensure that they can access the curriculum and work towards mastery of mathematical standards. In the elementary division, a teacher shared "There has been an increase in administrative attendance in meetings with parents to reiterate the importance of a positive school family partnership." Another elementary teacher affirmed the previous statement by sharing how far the elementary administrative team has come because now there are hard lines and clear expectations that are set and upheld.

I asked one principal "what specific steps do you take to secure support from instructional and curriculum coaches, and Teaching and Learning Center to align their assistance with the institutions goals for math instruction? and their response was "it is my job to make sure

that there are opportunities between the office of learning, the learning leader and the teachers of mathematics to come together." However, when I posed the same question to another principal they said "We (principals and coaches) are also attending planning sessions with teams, supporting teachers in collecting student data, and designing a body of evidence that is stored all in one place so that all necessary stakeholders can access it." The institution, and primarily its administrative stakeholders, expressed mixed levels of shared accountability and responsibility around which stakeholders should be involved in conversations regarding the teaching and learning that occurs in math classrooms. A director shared "Whenever there is a consultant on campus the institutional administrative teams are invited to be involved in that process as well. There is an expectation that they (principals) attend those meetings and are included in the learning." The main ways that the principals expressed their support for the mathematics programs offered in their various divisions are through occasional classroom walkthroughs and asking questions of students about their learning both inside and outside of the classroom. Overall, many participants have shared that they have a satisfactory relationship with their principals. While positive administrative support fosters collaboration and effective instructional practices, inconsistencies in support creates barriers to achieving these outcomes.

Uneven Instructional Support and Teacher Involvement

Discrepancies in instructional support and teacher involvement have contributed to inconsistencies in key educational initiatives across the institution. A principal provided clarification on how they work with their teachers to identify those students who are consistently not meeting course and mathematical standards. They shared the process by which they begin the individualized student support procedure:

> We enact a four-part process of identifying student behaviors and outcomes, analyzing data with a system, collaborating with members of the learning support team and/or school counselors if needed, and finally tapping into other principals' experiences. An understanding of what that process could look like is identifying a student who is not meeting core mathematical standards over a period of time, the next step is to bring together that department or grade level team to identify any patterns that have presented themselves either in classrooms or across academic areas. Then, the next step would be to provide that student with some pullout and targeted instruction for a predetermined amount of time. In a perfect world, the student is able to address their learning gaps and rejoin with specific content mastery and they will now move through the rest of the course with ease. But that is not how most scenarios go; so, the final step is meeting with other administrators at the institution to brainstorm other strategies that can be implemented to support this student on their learning journey. Regrettably, the last step in this process is often neglected because of time and the speed of mastery that required for students to maintain momentum in their learning.

The institution situates instructional coaches as the primary pedagogical support point-people for teachers. While instructional and curricular coaches spoke about teachers' pedagogical strategies, they did so abstractly, unsure of what math instruction looked like in practice. The curriculum coach revealed "In coaching it would be looking at instructional strategies and practices, to then also identify what our strategies will be. That said, I have not done any of that here with any math teachers." They continued, "It seems coaching is happening in elementary. Though, I do not know what it looks like. Outside of the selected teachers I work with, I do not know what it looks like in secondary. I hear that it is happening, but I do not know."

When administrative support falls short, educators struggle to align their practices with institutional goals, leading to gaps in instructional effectiveness. A high school teacher expressed "I would like new strategies because the current strategies we (high school math department) are employing are not useful in meeting the needs of our current demographic and student needs." Another high school teacher shared "I would like to have an expert in instructional strategies and implementation to give me more support that is specifically tailored to what has been identified as needs from us – the teachers, not what coaches or principals are saying they would like to see." An elementary teacher shared "while we are differentiating and scaffolding their mathematics instruction, yet there are times when these efforts prove to be insufficient, leaving feeling frustrated and unsupported in meeting the needs of our students." One participant shared "At a previous institution, there was a department of teachers who job was to help the content area teachers with instructional support and resources to help their students." Having a similar structure implemented has been identified as something that is needed by participants at the current institution because there is an increasing subset of learners who are encountering daily difficulties in mathematical content, comprehension, and demonstrating proficiency. Some teachers in the high school revealed that they have opted to give up one of their instructional planning periods to get support from departmental team members through co-teaching. These teachers are going into another mathematics class to support their team members because there is a unifying belief that having two teachers in the classroom is most beneficial to students and alleviates isolation in teachers but more importantly as one of the teachers communicated "We provide each other with the support we need within the department; otherwise, it almost does not exist."

Correspondingly, in the elementary division, teachers would like to participate in more meaningful data conversations. An elementary teacher elaborated "Whenever there is a new professional development opportunity it seems like the focus is on the shiny and new idea rather than getting to the conversations about what is currently being done for their students and whether or not there is a shared belief that the identified students needs are adequately being met." Another elementary teacher expressed "I would much rather spend time having more discussions about data and focusing on current data analyses and various instructional practices that can be implemented to meet students' needs." Something that was omitted from all principals and directors was the support they received from each other (either positively or sub-optimally). While all principals or directors were able to thoroughly explain what supports are available for teachers – specifically through the instructional and curricular coaches, it was interesting that no senior level cross divisional collaboration or support was ever mentioned. Ultimately, the lack of consistent and cohesive administrative involvement compromises the institutions' ability to foster an environment conducive to collaboration and student success.

Summary of Findings

The findings in this chapter highlight the critical factors influencing how various educational stakeholders at an international K12 American institution approach their individual and collective educational practices. This chapter examined the institutional layers of support that shape instructional strategies, teacher collaboration, and student learning experiences. Efforts such as differentiation, scaffolding, co-teaching, and curriculum alignment are key instructional strategies aimed at improving student engagement and achievement. However, these efforts are often constrained by curricular misalignment, time limitations, and the demands of external assessment in the high school, which pose challenges to both instructional planning

and student mathematical progress. The findings also emphasized the role of assessment and data-driven instruction in shaping teaching strategies. While assessment practices are intended to guide instructional decisions, disparities in curricular competencies and student performance have created additional complexities, particularly in meeting the needs of students performing at various levels in course standards. Coupled with uneven instructional support and variations in administrative support magnifies the gaps that impact the alignment of institutional goals with day-to-day classroom practices. The next chapter will further analyze these findings within the context of this qualitative case study's research questions, situated within literature and conceptual frameworks to explore their broader implications.

Chapter 5 - Discussion of Findings

The purpose of this qualitative case study employing a phenomenological analysis technique was to examine how an international K12 American institution supports its teachers with the implementation of the mathematics curriculum through institutional collaboration with educational stakeholders to meet the mathematical learning needs of students. The following questions guided this research:

1. What complexities shape the experiences of educational stakeholders' and their institutional collaboration?
    a. What are the roles and responsibilities of institutional educational stakeholders involved in the curriculum selection process?
2. How does the institution support mathematics teachers in addressing the learning needs of underserved students and students with exceptionalities?
    a. How do mathematics teachers across grade levels perceive the institutional support in addressing the learning needs of underserved students and students with exceptionalities?

This qualitative case study employing a phenomenological analysis technique examined how an international K12 American institution supports its teachers with the implementation of the mathematics curriculum through institutional collaboration with educational stakeholders to meet the mathematical learning needs of students. Participants represented a variety of K12 institutional roles who discussed stakeholder interactions and collaborations, math curriculum, and instructional and pedagogical strategies for supporting students. Framing the institution-as-case, findings highlighted the role of institutional support in shaping instructional practices, with efforts in co-teaching, differentiation, and curriculum alignment facing challenges such as

curricular misalignment, time constraints, and external assessments. Additionally, assessment-driven instruction and administrative support influence instructional consistency, emphasizing the need for greater coherence, professional development, and resource allocation; speaking to how the educational stakeholders of the institution (the case) collaborate to support its students in math. This chapter situates findings of this study within the broader context of relevant literature and theories, addressing the research questions that guided this study.

Participants shared how instructional approaches at the institution have been constrained by established curriculum pedestalized as the sanctioned form of knowledge and teachers shared how that limits the flexibility in the classroom for teaching and learning (Peng & Nair, 2022). They shared their struggles with maintaining a balance between instructional innovation and the challenges they are facing with implementing teaching strategies with limited time and resources as significant barriers (Mokgwathi et al., 2019). Participants also emphasized the importance of establishing coherence through alignment within the institution to create a unified and structured approach to education (Hadisaputra et al., 2024). Teacher participants shared their experiences of striving for professional empowerment while attempting to navigate institutional challenges, resulting in them often feeling unsupported (Liang et al., 2024). Other educational stakeholders reflected on the lack of a cohesive vision for institutional math curriculum and instruction, which has led to inconsistencies in leadership and decision-making (Siuty et al., 2016). Ultimately, participants highlighted ongoing tensions between institutional aspirations and the realities of everyday execution.

Curriculum and Pedagogy: Confining & Sanctioned Knowing and Doing

As educators strive to meet the demands of curriculum, pacing, and accountability measures, instructional strategies often shift toward procedural shortcuts as was mentioned by

several teacher and coach participants across the institution. Standardized curricula are plans and structures that limits teacher pedagogical autonomy and individual student learning autonomy. One size fits all curricular framing obscures the diverse student needs present in the classroom (Apple, 2006; Ayers et al., 2009). While these rigid approaches may help students achieve immediate math learning outcomes, they do so at the expense of deeper conceptual understanding; a source of tension that was highlighted as a serious area of concern by all secondary math teacher participants in this study. Consequently, this focus reflects a broader misalignment between the intended pedagogical goals of fostering proficient mathematical conceptual understanding and the realities of high-stakes assessments and time bound classroom instruction (Nolet & Tindal, 1994).

A sanctioned form of knowledge refers to knowledge that is officially approved, endorsed, or legitimized by an authority, institution, or governing body (Apple, 2000; Giroux & Kincheloe, 1992). In the context of education, a sanctioned form of knowledge pertains to the curricula, standards, or instructional materials that are recognized as valid and authoritative by educational institutions or governing bodies like school boards and accrediting agencies. While curricular standards aim to provide a structured framework for instruction, educational stakeholders often grapple with the tension between adhering to these standards and addressing the unique needs of students (Grant, 2010). Central to this tension is the concept of curriculum alignment, which seeks to ensure unity between instructional objectives and student outcomes. Also, the relationship between curriculum and pedagogy is fraught with challenges, particularly in the context of diverse student readiness levels; teacher participants expressed how difficult it has been for them to plan and provide instruction when the needs of the students in the classroom are vast.

Ensuring Coherence

Case and Zucker (2005) define alignment as the unity between content standards, assessments, and instructional practices. They explain that educational alignment is needed to ensure that what is taught in classrooms matches the educational standards that have been previously set or agreed upon and is evaluated through assessments. Participants were not able to share how there is institutional alignment between standards, assessments, and instructional practices. While many teacher participants were able to share what they have done or are doing in their classrooms, the conversations were mainly geared to getting students to the end of the year or ready for their next grade level or math course. There was not an emphasis placed solely on improving instructional practices for student learning.

Institutional Horizontal Alignment

Within the broader stroke of educational alignment, there were two main foci, horizontal and vertical. Horizontal alignment is an area of strength for certain divisions of the institution. Horizontal alignment concentrates on how assessments accurately reflect on the standards for a specific subject at a specific grade level (Case & Zucker, 2005). Participants noted that horizontal alignment was an area of strength through shared pedagogical practices, and how they were constantly evolving their individual instructional practices. However, there are divisions in the institution where horizontal alignment is a must; specifically, within grades seven through 12. Through meetings and conversations lead by various stakeholders at the institution, students, parents, and teachers discuss which mathematical pathways students will take beginning in grade eight, teachers begin this unfair race against the clock that is which math with students be able to take in grade 11.

One example was when the institution made the decision to switch to the Integrated Mathematics Pathway in the high school, the choice was made to offer Integrated Mathematics One in grade eight as well. Participants in the high school questioned if the institution truly understood the curricular repercussions of that decision they should have continued to work backwards to answer if students take Integrated Mathematics One in grade eight they will also be missing some of the content that is taught in grade eight math so, the next steps should have been to reexamine and reappraise the curriculum of grade seven and below to ensure that as many students as possible are being prepared for the next math course in the sequence. Thus, creating pathways within the classroom for students to move through the content; not independently, but enclosed in an organized learning framework (Benken & Brown, 2008). Providing opportunities for students to dig deeper into the content not just to go faster and farther ahead. Allowing students to have a learning experience facilitated by the teacher so students can master the mathematical content at the level that is required for that grade and creating conditions conducive for success in their next sequential development in mathematical skills to successfully transition from elementary to middle school and eventually equipping them for high school. It is important to highlight that this was one of the few occurrences throughout this study where participants directly aligned with both Apples' support of curriculum that reflects students' needs (Apple & Beane, 2007) and Ayers' endorsement of student-centered learning (Ayers et al., 2017).

Institutional Vertical Alignment

The second focus of educational alignment - vertical alignment is the coherence between various aspects of the education system: curriculum, textbooks, instruction, and assessments across grade levels to ensure students receive a sound progression of knowledge and skills (Case

& Zucker, 2005). This was a major area of concern for me throughout my interviews with all participants. No one was able to share how vertical alignment is addressed or completed at the institution outside of theoretical steps that should/would be taken. This lack of oversight makes the frustrations that the participants shared more understandable. Apple (2014) discusses how curriculum is shaped by prominent forces, and those voices are what controls knowledge within the schools. If stakeholders are not on the same page about what the end learning goals are for students year after year, there is no way to ensure that students remain centered in curriculum decisions (Apple & Beane, 2007).

When there are no conversations happening about how the institution is planning on supporting its staff members to ensure that students from kindergarten to grade twelve can have a cohesive educational experience, it should not be a surprise when staff members report that students are not seamlessly progressing from one grade level to the next and from one math course to the next. The disconnect between the theoretical promise of alignment and the practical realities of classroom implementation underscores the complexity and failed responsibility of an institution to support its stakeholders and students (Credé et al., 2010). Both horizontal and vertical alignment are critical for fostering student, teacher, and institutional success (Case & Zucker, 2005). Horizontal alignment ensures clarity and consistency at a grade level, while vertical alignment strengthens the entire educational system's coherence, ultimately both supports better instructional and learning outcomes for all involved. In theory, alignment systematizes educational expectations, fostering equity across diverse learning environments (Crotty, 1998). However, when alignment is not prioritized, practiced, and regulated the lack of structure limits stakeholders ability to respond effectively to the individual needs of their students. Curriculum is not solely a collection of content within a subject area, and it is the

responsibility of educational stakeholders to engage with curriculum in a way that allows students to foster inquiry and critically interact with the world around them (Apple, 2019; Ayers et al, 2017).

Instructional Practices: Innovation vs. Barriers

Teacher participants revealed that they are employing strategies such as differentiated instruction and scaffolding to create more inclusive learning environments. Differentiation and scaffolding were evident as being central to teacher participants efforts to personalize learning and support the diverse needs of the students in their classrooms from kindergarten through grade twelve. These strategies are critical for fostering equitable access to education, as they enable teachers to tailor instruction to individual student readiness levels and learning preferences (Ouyang & Ye, 2023). Teachers are notorious for being reflective practitioners who are constantly refining their craft to create meaningful learning experiences for their students (Apple, 2019; Ayers, 2010). However, despite their significance, the consistent implementation of differentiation and scaffolding remained absent from the perspectives of principals and directors.

In addressing the diverse needs of students, innovative instructional practices are essential tools in the classroom (Polikoff, 2015). Differentiation and scaffolding are indispensable instructional strategies necessary to address the diverse learning needs of students, working to guarantee that students can access and meaningfully engage with the mathematics curriculum (Santangelo & Tomlinson, 2012; Siemon & Virgona, 2002). Differentiation, a cornerstone of the many teacher and coach participants teaching philosophy, is designed to provide customized instructional pathways that meet the diverse learning needs of every student (Demos & Foshay, 2009). In practice, however, its application varies widely. In some

classrooms, teachers effectively employ tiered differentiation to offer tasks of varying complexity, ensuring that all students can meaningfully engage with the mathematics content. Conversely, in other contexts such as divisional planning, vertical alignment, and institutional directives, differentiation is entirely absent, leaving students without the targeted support necessary to close gaps in understanding and achieve their full potential.

Scaffolding plays a similarly vital role in improving students' foundational conceptual understanding. By breaking down complex ideas into manageable steps, scaffolding helps students build confidence and mastery over challenging content (Bakker et al., 2015). When applied equitably, it ensures that all learners, regardless of their starting point, can progress through rigorous academic coursework (Amiripour et al., 2012; Widjajanti et al., 2019). However, disparities in how scaffolding is implemented across math classrooms revealed inequities in student access to this essential instructional support again because while coaches, principals, and directors were able to express their varied levels of understanding of scaffolding and the instructional value it provides, tangible evidence of how the institution is currently supporting scaffolding was absent from the discourse of coaches, principals, and directors.

However, facilitating differentiation, scaffolding, and other instructional practices also necessitates significant time and resource investments, and as the student population expands, managing these practices independently in the classroom can become overwhelming. Despite these efforts, systemic barriers often hinder the full realization of these innovative instructional practices. The rigid structure of standardized curricula imposes significant restrictions on content, while time constraints limit the extent to which teachers can implement these strategies effectively (Anfara & Angelle, 2007; Hilliard, 2009; Sagar et al., 2012). For example, while hands-on activities and modeling offer rich opportunities for student engagement and conceptual

development, elementary participants (teachers, coach, and principals) all expressed that their use is frequently curtailed by the demands of a packed curriculum and the need to maintain a predetermined instructional pace. Similarly, middle school and high school participants revealed that teaching students' multiple strategies fosters greater flexibility in problem-solving but requires additional instructional time that they struggle to allocate given the rigid time constraints of a single academic school year and content needed to cover to prepare students for the following years math course and external assessments.

The inconsistent application of these strategies points to broader institutional challenges. Teachers shared that they often lack the time, resources, or institutional support needed to fully integrate differentiation and scaffolding into their daily practices. As a result, promising approaches like tiered differentiation and equitable scaffolding are underutilized, and opportunities to enhance student learning are missed (Windschitl, 2002). The lack of institutional support provided to promote and maintain differentiation and scaffolding underscores the critical importance of nonexistent measures to promote student success (Apple, 2007; Crotty, 1998). However, the potential of differentiation and scaffolding can only be realized if the institution prioritizes the necessary resources, professional development, and support to ensure these strategies are implemented consistently and effectively (Sizemore, 2015). Hands-on activities, modeling, and teaching multiple strategies are the most common practices that were other instructional strategies that were shared across all grade levels. The instructional coach and curriculum coordinator participants communicated how they work with teachers to design curriculum with the purpose to engage students and enhance their understanding of mathematical concepts. These approaches are aimed to provide varied entry points for learners and to deepen their conceptual grasp, aligning closely with the eight mathematical practices that emphasize

reasoning, problem-solving, and communication skills (Ayers et al., 2017). The tension between the breadth of content that must be covered and the depth of understanding that innovative practices seek to achieve highlights a persistent challenge in educational settings (Sullivan et al., 2005; Vigdor, 2013). Ultimately, the narrative of instructional practices in mathematics classrooms reveals a critical tension: while innovative strategies hold the potential to transform student learning, their effectiveness is often undermined by structural institutional barriers (McLeod, 2008). Addressing these challenges will require institutional shifts that go beyond the classroom, enabling teachers to fully embrace best practices and support all students in achieving meaningful math learning outcomes.

Time Constraints and Limited Resources

While the teacher participants know how students should be learning mathematics and were all able to explain how a good math classroom looks and feels, they all revealed that there is not enough time to cover new standards, cover mathematical gaps, assess student learning, prepare students for the next sequence in the pathway, and meet all content requirements for external assessments. Apple & Beane (2007) and Ayers (2010) argue that classroom teachers need the freedom to amend and bend their curriculum to reflect the needs of the students in their classroom and not focus on reiterating the same curriculum screenplay year after year. While participants also shared that challenges such as time constraints and limited resources have hindered progress, these issues are not insurmountable. Teachers and coaches highlighted how through fostering collaboration and providing targeted support, they have worked around those barriers to create meaningful change for themselves and students. One significant challenge that was mentioned by participants was the restriction of time, which limits teachers and coaches' ability to implement innovative strategies and provide individualized support to students and

stakeholders. Additionally, the lack of adequate staff poses a substantial barrier, as teachers are often overburdened with responsibilities that could be alleviated by additional personnel. The shortage of math-specific resources further compounds these difficulties, making it harder for teachers to deliver effective instruction that meets diverse student math learning needs. Financial limitations also play a role, as restricted budgets prevent the acquisition of necessary materials and the implementation of broader institutional initiatives. Despite these challenges, the institution has opportunities to address these barriers through strategic investments and improved resource allocation. By prioritizing funding for additional staff and math resources, as well as creating structured, frequent, and consistent time for collaboration and planning K12, the institution can empower teachers and enhance student outcomes (Crotty, 1998). Ultimately, a commitment to addressing these systemic challenges can pave the way for a more supportive and effective educational environment.

Data-Driven Decision Making: Opportunities and Gaps

Like many US K12 institutions, data-driven decision-making is what was shared by many principals and directors that forms the backbone of the institution's instructional approach, aiming to assess student progress and tailor instructional practices to diverse learning needs. Coaches, principals, and directors stated by leveraging both internal and external data sources, they assert the need for teachers to refine their practices, address gaps in student understanding, and enhance student outcomes. However, despite its potential, significant gaps in the consistent and effective use of data undermine the impact that what principals referred to as “data-driven decision making” has at this institution. Elementary teacher participants revealed that assessment practices, including pre-tests, post-tests, and ongoing evaluations, provide critical insights into students' learning trajectories. They shared how those tools enable them to measure growth and

identify areas of need, laying the foundation to offer differentiated and scaffolded instruction. Yet, the inconsistent implementation of such assessments limits their utility in driving instructional decisions. The role that effective assessment implementation plays in guiding instructional decisions and improving student learning outcomes is not one that should be ignored (Williams, 2012). Formative assessments, in particular, represent an unevenly utilized resource for designing interventions that respond to the unique challenges faced by students across different readiness levels at the institution (O'Roark, 2013). Formative assessments, when utilized and implemented correctly, can represent a piece of the learning process that reminds its participants (students and educational stakeholders) that learning is not stationary, but rather a flowing and involved process that should have student inquiry and engagement with the world around them as the focus (Apple & Beane, 2007; Apple, 2019; Ayers, 2010). Teachers, coaches, and principals all sang the praises of how integral formative assessments are to the institutions' learning approach, however, through a combination of lack of follow-through, limited time, diverse student needs, and limited resources, formative assessments are not being used to its full potential to make a significant impact on student success in the mathematics classroom.

The use of data to influence the implementation of instructional practices varies widely, despite principals' asserting its foundational role in pedagogical and broader institutional efficacy. Some elementary educational stakeholders shared how they have successfully integrated insights from assessments to adapt their strategies, addressing individual student needs through differentiation and scaffolding. However, other stakeholders in middle and high school emphasized that they face barriers such as limited time, insufficient training, or a lack of actionable data, which constrain their ability to make the informed adjustments necessary to support their students in attaining mathematical conceptual understanding. While internal data

(MAP scores, assessment grades, and year-end report cards) hold promise for personalizing instruction by providing detailed insights into student performance and readiness, without an institutional approach to interpreting and applying this data, opportunities for targeted data driven decision making have been continuously missed. This inconsistency highlights a broader need for institutional support in fostering a culture of data literacy and equipping teachers, coaches, principals, and directors with the tools necessary to translate data into effective instructional practices. This also exposes the issue that teachers feel the need to teach to the test, which is a very US based educational practice that Ayers and Apple both vehemently oppose (Apple, 2006; 2019; Ayers, 2009; 2010) due to its capacity to constrain what "knowledge" is considered valuable, further entrenching this framing of knowledge as something finite to acquire (Crotty, 1998). Ultimately, while data-driven decision-making presents a powerful avenue for improving student outcomes, its potential can only be realized through a methodical and consistent effort to bridge the gaps between theory and its application (Cawley, 2017; Maccini & Gagnon, 2006). By prioritizing the use of formative assessments, ensuring equitable access to actionable data, and supporting teachers in leveraging insights effectively, the institution can create a more responsive and inclusive learning environment.

Teacher Tensions around Autonomy, Empowerment, and [Lack of] Support

Teacher participants highlighted the importance of institutional collaboration, emphasizing that interdisciplinary and cross-departmental teamwork fosters a more integrated instructional approach. Within institutions, teachers are at the heart of student success, yet their ability to shape instructional quality and fostering a positive classroom culture is reliant on institutional structures and systems (Harper & Crespo, 2020). Meeting diverse student needs and managing classrooms effectively requires not only teachers' professional judgment but also

institutional policies, resources, and support to enable their success (Manouchehri, 1998). However, their roles (teachers) are increasingly complicated by the tension between their instructional autonomy, lack of necessary support, and the pressures imposed by institutional expectations. Teacher participants also shared how a lack of administrative presence throughout all divisions impact their daily operations in the classroom. Many of them voiced how they have internalized these pressures, placing significant demands on themselves to ensure their students' success while remaining unclear about what the institutional benchmarks are because they have not been vocalized. While this self-imposed accountability has been evident through the teachers drive, innovation, and dedication, it also contributes to heightened stress levels and, in some cases, professional burnout (Apple, 2006; Jerrim & Sims, 2021; Li & Tsang, 2023). These dynamics reinforce the need for the institution to provide robust support structures that alleviate these burdens while empowering teachers to thrive in their roles.

The value of seasoned math teachers within the institution cannot be overstated. Their experience and expertise enable them to adapt instructional strategies to meet varying student needs, support their grade level or departmental colleagues, and maintain stability within the teaching community (Krainer, 2014). Despite their critical contributions, the institutional recognition and support for these stakeholders often fall short, limiting their potential to fully influence the educational environment. At the core of effective teaching is professional judgment, which allows teachers to tailor instruction to the unique needs of their students (Thiede et al., 2019). Yet, the increasing emphasis on standardized practices and accountability metrics often restricts this judgment, reducing opportunities for individualized instruction, teacher autonomy, and expansive enactments of "curriculum" (Ayers, 2009; 2010; Bagger, 2024). Addressing this challenge requires an institutional shift toward a more balanced approach

that values teachers' expertise while establishing and maintaining institutional goals (Sullivan et al., 2013). Ultimately, the narrative of teacher empowerment and challenges reveals a need for institutional overhaul around systems of support both for and by teachers (Apple, 2019; Ayers et al., 2009; Crotty, 1998). By recognizing the essential contributions of teachers, alleviating unnecessary pressures, and fostering an environment that values professional judgment, institutions can create a more sustainable and effective educational system that benefits both teachers and students alike (Bay-Williams & Speer, 2012; McClain & Cobb, 2004).

Other Institutional Stakeholders: An Absence of Unified Direction

Institutional middle and senior leader stakeholders (coaches, principals, and directors) shared how they approach their influence of teaching and learning through administrative classroom observations in elementary, collaboration between instructional and curricular coaches with mathematics teachers. However, intentional collaboration between coaches, principals, and directors was notably absent. Middle and senior-level stakeholders described their roles in supporting teachers and managing institutional responsibilities, yet they did not mention team planning meetings to gain insights from other stakeholders. Although participants recognized the value of collaboration within teaching teams and departments, there was no evidence of such practices being consistently implemented at the institutional level. A principal expressed feelings of isolation, highlighting the absence of a team to provide perspectives and feedback on resolving issues within their division. Balancing the frustrations of teachers, who often feel overburdened by conflicting expectations from various institutional stakeholders, with the somber reflections of middle and senior leaders, who lack day-to-day support, underscores a critical gap.

It is imperative for institutional stakeholders to recognize the immense challenge teachers face in understanding and implementing the many components of successful teaching and learning to meet students' needs. While teachers excel at identifying areas where students struggle and providing diverse methods to support mastery of content, it is unreasonable to expect them to address every individual student need on their own (Rigby et al., 2017). Collaboration across all educational stakeholders is essential to navigate these varied student and teacher needs effectively (Crotty, 1998; Lawson, 2004). The success of instructional strategies at the institution is heavily influenced by the level of support teachers receive from middle and senior leadership. Administrative involvement—or the lack thereof—significantly impacts institutional instructional effectiveness. Administrative observations and positive support play critical roles in fostering a collaborative environment where teachers feel encouraged to implement new strategies and refine existing ones. To address these challenges, it is vital to examine how administrative practices influence teachers' ability to meet instructional goals and foster professional growth.

This disconnect raises essential questions: How does the lack of collaboration between coaches, principals, and directors contribute to low teacher morale and growing frustrations with math instruction? What are the expectations for middle and senior leader stakeholders to support one another in fulfilling their roles? The roles of coaches, principals, and directors are designed to expand the impact of collaboration and provide essential support to teachers in meeting students' learning needs (Crotty, 1998; Goulet et al., 2003; Roberts & Bradley, 1991). However, achieving these goals requires a shared understanding and a commitment to mutual support throughout all phases of the educational process for all institutional stakeholders.

Student Needs: Well-Intentioned Misalignments

Addressing diverse student needs was a central theme in interviews with teachers across all grade levels. Teachers shared how they examine how the classroom environment shapes learning outcomes. A shared struggle for all teachers was the struggle to balance their focus on supporting the students in the classroom at both ends of the spectrum: those who are not ready to engage with grade level content and those who were achieving above the current course or grade expectations. Teachers are tasked with creating an environment that fosters the development of student self-esteem, recognizing that confidence in mathematical abilities is closely tied to students' academic success (Ng, 2018). Student math retention and application represent other critical areas of concern shared by teachers, with scaffolding employed as a strategy to ensure students can internalize and apply mathematical concepts effectively while also attempting to maintain linguistic and cultural diversity to reflect the identities of the students in the classroom (Apple & Beane, 2007; Ayers et al., 2009; Edwards et al., 2017; Manalu & Judijanto, 2024; Mulwa, 2015).

However, factors such as the composition of student populations in classrooms often restrict the implementation of scaffolding (Rice, 1999). Large class sizes and diverse ability levels present significant challenges to providing individualized support, underscoring the need for institutional strategies that address these limitations (Abbati, 2012). High school teachers shared that there are some mathematics classes that are a lot bigger than they should be, given the diversity in the class and how much support the students that are enrolled need. The classes are very diverse in terms of student readiness for the current math level and their ability to work independently, which severely impacts the level of support teachers are able to offer within a class period (Handal et al., 2015).They shared when there is a mix of students enrolled in a

classroom there are two unique restrictions that present themselves, from the perspective of a high school mathematics teacher: the content and the number of hours for instruction.

While it was affirming, yet heartbreaking, to hear from teachers across all grade levels to hear that the struggles they are facing in their classrooms are the same (Lotter et al., 2024). Conversely, with coaches, principals, and directors there was not a grounded understanding of the pressure that the teachers are feeling every day. These middle and senior leader stakeholders at the institution provided glowing retellings of learning experiences they have had a hand in bringing to life at the institution for both students and teachers, positions they have created to meet the needs to various departments (without structures put in place to mitigate the level of support needed year after year), professional consultants they have brought in for a set amount of time historically to aide math teachers in the development of curriculum scope and sequence, and curriculum they have purchased to "hopefully" be more aligned across various grade levels (without bringing all math teachers together to ensure vertical alignment) (McMahon et al., 2017). Yet, none of these coaches, principals, and directors discussed the current needs of the students that are enrolled at the institution. Unlike the teachers who were able to articulate what they are seeing, what students need, what they need as teachers, and how the institution can – better – support them. There is a disconnect between teachers and all the other stakeholders at the institution; and unfortunately, student learning and conceptual understanding in mathematics classrooms are being negatively impacted (Crotty, 1998; LeMire et al., 2012). Bridging this gap requires intentional dialogue and collaboration among all institutional stakeholders to align their efforts with the realities of classroom teachers and their students. Without such alignment, the institution risks perpetuating a cycle where well-intentioned initiatives fail to address the core challenges faced by both teachers and students.

Institutional Aims vs. Institutional Realities

This international K12 American institution is filled with highly qualified educational stakeholders who are working together within their departments and teams to ensure that the instruction, assessment, and feedback all students receive are angled towards supporting students on their current and future mathematics journey. The tension exists when classroom teachers are asking for support to meet the needs of their students, coaches are focusing on curriculum selection and facilitating department meetings, principals are entrusting the student academic progress to the Office of Teaching and Learning, and the directors are singing the praises of student growth through Measures of Academic Progress (MAP) scores, Preliminary SAT, SAT, International Baccalaureate and Advanced Placement scores. It appears that institutional perspectives are not unified and there is a lack of alignment among stakeholders about the needs of students and staff—and what student "achievement" means in philosophy and practice.

Institutions disseminate their privileged ways of knowing through content standards, curriculum selection, external assessment qualifications, and scores as the primary purpose of their existence. Often through a uniformed model of instruction, these institutions mandate both explicitly and implicitly that those who seemingly care to drive learning, instruction, and conceptual understanding entrench themselves within existing systems and beliefs—however unsynchronized or dysfunctional (Crotty, 1998). The story of this international K12 American institution is that of an of an institution striving to implement progressive teaching practices but is hindered by systemic challenges and confining notions of what "curriculum" means. It highlights how teachers, middle and senior stakeholders navigate these constraints, their efforts to use data and innovation, and ultimately how these dynamics impact the math learning outcomes of students. The culture of this international K12 American curriculum institution is

one that prides itself on hiring highly qualified classroom teachers to provide mathematics instruction to students throughout kindergarten through twelfth grade. Understanding that an institutions culture directly impacts those who operate in it (Crotty, 1998). What an institution promotes, emphasizes, and allocates time and money to are glowing neon signs that assert what is privileged and valued within the institution. The struggle of this international K12 American institution is that senior stakeholders are saying one thing, and the realities of the daily operations are in direct conflict with the messaging; and no one knows which to focus on.

The institutions mission and vision statements (See Appendix L.) emphasize its aim to foster a compassionate, student-centered community that empowers and inspires learners to shape their educational and professional futures through engagement, service, and global citizenship. Through this research study, participants made evident the challenges the institution faces in meeting the needs of its diverse student population through institutional support of and collaboration with math classroom teachers. Through the experiences that teacher participants shared, the institution needs to (re)analyze whole school data to provide learning opportunities for students. While a director shared that "the institution looks at a lot of data not just around the developmental needs of student but also side effects that impact curriculum"; from the teachers lived experiences, it did not appear that the prior statement was a shared belief amongst all institutional stakeholders. The institution's reflex to assert these lofty goals, and their desire to unite everyone around seemingly "shared" practices and academic wins – remains on trend for how institutions socialize their stakeholders. Curriculum is not solely focused on the content that is taught (Apple, 2019). Curriculum also exists in an institution's everyday norms and routines. The common belief that the more something is said, the more people believe it to be true - particularly when emphasized by key institutional stakeholders. Whether that common belief is

actually true or happening does not even matter. Teachers provided a reality check to institutional norms and routines that illuminated gaps between stakeholder groups—and how these gaps shape the truth about the institutions' support of students and teachers in math, which is also fundamentally at odds with Ayers' vision of education as a student-centered process (Ayers, 2010).

Participants highlighted a significant gap in students' understanding of mathematical content standards across grade levels, requiring teachers to dedicate additional instructional time and emphasis on reviewing prior knowledge and standards that students were expected to have already mastered. Gaps in curricular alignment and instructional support ultimately impact the ability of teachers to meet the diverse needs of students, particularly as they transition between grade levels and encounter increasingly complex mathematical concepts (Levine & Marcus, 2007; Ng, 2018). These institutional challenges underscore the importance of addressing student needs within the classroom environment, where targeted support and inclusive practices can create a more equitable and effective learning experience. Participants also shared that across the institution there is a misalignment of what is being taught and what is being assessed. The content, skills, and standards that need to be addressed are causing teachers to implement strategies that are slowing down the pace of current curriculum delivery (Demeuse & Strauven, 2006; El-Astal, 2023). Additional work around mathematical best practices needs to be adopted institutionally, not just in the classroom (Hallinger & Heck, 2010).

The blueprint of American curriculum standards is not about simply providing students with learning experiences through presenting them information; it is also about reasoning and providing opportunities for students to practice those curriculum standards (Gillies, 2001). The globalization of US education ideologies that emphasize meritocracy, standardized and high-

stakes assessments often conflict with the instructional and cultural norms of host nations (Liu, 2011; Tannock, 2009). Tensions between the global push for an institutionalized merit-based education system exacerbate educational inequalities (Batruch et al., 2022). In following the footsteps of the US education system, international K12 American institutions stress to students, parents, and educational stakeholders that acing standardized testing is the only metric for student success from kindergarten through grade twelve; accentuating that there is not room left for the students that do not fit that success mold. Embracing and implementing this one size fits all approach to education creates a narrow, testing focused curriculum that is not student centered and further marginalizes students with exceptionalities and underserved students (Lingard, 2010). Both in the US and internationally, institutions need a more refined approach to education that embraces diversity of knowledge, culture, curriculum, and voice. Addressing the educational requirements of students in the mathematics classroom prioritizes what the needs of the students are and ensures that what is happening in the classroom is explicitly coordinated with the curricular skills required for current and future success in mathematics. Ultimately, this narrative of curriculum and pedagogy highlights a critical gap between the mission and vision this international K12 American institution has about education, its approach to instruction, and the daily experiences of those involved in the classroom.

Summary of Interpretation of Findings

This chapter highlights how institutional collaboration, teacher empowerment, and administrative support critically impact stakeholder understanding and implementation of what constitutes effective instructional practices. These findings emphasize the complexity of addressing diverse student needs within the institution, despite widespread institutional assertions of equity-oriented and data-drive decision making. These findings raised the issue that

there is a singular “scripted” curriculum that is being utilized per division, and it is expected to meet the needs of all students – and only a few of the participants found that to be a salient concern. This goes against how Ayers (2010) envisions content “curriculum;” however, it illuminates Apple’s assertion that curriculum is meant to sanction, to socialize, and to control (Apple, 2019). When you have an international K12 American institution that can support learners on their entire academic journey, it is important that there is intentional alignment between divisions across content areas so that the transitions each year is seamless for the students and allows for teachers to move through the required curriculum with as much ease as possible.

Chapter 6 - Conclusions and Implications

This chapter centers the research questions that guided this qualitative case study, that were crafted based on insights gained from my pilot study, which provided initial evidence on instructional strategies in math classrooms. The pilot study highlighted the ways in which students recognized that their teachers differentiated and scaffolded math instruction. This broader application of instructional strategies became a key consideration in shaping the focus of this dissertation. Although the findings reaffirmed that differentiation and scaffolding are being implemented across classrooms, they also revealed that narrowing the institutional focus solely on special education and underserved students does not align with the current educational needs of the institution and its stakeholders. Instead, these results emphasize that all students (general education, special education, and underserved) and math teachers require institutional support to address the broader challenges identified in this research.

This dissertation was a qualitative case study that employed a phenomenological analysis technique to examine how an international K12 American institution supports its teachers with the implementation of the mathematics curriculum through institutional collaboration with educational stakeholders to meet the mathematical learning needs of students. Through the binding of this case as a deep dive into an international K12 American institutions' approach to utilizing the expertise of its educational stakeholders to collaborate to meet the learning needs to both students in mathematics curriculum and math teachers. This qualitative case study employed a survey and then a semi-structured one-on-one interview with a hermeneutic phenomenological data analysis approach. Participants included teachers across all divisions (elementary, middle, and high school), the instructional coach, the curriculum coordinator, principals across all divisions (elementary, middle, and high school), the director of student

support, and the director of teaching and learning. The sample of participants represented a variety of K12 institutional stakeholders selected to provide insight into their interactions with students, their math curriculum, and share in detail how they navigate meeting students learning needs daily.

I engaged in understanding participants' experiences individually and across participant descriptions, illuminating my understanding of how the educational stakeholders of the institution (the case) collaborate to support its students in math. The research questions (guideposts) were as follows:

1. What complexities shape the experiences of educational stakeholders' and their institutional collaboration?
    a. What are the roles and responsibilities of institutional educational stakeholders involved in the curriculum selection process?
2. How does the institution support mathematics teachers in addressing the learning needs of underserved students and students with exceptionalities?
    a. How do mathematics teachers across grade levels perceive the institutional support in addressing the learning needs of underserved students and students with exceptionalities?

The findings of this study illuminate the complex interactions between educational stakeholder roles, responsibilities, and institutional structures that shape the collaborative efforts in curriculum selection at an international K12 American institution. Rather than functioning within clearly defined boundaries, stakeholders often navigate overlapping domains of influence; highlighted by the fact that while all stakeholders have formal roles and detailed job descriptions those coexist within an informal professional network at the

institution. This complexity is evident in the ways that the institution discusses math curricular decisions, revealing both coherence and fragmentation in stakeholder collaboration. At the same time, the institution's effort to support its mathematics teachers, specifically around addressing the needs of underserved students and students with exceptionalities, emerged as both intentional and uneven. While there are certain structures in place such as grade level and department meetings and conversations facilitated by either instructional or curricular coaches, the accessibility and perceived effectiveness vary across grade levels and divisional teacher experience. Teachers' perceptions stress a broader institutional tension, although a commitment to inclusive education exists, it is often interrupted by systemic limitations, such as resource constraints or insufficient training. These findings reveal that institutional support is not experienced uniformly but is shaped by educational stakeholders' proximity to decision making, the (mis)alignment between institutional policies and classroom realities, and the evolving demands of creating equitable mathematics instruction that meets the learning needs of all students in the classroom.

Systemic Strains: The Need for Institutional Cohesion

While I was the writing discussion chapter for this study, I emailed some of the institutions' stakeholders asking if they could provide me with the philosophical framework of the Teaching and Learning Center so I could define its institutional role and collective responsibility. The email response I received was "with new leadership and our growing enrollment, the TLC has been under construction this year. We are revising philosophies and approaches. I have attached a first draft of our new philosophy statement that we will bring to the team this spring to refine and edit." I have utilized the draft of the institution's current philosophical framework of the Teaching and Learning Center (see Appendix T.) to compare its

aims with participants' realities. The institution shared that the Teaching and Learning Center (TLC) -*formerly the office of learning*- fosters a culture of excellence in teaching and learning by empowering educators to grow, collaborate, and lead. Our mission is to partner with principals and teachers to support faculty at every stage of their professional journey. Together, we facilitate curriculum development, guide resource adoption, ensure vertical alignment, and elevate instructional strategies. Institutional curriculum and instructional alignment are within the roles and responsibilities of the Teaching and Learning Center. Apple and Beane (2007) argue that schools should work to resist hierarchical control; however, through this new philosophical framework the TLC posits itself as the sole knowledge keeper of the institution. Utilizing this top-down approach, the institution negates the power and knowledge that other stakeholders bring into the institution (Krainer, 2014). Teachers of all content areas and specialties play critical roles in the instructional learning outcomes of their students, and thus, teachers should be viewed as key stakeholders in conversations about connecting what they are teaching to how students are learning (McClain & Cobb, 2004).

Even though the institution has identified its guiding philosophical framework, it is still lacking language and action to ensure that their approach to curriculum is equitable, ethical, and resistant to pushing students toward academic success only through their ability to complete standardized assessments (Ayers, 2009; Ayers, 2010). After making sure that all decisions have been rooted in strong and justified mathematical and instructional practices, then the institution can ensure that all stakeholders are then working from that common established institutional mathematical philosophy (Idol & West, 1991). The selection of math curriculum plays a vital role in the systematic success that students and teachers will face if curriculum decisions are made through careful and analytical approaches (Tran et al., 2016). Overall, what the selected

math curriculum will do and currently does to aid the institution in achieving their philosophy is within the roles and responsibilities that the institution has placed on the Teaching and Learning Center (Goddard et al., 2010). Once there is a common language and ideas around the curriculum, then the institution can begin to have collaborative discussions about assessing students and how stakeholders instruct as related to the established institutional mathematical philosophy and our mathematical practices.

But how does this international K12 American institution make collaboration happen? How are those conversations facilitated and who is responsible? While principals were asked to specify steps they take to support instructional coaches, most responses were vague or read like what is presented in a job description; offering few details into what day-to-day instructional support from them actually looks like. This means that all support-based conversations start and end with the Teaching and Learning Center. Especially for an institution that utilizes American standards and curriculum, it needs to be clear the point from which it starts curricular conversations, what their instructional philosophies are, what their curriculum needs to provide for its students, teachers, and staff, how they will assess, how they will moderate, and how the selected instructional practices will support its students mathematically (Demeuse & Strauven, 2006; Gillies, 2001; Hayden, 2006). Once all stakeholders within the institution are on the same page, from there the institution can adjust to provide more opportunities to practice or feedback to check for understanding. This works for any combination of two parties within the institution: teachers and students, teachers and teachers, teachers and coaches, coaches and principals, directors and principals, and the institution and its stakeholders.

The Power of Institutional Alignment

Continuing to utilize the draft of the institution's current philosophical framework of the Teaching and Learning Center (see Appendix T.) to compare its aims with participants' realities, at the end of the philosophical framework it says, "At its heart, the TLC is a collaborative partner for teachers and leaders, providing guidance, inspiration, and opportunities for growth." By supporting and leading learning within our community, the TLC ensures that the institution maintains a shared commitment to excellence, innovation, and continuous improvement. But then, where do teachers fit into the curricular and instructional decision-making process? How are stakeholders conceptualizing the intersections between improvement, curricular alignment, and what [can] constitute "curriculum"? These were questions that teacher participants shared during interviews, and they expressed that they did not know who at the institution was responsible for answering those questions and implementing the necessary changes or if they could go to them to make their concerns known. If mathematical learning and mastery begins to unravel in grade three, then unfortunately mathematical successes will deteriorate quickly and often persist negatively in that direction.

When an institution is looking at rolling out a new curriculum to an entire division, the focus is on the content and how it will fit into the bigger instructional, it should also be about professional development and what skills can be targeted to provide necessary support to the mathematics teachers because it is not just about the program. It is also about teachers' needs; do they need to have more intentional and structured conversations about scaffolding instruction for students who do not meet grade level or content math standards? Do they need strategies for making thinking visible in the classroom? Do students need more instruction directed at problem solving? Is the purpose of curriculum to serve as a political act where teachers are supporting

students on their journey to dive deeper into learning through inquiry-based learning and exploring real-world problems (Ayers, 2010)? Are teachers given the freedom to use the curriculum to foster critical thinking without the heavy burden of standardized eternal assessments (Ayers, 2010; Ayers et al., 2017)? Institutional stakeholders must work collaboratively to align their efforts and ensure a unified educational vision that supports both teachers and students effectively. To accomplish this task, it is paramount to reconsider how curriculum standards, alignment, and instructional strategies can be (re)designed and (re)implemented to better support both teachers and students in achieving and maintaining mathematical learning outcomes.

It is necessary to have systems and structures and ways to get feedback, from students, teachers, coaches, principals, and directors about what is working, and what is needed to be able to replicate it across the institution (Heaton et al., 2009). In addition to the positives, also analyzing what might not working and what needs to be reimagined (Horn, 2012). Understanding that the shift that needs to happen must come in partnership from the mathematics teachers and their students (Grant, 2010). Hearing the stories about the content limitations that students are presenting with and making shifts based on the expertise of all educational stakeholders at the institution around what alterations and realignments are required for teachers to be and feel successful in their instructional performance and for students to be and feel successful on their mathematical learning journey. Now, these experiences feed into a larger conversation that the institution needs to have regarding what curricular options it has for their students, and if they are truly meeting every student's needs, or if they are expecting students to just “fake it till, they make it” (Sheldon et al., 2010). While there appears to be a robust offering of mathematics course for students, the reality is that their options are still very, very limited, and

the institution needs to begin to look at what is purpose of providing quality, inclusive education for all students; if that is even something they want to continue to offer.

Having stakeholders who know or at least can see the whole picture of what the arch of mathematics is needed for students to be successful through their tenure at the institution is a make-or-break factor (Ball, 2003). Having seasoned teachers across divisions, having strong teams collaborating, and having principals on board with the journey does not automatically ensure that all math learning K12 will work seamlessly as intended (Aldridge & McLure, 2024; Bros & Schechter, 2022). Additionally, increased funding and opportunities for professional development that teams and departments can utilize helps to support and increase the innovative instructional practices that classroom teachers are already providing to students. Another aspect of effective curriculum design is vertical alignment across grade levels, which ensures that instructional practices and learning objectives are consistently integrated. The institution should prioritize regular interdisciplinary meetings with its stakeholders to ensure alignment within instructional practices and foster a culture of collaboration above departments and teams (Anfara & Angelle, 2007; LePage et al., 2001). Despite the challenges identified, the discussion of these findings provides a pathway for meaningful improvement, grounded in the collaborative efforts of all institutional stakeholders to build a more cohesive educational learning environment through aligning institutional priorities to the diverse needs of its students and staff (Krainer, 2014; Roberts & Bradley, 1991). This international K12 American institution has the opportunity to transform its culture of learning into one that is equitable and effective for math teachers and students.

The [Non]-Presence of Instructional Support In/Beyond Math Classrooms

Knowing educational best practices for math instruction is one thing, but whether the institution providing the time or the resources for mathematics teachers to come together and share those strategies with one another? Is there intentional time that is being set aside regularly and consistently to allow for not only the agenda items that need to get done to check a box, but also the agenda items that will push the institution in a direction to allow for the things that elevate students' mathematical learning experiences and teachers instructional practices? The primary focus of a student-centered curricula is leveraging the expertise of teachers within an institution to support their students and colleagues (Apple, 2016). Classroom teacher collaboration looks like having teachers present in other teachers' classrooms to provide insight, feedback, and suggestions (Ronfeldt et al., 2015). Within teaching teams, there are numerous years of teaching experience, experience working with students with diverse needs, and diversity of teaching practices and approaches; teachers should be leveraged and recognized for their work as the primary line of defense within an institution in their daily professional attempts to meet the needs of the students in their classrooms (Marsh et al., 2015).

However, classroom support is not and should not be viewed as one dimensional. It is multidimensional in nature and should/needs to include support for the students alongside classroom management, instructional, and curricular support for the teacher (Mu et al., 2022). This is where the institutions approach to coaching should begin to mesh with the institutions approach to curriculum, instruction, and learning. In the draft of the institutions' current philosophical framework of the Teaching and Learning Center (see Appendix T.) they say (…In addition to aligning with these standards, the TLC offers a wide range of resources to support educators, including a professional library, instructional coaching, and mentoring for teachers

new to [the institution]). The National Council of Teachers of Mathematics (*Index - National Council of Teachers of Mathematics*, n.d.) emphasizes how influential and beneficial instructional and curriculum coaching is to math instruction (Hiebert et al., 2002). The roles of coaches inside and outside of the classroom should not be minimized or ignored but celebrated and visible across math classrooms within the institution to ensure equal and equitable access to feedback, modelling, and support of professional growth to teachers (Amador et al., 2024; Apple, 2006; Ayers, 2009).

The success of instructional support and effective collaborative practices that enhance teaching and learning within an institution, is only possible if the senior stakeholders show external and vocal support for collaborative teaching practices while also highlighting how utilizing coaches can help grow a teacher's institutional practice (Bakhshaei, 2022). The institutions' senior stakeholders need to show teachers and coaches that the institution values and is willing to foster a culture of instructional and content area practice improvement (Ronfeldt et al., 2015). Where there is continuous collaboration between teachers and other educational stakeholders there is a resistance placed on the top-down hierarchical nature of institutions, and instead there is a notable increase in student achievement, deeper development of students' critical thinking skills, new implemented instructional strategies, and increased professional expertise across all stakeholders (Apple, 1993; Ayers et al., 2017; Desimone & Pak, 2016; Foster, 2018).

Broadening the Institutional Scope of Math "Curriculum"

Issues and trends that participants detailed, showcased that the current state of K12 math at the institution needs to be revamped and enhanced. Teacher participants shared how students have been minimally introduced to real-world connects and math problems due to time

constraints within the school year and worries of external assessments (Romberg, 2010). When it comes to teaching students math at any divisional level, there needs be a collective understanding of what the mathematical learning journey has and will look like for students - and whether other and better learning journeys exist and can be implemented. For that to happen successfully, all educational stakeholders need to have a better understanding of what end goals are for students, individually and collectively; and how are stakeholders are going to collaborate to get them there. Looking at an entire K12 learning journey, the institutions collective goal should be to open as many doors for students. To meet that goal with fidelity, intentional conversations need to continuously occur to make sure that the institution is fulfilling their responsibility to make sure that its students are ready for what comes next mathematically.

At this institution, curricular changes are made with and by administrative key stakeholders. They need to begin meeting with classroom teachers and the coaches to work together and make informed decision on curriculum selection to best meet students instructional needs (Stein & Kaufman, 2010). Some teachers discussed how they integrate problem solving and critical thinking into their classrooms and math instruction, but this is not a shared practice across all math classrooms at the institution. Providing teachers and coaches with the curricular tools needed to implement effective math curriculum and support students who have successfully advanced in higher level critical thinking and problem solving is a another manageable step that can be taken and will improve students outlook of and their self-confidence in math (Popkova et al., 2023). Through providing stakeholders with appropriate professional development, the institution can begin to create alignment with innovative and effective teaching practices across all grade levels and all math classrooms (Hiebert et al., 2025). Remaining focused that one of the many roles of all educational stakeholders should be to view curriculum and its implementation

as an act of power and resistance; and to do that, the institution must have a concrete definition of education and its vision to select, implement, and enhance student centered curricula (Apple, 1993; Ayers et al., 2017).

Enhancing Math Course Options

Focusing on and understanding that how curriculum is selected is an important factor and so is ensuring alignment with student learning needs (LeMire et al., 2012). While elementary teacher participants shared how they were able to support all levels of student learners across grade levels, teacher participants in middle and high school discussed how challenging it has been for them to have students with such vast conceptual mathematical understanding in the same math courses and classrooms. High school teachers shared that their frustrations were because they knew students were not appropriately placed in those courses, but because there were limited course offerings, both students and teachers were essentially "stuck". In the same breath, students in middle school (specifically those in grade six and seven) were stuck in their respective grade level math even if they were proficient and advanced at the content standards for their grade level. The pathway course offerings for middle and high school needs to be expanded to allow students to have options for their appropriate math course and deepened to allow students the opportunity to be successful in math without worrying about time constraints or external assessments.

For an institution that values student achievement on external assessments, creating opportunities for students who are ready to advance to appropriate higher level math courses will build substantial math achievement gains and can result in higher Advanced Placement scores in the future (Burris et al., 2004); but also, while adopting an understanding that such assessments are mere snapshots into what constitutes "knowledge." Proper placement in math courses is a

successful instructional strategy that benefits all students – regardless of whether the placement is more advanced or slower-paced – because it puts students in the best learning environment to meet their math needs (Dossenbach, 2017). Placing barriers to students' academic pathways under the false pretense of "equality" only further the extent of educational inequity that students face, and teachers are forced to maintain across institutions (*RAND*, 2024). Another corrective step that could be implemented is to create a math pathway that would allow students to take one math course over the course two years for students who need more time to grasp concepts and process their conceptual understanding, allow students to take math everyday (straying from rigid scheduling), or to allow students to take two math courses of three years. If the purpose of institutions that provide education is to support students on their journey as human beings to think critically and creatively, then as an educational institution we owe it to them to do the same by removing ourselves from self-imposed and rigid structures (Apple, 2007; Ayers, 2010). For everyone involved, expanding the scope of math courses offered and who those courses are offered to is a step in the right direction towards a democratic, student-centered educational institution that values curricular equality over maintaining the status quo (Apple, 2007; 2019; Ayers, 2009).

Strategic Staffing that Connects and Supports Everyone?

Participants' experiences also illuminated a need at the institution for the creation of a specialized role to enhance math instructional and curriculum quality (Panfilio-Padden et al., 2024). This position would allow for much needed institutional insight that would provide dedicated and effective support to math teachers and assist them on their journey to improve student learning outcomes (Jakopovic, 2021). Having a K12 math specialist coach would allow for students to receive support through additional instruction – either through modeling during

push-in classroom support or direct instruction during pull out support (Palsma, 2018). This specialist coach would act as the key facilitator in the implementation of integrated math instruction as well as beginning early intervention systems. This position would also work with teachers to identify areas of professional need and provide resources and strategies to address these areas. Institutional coaching partnerships enhance teachers' implementation of instructional practices which leads to an increase in students' math conceptual understanding (Panfilio-Padden et al., 2024). Most importantly, the creation of this position would open the door for the institution to provide professional development for teachers, principals, and directors to address curriculum, teaching strategies, and curricular and instructional analysis (Marshall & Buenrostro, 2021). The idea of having a dedicated and go-to math specialist is not a foreign concept to the institution. As mentioned by a principal and director during their interviews, years ago, the institution hired a math consultant to assist them on their journey as they were developing the integrated mathematics pathway with middle and high school. The support of having a consultant was one that many participants highlighted as successful; so why not have a fulltime specialist in house? With an already established coaching program and philosophical framework, having a K12 math specialist coach will allow more students to achieve math success and more teachers to feel supported, seen, and valued by the institution (Stewart, 2013).

Recommendations for Future Research

Finally, this research underscored a key concept that is effective math instruction across an institution is influenced by a combination of strategic and aligned leadership, curriculum coherence, and collaborative practices. Additional literature is needed to identify whether hiring principals with or without a mathematics back, approaches to vertical alignment in international K12 American institutions, and the impact that collaborative teaching practices has on student

mathematics achievement. While I know (as an employee of the institution) that other subject areas have been invested in because of the recognized need for specialized support and resources, math instruction has often been overlooked due to the perceived lack of subject area expertise in non-math educators, further contributing to the feeling of isolation in math teachers. My first recommendation for future research is how principals without a background in math receive professional training on how to support math instruction at an institution effectively. It is important to have stakeholders in leadership positions that understand the impact and importance of shaping cohesive math instruction. Administrative expertise in math affects teacher retention and the support that students receive in the classroom (Redding et al., 2019). How do principals without a background in math develop instructional polices and evaluate mathematics curriculum effectiveness? Do they simply rely on student external assessment scores? What else can be taken into consideration? Is support for math teachers a prioritized professional development initiative? My second recommendation is to compare how different international K12 American institutions align math instruction. Specifically, how different institutions define mathematical alignment and the prioritization of its significance (Columnist, 2017). Understanding how institutions that offer diverse curricular frameworks (American standards, International Baccalaureate, Advanced Placement, etc.) guarantee that vertical alignment is/has been achieved. My last recommendation is to examine the impacts of co-teaching in math on student retention and readiness. Beginning with defining what co-teaching is and the different models that can be adopted in the math classroom. Providing experiences from teachers who have engaged in co-teaching and how it enhanced their instructional practices and identifying which strategies were most effective in improving math instruction (Lancaster et al., 2014). Filling in these research gaps will enrich math education for students, teachers, coaches, principals, and directors. It is

important to continue researching and developing in these areas to positively inform math curriculum development, educational stakeholder collaboration, and institutional policies (Mayer & Oancea, 2021; Mora-Ruano et al., 2019; Voogt et al., 2016).

Researchers Reflection

Reflecting on the transformative journey of my dissertation which examined how an international K12 American institution supports its teachers with the implementation of the mathematics curriculum through institutional collaboration with educational stakeholders to meet the mathematical learning needs of students, I expanded my understanding of curriculum from the "what" an educator is introducing their students to, to viewing it as a mechanism for teachers and institutions to expand student understanding. Through engaging with specific curriculum theories analyzing the role of "hidden curriculum" in shaping educational goals (Apple, 2019); and curriculum as an instrument to support students (Ayers, 1986) they disrupted my initial assumptions and opened pathways for re-envisioning my conceptual standpoint. These shifts not only deepened my engagement with the academic world but also underscored the transitional nature of qualitative inquiry. I was profoundly challenged during this transformative intellectual milestone, as it was shaped by years of rigorous research, critical engagement with theoretical frameworks, professional collaborations, in-depth discussions with colleagues and strangers, and extensive hours of solitary revision. This dissertation research study underscores the fluidity of embracing uncertainty and change in scholarly and professional work. By reflecting on pivotal moments in my own experiences, it identified educational situations that compel me to pause, reflect, and reimagine approaches to advancing teaching and learning. These efforts aim to enhance student outcomes through the collaboration and support of their institutional educational stakeholders.

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Appendix A - Participant Invitation Form

* Indicates required question

1. Email *

2. Would you like to participate in my dissertation research study? *

   Mark only one oval.

   - ◯ Yes, I am interested and wiling to participate in this research study
   - ◯ No, I am unable to participate in this research study

Appendix B - Pre-Interview Survey Questions

Pre-Interview Survey Questions

Start of Block: Demographics

Please provide your email address

_____

Highest Level of Education

- ○ Bachelors (1)
- ○ Masters (2)
- ○ Doctorate (3)

Years of Teaching Experience (in your home country)

- ○ 1-4 years (1)
- ○ 5-9 years (2)
- ○ 10-14 years (3)
- ○ 15-19 years (4)
- ○ 20+ years (5)

Years of Teaching Experience (internationally)

- ○ 1-4 years (1)
- ○ 5-9 years (2)
- ○ 10-14 years (3)
- ○ 15-19 years (4)
- ○ 20+ years (5)

Years of Teaching at *the institution*

- ○ 1-4 years (1)
- ○ 5-9 years (2)
- ○ 10-14 years (3)
- ○ 15-19 years (4)
- ○ 20+ years (5)

History of Teaching Math (select all that apply)

- ☐ I have taught elementary math (1)
- ☐ I have taught middle school math (2)
- ☐ I have taught high school math (3)
- ☐ I have never taught math (4)

Current Position

- Elementary Teacher (1)
- Middle School Teacher (2)
- High School Teacher (3)
- Instructional Coach (4)
- Curriculum Coordinator (5)
- Principal (6)

End of Block: Demographics

Start of Block: Differentiation and Scaffolding

How familiar are you with differentiation and scaffolding strategies in math instruction?

- Not familiar at all (1)
- Slightly familiar (2)
- Moderately familiar (3)
- Very familiar (4)
- Extremely familiar (5)

Please describe one differentiation strategy that you have used or encountered in math instruction

_____

_____

_____

_____

Please describe one scaffolding strategy that you have used or encountered in math instruction

_____

_____

_____

_____

_____

End of Block: Differentiation and Scaffolding

Start of Block: Implementation of Strategies

How often do you implement differentiation strategies in math instruction?

- ○ Never (1)
- ○ Rarely (2)
- ○ Daily (3)
- ○ Weekly (4)
- ○ Monthly (5)

What challenges do you face when implementing differentiation strategies in math instruction?

_____

_____

_____

_____

_____

What challenges do you face when implementing scaffolding strategies in math instruction?

_____

_____

_____

_____

_____

What factors influence your decision to implement these strategies in math lessons?

_____

_____

_____

_____

_____

End of Block: Implementation of Strategies

Start of Block: Effectiveness

How effectively do you believe differentiation and scaffolding address the learning needs of underserved students and students with exceptionalities in your math class?

- ○ Ineffective (1)
- ○ Not Very Effective (2)
- ○ Neutral (3)
- ○ Somewhat Effective (4)
- ○ Very Effective (5)

Can you provide an example of a time when differentiation or scaffolding had a positive impact on an underserved student and student with exceptionalities during math class?

_____

_____

_____

_____

_____

End of Block: Effectiveness

Start of Block: Impact on Proficiency

Do you believe differentiation and scaffolding strategies have positively impacted the proficiency of all students in foundational mathematical concepts?

- ○ Strongly disagree (1)
- ○ Somewhat disagree (2)
- ○ Neutral (3)
- ○ Somewhat agree (4)
- ○ Strongly agree (5)

Are there specific foundational mathematical concepts where you've seen the most significant improvement due to the use of differentiation? Please describe

_____

Are there specific foundational mathematical concepts where you've seen the most significant improvement due to the use of scaffolding? Please describe

_____

End of Block: Impact on Proficiency

Start of Block: Institutional Challenges and Support

What institutional support do you currently received that is helpful in implementing differentiation and/or scaffolding effectively?

_____

_____

_____

_____

_____

Are there any institutional barriers or obstacles you've encountered when trying to implement differentiation and scaffolding?

_____

_____

_____

_____

_____

What institutional support do you think would help you with implementing differentiation and/or scaffolding effectively?

_____

_____

_____

_____

_____

End of Block: Institutional Challenges and Support

Start of Block: Efficacy Assessment

How do you currently assess the efficacy of differentiation and/or scaffolding strategies in math instruction?

_____

How do you currently assess the efficacy of differentiation and/or scaffolding strategies in improving student learning outcomes in math?

_____

Have you collected any data or evidence to measure the impact of differentiation and/or scaffolding on student performance? If yes, what did you collect and what did it tell you.

_____

End of Block: Efficacy Assessment

Start of Block: Open Ended Comments

Is there anything else you would like to share about your experiences with differentiation in scaffolding in math instruction?

_____

End of Block: Open Ended Comments

Appendix C - Interview Questions for Classroom Teachers

This Year at *the institution*-

- What math classes do you teach currently?
- What does typical math instruction look like in your classroom?
- How are special education students identified to you in your classroom?
- How are underserved students identified to you in your classroom?
    - Underserved students in this context are students who do not have a diagnosed disability but are consistently not meeting grade level expectations.
- What is the number of special education students that you have this year?
- What is the number of underserved students that you have this year?
- What support do your students need this year that you are currently providing?
- What support do your students need this year that you are NOT currently providing? Why?
- What support do you need from instructional and curricular coaches this year that you are currently receiving?
- What support do you need from instructional and curricular coaches this year that you are NOT currently receiving? Why?
- What support do you need from your principals this year that you are currently receiving?
- What support do you need from your principals this year that you are currently NOT receiving?

Past Years at the institution

- Comparing your current students' needs to those you've taught in the past, have the math foundational skills that students walk into your classroom with at the beginning of the year have they
    - Gotten better, remained the same, gotten worse?
    - What is the trend that you've noticed?
    - Is this impacting how you are moving through the curriculum?

Question for teachers that are also parents

- As a parent, do you have concerns about the math instruction that your child is receiving?
    - If yes, what are they?
    - How do you support your child to meet the gaps?

Appendix D - Interview Questions for Instructional Coach and Curriculum Coordinator

- Can you describe your role in supporting teachers in implementing differentiation and scaffolding strategies in math instruction to address the learning needs of underserved students and students with exceptionalities?
- How do you collaborate with teachers to tailor differentiation and scaffolding strategies to the specific needs of their students in math classes?
- In what ways do you support teachers in utilizing technology and innovative tools to facilitate differentiation and scaffolding in math instruction?
- Can you share examples of successful differentiation and scaffolding strategies you've observed or facilitated that have led to enhanced proficiency in foundational mathematical concepts for diverse student groups?
- How do you assess the efficacy of differentiation and scaffolding practices in math instruction, and what data or metrics do you use to measure their impact on student learning outcomes?
- What roles do instructional and curriculum coaches play in ensuring that the math curriculum and materials support effective differentiation and scaffolding for underserved students and those with exceptionalities?
- How do you report progress, challenges, and successes related to differentiation and scaffolding practices to the school's principals and the Director of Teaching and Learning?
- Can you describe any ongoing collaborative efforts with the Director of Teaching and Learning to align your strategies with the institution's overall goals for student achievement in math?
- How do you ensure that differentiation and scaffolding practices in math instruction remain consistent with best practices, research, and emerging trends in the field of education, particularly in special education and supporting underserved students?

Appendix E - Interview Questions for Principals and Assistant Principals

- How do you ensure that differentiation and scaffolding strategies in math instruction are effectively implemented to address the learning needs of underserved students and students with exceptionalities in your school?
- Can you describe your role in supporting and monitoring teachers' efforts to differentiate and scaffold math instruction to meet the diverse needs of students?
- What steps do you take to foster collaboration and communication between instructional and curriculum coaches, teachers, and the Director of Teaching and Learning to ensure alignment in supporting math instruction?
- How do you ensure that the curriculum and materials used in math instruction support effective differentiation and scaffolding, especially for underserved students and those with exceptionalities?
- What strategies or practices have you observed or initiated that have positively impacted students' proficiency in foundational mathematical concepts through differentiation and scaffolding?
- How do you collect and analyze data to assess the efficacy of differentiation and scaffolding in math instruction and measure its impact on student learning outcomes?
- Can you provide examples of successful professional development initiatives that you've introduced to help teachers enhance their differentiation and scaffolding practices in math instruction?
- What specific steps do you take to secure support from instructional and curriculum coaches and the Director of Teaching and Learning to align their assistance with the school's goals for math instruction?
- How do you address challenges and obstacles related to the implementation of differentiation and scaffolding strategies, and how do you ensure continuous improvement in this area?
- What role does ongoing communication and feedback play in your leadership approach to ensure that support for differentiation and scaffolding in math instruction is responsive to the evolving needs of students and teachers?

Question for principals that are also parents

- As a parent, do you have concerns about the math instruction that your child is receiving?
    - If yes, what are they?
    - How do you support your child to meet the gaps?

Appendix F - Interview Questions for the Director of Student Support

- Can you describe the strategies and approaches that the institution has implemented to address the learning needs of underserved students and special education students in math instruction?
- How has the institution ensured that teachers are effectively differentiating and scaffolding instruction to support diverse student needs, including those with exceptionalities and underserved students?
- What specific professional development and support programs are in place to enhance teachers' ability to differentiate and scaffold math instruction effectively for a diverse student population?
- How are principals at the institution involved in promoting and supporting differentiation and scaffolding in math instruction, and what kind of leadership and resources do they provide to ensure its effectiveness?
- What data and assessment methods are used to measure the efficacy of differentiation and scaffolding in math instruction, particularly in terms of improved student outcomes for underserved students and those with exceptionalities?
- Can you describe any ongoing research or initiatives aimed at continuously improving differentiation and scaffolding practices in math instruction to better meet the needs of diverse learners?

Appendix G - Interview Questions for the Director of Teaching and Learning

- Can you describe the strategies and approaches that the institution has implemented to address the learning needs of underserved students and special education students in math instruction?
- How has the institution ensured that teachers are effectively differentiating and scaffolding instruction to support diverse student needs, including those with exceptionalities and underserved students?
- What specific professional development and support programs are in place to enhance teachers' ability to differentiate and scaffold math instruction effectively for a diverse student population?
- How do instructional coaches contribute to the implementation of differentiation and scaffolding strategies in math instruction, and what role do they play in supporting teachers in this regard?
- What is the role of curriculum coaches in ensuring that math curriculum and materials support effective differentiation and scaffolding for all students, including those with exceptionalities and underserved students?
- How are principals at the institution involved in promoting and supporting differentiation and scaffolding in math instruction, and what kind of leadership and resources do they provide to ensure its effectiveness?
- What data and assessment methods are used to measure the efficacy of differentiation and scaffolding in math instruction, particularly in terms of improved student outcomes for underserved students and those with exceptionalities?
- Can you describe any ongoing research or initiatives aimed at continuously improving differentiation and scaffolding practices in math instruction to better meet the needs of diverse learners?
- In what ways does the institution collaborate with external partners, such as experts in special education, to ensure that the strategies employed for differentiation and scaffolding align with best practices and the latest research in the field?

Appendix H - IRB Approval Original

KANSAS STATE UNIVERSITY | University Research Compliance Office

TO: J. Spencer Clark
Curriculum and Instruction
Manhattan, KS 66506

Proposal Number: IRB-11955

FROM: Lisa Rubin, Chair
Committee on Research Involving Human Subjects

DATE: 12/18/2023

RE: Proposal Entitled, "Enhancing Math Proficiency: Unpacking Key Factors in Differentiation and Scaffolding for Diverse Learners at an International American Institution."

The Committee on Research Involving Human Subjects / Institutional Review Board (IRB) for Kansas State University has reviewed the proposal identified above and has determined that it is EXEMPT from further IRB review. This exemption applies only to the proposal - as written – and currently on file with the IRB. Any change potentially affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Based upon information provided to the IRB, this activity is exempt under the criteria set forth in the Federal Policy for the Protection of Human Subjects, **45 CFR §104(d), category:Exempt Category 1.**

Certain research is exempt from the requirements of HHS/OHRP regulations. A determination that research is exempt does not imply that investigators have no ethical responsibilities to subjects in such research; it means only that the regulatory requirements related to IRB review, informed consent, and assurance of compliance do not apply to the research.

Any unanticipated problems involving risk to subjects or to others must be reported immediately to the Chair of the Committee on Research Involving Human Subjects, the University Research Compliance Office, and if the subjects are KSU students, to the Director of the Student Health Center.

Electronically signed by Lisa Rubin on 12/18/2023 3:05 PM ET

203 Fairchild Hall, Manhattan, KS 66502 | (785) 532-3224 | fax: (785) 532-3278

Appendix I - IRB Approval Amended

KANSAS STATE UNIVERSITY | Office of Research Integrity, Compliance and Security

TO: Angela Kraemer-Holland
Curriculum and Instruction

FROM: Lisa Rubin, Chair
Committee on Research Involving Human Subjects

DATE: 10/07/2024

RE: Proposal #IRB-11955, entitled "Enhancing Math Proficiency: Unpacking Key Factors in Differentiation and Scaffolding for Diverse Learners at an International American Institution."

MODIFICATION OF IRB PROTOCOL #IRB-11955, ENTITLED, "Enhancing Math Proficiency: Unpacking Key Factors in Differentiation and Scaffolding for Diverse Learners at an International American Institution"

EXPIRATION DATE: Exempt

The Committee on Research Involving Human Subjects (IRB) has reviewed and approved the request identified above as a modification of a previously approved protocol. **Please note that the original expiration remains the same.**

All approved IRB protocols are subject to continuing review at least annually, which may include the examination of records connected with the project. Announced in-progress reviews may also be performed during the course of this approval period by a member of the University Research Compliance Office staff. Unanticipated adverse events involving risk to subjects or to others must be reported immediately to the Chair of the IRB, and / or the URCO

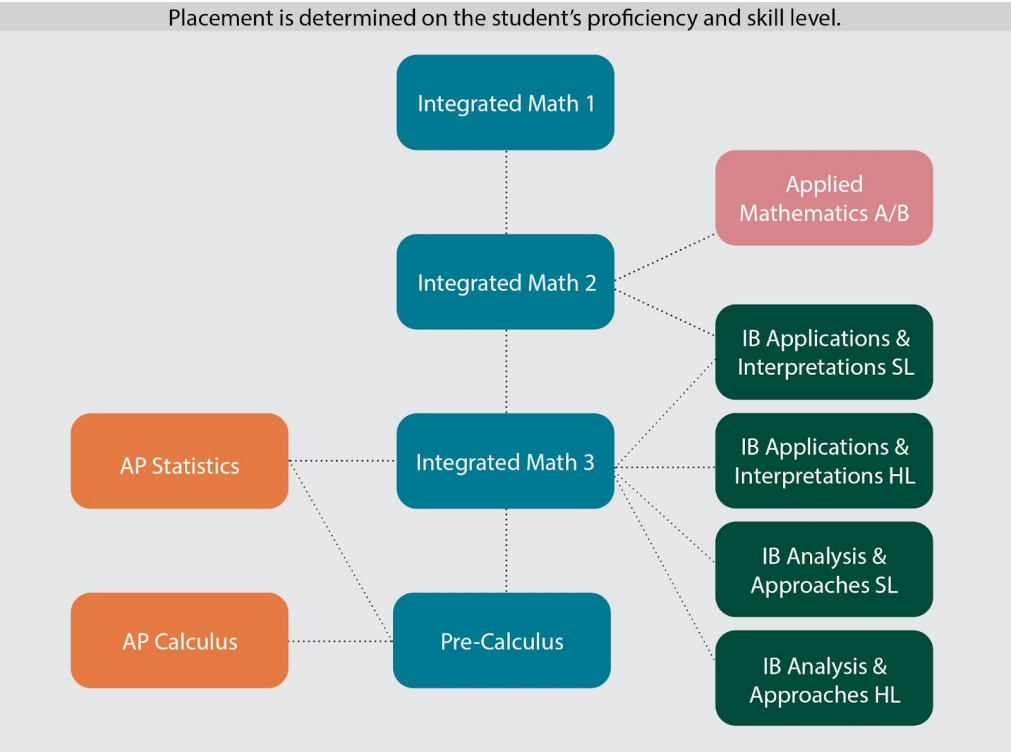
It is important that your human subjects activity is consistent with submissions to funding / contract entities. It is your responsibility to initiate notification procedures to any funding / contract entity of any changes in your activity that affects the use of human subjects.

Electronically signed by Lisa Rubin on 10/07/2024 10:41 AM ET

203 Fairchild Hall, 1601 Vattier St., Manhattan, KS 66506 | 785-532-3224 | fax: 785-532-3278 | comply@k-state.edu

Appendix J - Institutions' De-Identified High School Mathematics Pathway

Mathematics



Philosophy

The Mathematics program provides benchmarks for knowledge and skills as well as a focus on problem-solving, reasoning, constructing mathematical arguments, mathematical modeling, using mathematical tools appropriately, and attending to precision. Both conceptual understanding and procedural skills are emphasized as critically important components of overall achievement in our mathematics program. Students identify relationships between mathematical concepts and everyday situations and make connections between mathematics and other subjects.

We believe that students learn Mathematics best when they:

- embrace challenges and believe that they can be successful.
- persevere and feel comfortable taking risks.
- articulate their thinking processes.

It should be understood that the viability of courses will depend on student interest, available staffing, and timetable limitations. In the event that we are unable to offer a particular IB Math course, students will be able to access the course online using Pamoja Education.

Appendix K - Institutions De-Identified Strategic Plan

#1 Personalize Learning

- Offer highly engaging, flexible and innovative core-curriculum
- Meet the unique need of learners requiring additional support
- Establish structures and resources to challenge uniquely motivated and talented students

#2 Deliver Excellence

- Build an innovative, globally leading new campus that pushes the boundaries of education
- Analyze and share data to enhance learning outcomes
- Implement innovative curriculum that promotes creativity and self-expression

#3 Inspire Global Citizenship

- Strengthen school-wide service learning program to nurture global citizenship
- Provide social-emotional wellness programs to promote well-being and build confidence
- Enhance world languages mode, including a leading ***FOREIGN LANGUAGE*** program, for greater cultural awareness

#4 Grow Community

- Advance a shared understanding of who we are and what we do
- Deepen relationships with external apartment and leading universities
- Distinguish ***Institution*** as an internationally recognized institute

Appendix L - Institutions' De-Identified Mission and Vision Statement

Mission
Our community empowers all students to define and shape their futures for learning, service, and global citizenship.

Vision
We are a compassionate, student-centered community of learners that engages, prepares, and inspires.

Appendix M - The Eight Mathematical Practices

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

Appendix N - De-Identified Elementary School Principal Job Description

JOB DESCRIPTION:

TITLE: ELEMENTARY SCHOOL PRINCIPAL
REPORTS TO: Superintendent
CONTRACT DAYS: 200 days
POSITION SUMMARY:
The Elementary School Principal is the academic and administrative leader of the Elementary School. The principal will ensure that all programs and practices of faculty and staff support the school's mission and philosophy, and that all students are provided with an excellent educational program. The principal is expected to provide leadership, management, supervisory, and administrative skills, while nurturing the spirit of community at ***DE-IDENTIFIED INSTITUTION***.

RESPONSIBILITIES:
The Elementary School Principal will:
● Develop and execute a strategic plan to enable innovation at ***DE-IDENTIFIED INSTITUTION***. This includes a vision, discrete pedagogical practice, an active learning community, and a robust learning environment.
● Manage the performance of educational innovation by regularly and collaboratively reviewing community and student-level data to drive continuous improvement.
● Encourage and support the use of technology in the teaching/learning process, helping teachers pilot such efforts when appropriate.
● Develop the leadership capabilities of teachers so that instructional leadership becomes a shared responsibility.
● Assist in the development, revision, and evaluation of the curriculum.
● Gather validating information that helps determine whether curriculum and instructional goals and student performance outcomes are being met.
● Create an efficient, productive, and caring atmosphere where all students and faculty have an opportunity to be recognized for their best efforts.
● Assume responsibility for sound financial management including accurate program budget planning and fiscal accountability.
● Proactively seek constant professional learning and growth as a committed life-long learner.
● Be an active participant and supporter of after school student activity programs and parent events.
● Serve as a contributing member to the school's senior management team.
● Provide a healthy, safe, and secure environment for the school community.

REQUIREMENTS AND QUALIFICATIONS:
● Possess appropriate degrees (minimum Masters level or equivalent), plus current certification in the area of school administration.
● Previous successful administrative experience in an American curriculum school, with demonstrated successful leadership, organizational, and managerial skills.
● Experience building a common vision for student achievement through innovation.
● Demonstrated ability to use data to support student learning
● Willingness to work collaboratively, to compromise, and to find positive solutions.
● A leadership style that values strong communication and interpersonal skills with teamwork, and the proven ability to create and sustain a positive and supportive school environment.
● Experience with co-curricular activities, sports, and service-learning.
● Experience formulating and implementing accreditation and strategic plans for school improvement.
● Experience working in a digital environment and comfort using multiple forms of social media.
● Knowledge and experience with curriculum development, financial management, and community relations.
● Demonstrated success with the recruitment, development, and retention of excellent faculty and staff.

Appendix O - De-Identified ES Assistant Principal Job Description

TITLE: Elementary School Assistant Principal
REPORTS TO: Elementary School Principal
CONTRACT DAYS: 200 Days
POSITION SUMMARY:
The Elementary School Assistant Principal collaborates with the Elementary School Principal to provide professional leadership in the organization, administration, supervision, and evaluation of school programs and personnel. The Elementary School Assistant Principal works closely with Elementary teachers, students, parents, and support staff to accomplish this goal. The Elementary School Assistant Principal helps the Elementary community to achieve the Strategic Goal for the ***DE-IDENTIFIED INSTITUTION***: "**To be a compassionate, student-centered community of learners that engages, prepares and inspires."**

GENERAL DUTIES AND RESPONSIBILITIES: The typical duties and responsibilities of the Elementary School Assistant Principal include the following, but are not limited to:

Instructional Leadership

- Assist with the development of a program for the evaluation and improvement of instruction to ensure maximum educational benefits for students
- Assist with the development of a comprehensive curriculum and program of services in cooperation with teachers and school leadership
- Assist in maintaining effective programs to strengthen and monitor student discipline and individual progress.
- Assist with the selection and assignment of Elementary faculty and support staff
- Serve as a resource for teachers in supporting their classroom curriculum efforts ● Make effective use of consultants, specialists, conferences, and other professional learning opportunities in program and staff development
- Work cooperatively with teachers and school leadership in sharing ideas, techniques, and procedures for improvement of the learning environment
- Keep abreast of new information, innovative ideas, and techniques in a 1-to-1 digitally rich environment
- Encourage the support of the use of technology in the teaching and learning process.

Operational Leadership

- Assist with planning the school day and year to provide for efficient operation of the school
- Support with the administration of the school budget
- Assist with the maintenance of a safe and well-kept facility and materials
- Supervise, teach, and direct the work of volunteers and instructional assistants
- Serve on school-based and district-wide committees

Organizational Leadership

- Assist in providing professional leadership to organize, administer, supervise, and evaluate programs for the Elementary School
- Assist in establishing an optimal learning environment within the school
- React to situations productively and handle other tasks as assigned
- Other duties as assigned by the Principal or School Superintendent

PERSONAL AND PROFESSIONAL QUALITIES:

- Enthusiasm for working with Elementary students
- Openness and warmth in working relationships with students and staff
- Ability to conceptualize, create, and operate an exemplary Elementary school program
- Strong organizational and management skills
- Ability to work as part of a team

QUALIFICATIONS:

- Masters degree from an accredited college/university
- Experience in a position of educational leadership
- Experience teaching, modeling, and coaching elementary teachers
- Excellent tech proficiency
- Demonstrated ability to work successfully with K12 staff, students, and parents

Appendix P - De-Identified MS Principal Job Description

DE-IDENTIFIED INSTITUTION
Seeks a new **Middle School Principal**

School Mission
DE-IDENTIFIED INSTITUTION is a nonprofit, college preparatory institution, driven by student learning. Our American based curriculum promotes excellence in academics, athletics and the arts. We have a diverse community of almost 1220 students and 230 faculty and staff representing over 65 countries.

The Position:
The Middle School Principal is the academic and administrative leader of the Middle School. The principal will ensure that all programs and practices of faculty and staff support the school's mission and philosophy and that all students are provided with an excellent educational program. The principal is expected to provide leadership, organizational capacity building while creating a spirit of community at ***DE-IDENTIFIED INSTITUTION***.

Responsibilities:
● Provide principled, effective educational leadership to the middle school division
● Develop collaboration and support of students, faculty and staff in the major decisions affecting the middle school
● Establish a willingness to be a mentor to all faculty as well as encouraging their professional growth and career advancement
● Provide leadership that inspires and empowers teachers to be innovative in the classroom with students, faculty, parents, colleagues and the broader community and lead effective digital-age communication
● Develop the leadership capabilities of teachers so that instructional leadership becomes a shared responsibility
● Gather validating information that helps determine whether curriculum and instructional goals and student performance outcomes are being met
● Support digital tools and strategies to advocate for equity and responsible citizenship
● Create an efficient, productive and caring building atmosphere where all students and faculty have opportunity to be recognized for their best efforts ● Assume responsibility for sound financial management including accurate program budget planning and fiscal accountability
● Demonstrate the willingness to seek constant professional learning and growth as a committed life-long learner
● Be an active participant and supporter of the after school student activity programs and parent events.
● Serve as a contributing member to the school's senior management
● Coordinate an extensive Week Without Walls program
● Demonstrate the leverage of digital tools to extend and model on-going learning

Requirements and Qualifications:
● Possess appropriate degrees (minimum Masters level or equivalent) plus current certification in the area of school administration
● Previous successful teaching and administrative experience in an American curriculum school
● Demonstrated successful leadership, organizational and management skills
● Solid understanding of current instructional technology practices and innovation in the classrooms
● Demonstrated ability to use data to support student learning
● A leadership style that values strong communication and interpersonal skills with teamwork and the proven ability to create and sustain a positive and supportive school environment
● Experience with co-curricular activities, sports and service learning
● Knowledgeable and experienced with curriculum development, financial management and community relations including social media
● Demonstrates success with the recruitment, development and retention of an excellent faculty and staff

Appendix Q - De-Identified MS Assistant Principal Job Description

TITLE: Middle School Assistant Principal
REPORTS TO: Middle School Principal
CONTRACT DAYS: 200 Days
POSITION SUMMARY:
The Middle School Assistant Principal collaborates with the Middle School Principal to provide professional leadership in the organization, administration, supervision, and evaluation of school programs and personnel. The Middle School Assistant Principal works closely with Middle School Principal and Counselors, teachers, students, parents, and support staff to accomplish this goal. The Middle School Assistant Principal helps the Middle community to achieve the Strategic Goal for ***DE-IDENTIFIED INSTITUTION*** : "To be a compassionate, student-centered community of learners that engages, prepares and inspires."

GENERAL DUTIES AND RESPONSIBILITIES: The typical duties and responsibilities of the Middle School Assistant Principal include the following, but are not limited to:

Instructional Leadership

● Assist with the development of a program for the evaluation and improvement of instruction to ensure maximum educational benefits for students
● Assist with the development of a comprehensive curriculum and program of services in cooperation with teachers and school leadership
● Assist in maintaining effective programs to strengthen and monitor student discipline and individual progress
● Assist with the selection and assignment of Middle School faculty and support staff
● Serve as a resource for teachers in supporting their classroom curriculum efforts
● Make effective use of consultants, specialists, conferences, and other professional learning opportunities in program and staff development
● Work cooperatively with teachers and school leadership in sharing ideas, techniques, and procedures for improvement of the learning environment
● Provide leadership and/or feedback in the areas of interdisciplinary and inquiry-based learning, and UbD unit and lesson design.
● Keep abreast of new information, innovative ideas, and techniques

Student Support

● Assists with the student caseload as part of the leadership team
● Works with Student Support teachers, students, and their families to create Individualized Learning Plans
● Commits to using developmentally appropriate practices associated with adolescents as defined by the Association of Middle Level Education
● Create Values Learning plans in accordance with the handbook utilizing a restorative learning philosophy

Operational Leadership

● Assist with the administration of the school budget
● Assist with planning the school day and year to provide for efficient operation of the school (calendaring & scheduling)
● Assist with the maintenance of safe, clear, attractive, and well-kept facilities and materials
● Supervise, teach, and direct the work of volunteers and student assistants
● Serve on school-based and district-wide committees

Organizational Leadership

● Assist in providing professional leadership to organize, administer, supervise, and evaluate programs for the Middle School
● Assist in establishing an optimal learning environment within the school
● Ensuring that communication regarding the reporting procedure is well understood. Liaising with the tech department to ensure smooth preparation and dissemination of the electronic report card and grade book.
● Respond to situations productively and handle other tasks as assigned
● Other duties as assigned by the Principal or School Superintendent, including: Assume the responsibilities of the Principal in his/her absence; Participate in Leadership Meetings; Collaborate with the Principals in the development of agendas for professional development and other trainings/meetings; Assist in preparation for school opening and closing; Help counselors with scheduling students as needed; Coordination of special schedules with the High School; Supervision at break time, lunch, and after school bussing; Chaperone and assist with Week Without Walls organization.

Appendix R - De-Identified HS Principal Job Description

JOB DESCRIPTION
High School Principal

DE-IDENTIFIED INSTITUTION seeks a passionate, enthusiastic and experienced educational leader to serve as our next **High School Principal**. This student centered individual is the academic and administrative leader and ensures all programs and practices of faculty and staff support the school's mission and philosophy. The principal is expected to be forward-thinking, innovative and has the desire to be part of a collaborative community characterized by strong relationships.

Responsibilities

● Provide principled, effective educational leadership to the high school division
● Lead major decisions affecting the high school in collaboration and support of faculty, staff and students
● Communicate effectively with students, faculty, parents, colleagues and the broader community through verbal presentations, writing and/or videos.
● Seek the involvement of faculty and parents in a wide variety of school activities
● Analyze data to determine whether curriculum and instructional goals and student performance outcomes are being met
● Assume responsibility for sound financial management including accurate program budget planning and fiscal accountability for the HS budget
● Mentor faculty by encouraging their professional growth and career advancement
● Demonstrate a willingness to seek constant professional learning and growth as a committed life-long learner
● Develop teacher leaders so that instructional leadership becomes a shared responsibility
● Create an efficient, productive and caring atmosphere where all students and faculty have the opportunity to be recognized for their best efforts
● Support and participate in after-school student activity programs and parent events ● Serve as a contributing member of the school's senior leadership team

Requirements & Qualifications

● Must have extensive experience working in or with an American, standards-based curriculum with experience leading at the secondary level
● Holds appropriate degrees (minimum Masters level or equivalent) plus current certification in the area of school administration
● Fantastic interpersonal skills with the ability to maintain a positive, happy school environment while holding all accountable
● Excellent writing skills, top-notch presenting skills and the ability to use these talents to educate others and for formulating and implementing the strategic plan of the school
● Experience and enjoyment of leading/overseeing co-curricular activities, sports and service-learning
● Demonstrated success with recruitment, development and, most importantly, the retention of a high-performing faculty and staff
● Embraces using technology personally in a tech-rich environment and a willingness to model usage and stay current to support teachers/students in their growth
● Experience with the International Baccalaureate (IB) Diploma Program and/or the Advanced Placement (AP) program
● Proven commitment to a well-balanced program that focuses on the whole child

Appendix S - De-Identified HS Assistant Principal Job Description

TITLE: High School Assistant Principal
REPORTS TO: High School Principal
CONTRACT DAYS: 200 days
SUMMARY OF POSITION
Candidates for the Assistant Principal position should be proactive and able to formulate a creative vision of how to deepen and optimize the learning experiences of all students and teachers while ensuring the effective implementation of a holistic educational program. The primary role is focused on the administration of student affairs. The following responsibilities are undertaken in collaboration with the High School Principal; in some cases, these will be divided between the two principals:

MAJOR RESPONSIBILITIES
Student Affairs
● Develop systems, procedures, and oversight to ensure the high school team assumes collective responsibility for supporting students who are struggling academically.
● Collaborate with teachers and counseling team to enhance, coordinate, and carry out the implementation of all aspects of the Advisory program for grades 9-12.
● Coordinate, and create a calendar for, a robust and holistic co-curricular program of events, trips, and activities, communicating information pertinent to these to all staff, students, and parents.
● Collaborate with counselors and support specialists to convene meetings, support accommodation plans, and, when necessary, write and enforce academic and behavioral contracts.
● Refine and enforce all policies in the handbook related to student conduct within a framework that balances holding young people responsible for their choices and viewing mistakes as an integral part of the learning process.
● Help coordinate testing and develop schedules.
● Review student applications and make recommendations about admissions.
● Participate actively in student (and parent) events.

Educational Leadership/Administration
● Observe classes, provide substantive feedback to teachers, coach to improve instructional practices in a supportive and supervisory context.
● Encourage and participate in professional learning teams aimed toward improving student achievement, instructional practice, and teacher/administrator learning.
● Support the management of capital and instructional budgets.
● Help implement the Strategic Plan, especially as it relates to enhancing and improving student learning and professional growth.
● And the all time favorite of…other duties as assigned!

PREFERRED QUALIFICATIONS/CHARACTERISTICS
● Experience as an educational leader with a strong academic background and a Master's Degree along with successful experience as an assistant principal in a high school setting.
● Valid teaching credential with at least five years of divisional teaching experience
● Proactive, collaborative, receptive to feedback, reflective, flexible, and positive and of course, a sense of humor is just about the most important attribute needed when working with teens.
● Highly developed written and oral communication skills, organized, attentive to detail, strong work ethic with strong tech skills!

Appendix T - De-Identified Philosophy Statement for the Teaching and Learning Center

The Teaching and Learning Center (TLC) at ***DE-IDENTIFIED INSTITUTION*** fosters a culture of excellence in teaching and learning by empowering educators to grow, collaborate, and lead.

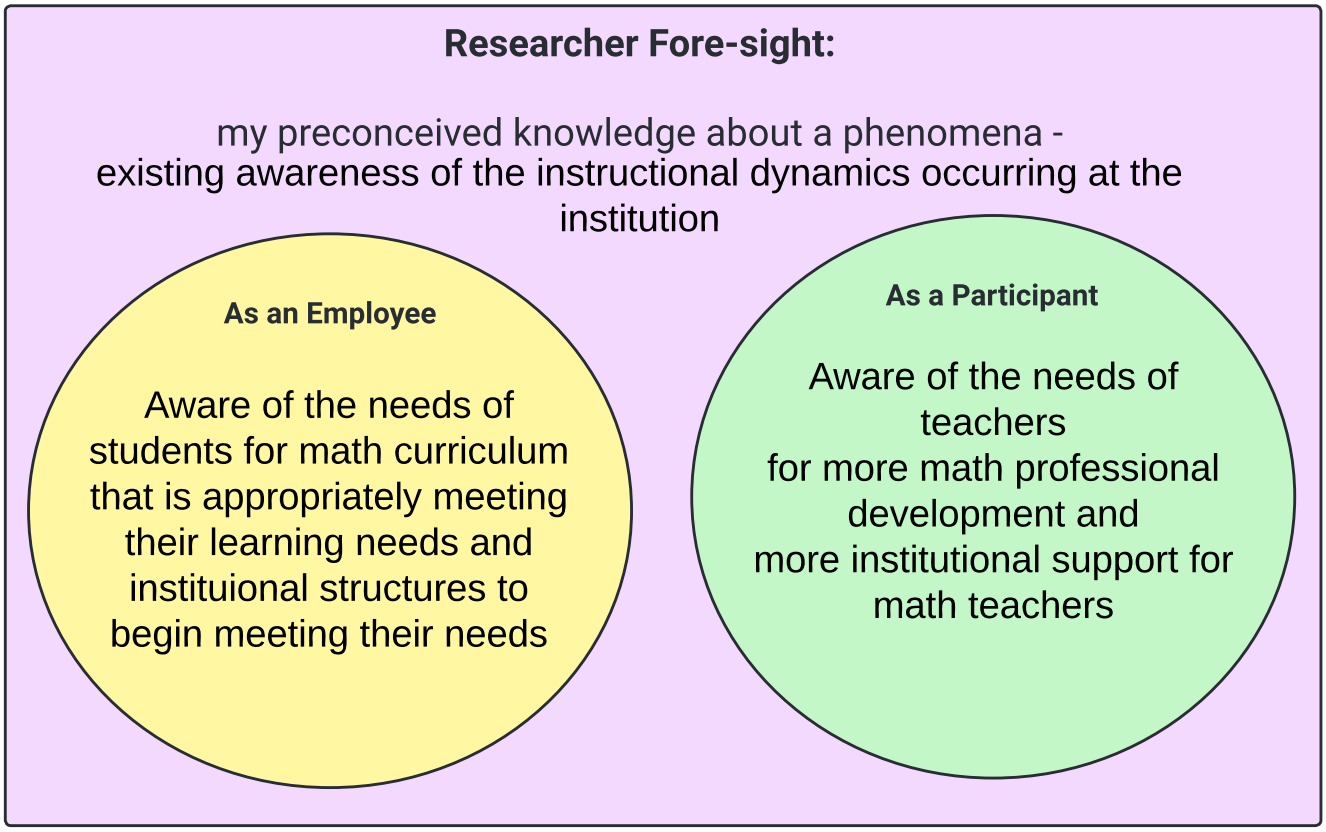
Our mission is to partner with principals and teachers to support faculty at every stage of their professional journey. Together, we facilitate curriculum development, guide resource adoption, ensure vertical alignment, and elevate instructional strategies. We actively support the design of lessons and units that leverage technology in authentic and innovative ways to enhance teaching and learning. The TLC creates and offers impactful learning opportunities while also helping faculty connect to professional experiences worldwide, including conferences, workshops, and global networks. We encourage our educators to share their expertise and present their work on these international stages.

The TLC's work is grounded in the *Standards for Professional Learning* developed by *Learning Forward, The Professional Learning Association* in the United States. These standards define the key attributes of professional learning that drive effective teaching practices, foster supportive leadership, and lead to improved student outcomes.

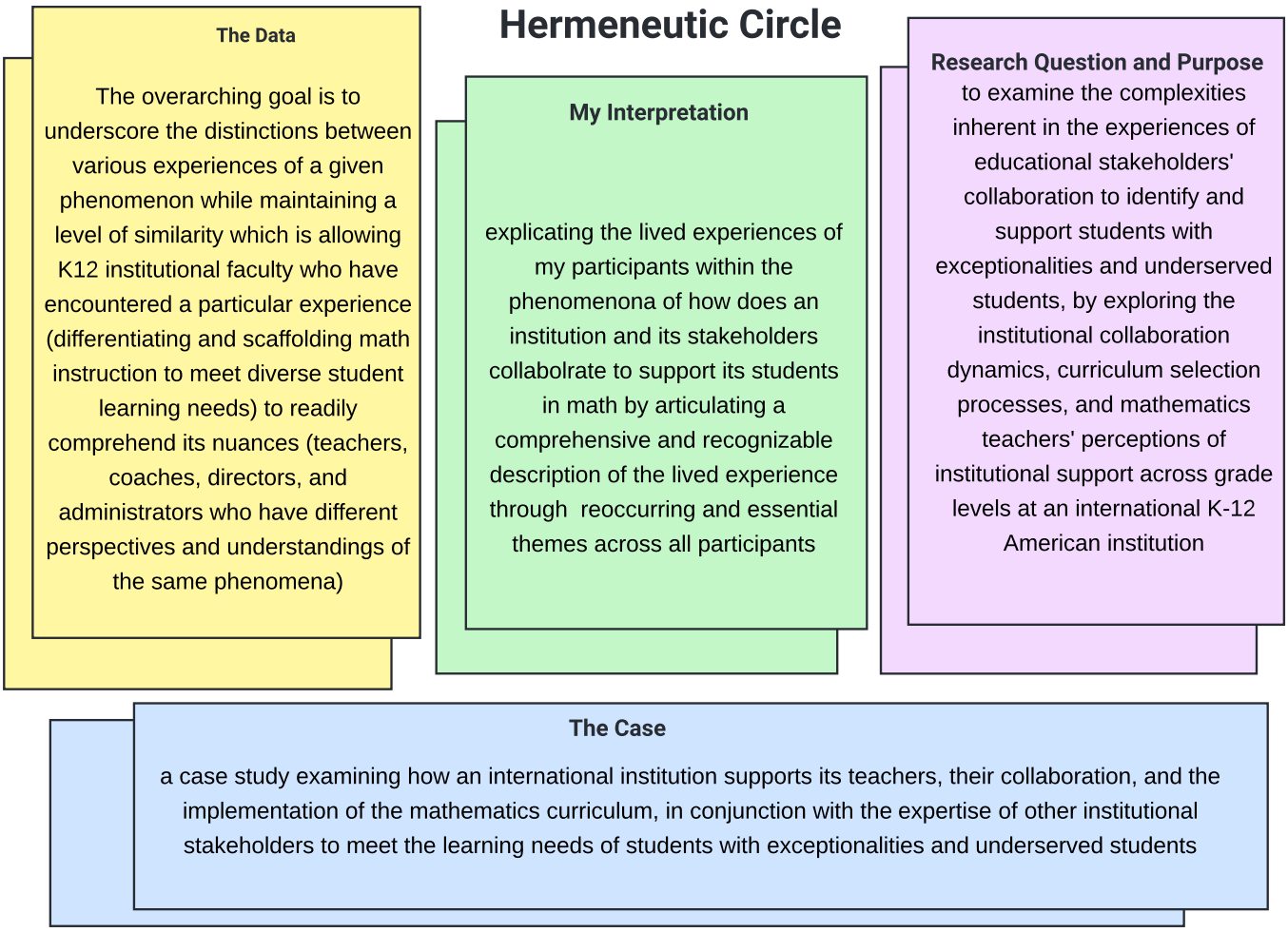
In addition to aligning with these standards, the TLC offers a wide range of resources to support educators, including a professional library, instructional coaching, and mentoring for teachers new to ***DE-IDENTIFIED INSTITUTION***. We also proudly host the ***DE-IDENTIFIED INSTITUTION*** Program, nurturing the next generation of educators in alignment with our school's mission and values.

At its heart, the TLC is a collaborative partner for teachers and leaders, providing guidance, inspiration, and opportunities for growth. By supporting and leading learning within our community, the TLC ensures that ***DE-IDENTIFIED INSTITUTION*** maintains a shared commitment to excellence, innovation, and continuous improvement.

Appendix U - Researcher Fore-sight



Appendix V - Hermeneutic Circle



Appendix W - Six Steps for Phenomenological Data Analysis