Fall 12-2018

A Case Study of the Implementation of Co-Teaching in a STEAM Elementary Magnet School in a Midwestern State

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by

Ashley Lane Copley

December 2018

A Dissertation submitted to the Education Faculty of Lindenwood University in

partial fulfillment of the requirements for the degree of

Doctor of Education

School of Education

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Jan. 9, 2019
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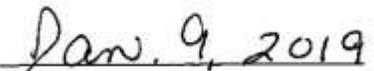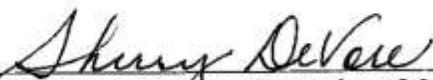
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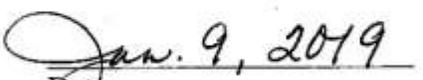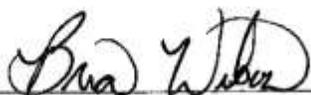
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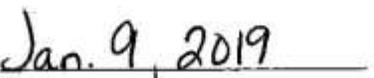
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Declaration of Originality

I do hereby declare and attest to the fact that this is an original study based solely upon my own scholarly work at Lindenwood University and that I have not submitted it for any other college or university course or degree.

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Signature: _Ashley Copley_ Date: Jan. 9, 2019

Acknowledgements

     I would like to take this opportunity to express my sincere gratitude to the many individuals who provided their time, support, assistance, and encouragement throughout this process. This paper would never have been completed if not for the timely feedback, suggestions, and constant encouragement from my advisor, Dr. Shelly Fransen. I am also thankful for the time and valuable advice received from my committee members, Dr. Sherry DeVore and Dr. Brian Wilson. Thank you for having high expectations and challenging me to expand my thinking.

     I would like to give a heartfelt thank you to the school district, teachers, and administrators who participated in this research. I want to thank Dr. Lara Wilbur for the time she spent away from her building to conduct the teacher and administrator interviews used for this study.

     Thank you to my family for providing unconditional love and support throughout this journey. My husband Jason sacrificed so much of his own time and never complained through the process. Our three small children, Meliah, Bodie, and Maggie, were my biggest cheerleaders and would always ask, "How many more pages do you have left, Mommy?" Finally, to our sweet baby boy Jake, who came into this world only three short months ago and who shortly had to return back into the arms of Jesus, you blessed our lives so much.

Abstract

Although research is limited on the effectiveness of co-teaching as a service delivery model for students with disabilities, through observation, many educators have reported positive outcomes with co-teaching (Beninghof, 2011). This case study was designed to examine the implementation of co-teaching in an elementary magnet school in a Midwestern school district driven by science, technology, engineering, arts, and mathematics (STEAM) and with a strong emphasis on personalized learning. General education teachers, special education teachers, and administrators were interviewed three times during the initial implementation school year. In addition, journaling was documented by three of the participants, and co-teaching fidelity checks were completed by the school district's Executive Director of Special Services. After information was gathered and analyzed, it was discovered both students with and without disabilities benefit from co-teaching as a service delivery model. It was also noted there are similarities between the benefits and challenges in a traditional co-taught classroom and a co-taught class in a STEAM elementary school with an emphasis on personalized learning. The benefits of co-teaching far outweigh the detriments. It was further discovered the success of co-teaching is attributed to the pairing of co-teaching partnerships. Finally, the participants shared the need for special education administrators to play a more active role in professional development and the sustainability of co-teaching.

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Chapter One: Introduction

With a push to educate students with disabilities to the maximum extent possible in the general education environment, educators are considering co-teaching as a solution (Friend, 2014). Beninghof (2016) defined co-teaching as "a partnering of two teachers with different areas of experience to provide more comprehensive, effective instruction to students" (p. 12). When co-teaching is used as a service delivery model to provide specialized instruction to students with disabilities, the co-teaching partnership consists of a special education teacher and a general education teacher (Friend, 2014). According to Friend (2016b), co-teaching not only gives students access to the general education curriculum, but also offers the specialized instruction students with disabilities need to be successful.

Studies have been conducted on the impact of co-teaching on student outcomes, student and parent perceptions of co-teaching, the structure of co-teaching, the role of administrators in co-teaching, and the relationships and practices of co-taught classroom teachers (Friend, 2014). No one, however, has addressed what co-teaching looks like in a Science, Technology, Engineering, Art, and Math (STEAM)-centered school with a rigorous curriculum that lends itself to personalized learning. Schmidt (as cited in Colvin & Jacobs, 2010), a Michigan State professor, described a rigorous curriculum as "focused, coherent, and appropriately challenging" (para. 15). When implemented correctly, personalized learning can be an environmental catalyst that helps students with disabilities succeed (National Center for Learning Disabilities [NCLD], 2016).

In Chapter One an overview of how students with disabilities are currently receiving special education services in a STEAM school in a Midwestern state is

provided. Also included are the added challenges of a STEAM school with a focus on personalized learning for students with disabilities. Consideration is given to the potential of co-teaching to give students with disabilities access to the general education curriculum while providing specialized instruction.

Background of the Study

This present case study is a narrative account of the implementation of co-teaching in a STEAM elementary magnet school within a public school district in a Midwestern state. Examined in this study are descriptions of the different elements involved in the implementation of co-teaching as a special education service delivery model. The challenges personalized learning poses for students with disabilities, the educational focus of a STEAM school and the effect it has on students with disabilities, the strategies used for the implementation of co-teaching, and the essential elements of bringing about effective change are also delineated.

The mission of the participating elementary STEAM magnet school is to build learners for life by preparing students for a culturally diverse and technology-driven world (District Handbook, 2017). This magnet school is STEAM-accredited with a focus on science, technology, engineering, art, and mathematics for grades kindergarten through sixth grade (District Handbook, 2017). Educators utilize a progressive student-driven model of education by empowering students to be innovative and creative problem solvers (District Handbook, 2017).

An outside agency is employed to generate a calculated lottery by family name to ensure fairness of entry into the program (District Handbook, 2017). The lottery is open to all families who reside within the school district in the Midwestern community,

including families who may have a student with a disability (District Handbook, 2017).

Federal law states a child who has a disability and needs special education services must

receive those services in the least restrictive environment (Wright & Wright, 2017).

There are different service delivery models through which special education services are

provided, and one of those models is co-teaching (Friend, 2014).

Conceptual Framework

Regoniel (2016) described the conceptual framework as the researcher's

understanding of how variables, factors, and concepts all connect to one another and map

out the entirety of a study. Chetty (2015) identified the conceptual framework as the link

among the literature, methodology, and results of the research and the essential focus of

the content of the study. The conceptual framework for the present study was based on

the use of co-teaching (or collaborative teaching) as a service delivery model for students

with an individualized education program (IEP). More specifically, the implementation

of co-teaching in a STEAM school with a focus on personalized learning was

investigated. Beninghof (2011) conceptualized co-teaching as "two or more educators

simultaneously work[ing] with a heterogeneous group of students in a general education

classroom" (p. 7). For the purpose of the present study, the roles and responsibilities of

both general education teachers, considered content experts, and special education

teachers, considered learning specialists were examined.

Students with disabilities receive a wide range of special services depending on

their individual needs, and many different options are available for providing those

services (Friend, 2014). Co-teaching is one educational delivery model used to provide

special education services to students with disabilities (Friend, 2014). However, where

other service delivery models are outlined in federal special education legislation and have existed for many years in public education the co-teaching model is not addressed, specifically within the law (Friend, 2014). Students with disabilities can no longer simply be included in general education classrooms; they must be given authentic opportunities to participate in and access the general education curriculum (Murawski & Bernhardt, 2016). Therefore, co-teaching is utilized in schools throughout the country as a way to meet the federal requirements of the least restrictive environment by educating students with disabilities in the general education environment when possible (Meglemre, 2016).

Friend (2016b) defined co-teaching as the arrangement of a general education teacher and a specialist working together to educate students with disabilities. The special education teacher is the learning specialist for the purpose of the present study. Educators are starting to realize by bringing together two different teachers with individual talents and backgrounds, the partnering produces the best instructional outcomes for students (Beninghof, 2016).

Cook and Friend (1995) developed six approaches to co-teaching. The six approached to co-teaching provide the framework in this study as to what a two teacher classroom should look like (Friend, 2014). Co-teaching increases educational opportunities for students with disabilities by providing access to the general education curriculum (Friend, 2014). In a co-taught classroom, two educators work to integrate special education strategies and techniques into each lesson to enable students with disabilities to reach the goals written into their IEPs (Friend, 2016b).

Due to increased diversity in classrooms today, a one-size-fits-all learning environment no longer makes sense (Tomlinson, 2017). But, it is unwise to assume a personalized learning environment is a good fit for all; some students with disabilities may have trouble finding success when provided the structure of personalized learning (Tomlinson, 2017). Special education is already an example of students receiving individualized instruction through IEPs (Wright & Wright, 2017). When a student with a disability has an IEP, a team of educators has already personalized the student's learning (Friend, 2014).

A psychological law called the Yerkes-Dodson Law, also referred to as the Goldilocks Effect, and implies optimal performance occurs through an intermediate level of stimulation, not through maximum arousal (France, 2017). With the implementation of co-teaching in a personalized learning environment, it may be possible for students to receive too much of a good thing (France, 2017). Co-teaching increases educational opportunities for students with disabilities by providing access to the general education curriculum (Friend, 2014).

Statement of the Problem

The current literature on co-teaching as a service delivery model for providing specialized instruction to students with disabilities addresses various aspects of co-teaching but remains limited in scope and depth (Friend, 2014). The research available reveals positive results connected to co-teaching, but the current database remains extremely limited (Beninghof, 2011). As co-teaching continues to expand in response to federal mandates to educate students with disabilities in the general education

environment, educators hope the research base on co-teaching will continue to grow as well (Beninghof, 2011).

In the current literature, there is no mention of the effectiveness of co-teaching in an environment where students are given the freedom to create their own learning pathways through the use of personalized learning. There are many different definitions of personalized learning, but what experts can agree on is that personalized learning involves students having greater control over the content they are learning, the pace at which they learn, and the use of technology to customize learning (Riley, 2017).

Purpose of the Study

The purpose of this study was to investigate the processes and outcomes of the implementation of co-teaching as a service delivery model in a STEAM magnet elementary school. There are a few things that set a STEAM elementary school apart from the typical structure of an elementary school (Chastain, 2014). Educators in this STEAM school embrace personalized learning and encourage students to create their own pathways of learning (District Handbook, 2017).

The research was designed to address the perceptions of various educational stakeholders as they implemented co-teaching in a STEAM-enriched learning environment for the first time. Perceptions were gathered from the following: STEAM teachers, including general education teachers and special education teachers, and administrators, including the building principal, building assistant principal, the district's executive director of special services, the district's elementary instructional specialist, and the district's executive director of elementary education. A focus of this study was the use of co-teaching as a way to deliver individualized instruction to students with

disabilities in a personalized learning environment. As a result, STEAM teachers and administrators had the opportunity to reflect on the effectiveness of co-teaching as a service delivery model in their school.

Research questions. The following research questions guided the study:

1.   Based on the perceptions of elementary school STEAM teachers, what are the benefits and detriments for students with and without disabilities when co-teaching is implemented with fidelity?

2.   In what ways does co-teaching enable students with disabilities to thrive in a learning environment driven by personalized learning?

3.   What are elementary STEAM teachers' perceptions of the benefits of co-teaching used as a service delivery model for inclusion in a STEAM school?

4.   What are strategies administrators can use to provide support for the co-teaching model in a STEAM school?

Significance of the Study

Federal law mandates students with disabilities are to receive specialized instruction in their least restricted environment (Wright & Wright, 2017). Co-teaching has become a common way to provide students the supports they need while accessing the general education classroom (Shi, Lee, & McKenna, 2016). This study was designed to fill current gaps in research by examining the benefits and challenges of providing specialized instruction to students with disabilities in co-taught STEAM classrooms where there is an emphases on personalized learning, and the rigor of the curriculum and content is arguably elevated when compared to typical elementary schools that do not have STEAM centered instruction.

Definitions of Key Terms

For the purpose of this study, the following terms are defined:

Co-teaching. Co-teaching, or collaborative teaching, is a service delivery model to provide specialized instruction to students with disabilities (Friend, 2014). The co-teaching partnership in this case study consisted of a special education teacher and a general education teacher (Friend, 2014).

Executive functioning. According to Meltzer (2018), executive functioning is an all-encompassing term for the efficiency and effectiveness with which individuals acquire knowledge and problem-solve in the areas of attention and emotional regulation, intuition and inhibition, goal setting, planning, organization, and flexibility.

Fidelity of implementation. According to Stains and Vickrey (2017), fidelity of implementation is used to assess the impact of an intervention. In this case, the fidelity of implementation was used to assess the impact of co-teaching.

Least restrictive environment. Least restrictive environment, as defined in the Individuals with Disabilities Education Act (IDEA) (2004), is the opportunity for students with disabilities to be educated with non-disabled peers to the greatest extent appropriate given each student's individual needs.

Specialized instruction. Specialized instruction is provided to students in special education at no cost to parents (Friend, 2018). Specialized instruction includes instruction designed specifically to meet the individual needs of a student and can be provided in the classroom, home, hospital, and other settings (Friend, 2018).

Limitations and Assumptions

The following limitations were identified in this study:

1. This study was conducted to examine one STEAM-accredited magnet school in a Midwestern school district. The findings and conclusions are not necessarily representative of STEAM magnet schools with different demographics.

2. An additional limitation could exist given the nature of the STEAM magnet school and the initial hiring process when the school was established in 2012. Teachers in the magnet school could be more motivated than typical general education and special education teachers. When the school was established, teachers already employed with the district had to apply and interview for the magnet positions.

3. Interview questions were created by the researcher based on the conceptual framework of co-teaching used as a service delivery model. Since the interview questions were not standardized, this instrument may be considered a limitation.

4. The co-teaching fidelity check is currently used by the district's special education administration to assess the effectiveness of co-taught classrooms at the junior high and high school levels. The fidelity checklist requires the observer to assess the following areas: co-teaching approaches used, professional relationships between co-teachers, the instructional environment, differentiation, and classroom and behavioral management. For this study, the fidelity checklist was completed by the district's Executive Director of Special Services. Since the co-teaching fidelity check is purely observational, this instrument may be considered a limitation.

The following assumption was accepted:

1. The responses of the participants were offered honestly and without bias.

Summary

As explained by Friend (2018), "The rise in inclusive practices has brought about the need for service delivery options that allow students with disabilities to access their education with their peers in general education while also receiving specialized services" (p. 108). One way this practice of inclusion is being achieved is through co-teaching. Policies and legislation, including the Individuals with Disabilities Education Act and the No Child Left Behind Act of 2001, have mandated services for students with disabilities in the least restrictive environment (Scruggs & Mastropieri, 2017). The decision to conduct a case study of the implementation of co-teaching in a STEAM magnet elementary school emerged from the lack of current research available on co-teaching in STEAM schools with a focus on personalized learning. Questions were developed for the purpose of evaluating the implementation of co-teaching as a service delivery model for students with disabilities in the STEAM school and to elicit the perceptions of teachers and administrators about the effectiveness of co-teaching.

Within Chapter One, the background of the study, the conceptual framework, and the statement of the problem were presented. The purpose of the study and the research questions were introduced. Finally, the significance of the study, definitions of key terms, and limitations and assumptions were provided.

A more thorough discussion of the conceptual framework is provided in Chapter Two. Also included in Chapter Two is a review of research on the following topics: STEAM education, personalized learning, personalized learning with a STEAM focus

and students with disabilities, inclusion and personalized learning, co-teaching as a

service delivery model, the definition of co-teaching, and the benefits of co-teaching.

Chapter Two: Review of Literature

Chapter Two contains a review of recent literature to further define co-teaching as a service delivery model for students with disabilities. More specifically, the review was based upon literature from articles, journals, websites, and books. Studies on co-teaching, personalized learning, and STEAM education, were examined through the lens of the co-teaching environment. The most current literature available was incorporated into this chapter.

Effective co-teaching must be viewed as an accommodating, ever-changing, and flexible form of teaching designed to meet the individual needs of the heterogeneous group of students in one general education classroom (Beninghof, 2011). Like most service delivery models, co-teaching presents benefits and challenges (Friend, 2014). When co-teaching is used as a service delivery model for students with disabilities, it exposes students with disabilities to the rigor of the general education curriculum (Friend, 2014).

Conceptual Framework

The Individuals with Disabilities Education Act, (IDEA), along with the Americans with Disabilities Act, the Every Student Succeeds Act, and other legislation, guarantee all students will be provided an education that is accessible, free, appropriate, nondiscriminatory, timely, meaningful, measurable, and in the student's least restrictive environment (Boroson, 2017). In the recent case of *Endrew F. v. Douglas County School District*, the U.S. Supreme Court ruled in favor of a higher standard of education for children with disabilities (McKenna, 2017).

On March 22, 2017, Chief Justice John G. Roberts, Jr. acknowledged in the court's opinion that a child's "education program must be appropriately ambitious in light of his circumstances" and that "every child should have the chance to meet challenging objectives" (as cited in McKenna, 2017, para. 5). Although co-teaching is not part of the service delivery continuum outlined in federal special education law, it has grown in its use as a service delivery model in the past decade (Friend, 2016a). Co-teaching provides access to the general education curriculum and seems to address the least restrictive environment issue for most students (Friend, 2016a).

Approaches to and methods of teaching have been significantly influenced by cognitive psychologists such as Vygotsky (Murphy, 2014). Vygotsky (1978) called the space between a child's current understanding and what he or she should learn next the zone of proximal development. The zone of proximal development relates to the difference between what children can do on their own and what they can do with assistance and encouragement from a more knowledgeable other (McLeod, 2014). According to Cherry (2016b), this zone is the gap between what the child knows and what the child does not know yet.

According to Yanbin (as cited in Chittenden, 2016), based on Vygotsky's theory of social constructivism, educators can develop three strategies to assist in the development and implementation of certain aspects of special education: (a) creation of special instructional methods, (b) use of appropriate social support systems, and (c) existence of diverse intellectual ability levels in the classroom. Chittenden (2016) suggested:

An appropriate social support system is vital to avoid the creation of an inferiority

complex with the term disability, identifying the correct special education setting

and implementing it effectively through the use of instructional methods, support

of various intellectual levels, and implementation of co-teaching effectively is a

necessity. (p. 7)

Vygotsky's theory allows for individualized learning to take place with each individual's

zone of proximal development unique to the learner (Cherry, 2016a).

Cook and Friend (1995) outlined six common approaches to co-teaching to

maximize the unique perspectives and strengths of the general education teacher and the

special education teacher. Co-teaching lends itself to differentiation, especially through

approaches such as station teaching, alternative teaching, team teaching, and parallel

teaching (Murphy, 2014). Vygotsky highlighted the need for differentiation and support,

and Beninghof (2011) proclaimed co-teaching makes differentiated instruction easier.

Beninghof (2011) noted, "Co-teachers bring different perspectives to lesson

design, creating plans that include higher and lower levels of complexity and more hands-

on applications" (p. 11). According to Friend (2014), differentiation is an appropriate

goal for co-teachers, but it is not enough. Friend (2014) indicated that if the goal of co-

teaching is to provide differentiation, then students with disabilities are still not receiving

the specialized instruction to which they are entitled. Cook and Friend's six approaches

to co-teaching are used as a way to integrate specially designed instruction into the

classroom (as cited in Friend, 2016b).

STEAM Education

Devon Cameron (as cited in STEAM Education, 2017), former principal of the first STEAM-certified school, generalized the following:

> STEAM represents a paradigm shift from traditional education philosophy, based on standardized test scores, to a modern ideal which focuses on valuing the learning process as much as the results. In essence, we dare our students to be wrong, to try multiple ideas, listen to alternate opinions and create a knowledge base that is applicable to real life as opposed to simply an exam. (para. 4)

Science, technology, engineering, and mathematics (STEM) was first originated in the 1990s by the National Science Foundation (Bybee, 2013). With the incorporation of the arts, the acronym STEM has evolved into STEAM (STEAM Education, 2017).

According to Bequette and Bequette (2012), "Hands-on, imaginative approaches to science education, using many of the methods used in the creative arts, have been shown to attract and retain young people in the fields of Science, Technology, Engineering, and Mathematics" (p. 43). The acronym STEAM represents how science, technology, engineering, arts, and mathematics relate to each other and the real world (STEAM Education, 2017). Yakman, owner and founding researcher at STEAM Education in Marion, Virginia, suggested, "Rather than teach subjects in a vacuum, STEAM programs integrate them in an inquiry-based, hands-on curriculum that more closely aligns with what students will experience in college and the workforce" (as cited in Callahan, 2017, p. 1). The U.S. Department of Education reported STEAM-related jobs in the United States would grow by 14% from 2010 to 2020, compared to the national average of 5-8% growth across all job sectors (Vidcode, 2017).

Personalized Learning

The online *Glossary of Education Reform* (2015) defined personalized learning as "a diverse variety of education programs, learning experiences, instructional approaches, and academic supports strategies that are intended to address the distinct learning needs, interests, aspirations, or cultural backgrounds of individual students" (para. 1). The *Glossary* (2015) added, "It is an alternative to so-called 'one-size-fits-all' approaches to schooling" (para. 1). Student-centered practices should be flexible and responsive to the needs of students (Richardson & Feldman, 2014).

Rickabaugh, Sprader, and Murray (2017) emphasized personalized learning does the following:

- Nurtures powerful learners rather than just proficient students.

- Positions learners as partners with educators to identify learning goals, design learning paths, create learning experiences, and share accountability for learning progress and success.

- Is competency-based, in that progress is based on learning rather than on time spent in learning activities. Students share in monitoring growth in their competencies and progress along learning continuums, often across multiple subject areas. (p. 23)

There have been many different definitions attached to the term personalized learning, adding confusion to what it is all about (Rickabaugh et al., 2017). There are also those such as Hernandez (as cited in Riley, 2017), who noted the absence of a common definition of personalized learning has led some critics to suggest educators should stop trying to develop one.

With personalized learning, students are now in a position to be partners with educators during the process of learning (Rickabaugh et al., 2017). Carter (2017) acknowledged, "Personalization is ultimately about designing stepping stones that build students' confidence and competence, enabling them to assume responsibility for their own adjustments" (p. 75). Educators agree the days of one-size-fits-all education are over (Kallick & Zmuda, 2017), and the traditional classroom setting is not conducive to personalized learning (Tucker, 2017a).

Riley (2017) posed the question, "What evidence do we presently have that personalized learning works?" with the answer, "Virtually none" (p. 69). More than $500 million was invested by the U.S. Department of Education in 21 school districts to support personalized learning programs, with no research to show if the investment improved student outcomes (Riley, 2017). When students are given the freedom to follow their own paths at their own pace with a little guidance, how do educators assure the students will learn what they need to know (Fisher & Frey, 2017; Riley, 2017)? As Riley (2017) noted, "Innovations in education will always race ahead of empirical research validating or invalidating new techniques" (p. 70). Tomlinson (2017) remarked, "It's unwise to assume that any model will work for learners of all ages, in all subjects" (p. 13). According to Lusardi (2017), personalized learning needs to be implemented intentionally and with purpose.

Personalized Learning with a STEAM Focus and Students with Disabilities

With the addition of personalized learning, educators are now providing a tailored education to all students that was once only available to those students in special education (Kelly, 2016). Worthen (2016) mentioned, "The passage of the Every Student

Succeeds Act provides a historic opportunity for states to redesign K-12 education systems to support competency-based, personalized learning" (p. 37). The Bill and Melinda Gates Foundation and the RAND Corporation conducted a study and found students in schools implementing personalized learning strategies, over the course of two years, made greater academic progress than comparison schools, with lower-achieving students experiencing the most significant growth rates when compared to their peers, particularly in mathematics (Pane, Steiner, Baird, & Hamilton, 2015). In the RAND study, those students in the bottom 60% of their group made greater learning gains than their peers in the top 40% (Goodwin, 2017). Goodwin (2017) noted one-quarter of the schools in the RAND study revealed adverse effects due to personalized learning and another quarter showed no effect (p. 81).

According to Pane et al. (2015), the schools with the greatest gains in achievement reported robust implementation of the following: student grouping by data and student needs, provisions of data to students and having the students be a part of data discussions, and learning spaces conducive to personalized learning strategies. Half of the schools in the RAND study set personal learning goals for students, and a little under half of the schools used learner profiles to guide and track progress (Goodwin, 2017). Personalized learning requires a shift in teaching and a willingness to stumble along the way (Goodwin, 2017).

Kelly (2016) explained, "Special education teachers are experts at personalized learning. Individualized education programs (IEPs), small group instruction and flexible classroom design are among the many tricks that special education teachers use to meet their students' needs" (para. 1). Federal special education law requires an IEP for

students who meet the eligibility criteria; an IEP is a personalized learning plan for the individual (Bateman & Soifer, 2015). Butler (2016) remarked, "We can learn a great deal about how to personalize learning by reviewing lessons learned from the field of special education" (para. 1). According to Kelly (2016), the same principles outlined in the IDEA are the principles around which the personalized learning movement is centered.

The National Center for Learning Disabilities (2016) wanted to make sure the voices of students with disabilities and their family's voices were heard. With the growth of personalized learning, the National Center for Learning Disabilities (2016) produced a comprehensive set of policy and practice recommendations addressing all stakeholders who have a role in ensuring the success of students with disabilities in the school setting. The National Center for Learning Disabilities (2016) recommended aligning existing Universal Design for Learning and Multi-Tier Systems of Support frameworks with personalized learning systems to provide adequate instruction and supports for students with disabilities. Worthen (2016) cautioned schools to be intentional about the design of personalized learning for students with disabilities to avoid the risk of excluding them.

The National Center for Learning Disabilities (2016) identified five benefits of personalized learning for students with disabilities:

1. Student achievement and engagement is increased;

2. Personalized learning encourages a growth mindset;

3. Builds self-advocacy and decision-making skills;

4. Personalized learning helps reduce the stigma of special education; and

5. Gives individuals who learn and think differently alternatives to show what they have learned. (p. 1)

With benefits come challenges, and the National Center for Learning Disabilities (2016) also identified five challenges of personalized learning for students with disabilities:

1. Students with disabilities have a wide variety of individual needs, and if their individual needs are not met, they could fall behind;

2. Accountability and assessment systems must be aligned with personalized learning so valid and reliable data can be gathered on student progress;

3. Appropriate technology must be available to students with disabilities;

4. Parents of students with disabilities must be informed, included, and feel empowered;

5. Educators must be aware of the demands personalized learning systems place on students' executive functioning skills, and teachers must be available to support students in a personalized learning environment. (p. 1)

Personalized learning can close the achievement gaps for students with disabilities, but when working personalized learning into educational systems, schools must be aware of students with disabilities (Worthen, 2016).

Inclusion and Personalized Learning

According to Friend (2018), the goal of inclusive education is for the 80% of students with disabilities who do not have a significant intellectual disability to learn the skills and achieve academically at a similar level as their peers in the general education classroom and while utilizing grade level curriculum. The Institute of Education at the University of London (as cited in Butler, 2016) carried out a study and determined the

following eight themes necessary for inclusion: inclusive learning environment, multi-sensory approaches, working with additional adults, managing peer relationships, adult/pupil communication and language, formative assessment/assessment for learning, motivation, and memory/consolidation. Butler (2016) noted, "When reviewing the themes necessary for successful inclusion, the components of personalized learning become clearly linked" (para. 5). According to Worthen (2016), the multiple pathways and flexibility of personalized learning create new possibilities for the least restrictive learning environment.

The IDEA (2004) requires school districts to place students with disabilities in the least restrictive environment. Least restrictive environment means schools districts must educate students with disabilities in the regular education classroom to the maximum extent appropriate with necessary aids and supports (IDEA, 2004). The one-size-fits-all approach to learning started to shift with the IDEA's core principle of least restrictive environment, and students with disabilities started to be mainstreamed into regular education classrooms (Carolan, 2016). Giangreco (2017) stated, "Placement in special classes has unnecessarily kept too many students with intellectual disabilities from accessing the benefits of regular classes" (p. 53). Carolan (2016) concluded the strategies used with the initial inclusion of students as a result of least restrictive environment proved to be favorable for all students by enabling more accessibility to learning.

Co-Teaching as a Service Delivery Model

Inclusion is the term used by educators to describe the educational placement of special education students in the general education classroom (Bateman & Bateman, 2014). The topic of inclusion has been popular in education since the passage of the

IDEA (Eller, Fisher, Gilchrist, Rozman, & Shockney, 2016). Although the IDEA does not use the term inclusion, it does require school districts to place students in the least restrictive environment (Wright & Wright, 2017). Eller et al. (2016) expressed, "The least restrictive environment is any setting where a student can learn to the best of their ability and will vary for every student" (p. 4).

Bateman and Bateman (2014) asserted, "The presumption of the law is that students with disabilities will be educated to the maximum extent possible with children without disabilities" (p. 75). Those in favor of inclusion believe the least restrictive environment for all students is the general education setting (Eller et al., 2016). There are also those who advocate the least restrictive environment varies from student to student (Eller et al., 2016).

According to Bateman and Bateman (2014), "The presumption of the law is that a continuum of services (of differing types and at differing levels of inclusivity) will be available for every student" (p. 75). The IEP team takes into consideration many different issues when determining educational placement for students with disabilities, including the category of disability, availability of educational or related services, availability of space, administrative convenience, and the configuration of the delivery system (Wright & Wright, 2017). Villa and Thousand (2016) asserted, "Inclusive education is both the vision and practice of welcoming, valuing, empowering, and supporting the diverse academic, social/emotional, language, and communication learning of all students in shared environments" (p. 18). Wolter (2017) stated, "When we view struggling readers primarily through the lens of their disabilities, we set them on a path to segregation and ineffective instruction" (p. 74). To support students with

disabilities in the general education setting and to meet federal mandates, co-teaching is commonly used to improve student access to necessary supports and instructional strategies (Shin, Lee, & McKenna, 2016).

Friend (2014), a pioneer in co-teaching, explained co-teaching is a unique service delivery model for two reasons. First, co-teaching is not based on the premise of the more intense a learner's needs, the more time he or she should spend in a separate setting (Friend, 2014). Second, co-teaching is not addressed in federal special education legislation since co-teaching is a model that has evolved with the growing expectation that students with disabilities will be educated in the general education setting (Friend, 2014). Co-teaching allows students with disabilities to receive the specialized instruction necessary to meet their individual learning needs while accessing the general education curriculum (Shin et al., 2016). The National Center for Education Statistics discovered the number of students with disabilities receiving services at least 80% of the time in the general education setting has almost doubled in the past 20 years (as cited in Kramer & Murawski, 2017, p. 152).

What is Co-Teaching?

A professional marriage is the metaphor often used to describe co-teaching (Friend, 2014). According to Taylor (2016), co-teaching is more like an arranged marriage with two adults operating as a family unit responsible for a group of children. Friend (2014) added, "Co-teachers lead a classroom family, jointly establish their own culture, and negotiate their own roles and responsibilities" (p. 4).

Beninghof (2016) reiterated co-teaching is "a partnering of two teachers with different areas of expertise to provide more comprehensive, effective instruction to

students" (p. 12). When co-teaching was first established, the most important goal was to place students with disabilities in the general education classroom (Friend, 2016b). Currently, co-teaching is also referred to as collaborative teaching, team teaching, cooperative teaching, and partner teaching (MacDougall, 2017).

Many different educators are now involved in co-teaching relationships (Beninghof, 2011). Special education teachers paired with general education teachers have been the most common partnership in co-teaching environments (Beninghof, 2011). However, over time other partnerships have evolved to include speech therapists, English language learner teachers, literacy specialists, librarians, gifted teachers, occupational and physical therapists, technology specialists, school psychologists, and social workers (Beninghof, 2011). Beninghof (2016) credited the movement to "educators recognizing the inherent sense in bringing together individuals with different talents to provide the best instructional outcomes" (p. 12). Both special education and general education teachers bring important knowledge and skillsets to the classroom, without being transposable (Friend, 2016b).

According to Friend (2014), effective co-teaching takes place when partners co-plan instruction, co-assess student progress, and deliver instruction in a variety of ways. Kramer and Murawski (2017) remarked, "A collaborative support system, flexible instructional approaches, and data-driven decisions are an integral part of what makes co-teaching work" (p. 153). Both the general education teacher and the specialist have to be actively involved for the entire class period for effective co-teaching to happen (Beninghof, 2011).

Gately and Gately (2001) observed relationships take time and effort, and co-teaching partnerships are no different. Friend (2014) reported, "For co-teaching to have enough impact to improve outcomes for students, both teachers must have an unwavering commitment to the entire instructional process and actively contribute to helping all students reach their potential" (p. 5). When co-teaching is implemented with fidelity, it has the power to support an inclusive environment (Kramer & Murawski, 2017).

The Benefits of Co-Teaching

The research base on the effectiveness of co-teaching as a service delivery model is limited (Friend, 2014). Although the research is limited, through observation many educators have reported positive outcomes with co-teaching (Beninghof, 2011). Teachers believe the social and academic needs of students with disabilities and those without are better met in co-taught classrooms (Kramer & Murawski, 2017). Beninghof (2011) identified 11 observable benefits of co-teaching.

Professional growth. Experienced co-teachers report a teaching partner provides an alternative perspective to instruction, student learning, classroom management, classroom procedures, and discipline (Friend, 2014). Beninghof (2011) mentioned, "Educators who co-teach have the opportunity to learn from daily interaction and observation of a colleague with a very different background" (p. 10). When a teacher works closely with another educator, both become better teachers (Sandstead, 2016). Donohoo, Hattie, and Eells (2018) found, "When teams of educators believe they have the ability to make a difference, exciting things can happen in a school" (p. 41). Co-teaching lends itself to daily opportunities for professional growth through constructive

criticism from a partner that is more effective than feedback from a routine administrative observation (Mandel & Eiserman, 2016).

Improved instruction. With co-teaching, when one teacher needs to respond to a student need, the other teacher can pick up with little instructional time lost (Murdock, Finneran, & Theve, 2016). Beninghof (2011) reiterated, "Teachers who collaborate with colleagues develop instructional ideas that are more effective for students" (p. 10). Co-teaching synchronizes instruction by bringing two teachers with different abilities, talents, expertise, and strengths together (Honigsfeld & Dove, 2016).

Differentiation. By putting two heads together, teachers create instructional plans that include higher and lower levels of complexity and that allow more hands-on application (Beninghof, 2011). Friend (2014) acknowledged how the term differentiation has been used to describe many different educational practices, and it has lost some of its technical meaning. Tomlinson (2013) explained, "The idea of differentiating instruction is an approach to teaching that advocates active planning for and attention to student differences in the classrooms, in the context of high quality curriculums" (para. 1). Teachers should differentiate for all students, and co-teaching can promote more differentiation than solo teaching (Friend, 2014).

Teacher access. Students report a preference for co-taught classrooms, because when one teacher is busy, there is another teacher available to assist and meet individual needs (Beninghof, 2011). In a one-teacher classroom, it is difficult for the teacher to stop to help a student who has an academic need or who may be emotionally upset (Murdock et al., 2016). In a co-taught classroom, students have access to a co-teacher who can take action before the student falls behind or before behaviors escalate (Murdock et al., 2016).

Behavior management. According to Gately and Gately (2001), effective

classroom management includes two elements: relationships and structure. Beninghof

(2011) wrote, "Behavior management is a natural outcome of a co-taught class because

there are two sets of eyes for monitoring students, two bodies for proximity control, and

two teachers to mix things up and make learning more interesting" (p. 11). Co-taught

classrooms can result in more on-task behaviors, increased cooperation among students,

and fewer behavior problems (Adams, 2015).

Student engagement. Researchers Ryan and Deci (as cited in Feriazzo, 2017)

identified four key elements that spark intrinsic motivation in students: autonomy,

competence, relatedness, and relevance. Students become most engaged when they are

able to find their work both challenging and enjoyable (Hoerr, 2016). Jackson and

Zumba (2014) stressed, "If you want real engagement rather than mere compliance,

provide clarity about the goals of learning" (p. 24). Co-teaching allows two teachers to

combine their talents to hit on the four major components of engagement in every lesson:

emotion, student interest, an understanding of importance, and a sense of efficacy

(Beninghof, 2011).

Support for unidentified students. The academic performance and self-esteem

of students without disabilities increase in a co-taught classroom, because co-teachers are

constantly varying their ways of presenting material in an effort to meet the learning

needs of all students (Adams, 2015). With a learning strategist and a content expert in

the classroom, when missing concepts or misconceptions are apparent, the teachers can

adjust the mode of teaching to reach struggling learners (Carr & Bertrando, 2012).

Teachers often worry about those students who do not meet the eligibility criteria to

receive specialized instruction through an IEP but who still need extra supports; with a specialist in a co-taught classroom, the teachers can use different learning strategies to assist all students (Beninghof, 2011).

Time on task. Time on task has long been considered one of the most important factors affecting student learning and achievement (Mitchell, 2013). When students with disabilities travel the halls to their special education classrooms to receive specialized instruction, they miss out on valuable instructional time (Beninghof, 2011). Co-teaching maximizes time on task because the students never leave the classroom (Beninghof, 2011).

Sense of belonging. According to Perez (as cited in Adams, 2015), students with disabilities in co-taught classrooms are given more opportunities to interact and socialize with their peers without disabilities, resulting in more positive attitudes toward learning. An advocate for the inclusion of students with disabilities in general education classrooms linked the rise of teen suicide to the increase of students in special education (Beninghof, 2011). Beninghof (2011) discussed her concerns that special education classes send the message students with disabilities do not belong. Co-teaching alleviates the stigma of students with disabilities being pulled into the special education classroom by creating an environment where all learners make up the learning community and have worth (Beninghof, 2011).

Acceptance of diversity. Friend (2016a) declared the aim of co-teaching is to "create a classroom culture of acceptance, in which learning variations and strategies to address those variations are the norm" (p. 21). Beninghof (2011) proposed, "Take a look inside a truly inclusive classroom and you will see a kaleidoscope—students of different

colors, sizes, talents-all blending together into one masterpiece of learning" (p. 13). Co-teaching allows students to grow up in an environment that blends all types of learners into one classroom; in turn, students embrace diversity in the world around them (Beninghof, 2011).

High expectations. When students with disabilities are in a general education setting, specialists broaden their sense of what students need to do and what they are capable of doing (Beninghof, 2011). Tomlinson (2014) suggested teachers must be supported in creating classrooms where "high-end curriculum is the standard and differentiation is the mechanism for helping a broad range of students to achieve or even exceed the standards for that level of rigor" (p. 41). Students will rise to the higher expectations of a general education setting (Beninghof, 2011).

According to Friend (2016b), for students to reap the benefits of co-teaching, co-teachers must go beyond just sharing a classroom to connecting lessons to the needs of each individual student. They must also modify the content when necessary, develop instruction in different ways, conduct progress monitoring, and provide specialized techniques for those learners in need (Friend, 2016b). When co-teaching is implemented with fidelity, it has the potential to create an environment in which students flourish (Kramer & Murawski, 2017).

The Challenges of Co-Teaching

Successful co-teaching has its roots in collaboration; without effective communication, co-teaching most likely will flounder (Kramer & Murawski, 2017). Co-teachers must be good communicators, share similar teaching philosophies, spend time planning together, and be willing to drop their own ideas to go with the other's plan

(Murdock et al., 2016). Co-teaching is viewed as a partnership, and as with all partnerships, it takes work and problems can arise (MacDougall, 2017). It is important co-teachers communicate openly, not only about the students but also about their own interactions (Murawski, 2012). Experts in co-teaching have said if teachers are not co-planning, co-instructing, and co-assessing on a regular basis, then they are not truly co-teaching (Kramer & Murawski, 2017).

Co-planning. Hattie (as cited in Scherer, 2015) concluded, "The co-planning of lessons is the task that has one of the highest likelihoods of making a marked positive difference on student learning" (p. 7). To meet the needs of all students, co-teaching is essential, but when co-teachers are not given the time to co-plan and work together, they will struggle (Adams, 2015). Friend (2014) explained teams need to find creative and effective ways to collaborate.

Co-instructing. Beninghof (2016) asserted a common misconception with co-teaching is that observers should not be able to tell the difference between the general education teacher and the specialist. In reality, the best instruction takes place when the specialist is "doing something special" (Beninghof, 2016, p. 10). Parity must be established between co-teachers and should be clearly evident to students (Kramer & Murawski, 2017). It is important for both teachers to deliver essential instruction so both teachers are viewed as equals in the classroom (Adams, 2015).

Co-assessing. According to Conderman and Hedin (2012), there are four times when co-teachers should be discussing assessments: (1) at the beginning of a co-teaching pairing, (2) before a unit of study, (3) during instruction, and (4) after instruction. Beninghof (2011) explained the importance of co-teachers discussing their philosophies

on assessments and grading before they share procedures with students. It is important for co-teachers to assess their own developing relationship and to take time to discuss what is working and what is not working (Kramer & Murawski, 2017).

Teams who do not work well together are unlikely to promote high levels of learning (Beninghof, 2011). Co-teaching relationships fail because teachers avoid talking openly about how to share responsibilities (Beninghof, 2016). Honigsfeld and Dove (2016) wrote, "When trust develops between two educators, their instruction is fully focused on the students rather than on the uncertainties of their work relationship" (p. 58). When students are left in the hands of two teachers who want to co-teach, who are committed to the model, and who share similar teaching philosophies, this creates an environment where students can learn at their best (Murdock et al., 2016).

Models of Co-Teaching

According to Beninghof (2011), co-teaching is most successful when partners implement co-teaching models that work best for their students. Cook and Friend (1995) developed the six approaches to co-teaching. Since then, the six approaches have remained the basis for co-teaching, but what Friend (2016b) referred to as Co-Teaching 2.0 consists of the six approaches to integrate specially designed instruction into the general education classroom. Beninghof (2011) laid out nine models of co-teaching and observed, "The number of models presented by any text or consultant is somewhat arbitrary given that there are really unlimited ways that two teachers can work together" (p. 51). Friend (2014) emphasized how many different factors go into successful co-teaching, although maybe one of the most essential dimensions is the effective arrangement of teachers and students to maximize learning.

Beninghof (2014) suggested before school starts or at the beginning of the school year is the key time for co-teaching partners to decide what co-teaching models they want to use. A two-teacher classroom should be designed based on an understanding of the content being taught and the needs of the students in the classroom (Friend, 2014). Within a single course, lesson, or week, teachers might move in and out of several different models or approaches to co-teaching to best meet the needs of their students (Beninghof, 2011).

This study was focused on the six approaches to co-teaching described by Cook and Friend (1995). The six approaches to co-teaching provide teachers a framework of what a two-teacher classroom should look like (Friend, 2014). The six models allow teachers to address IEP goals and objectives for students with disabilities, while at the same time meeting the learning needs of other students (Friend, 2014).

One teaching, one observing. In this model, one teacher gathers observational data while the other teacher leads instruction (Friend, 2016b). Friend (2014) recommended this model be used frequently, but only for brief periods of time.

Station teaching. In this model, students are divided into at least three groups (Friend, 2016b). Each teacher takes a group and leads instruction while students complete independent work at stations not assigned to a teacher (Friend, 2016b). Friend (2014) recommended frequent use of this model.

Parallel teaching. In this model, the teachers divide the students into two different groups (Friend, 2016b). The teachers may teach the same thing in the same way, or they may present instruction in different ways (Friend, 2016b). Friend (2014) recommended frequent use of this model.

Alternative teaching. In this model, the majority of students stay with one teacher while the other teacher instructs a small group of students for a variety of purposes (Friend, 2016b). Friend (2014) recommended occasional use of this model.

Teaming. In this model, the students are left in a single group (Friend, 2016b). The teachers co-instruct and both contribute to the lesson (Friend, 2016b). Friend (2014) recommended occasional use of this model.

One teaching, one assisting. In this model, students are left in a single group (Friend, 2016b). One teacher leads instruction while the other teacher provides brief support and interaction with individual students (Friend, 2016b). Friend (2014) recommended seldom or less-than-seldom use of this model.

Supporting Co-Teaching

Administrative support is essential to the success of co-teaching (Cook & Friend, 1995). A sense of team is developed when administrators are on-board and energy is directed toward the success of the project (Smith, 2003). Without administrative support, the continuity of any project is uncertain (Smith, 2003). According to Murawski and Bernhardt (2016), to meet the learning needs of all students using the co-teaching model, administrators should develop a plan of action that incorporates five important steps.

Provide professional development on inclusion, collaboration, and co-teaching. Most administrators do not have backgrounds in special education (Hussin & Hamdan, 2016). Ploessl and Rock (2014) suggested the special education administrator should be proficient in developing the professional development program for all co-teachers. Administrators who wish to use co-teaching should plan for implementation by

participating in training aimed to create the conditions for success (Murawski &

Bernhardt, 2016).

When administrators examine co-teaching in their buildings, they should observe

individuals who have already bought into the model, both special and regular educators

(Murawski & Bernhardt, 2016). Murawski and Bernhardt (2016) acknowledged, "Co-

teaching shouldn't be seen as a 'special education thing,' but rather as a 'best practices in

education thing'" (p. 31). McClure and Cahnmann-Taylor (2010) confirmed in an in-

depth case study of co-teaching pairs, "Co-teachers needed sustained dialogue and

support as they work to collaboratively develop their co-teaching" (p. 122).

Administrators should attend the same trainings before or alongside their co-teachers so

all are aware of the skills and demands required for successful co-teaching (Nierengarten,

2013).

Establish scheduling strategies. According to Murawski and Bernhardt (2016),

only 30% of a general education classroom should be made up of students with special

needs (p. 32). This includes students with disabilities, English language learners,

students who are highly gifted, and students with 504 plans (Murawski & Bernhardt,

2016). Walther-Thomas, Bryant, and Land (as cited in Nierengarten, 2013) found when

co-teaching, school teams should consider co-teaching time, paraprofessional time,

scheduled planning time, class size, and special caseloads.

Partner the right teachers. Beninghof (2011) acknowledged, "Administrators

should recruit teachers who fully embrace an inclusive philosophy" (p. 148). Murawski

and Bernhardt (2016) proposed after providing proper professional development to

teachers on co-teaching, allow them to develop their own co-teaching pairs when they

can. Nierengarten (2013) suggested, when possible, allowing teachers to choose if they would like to co-teach, as choice implies willingness and ownership.

Supervise and evaluate strategically. According to Friend (2016b), when administrators observe a co-taught classroom, they should look for traditional indicators that the instructional environment is supportive and the pair has a strong relationship. They should also apply an understanding of IEPs and specialized instruction (Friend, 2016b). When evaluating a co-teaching pair, the administrator must have a good understanding of the principles of co-teaching (Murawski & Bernhardt, 2016). Moreover, administrators need an understanding of the strategies used in co-teaching, as well as what they already know about effective teaching principles (Murawski & Bernhardt, 2016). Observation of co-teaching teams can be a valuable asset to the effectiveness of the model, as it sends the message administrators value teacher investment in the program (Nierengarten, 2013).

Improve, increase, and institutionalize co-teaching practices. Once co-teaching is up and going, administrators should solicit feedback from all stakeholders: students, parents, teachers, administrators, and community members (Murawski & Bernhardt, 2016). Riley (2017) suggested giving feedback that will promote, change, and preserve professional relationships. Administrators must find ways to keep effective co-teaching partnerships together and find ways not to let frustrations or aggressions build between partners (Murawski & Bernhardt, 2016).

Administrators can be the key in both the planning and implementation of successful co-teaching by being active and visible in the process (Nierengarten, 2013). Administrators should be a "safety net" for co-teaching teams by allowing them to take

risks as they try new and different strategies related to their co-teaching assignments (Nierengarten, 2013). Administrators must realize they have the leadership abilities and resources to promote successful co-teaching (Murawski & Bernhardt, 2016).

Summary

The primary goals of co-teaching are to ensure students with disabilities have access to the general education curriculum and to give students the support they need to keep up with the rigorous academic standards of today (Friend, 2014). Outlined in Chapter Two are the conceptual framework used for this study and included definitions of STEAM education and personalized learning. Chapter Two included information on how co-teaching is used as a service delivery model, what co-teaching is, the benefits and challenges of co-teaching, the different models of co-teaching, and how administrators can support co-teaching.

If part of the goal of co-teaching is to support students with disabilities in the general education setting with the rigor of today's academic standards, it was important in Chapter Two to include information on the paradigm shift from the traditional educational philosophy to the modern idea to focus on the process of learning as much as the results (STEAM Education, 2017). With a focus on the learning process, personalized learning is growing in popularity, and the days of a one-size-fits-all education are past (Kallick & Zmuda, 2017). With an emphasis on personalized learning, once only available to students with disabilities through an IEP, schools are now providing an individualized education to all students (Kelly, 2016).

Included in Chapter Three is a detailed account of the qualitative methodology used for this study. The chapter consists of the purpose of this study and the research

questions used to guide the study and an explanation of the research design. Ethical

considerations and the targeted population and samples are also discussed. In addition,

Chapter Three includes descriptions of the instruments and methods of data collection

and analysis used.

Chapter Three: Methodology

The IDEA states that to the maximum extent appropriate, students with disabilities must be educated with non-disabled peers in the least restrictive environment through the use of supplementary aids and services (Wright & Wright, 2017). One way schools are meeting this requirement is through the use of co-teaching as a service delivery model (Friend, 2014). To provide specialized instruction to students in the least restrictive environment, the STEAM elementary magnet school implemented co-teaching as a service delivery model for the first time.

In Chapter Three, the problem and purpose of this case study are discussed, and the research questions are restated. The research design of the case study, ethical considerations, and the population and sample are reiterated. A description of the instruments, data collection and data analysis procedures are presented.

Problem and Purpose Overview

The purpose of this case study was to evaluate the implementation of co-teaching when used as a service delivery model in a STEAM magnet elementary school that implements personalized learning. The study was designed to obtain the perceptions of STEAM teachers and administrators of co-teaching and the benefits and/or detriments of its implementation for students with and without disabilities.

Research questions. The following research questions guided the study:

1. Based on the perceptions of elementary school STEAM teachers, what are the benefits and detriments for students with and without disabilities when co-teaching is implemented with fidelity?

2. In what ways does co-teaching enable students with disabilities to thrive in a learning environment driven by personalized learning?

3. What are elementary STEAM teachers' perceptions of the benefits of co-teaching used as a service delivery model for inclusion in a STEAM school?

4. What are strategies principals can use to provide support for the co-teaching model in a STEAM school?

Research Design

A qualitative case study methodology was applied for this study. A qualitative case study is a search for meaning and understanding, where the researcher is the primary instrument for data collection and analysis, with the end product being very descriptive (Merriam & Tisdell, 2015). Maxwell (2013) characterized a case study as a justification of a selection of a particular case determined by the goals of the study and the existing theory and research, often called purposeful selection.

The instruments used to collect the data included a set of interview questions designed to gather honest, open-ended feedback from participants. The interviews were conducted at a time and location convenient for each participant during the beginning, middle, and end of the implementation school year. An observational co-teaching fidelity checklist was used by district administrators to evaluate co-teaching classrooms and co-teaching teams for fidelity. The fidelity checks took place two different times during the first year of implementation: middle of the year and end of the year. In addition, the implementation of co-teaching was journaled by STEAM teachers throughout the first year. Before conducting research, the researcher followed Institutional Review Board guidelines for obtaining consent. Participants who took part in the case study included

general education teachers, special education teachers, and building and district administrators within the school. Careful analysis of fidelity checks and participants' interview responses allowed the identification of tendencies and similarities in themes and characteristics.

Ethical Considerations

Once approval was obtained through Lindenwood University's Institutional Review Board (see Appendix A), data collection began. Participants were provided with a copy of the Informed Consent form (see Appendix B) and were given the opportunity to opt out of the study. Data collected were locked and secured in a designated location. Any information or correspondence collected electronically on a personal computer was protected by a password known only to the researcher. Students remained anonymous when information was given for the purpose of the research. Documentation gathered for the study will be destroyed three years after its conclusion.

Population and Sample

Purposive sampling (Crossman, 2018) was utilized to examine the entire population of educators involved in the implementation of co-teaching in the selected STEAM elementary magnet school. The sample consisted of seven general education teachers, three special education teachers, the building principal, and the building assistant principal, the district executive director of special services, the elementary instructional specialist, and the executive director of elementary education.

The teachers and administrators selected were those participating in the initial implementation of co-teaching in the STEAM elementary magnet school. Each individual in the sampling had an option to participate in the case study. All individuals

involved in the initial implementation of co-teaching chose to participate. The sample was selected from the targeted population (Merriam & Tisdell, 2015). The targeted population consisted of a total population including 21 general education teachers, five special education teachers, two building administrators and five district administrators who make up the STEAM elementary magnet school, consisting of around 500 students.

Instrumentation

The interviews consisted of a set of questions designed to allow the researcher to understand the perceptions of the participants related to the implementation of co-teaching in a STEAM school. The extensive individual interviews will provide a first-person narrative to be used as a comparative among participants (Merriam & Tisdell (2015). The interview questions were designed based upon the conceptual framework of co-teaching as a service delivery model (Friend, 2016b).

In addition, this study included a co-teaching fidelity check (see Appendix C) used by the district to assess the effectiveness of co-teaching in the junior high and high school buildings. These fidelity checks were observations completed by the district's executive director of special services. The fidelity checks were conducted at the middle and end of the first year of the implementation of co-teaching in the STEAM elementary magnet school. The findings of the fidelity check observations were shared with the general education teachers and special education teachers who were observed and with the building principals. Feedback was provided to the co-teaching teams on what was observed during the visits. A supplementary instrument used was the journaling of two special education teachers and one general education teacher who volunteered to keep

chronological records of their journeys through the implementation of co-teaching in a STEAM school.

Butin (2009) indicated validity is "being sure the strength and accurateness of one's conclusions are necessary because it is seemingly harder to prove what is seen in the field if you are the only one doing the observations and conducting the analysis" (p. 102). To ensure the validity of this case study, interview questions were developed and data were collected based upon the research reviewed in Chapter Two regarding common benefits and detriments of co-teaching used as a service delivery model for students with and without disabilities, along with information on the implementation of co-teaching is a STEAM school where there is an emphasis on personalized learning. Merriam and Tisdell (2015) stated, "The key to getting good data from interviewing is to ask good questions; asking good questions takes practice" (p. 117). Pilot interviews and peer review and examination were used to ensure the reliability of this case study. Multiple methods of data collection were used to obtain consistent and dependable data that were most congruent with reality and understood by participants (Merriam & Tisdell, 2015).

Data Collection

Upon approval of the Lindenwood University Institutional Review Board and of the STEAM school district's superintendent, participants were contacted through electronic communication and through a visit to one of the STEAM school's staffing meetings. Email addresses were obtained using the STEAM schools contact directory. The study was introduced, consent forms were distributed, interview questions were provided for participants to review prior to any questions being asked, and the purpose and intent of the study were explained.

A third party conducted the interviews. Participants were then asked the first set of questions (see Appendices D & E) before co-teaching began. Shortly after, the general education teacher and special education teachers who volunteered to journal their experiences with co-teaching began documenting their accounts.

Halfway through the school year, the researcher sent the second phase of interview question electronically to participants and a time for interviews was set up to gather their perceptions to date. At this time, a middle-of-the-year co-teaching fidelity check was conducted, and the results were shared with the corresponding classroom teachers. In the spring, the researcher sent the final set of questions to participants and the third party again set up and conducted interviews

Finally, end-of-the-year fidelity checks were completed and results sent to the corresponding co-teaching teams. All data were stored on a secured, password-protected computer. Data were transcribed after collection, and participants were asked to review the transcriptions and to approve, edit, or expunge details as they saw fit.

Data Analysis

Open-ended interview questions were created in to elicit the true perceptions of participants on the implementation of co-teaching (Saldaña, 2015).   The co-teaching fidelity checks had previously been adopted and used in the district to evaluate the effectiveness of the district's junior high and high school co-teaching programs. The co-teaching fidelity checks, the interviews, and the journal entries completed by three of the participants were all collected to be analyzed at the end of the 2017-2018 school year. The researcher utilized open coding to determine developing themes collected from all qualitative data (Saldaña, 2015). According to Maxwell (2013):

> Reading and thinking about your interview transcripts and observations notes, writing memos, developing coding categories and applying theses to your data, analyzing narrative structure and contextual relationships, and creating matrices and other displays are all important forms of data analyses. (p. 105)

Open coding allows the researcher to conduct a complex analysis of relationships between the responses and codes to recognize and categorize emerging themes. This is referred to as axial coding (Creswell, 2013). Through the analysis of data, the following themes emerged:

1. The benefits of co-teaching far outweigh the detriments for students both with and without disabilities.

2. Co-teaching partnerships can contribute to the success of co-teaching.

3. There are similarities between the benefits and challenges of co-teaching in a STEAM school driven by personalized learning and a traditional co-taught classroom.

4. There is a need for the special education administration to play a more active role in the professional development and the sustainability of co-teaching.

The patterns were then compared to literature reviewed in Chapter Two to determine alignment with previous research.

Summary

Included in Chapter Three was a description of the qualitative case study designed to follow a STEAM elementary magnet school's implementation of co-teaching as a service delivery model for students with disabilities. The design of the research was reviewed, along with the purpose of the study. Information was provided on how ethical

considerations of the participants were addressed and how the data gathered were

secured. In addition, a description of how the data were analyzed was discussed.

Chapter Four includes an in-depth analysis of the data collected for this study.

Chapter Four: Analysis of Data

A STEAM elementary school, established in 2012 served as the primary site for this case study. There are around 6,200 students enrolled in pre-school through 12th grade in the school district in which the STEAM school resides (District Handbook, 2017). The STEAM school is a kindergarten through sixth-grade building with almost 500 students, and each grade level is capped at three sections and 24 students per class (District Handbook, 2017). In addition to general education teachers, the STEAM school houses three special education teachers (District Handbook, 2017). Students were selected for entry into the STEAM magnet school using a lottery process (District Handbook, 2017).

The four primary research questions that guided the study were expanded into two different series of sub-questions. The first series of questions were asked of the general education teachers and the special education teachers. The second series of questions were reserved for the building and district administrators who took part in the study. Each corresponding series had a set of questions asked at the beginning, middle, and end of the implementation year.

Questions for the case study were designed to obtain responses from the individual participants to determine if the implementation of co-teaching in a STEAM magnet school with a focus on personalized learning was beneficial as a service delivery model for students with and without disabilities. The intent of the study was to gain insight into the opinions of those who participated through individual interviews. In addition to the interviews, the case study consisted of co-teaching fidelity checks and journaling from three of the participants.

Interviews

Individual interviews were conducted three times during the implementation school year. The first set of questions were asked at the beginning of the school year, the second set were designated for the middle of the school year, and the third set were asked at the end of the co-teaching implementation school year. The questions were answered by multiple participants involved in the implementation process. The participants included seven general education teachers, three special education teachers, and five building- and district-level administrators.

To maintain anonymity, participants were assigned identification codes. The general education teachers were labeled General Education Teacher 1 (GnEd1), General Education Teacher 2 (GnEd2), General Education Teacher 3 (GnEd3), and so on. The special education teachers were labeled Special Education Teacher 1 (SpEd1), Special Education Teacher 2 (SpEd2), and Special Education Teacher 3 (SpEd3). The building and district administrators were labeled Administrator 1 (ADMIN1), Administrator 2 (ADMIN2), Administrator 3 (ADMIN3), etc.

Prior to the interviews, individuals who agreed to participate in the case study were given a letter of participation, a consent form, and a copy of the interview questions. Participants were informed there would be a beginning, middle, and end-of-the-year interview. They were also informed each interview would take approximately 20 minutes and would be conducted in the STEAM magnet school. The interviews were conducted by a third party to eliminate any bias on the part of the researcher. Permission was gained from participants for the interviews to be audio-taped and then transcribed to ensure research accuracy.

Beginning of the year. The beginning-of-the-year interviews took place before the first day of school and before the implementation of co-teaching.

Teacher question one: Background information. Tell me about yourself (what grade level taught, number of years teaching, number of years with the district, number of years teaching in this STEAM magnet school)?

The background question was asked to begin the interview process and to gain information to understand each participant's professional background and experiences that could influence the implementation of co-teaching. This question resulted in a variety of answers from participants. The seven general education teachers had a wide range of teaching experience from a second-year teacher to a 33-year veteran teacher. Since the STEAM school was established in 2012, five of the seven teachers interviewed were a part of the school's staff the first year the school was opened. Some of the general education teachers got their start in other districts, but the majority of their experience had been in the home district of the STEAM school.

The three special education teachers interviewed had three years, nine years, and 17 years of teaching experience. Two of the special education teachers have been in the STEAM school since it was established, while the third special education teacher is in year two at the STEAM school. Of the combined years of experience for the three special education teachers, only two years were spent in another school district.

Administrator question one: Background information. Tell me about yourself (what is your position, how long have you been in education, what did you teach while in the classroom, how long have you been in administration, how long have you been in the district)?

The five building and district administrators included the building principal, assistant building principal, executive director of special services, executive director of elementary education, and an elementary instructional specialist. Like the teachers, most of the administrators' years have been in the district of the STEAM magnet school. The years of educational experience ranged from seven years to 21 years. The years of administrative experience varied from two years to 14 years. Only one of the administrators had experience in special education before becoming an administrator. That participant spent two years in a resource special education classroom and three years teaching adaptive physical education.

Teacher and administrator question two: Co-teaching knowledge. Do you have any prior knowledge or experience in co-teaching? If so, in what capacity?

Several of the general education teachers and a few of the administrators shared how their school district and building have incorporated some co-teaching with student teachers. Administrator 2 responded, "Our local university partnership with the school district has been focused on co-teaching with our student teachers and student teacher interns for several years now." However, ADMIN2 did express no experience with co-teaching as a service delivery model for students with disabilities. General Education Teacher 7 shared having an intern all last school year and how he and his intern co-taught as part of the partnership with the university. Again the co-teaching partnership in this case was not between a special education teacher and a general education teacher, but rather between a general education teacher and an intern completing student teaching to become a general education teacher.

A few of the general education teachers shared they had some experience with a special education teacher pushing into their classrooms in the past but did not believe pushing in to be co-teaching. General Education Teacher 5 stated, "My prior knowledge of co-teaching is really just push-in where the special education teacher would help individual students or maybe teach a station with special education students." Special Education Teacher 1 shared she had one year of class-within-a-class experience at the high school level and occasionally pushed in with a paraprofessional or a special education teacher. Special Education Teacher 3 gained limited experience through attendance at a co-teaching meeting in the school district and through reading books about co-teaching. It was noted by participants that the school district held a training the spring before implementation that many of the participants in this case study attended.

Teacher and administrator question three: Benefits and challenges of co-teaching. What do you perceive to be the benefits and challenges of co-teaching for students with and without disabilities?

Benefits. Six of the seven general education teachers mentioned how having two teachers in the classroom is better than just one. General Education Teacher 1 explained having an extra adult in the classroom allows for quicker responses to student questions. Similarly, GnEd7 stated, "Another point of few in the classroom is nice to have, discussions can be modeled, and disruptive behaviors are decreased." General Education Teacher 3 added, "You are able to meet so many different needs when you have another person in the room that is teaching alongside of you." According to GnEd2, students benefit from the opportunity to learn from two different minds and perspectives. General

Education Teacher 2 went on to explain how different learning styles can be addressed

and assessed with two teachers in the classroom. General Education Teacher 6 added:

> I see great benefits for students with the co-teaching model. Both the classroom
>
> teacher and I are able to give more student-centered lessons. We have different
>
> perspectives and see different needs. I think we plan better for students when we
>
> plan together. I believe we will continue to see a lot of growth in our students.

Another benefit shared by GnEd5 was that co-teaching students who would otherwise be

pulled out of the classroom for services can stay in the general education classroom and

feel like they are part of the classroom community.

The special education teachers seemed to focus more on the one-on-one

assistance students can receive in the general education classroom through co-teaching.

Special Education Teacher 2 replied, "Students receive more one-on-one assistance

where progress can be tracked more regularly." From a different perspective, SpEd3

mentioned the benefit of having the opportunity as a special education teacher to get to

know more students in the school aside from the students with disabilities. Special

Education Teacher 1 found a benefit to be the ability to better manage the classroom with

two teachers.

Four of the five administrators shared students with disabilities benefit from

receiving their services in the general education classroom, making them feel like they

are a part of the classroom community versus being pulled out to receive services in a

different location. Administrator 5 explained, "I feel co-teaching helps students with

disabilities feel more like part of the class while getting the supports he or she needs."

Likewise, ADMIN4 added, "Co-teaching allows for our students in special education to

feel a part of the classroom and to transfer their learning from the special education teacher in a more effective way because they are in the general education classroom." Administrator 2 mentioned, "Our goal is always to get our students with disabilities in the least restrictive environment; co-teaching is definitely one of our best avenues to get there." Another benefit shared by ADMIN3 was that students in special education can continue to learn from the general education teacher while receiving direct and differentiated instruction from the special education teacher.

Administrator 5 explained that everyone benefits from extra support in the classroom, including the teachers. According to ADMIN4, the ability to divide into groups and to have more time with students with more adults in the classroom is a benefit. In addition, ADMIN4 shared how when co-teaching, teachers are learning from each other, which allows for more learning opportunities for the students. Administrator 1 pointed out that with two different teaching styles in the co-taught classroom, teachers are able to provide a variety of instructional strategies to meet students' individual learning styles.

Challenges. General Education Teacher 5 predicted a challenge of co-teaching would be planning and discussing content daily with a partner to ensure both teachers are on the same page. General Education Teacher 7 added, "The only challenge I perceive is giving up control and setting your ego aside." Furthermore, GnEd7 explained it could be challenging to find the instructional balance and best strategies with a co-teacher. General Education Teacher 2 stated, "Co-teaching could be potentially overwhelming for students if the co-teachers are not consistent." Specifically, GnEd1 pointed out that when

other adults are in the classroom, students do not always show respect the special education teacher deserves because he or she is only in the classroom for a short while.

Special Education Teacher 1 believed a challenge of co-teaching would be finding a good personality match when it came to a co-teaching partnership. When asked about challenges for students with and without disabilities when using co-teaching as service delivery model, SpEd2 stated she could not think of a disadvantage at that time. Special Education Teacher 3 explained, "Working out the 'bugs,' developing lessons, and assessing students could be a challenge." Additionally, SpEd3 clarified it could be a challenge for students and teachers as the new co-teaching partners got to know one another's teaching styles.

Participants ADMIN1 and ADMIN2 asserted co-teaching is not for every student with disabilities, and there could be students in the co-taught setting who still need small group pull-out service provided in the special education classroom. Administrator 1 explained, "They may still need that pull out to maintain focus due to noise levels and distractions in the classroom." Administrator 2 shared:

> Co-teaching is not perfect for every student. There are students that simply aren't ready for some of the content that is being presented in the general education classroom and so it is challenging to figure out how we serve students who are ready for it and students who aren't ready depending on their unique characteristics.

Participants ADMIN3 and ADMIN4 both believed finding the right co-teaching pairing could be challenging. Administrator 3 commented, "Teachers finding the balance on how they are going to work together could be a challenge." According to ADMIN4,

"The biggest challenge is the trust level between teachers and their ability to get along and work together." Administrator 4 also stressed the importance of a symbiotic relationship where an observer would not know who the special education teacher was and who the general education teacher was. Moreover, ADMIN4 asked the question, "How do we match them, train them, and develop the relationship where they see all the kids as their kids?" Administrator 3 predicted another challenge would be finding the time to evaluate assessment data to alter groups and co-teaching models needed for the most effective co-teaching plan. Finally, ADMIN4 explained how scheduling would be a big barrier when the special education teacher sees various students at various times with various classroom schedules.

 Teacher and administrator question four: Personalized learning. In what ways do you believe co-teaching will enable students with disabilities to thrive in a learning environment driven by personalized learning?

 General Education Teacher 5 explained, "No longer will students be singled out for their disability but will be given the opportunity to work at a pace that is conducive to their learning." General Education Teacher 1 stated how by not being pulled from the general education classroom, all students will receive the instruction and hear the same questions as other students without being made to feel different. According to GnEd6, "They will know we are making learning more personalized and will be there to answer their questions and scaffold accordingly." General Education Teacher 4 affirmed students with disabilities would thrive in a personalized learning environment because they would be learning without their areas of weakness being obvious. In addition,

GnEd4 asserted a personalized learning environment would decrease behaviors because all students would feel successful when working with their strengths.

Special Education Teacher 3 commented on how personalized learning allows students to have a more hands-on experience. She added that in a STEAM school, there are lots of hand-on projects in the general education classroom, and when students with disabilities are removed from the general education classroom to receive services in the special education setting, they miss out on learning opportunities. According to SpEd2, "Co-teaching allows a wide variety of teaching methods to be used for students who thrive from differentiated learning strategies." Special Education Teacher 2 went on to say, "STEAM and personalized learning allows for further extension on learned materials and can further mastery."

Similarly, SpEd1 shared how the confidence of students with disabilities is built when in a general education classroom, especially when STEAM is implemented. Special Education Teacher 1 continued, "Co-teaching allows students to be in the general education classroom [with] the ability to collaborate and participate in hands-on inquiry." According to SpEd3, when students with disabilities are in a personalized learning and STEAM-enriched general education classroom, students with disabilities have the opportunity to learn from students without disabilities in the room.

Participant ADMIN1, when asked about personalized learning and students with disabilities, replied, "Personalized learning allows every student to learn at their own pace regardless if they are special education or general education… It gives students with disabilities the opportunity to rise to the occasion." Administrator 3 indicated personalized learning in a co-taught environment would allow students a greater variety

of opportunities to show what they know and to learn in a variety of ways that are more effective for their individual needs.

According to ADMIN5, personalized learning gives students more "voice and choice" in their learning. Administrator 5 added, "Last school year we worked with a mentor to learn more about helping our students be more autonomous, and that will be a continued focus on our professional learning for this school year." Administrator 4 declared personalized learning is how educators can customize education to meet the needs of students. In addition, ADMIN4 shared, "Schools need to be about life preparation and not standardized testing preparation." Administrator 2 expressed that when a teacher is trying to facilitate personalized learning in the classroom, having a co-teacher allows students with disabilities to participate while having the supports they need to achieve their goals.

Teacher and administrator question five: Service delivery model. What service delivery model (small group/resource room, consultation, co-teaching, self-contained/special education classroom) do you perceive as most beneficial for students with disabilities? Why?

Participants GnEd2, GnEd3, GnEd4, GnEd6, and GnEd7 all agreed a combination of co-teaching and small group instruction in the special education resource room is most beneficial for student with disabilities. General Education Teacher 2 stressed the resource special education classroom is less overwhelming for students, while the co-taught classroom gives students the chance to be understood through different perspectives. According to GnEd4, "Every student is different, so their needs are

different; therefore, I think a combination is necessary with the majority of time being in a co-teaching classroom."

General Education Teacher 6 shared that the service delivery model is situational for the student. She explained how each child is different and believed a combination to be best. General Education Teacher 7 explained students need an outlet when the content becomes too difficult, and he shared how an alternative setting may be needed for students to regain confidence. According to GnEd1, co-teaching is the most beneficial service delivery model when the teaching partnership is strong and the experience is positive for students. General Education Teacher 5 found value in co-teaching because students with disabilities are learning in the same environment with their non-disabled peers and receiving instruction from two teachers and are also learning from their peers.

Both SpEd2 and SpEd3 mentioned the most beneficial service delivery model would depend on the students' needs. Special Education Teacher 2 stated, "We have to look at each student's learning to determine which service delivery model would be best." Similarly, SpEd3 added, "Some students just need the one-on-one with no distractions or a quieter environment that is less stimulating, which would be the resource room." Special Education Teacher 1 asserted students with disabilities could receive small group instruction in the general education classroom through co-teaching. Special Education Teacher 1 believed co-teaching to be the most beneficial service delivery model and explained, "Small groups within the general education classroom allows students to voice, think, and hear others doing the same." She added the students are able to ask the content expert (general education teacher) questions and have the learning

strategist (special education teacher) in the room to provide extra resources all at the same time.

Administrator participants ADMIN2, ADMIN3, and ADMIN4 all stated the most beneficial service delivery model depends on the needs of each student. Administrator 2 discussed, "It depends on the student. Co-teaching is effective for those who are ready for it, and for others, one-on-one is exactly what they need." Administrator 3 added:

I think co-teaching can be the most beneficial for the majority of students; however, I still believe there is a need for the continuum of placement possibilities to assist with those gap areas in an environment that is appropriate for the student and the content.

Administrator 4 mentioned that while co-teaching is probably the best tool, educators still need to take into consideration the students who disrupt the environment and take away learning opportunities for themselves and for other students.

According to ADMIN4, "To some degree maybe the co-teaching model is situational based off the needs of the good of the whole." Both ADMIN1 and ADMIN5 commented on co-teaching being the most beneficial service delivery model. Administrator 1 said co-teaching is by far the best service delivery model when two experienced, knowledgeable teachers are working together to benefit students.

Teacher question six: Co-teaching preparation. What resources or training have been provided to help with the implementation of co-teaching? In what ways has your administration prepared you for the co-teaching environment?

All seven of the general education teacher participants mentioned attending a day-long training on co-teaching provided by their regional professional development agency

during the spring before the implementation of co-teaching. General Education Teacher 3 shared the building principal purchased Anne Beninghof's (2011) book, *Co-Teaching That Works*. General Education Teacher 5 shared the faculty had discussed the elements of co-teaching. In response, GnEd6 stated, "Our administration allows us to try new things to find out what works best for us." Similarly, GnEd7 explained administrators provide flexibility and openness to work together to try new strategies, including co-teaching.

The three special education teachers all reported attending the same co-teaching training in the spring that the general education teachers mentioned. Special Education Teacher 1 discussed receiving similar co-teaching training in the past but did not find it to be beneficial. Both SpEd2 and SpEd3 mentioned receiving Anne Beninghof's (2011) book to use as a reference. Special Education Teacher 1 stated, "Administration has been supportive of the idea of co-teaching, but has not been an advocate in helping with scheduling." Special Education Teacher 2 mentioned a lot of training would come from trial and error when school begins and co-teaching is implemented.

Administrator question six: Co-teaching preparation. How do you prepare teachers for co-teaching? What training is provided at the beginning and throughout the school year? How do you ensure your teachers are a good fit for co-teaching?

Administrator 3 specified, "I think the first step in preparing for co-teaching is making sure both the general education teacher and the special education teacher understand what the models of co-teaching are and how they benefit students." According to ADMIN4, providing training for co-teaching is an area in which the district could grow. Administrator 5 reported the building participated in some co-teaching

training, including a training provided by a regional professional development agency and a training the district provided to their student teachers and interns.

As far as continued training throughout the school year, ADMIN1 explained, "We have to continue to check in with them and give them feedback on what is working and what is not working and help them to problem solve." Administrator 3 clarified the district provides co-teaching fidelity checks a minimum of twice a year throughout the district. When asked about training provided throughout the school year, ADMIN4 added, "We need to find something we can do that demonstrates follow-through and is embedded throughout the year and not just frontloaded."

All five administrators spoke of the importance of collaboration between co-teaching partners. Administrator 1 indicated the more the partners focus on the students and the students' needs, the better they are able to reflect on best practices. According to ADMIN2:

> Throughout the course of the year, I think the number one form of training is probably simply collaboration and just meeting with and talking with those teachers involved in co-teaching to hash out problems and experiences together so we can grow together.

Administrator 4 stated it is important when co-teaching is first started that teachers find the time to collaborate and learn to drive themselves. He added, "We as a district have to find the opportunities and the resources to provide that to them." Administrator 5 mentioned the work done with interns for the past two years would make co-teaching with special education a natural transition.

When asked how the district ensured teachers were a good fit for co-teaching, ADMIN1 laughed, "We joke with our teachers that co-teaching is like a marriage and that they have to be a good fit." Administrator 2 shared prior experience and how knowing the teachers are good with collaboration is an indicator they will do well in a co-teaching partnership. According to ADMIN3, "I think both teachers need to have a good understanding of their role and how they're going to work together to establish a strong partnership which will be crucial to the success of a co-taught classroom." Administrator 4 spoke of how relationships are the key: "They are going to have to trust and work together to see the greater good." In response, ADMIN5 shared that all the teachers in the building want what is best for kids and have strong professional relationships.

Teacher question seven: Co-teaching vs. traditional classroom. Can you describe some of the specific benefits to students with disabilities that you believe co-teaching provides that traditional teaching methods do not? Likewise, can you describe some of the potential concerns/problems you believe co-teaching creates?

Benefits. Both GnEd1 and GnEd2 described the benefits of situations in which general education teachers provide large-group instruction while the special education teacher moves around the classroom promoting student understanding, providing feedback, and answering questions. Participant GnEd3 added, "We can do small group ability-based grouping during lessons, giving students more individualized attention." General Education Teacher 6 explained, "I think they receive more personalized learning and scaffolding, and, as they say, two heads are better than one." Similarly, GnEd6 mentioned that with a co-teaching partner, problem solving and troubleshooting becomes

easier when two teachers know the students and have time to plan and discuss together. General Education Teacher 5 shared:

> There are times when students in the past have been pulled out and have missed labs or hands-on activities. When co-teaching is implemented, with the additional support, students have the opportunity to stay in the classroom and receive the same services everyone else has.

Participant GnEd7 added that when students are able to stay in the general education classroom with their peers, they have more confidence than when they are pulled out for services.

Special Education Teacher 1 explained, "Allowing students to feel part of the general education classroom is a benefit to students with disabilities." Participant SpEd1 also added another benefit is that students with disabilities receive grade-level content with the support they need in a co-taught classroom. According to SpEd2, a specific benefit for students with disabilities is the insight and level of understanding and engagement two teachers bring to the classroom. Participant SpEd3 shared, "Co-teaching would provide a lower student-to-teacher ratio." Special Education Teacher 3 supposed the lower student/teacher ratio would allow students with disabilities to get the support they need that a solo teacher classroom could not provide with a classroom full of students. In addition, SpEd1 asserted that with the additional teacher in the classroom, students with disabilities receive extra encouragement that builds confidence.

Challenges. General Education Teacher 1, GnEd3, GnEd5, and GnEd7 all noted no concerns when it comes to potential problems due to co-teaching. Participant GnEd2 stated, "If co-teachers aren't consistent, issues could arise." General Education Teacher 4

and GnEd6 believed problems can arise when teachers do not have the time to plan lessons together.

Participant SpEd1 found it concerning that students with disabilities could become dependent on the adults in the co-taught classroom for "survival," which could in turn cause a dependency in other learning environments. When sharing potential concerns co-teaching could create, SpEd3 explained:

> In a STEAM school, students do not receive special education services for science. This can be a problem when special education students are having difficulties following or participating in a lesson. Co-teaching in a science lesson would be beneficial. Hopefully it would tie into reading and writing goals for the student.

Special Education Teacher 1 emphasized the pace of the regular education classroom is still too fast for some students with disabilities.

Administrator question seven: Challenges of initial implementation. What do you anticipate as the top three challenges your co-teaching teams will face during the initial implementation of co-teaching?

Participants ADMIN1, ADMIN3, and ADMIN5 anticipated time to be the biggest challenge co-teaching teams would face during the initial implementation of co-teaching. Administrator 1 shared, "Sometimes when they already have to meet with their grade-level team, their departments, and their principals, finding time to collaborate on a regular basis would be a challenge." Likewise, Administrator 5 laughed, "Time, and time again." Participant ADMIN3 also confirmed finding time to collaborate and plan could be a challenge.

Scheduling was also a shared concern when it came to the challenges of co-teaching. According to ADMIN2, scheduling could cause a hurdle when it comes to staying collaborative through the co-teaching process. Administrators 3, 4, and 5 projected scheduling to be a concern as well. Administrator 3 explained how it could be difficult working with the special education teacher's schedule to assure all student needs are met.

Aside from time and scheduling, the other areas of concern focused around co-teaching partnerships and instruction. Participant ADMIN1 focused on literacy and explained the special education teacher might not be trained in the methods and expectations used by the district when it comes to teaching content, so a challenge could be the teachers having to teach one another. Administrator 2 also mentioned the difficulty of identifying the students for whom co-teaching would be the best fit and those for whom it would not. Participant ADMIN3 agreed, "Identifying the kids who would benefit best from the co-teaching environment could pose a challenge." Administrator 4 raised the following concern:

> How do we know co-teaching works and how are we going to evaluate its
> effectiveness? It is one thing to do something just to do it, but we need to figure
> out the merit to it and what the benefits versus maybe some of the things we have
> to give up to do it.

According to ADMIN1, sometimes the idea of co-teaching is wonderful but then teachers get into it and start thinking it is not the right fit for them or for the students.

Middle of the year. General education teachers GnEd1 and GnEd3 did not participate in the middle-of-the-year and end-of-the-year interviews. Both participants

initially planned on co-teaching, but they were unable to for the initial co-teaching school year; therefore, there will be no further interview responses from GnEd1 and GnEd3.

Teacher and administrator question one: Benefits of co-teaching. What do you perceive to be the benefits of co-teaching for students without disabilities? Students with disabilities?

Participant GnEd2 felt co-teaching was beneficial for children of all abilities due to the fact students have the opportunity to receive instruction from more than one person. General Education Teacher 2 gave the example, "If I have a student who is a visual learner, I can be writing on an anchor chart while the other teacher is explaining for our auditory learners." According to GnEd6, "Two educators in the classroom working together brings more ideas and experience to the table." Furthermore, GnEd2 explained having two teachers in the classroom to meet student needs is extremely helpful.

When it came to the benefits of co-teaching for students with disabilities, GnEd4 explained, "They get to stay in the classroom with their peers while having their special education teacher with them." General Education Teacher 4 added, "They are a part of something and it really boosts their confidence." Participant GnEd4 explained there are students in the classroom without IEPs who may not have identified disabilities but who benefit from all the things a co-taught classroom can offer such as "a slower pace, more hands on, and more than one instructor." When considering students without disabilities, GnEd5 agreed, "There is another teacher in the classroom that makes even those mini lessons a little bit smaller so those students who seem to slide through the cracks are

getting the additional help they need." According to GnEd7, "Anytime you can reduce the ratio of students to teachers, it will be a positive experience for everyone."

Special Education Teacher 2 found a benefit for students without disabilities to be the different way each teacher teaches and the varied vocabulary used by the teachers. She explained:

> The co-teacher I teach with does have several students without disabilities who struggle with writing that I'm able to identify and put some interventions in place for before they fall too far behind or before they are put in the special education referral process.

Participant SpEd3 agreed, "Students without disabilities get two different forms of teaching. We both have different ideas and different aspects of things."

Teacher SpEd3 proclaimed, "There are so many students who need assistance but don't have an IEP… It [co-teaching] is so beneficial for all students." When considering students with disabilities, SpEd2 explained:

> I see a more of a cohesive unit in the teaching where the kids aren't as unsure on what they should be doing. Last year I thought there was a little disconnect on what the students in the general education classroom were doing verses the students in the recourse classroom. This year co-teaching kind of brings the two settings together and the kids are more focused.

Special Education Teacher 3 shared that with more than one teacher in the classroom, students get the one-on-one attention they need, benefiting both students with and without disabilities.

Participant ADMIN1 explained that during co-teaching classroom observations this school year, there were students without disabilities who would not have gotten the degree of individual help they received with two teachers in the classroom. Administrator 1 also added:

Students without disabilities can be grouped with students who have disabilities and use each other as a sounding board as they problem solve while the general education teacher and the special education teacher facilitate those conversations between the students with and without disabilities.

Participant ADMIN5 explained that with flexible grouping paired with co-teaching, students without disabilities who do not quite have the skill mastered can get small group and individualized instruction from the special education teacher. Similarly, ADMIN3 shared co-teaching allows students without disabilities the extra support and instruction they would not receive in a traditional one-teacher classroom. Administrator 4 believed the addition of an interventionist [special education teacher] in a general education classroom benefited all students.

When asked about the benefits co-teaching for students with disabilities, ADMIN2 commented:

The fact that they are getting closer to their least restrictive environment where they can be as close to a normal student participating with their friends as possible is a big benefit. Co-teaching gives them [students with disabilities] opportunities not to miss those highly collaborative conversations, instruction, and experiences that comes from the general education classroom. Students with disabilities miss out on all of this when they are pulled out to go to the resource classroom.

Administrator 3 stated, "For our kids with disabilities, it [co-teaching] gives them more opportunities to learn alongside their peers and to still progress at their own level."

According to ADMIN4, having students with disabilities in the general education classroom increases the likelihood of transfer to take place when learning. Administrator 5 confirmed, "Students with disabilities have the support of their special education teacher the whole time, yet they are still with their peers." In addition, ADMIN5 proclaimed the benefit teachers gain from seeing strategies modeled by the other teacher in the classroom.

Teacher and administrator question two: Challenges of co-teaching. What do you perceive to be the challenges of co-teaching for students without disabilities? Students with disabilities?

Participant GnEd2 shared that both students with and without disabilities who have the tendency to become overwhelmed sometimes struggle to know which teacher to focus on in the moment. General Education Teacher 6 expressed, "Students with and without disabilities are one and the same; I don't see how it would affect one differently than the other." General Education Teacher 4 commented on the ranges of abilities in the classroom posing a challenge. According to GnEd4, "Even with two teachers we feel much stretched out in trying to meet all the student's needs." Participant GnEd4 also noted teachers have to adapt their strategies often to meet the needs of students.

Participants GnEd2, GnEd5, GnEd6, and GnEd7 all mentioned co-teaching from the teacher side can be a challenge. Both GnEd2 and GnEd5 shared that finding a common time to plan together is a challenge, while GnEd6 and GnEd7 focused more on the relational side of co-teaching. General Education Teacher 6 stated:

The relationship between the teachers co-teaching has to be strong. If they are not

working well together, then that is going to affect students in a negative way. If

there is going to be conflict between the teachers, the students might feel that. If

they [co-teachers] are not planning well together, the students might feel that, too.

Participant GnEd7 cautioned co-teachers need to be careful one of the teachers in the

room does not become an aide. General Education Teacher 7 asserted this can be

avoided by communication and planning together.

Special Education Teacher 2 described the difficulty of being placed in a

classroom to meet the needs of students with IEPs but knowing the general education

students need your time and expertise just as much. Continuing, SpEd2 said, "The

challenge is making sure your student with disabilities are getting what they need."

Special Education Teacher 1 alleged the higher-level thinking and problem solving

required in the general education classroom is a challenge for students with disabilities.

On a similar topic, Special Education Teacher 3 explained:

Some of the kiddos without disabilities are working on a higher level and they are

flying through things where maybe the two of us [co-teachers] are still trying to

find that balance to work with all the kids in the room and what teacher needs to

work with what kids. How do you meet the needs of all the students?

Special Education Teacher 3 added when students with disabilities are in the general

education classroom, they are part of a large group and do not always get the one-on-one

assistance they need.

Administrator 2 shared, "I don't know if there would be a tremendous amount of

challenges for a student without a disability when it comes to co-teaching." He added, "I

can't think of anything problematic on the students' end when there is another teacher in the room serving you." According to ADMIN4, the challenge of having both students with and without disabilities in the classroom is the ability for the general education teacher and the special education teacher to see all students as "their" students and not "mine" and "yours." Administrator 5 commented that from a student's perspective, there are nothing but benefits with co-teaching, but the challenge is for the teachers. Participant ADMIN4 stated, "The biggest challenge is time for the teachers to collaborate to help students." Administrator 5 agreed it is a challenge for teachers to find time to plan together.

When it came to the challenges of a co-taught classroom for students with disabilities, ADMIN1 explained, "The general education classroom could be distracting for some students." Administrator 2 commented that for students with disabilities, the challenge might losing some of the one-on-one, small group attention they are used to receiving in the special education classroom. In addition, ADMIN2 commented, "I don't think you could incidentally lose a little bit of the focus on that individual student as you are servicing a group of students, some of which may or may not have a disability." Administrator 3 shared teachers could sometimes forget to provide students with disabilities their accommodations and modifications when in a co-taught setting.

Teacher and administrator question three: Personalized learning. What do you see to be the benefits and challenges of an environment of personalized learning for students with disabilities?

Benefits. Participant GnEd4 proclaimed, "Personalized learning is good for everybody, but especially for students with learning disabilities." General Education

Teacher 4 added, "Students with learning disabilities often have different learning styles and different learning needs, and with personalized learning, we can meet those based on what they need individually." According to GnEd6, regardless of whether a student has a disability or not, all students learn differently, so what works for one student may not for another. General Education Teacher 6 added, "If learning is personalized, it is focusing on that specific student's needs and learning style giving students what they need to meet their full potential." Similarly, GnEd7 agreed, "Personalized learning is going to be beneficial for all students because it is what the student needs."

Participant SpEd2 commented a benefit of personalized learning in a co-taught setting is that with two teachers in the room, students can personalize their own learning while getting much-needed interventions from the second teacher in the classroom. Special Education Teacher 3 shared, "Students with disabilities see how the general education kids problem solve through personalized learning, so just being with their peers can be a benefit." According to SpEd3, "Personalized learning lets all student think for themselves."

Administrator 1 declared personalized learning to be beneficial for all students, especially those with learning disabilities:

> Before personalized learning was a thing, it was considered accommodations and modifications as part of a student's IEP and not necessarily learning styles and/or learning topics. Now personalized learning allows student to learn about materials that they're interested in.

Participant ADMIN2 believed personalized learning to be nothing more than just good instruction: "It [personalized learning] is finding ways to provide targeted and specific

interventions for students, giving them the opportunity to have some say in the instruction that they receive." Administrator 2 added, "I don't think personalized learning would at any point have a negative effect on a student with a disability; in fact, I would argue that an IEP is one of the best personalized learning plans there is." Likewise, ADMIN3 shared a similar viewpoint that personalized learning, like an IEP, gives students with and without disabilities what they need when they need it. Administrator 5 asserted personalized learning allows teachers to meet students with disabilities where they are.

Challenges. When asked what the challenges of personalized learning could be for students with disabilities, GnEd4 commented, "The challenge with personalized learning in a co-taught classroom is trying to meet the students' needs in a larger classroom." General Education Teacher 5 shared that if educators are truly meeting the needs of students with disabilities in a personalized learning environment, there must be a way to ensure their needs are being met through the activities they are choosing for themselves. General Education Teacher 7 confirmed, "If we are not pulling students out of the general education classroom for small group or individualized instruction, this could pose a challenge."

Special Education Teacher 1 expressed that with personalized learning and co-teaching, students with disabilities who lack of organization, time management, and perseverance can be challenging. According to SpEd3, "Students with attention problems who are easily distracted are going to become even more distracted in a co-taught classroom where personalized learning is taking place." Special Education Teacher 2 added, "Personalized learning in a co-taught classroom takes a lot of

collaboration with your co-teacher. When this doesn't happen, it is nearly impossible to be prepared for personalized activities."

Administrator 1 reported staffing for personalized learning as a challenge: "When you get into personalized learning, you have a lot of different topics going on that require a lot of different recourses for it to happen." Administrator 4 shared, "Of any environment where you have students at various degrees of ability and strengths, it's always hard for a teacher to differentiate and to personalize that sort of learning, especially when there are big differences." According to ADMIN5, making sure educators provide what students need when they need it can be challenging. Administrator 2 explained, "Ideally, if we could have the manpower or the ability to pull off an IEP for every student, not in the special education sense but a personalized learning plan, that is what personalized learning is all about." Therefore, ADMIN2 denied there are any challenges to personalized learning for students with disabilities.

Teacher question four: Amending the IEP. Have you had to make amendments or adjustments to the IEPs of students with disabilities after initial implementation of co-teaching due to co-teaching being used as a service delivery model? If so, why were the changes made?

General Education Teacher 2, GnEd6, and GnEd7 shared they did not know what changes were made to students' IEPs. Participant GnEd4 stated, "I don't know what a service delivery model is because I'm not a special education teacher." General Education Teacher 5 shared there had been one amendment made for one of the IEP students in her co-taught class, but she did not think the amendment had anything to do with the co-teaching model. All three of the special education teachers reported the only

change made to student IEPs was to amend the IEP to show the specialized instruction minutes would be taking place in the general education classroom and not the special education setting.

Administrator question four: Challenges for teachers. What do you perceive to be the challenges of co-teaching for students without disabilities? Students with disabilities?

Administrator 2 stated the challenges were purely logistical:

It is the ability to meet with and plan with the general education teacher while still functioning as a special education teacher when you also have students with behavior challenges and academic challenges that pop up unexpectedly when you are working with other things. The special education teacher has to be able to find a way to plan with the teachers they need to plan with while still being in their own classrooms to manage everything else when a student needs them. I think that has been the biggest challenge and will continue to be.

Participant ADMIN5 agreed, "When we have behaviors, then our special education teachers are pulled to handle that behavior, so the general education teacher is losing a teacher they have come to count on." Administrator 1 found the two biggest challenges to be time for collaboration and differences in the teaching styles of co-teaching partners.

One thing all administrators agreed on was that time and planning present a big challenge for co-teaching teams. Administrator 3 explained, "They [teachers] don't have the time they would like to have to get their lessons together the way they would like for them to be." Participant ADMIN4 shared nearly all district leadership team members would like to see cross-content learning happening in the classrooms; however, because

scheduling can be difficult, learning often becomes more isolated in the content when the special education teacher is co-teaching in the general education classroom. Administrator 5 added, "Time and making sure the teachers have adequate time to prepare is a challenge." In addition, ADMIN5 emphasized, "Not always does the special education teacher have the same plan time as the general education teacher, so they are having to catch each other in the hallway before and after school to plan."

Teacher question five: Administrative support. How have your principals and special education directors supported you to date with co-teaching? What else could they do to better support co-teaching?

General Education Teacher 2 commented, "Administration has been super encouraging with the co-teaching model and have come and observed a few times, which has been wonderful." She added that more feedback on the co-teaching model and what their team is doing well and could improve upon would be appreciated to assure the partners are doing the best they can for students. General Education Teacher 4 agreed, "They [administration] have been totally supportive in our co-teaching… We were matched up with a special education teacher that was the most beneficial to our classroom." According to GnEd5:

> I think that both the principals and the special education directors have been supportive in the fact that they're letting the teachers work together and decide how it is best implemented for the students within their classrooms with and without disabilities. I think that has been a plus for myself and my co-teacher. My principal checks in periodically to see how it is going and if there are

struggles finding resources or coming up with a game plan to try. We all are

working together to make co-teaching successful.

General Education Teacher 6 shared how the building principals are coming in and

observing the co-teaching classroom, but GnEd6 felt like the special education directors

could come in a little bit more. According to GnEd7, just allowing teachers to try co-

teaching has been beneficial, along with allowing time to plan with the special education

teacher.

Special Education Teacher 2 expressed, "The principal has been awesome,

checking in frequently to see how we are doing and if we need anything." She added, "It

would be helpful if the special education directors could come and observe us more and

provide feedback on what we need to be working on to fill those gaps." Participant

SpEd3 commented that both the principals and the special education directors had been

supportive, particularly considering how difficult it was to determine in the first year of

implementation what a teacher's needs might be. Special Education Teacher 1 reported

needing more administrative help with behaviors so that the special education teacher is

not pulled away from co-teaching to deal with behavioral issues.

Administrator question five: Learning about co-teaching. What have you

learned about co-teaching so far?

Participant ADMIN1 proclaimed:

I learned co-teaching is very powerful for student achievement. It is helping our

students not feel different, because they are staying in the general education

classroom. The opportunities taking place with instruction is amazing because the

workshop model runs a lot smoother with having more hands to pull those small

groups and are able to redirect misconceptions immediately. I think the other

thing I have learned is that not all teachers have the buy-in yet. We have to have

full buy-in for co-teaching to be successful.

Administrator 2 learned the different models of co-teaching and the challenges the co-

teaching teams are facing. Additionally, ADMIN2 noted one of the biggest challenges

had been not having enough personnel, and that there is not an easy fix.

Administrator 3 stated, "Co-teaching is beneficial for all students, and I'm really

hoping our test scores will reflect that in different areas." According to ADMIN3, "It

[co-teaching] is providing a more inclusive environment for the kids and for the families

who are wanting their kids to be in the general education classrooms more."

Administrator 5 shared students with disabilities are not being pulled out of the classroom

and noticed co-teaching is helping with improving the self-esteem of students.

Participant ADMIN3 shared, "I think co-teaching has challenged some teachers and made

them better, and I think there are still some teachers who have room to grow."

End of the year. The following questions were asked to teachers and the

administrators.

Teacher and administrator question one: Is co-teaching beneficial? Do you

believe co-teaching to be beneficial to both students with and without disabilities? Why

or why not?

General Education Teacher 4 stated she had seen students with disabilities

blossom because they felt they were a part of the group and of the general education

classroom. Specifically, GnEd4 continued, "We have seen leaders come out of our

students with disabilities. They think, 'Okay, I can do this, and I can help someone else

by showing them what I'm doing.'" General Education Teacher 2 explained:

> Yes, absolutely it [co-teaching] has been a wonderful and beneficial experience
>
> not only for my students but for me as a teacher. Not only do you have a second
>
> set of hands in the classroom, but you also have a second voice. So, whatever I'm
>
> teaching is echoed by my co-teacher. Whatever I don't share or skip over, my co-
>
> teacher picks up on. I'm able to reach twice as many students because there are
>
> two teachers there. I would definitely suggest co-teaching, and I would definitely
>
> do it again.

General Education Teacher 5 agreed co-teaching had been beneficial for all students,

because it had given them the opportunity to receive small group instruction in addition

to extra support they might not get in a traditional, single-teacher classroom.

Participant GnEd6 commented two teachers working together to meet the needs

of all students appeared to be better than just one teacher. According to GnEd2,

individualized instruction had increased dramatically with co-teaching. General

Education Teacher 7 observed, "You have one teacher who can continue to teach the

whole class while the other pulls small groups who might need more individualized

instruction."

Participant SpEd3 discussed the benefit of students experiencing different

teaching styles as each teacher brings a different set of ideas. Special Education Teacher

3 also shared co-teaching had been beneficial for students with and without disabilities.

According to SpEd1, "Co-teaching has been beneficial for two reasons: one, for the

collaboration and learning from their peers, and two, the growth I have seen from the kids

on collaboration and socialization." Special Education Teacher 2 commented on the benefits of co-teaching for both students with and without disabilities: "There is an extra set of perspective and an extra set of hands… Students learn from the modeling and cooperation of the two teachers in the classroom."

Administrator 1 believed co-teaching to be beneficial for all learners. Similarly, ADMIN2 shared, "I absolutely believe co-teaching to be beneficial to students with and without learning disabilities." He added, "Two minds are better than one, and four hands are better than two, so the more people you can have supporting students in the classroom, it's certainly going to benefit them." Participant ADMIN3 stated co-teaching is beneficial for all students and spoke about co-teaching allowing for flexible grouping of students, regardless of disability, to provide a stronger level of instruction more specific to actual deficiencies. Administrator 3 continued, "I think when you are able to bring those low kids up to a higher level with more intense and specific instruction on a specific skillset, it is beneficial."

Administrator 4 also found co-teaching beneficial due to having two experts in the classroom versus one. According to ADMIN4, "There is an opportunity for kids to learn from two different teachers with various expertise… so I think the benefit is tremendous." Administrator 5 shared:

> What I think has been the best thing for our kids this year is that all students are included. All students feel capable, and all students are provided with the support they need within the classroom rather than being pulled out. Plus, the stigma of being pulled out goes away. I feel like students are more confident and more

capable of tackling things they find hard. I think co-teaching has prepared our students to move onto the junior high school.

Administrator 2 shared co-teaching takes collaboration and effort, but it is also a "win-win" no matter what if it can be made to work logistically.

Teacher and administrator question two: Challenges of co-teaching. What did you find to be the biggest challenge during the initial implantation of co-teaching in a STEAM school? Are there other challenges you would like to share?

Participants GnEd2, GnEd5, and GnEd7 all shared the challenge of getting to know their co-teaching partners and their teaching styles had been the biggest challenge initially. General Education Teacher 2 shared:

> You have to really make sure you and your co-teacher are on the same page… If you are not 100 percent aligned on what is going on, you are not going to be able to carry out the lesson, and the whole process is going to be rough.

According to GnEd5, the initial challenge was getting in sync with a co-teaching partner, but with comfort, it had become a seamless transition. General Education Teacher 7 added:

> The biggest challenge was opening up your doors to another person and setting your ego aside to let the other person take the lead… Personality might be an issue for some, but if teachers could let go of some of that control they might find co-teaching very beneficial.

Another challenge GnEd2, GnEd4, and GnEd5 shared was concern about times when the special education teacher had to be out of the classroom with little to no warning. General Education Teacher 2 stated:

Occasionally there are things that come up that are unforeseen, and they [the special education teachers] have to be gone with no warning at all… With us being STEAM-driven, lots of things are hands-on, analytical, abstract, and conceptual, so with not having those two sets of hands in those moments, makes it a lot trickier.

According to GnEd4, "There are behaviors of special education kids that come up, so the special education teachers aren't always there the whole time if they have to go out to get the student back on track." General Education Teacher 5 shared it became a challenge when the special education teachers had to be pulled out of the co-taught classroom for another issue.

Participant SpEd1 asserted finding the time to provide proper accommodations and modifications for students can be a challenge with co-teaching. Special Education Teacher 1 shared:

A lot of students with IEPs are still struggling with the executive functioning skills, and they still don't have for the planning and the organization they need to be successful in a classroom that is running at a rapid pace. Our kids are having trouble with not taking the time out of the classroom to work on those executive functioning skills. Trying to do this with my IEP students in a large group is challenging. I still think they need pulled out a little bit for this coaching to take place in a smaller setting.

Participant SpEd2 explained the initial team-building between the two teachers is very important and sets the tone for the year. Special Education Teacher 2 found a challenge to be finding a cohesive plan time where both teachers can be together to collaborate.

According to SpEd3, "I had a great experience co-teaching, but I can see how scheduling and finding the time to talk and plan can be a challenge."

Adminstrator 1 commented that one of the biggest challenges was finding time for teachers to share and plan collaboratively. According to ADMIN2, the challenges were not specific to a STEAM school, but were the same challenges that would be faced by any school implementing co-teaching. Administrator 2 commented, "Whenever trying to find a way to organize two people in the same place at the same time in a system that maybe isn't developed for that is a challenge." Similarly, ADMIN3 did not feel the challenges were specific to STEAM. A challenge ADMIN3 shared was that of the teachers struggling to think outside of the box when it came to trying different models of co-teaching and techniques. Administrator 4 shared the unique challenges of being a STEAM school:

> The inquiry and blended learning cross-curricular that is necessary in a STEAM school sometimes can be difficult when it comes to scheduling and co-teaching. So for example, if a classroom is trying to do a big activity using project-based learning that blends different subjects, the co-teachers might have to adjust their schedule instead of going in to service a particular content area. I could see how this would present a few challenges.

Administrator 5 believed time to be the biggest challenge and explained how both the general education teachers and the special education teachers are spread so thin that it became a challenge to find the time to plan together.

Teacher and administrator question three: Personalized learning. What is your perception of personalized learning and students' IEPs? What does this look like in a co-taught classroom?

General Education Teacher 3 shared personalized learning with students who have disabilities is no different than personalized learning with students who do not have disabilities. According to GnEd3, "We just focus on what their IEP goals are and keep those in mind." Participant GnEd2 commented:

> To me, personalized learning is where the students are in the driver's seat, and they are taking the reins in the direction their learning goes. With special education students, they need more guidance and more scaffolding through that process, so having a co-teacher is beneficial. They [special education teachers] can be the student's voice when they have trouble articulating what they need. I think it would be a lot harder guiding the personalized learning process with a student who has an IEP without the special education co-teacher.

Participant GnEd5 explained that personalized learning does not change anything if students have an IEP or if they do not. Specifically, GnEd5 observed, "It is all about making it fit the student's ability and making sure the resources and the activities truly fit the needs of the student."

General Education Teacher 6 proposed all students should have as much personalized learning as the school can provide. Explicitly, GnEd6 shared, "In a co-taught situation, I think it [personalized learning] gives more opportunity to meet those individuals' needs and to assure the student's plan is being followed." General Education Teacher 7 spoke of personalized learning allowing teachers to tailor the learning of

students for their success. According to GnEd5, "There are ways to personalize any lesson to assure students are getting more out of it."

Special Education Teacher 1 commented that personalized learning allows students with disabilities to get what they need while in the general education classroom with their peers modeling for them. In the words of SpEd2, "The accommodations and modifications needed for personalized learning fall on the special education teacher. It is more challenging to provide those accommodations and modifications in a general education classroom." Participant SpEd3 proclaimed, "When personalized learning is used in a co-taught classroom, students with disabilities are able to see the different learning styles from their peers and can find what works best for them."

Administrator 1 addressed how similar an IEP is to a personalized learning plan and discussed that when co-teaching allows students to stay in the general education classroom to address the goals of the IEP, the goals became more closely aligned to the grade-level content. In addition, ADMIN1 commented:

> I feel like personalized learning in the general education classroom puts the pieces of the puzzle together. They [students with disabilities] can continue to grow in their own learning, but they can see the big picture of where they need to be.

Administrator 2 defined personalized learning as "the opportunity for students to pursue their own interests, driven by problems, curiosity, and inquiry." According to ADMIN2, personalized learning in a co-taught classroom provides students with additional supports. Administrator 2 added, "Having two teachers in a personalized learning classroom gives you two people teachers facilitating inquiry. With two facilitators, there

are more opportunities to independently work with students through their personalized learning journey."

Administrator 3 stressed the importance of letting the data of a student with an IEP guide their personalized learning in the co-taught classroom: "You have to know when to reteach and when to move on." Participant ADMIN4 stated, "Personalized learning is voice and choice given to the students by offering them opportunities to select and choose their learning based off of their passion and strengths." Similarly, ADMIN5 shared, "In education right now there is a big misconception as to what personalized learning is. To me, it is allowing students to have voice and choice in what they are doing." Administrator 5 added, "We individualize, we differentiate, but ultimately our goal is personalizing the students' education, and it is a true continuum to get there."

Teacher and administrator question four: Co-teaching as a service delivery model. What is your current perception of co-teaching as a service delivery model? Has your perception changed since the beginning of the school year?

Participant GnEd4 described a change in perception of co-teaching used as a service delivery model through the process. Specifically, GnEd4 shared, "I have always been in a one-teacher classroom, so I was nervous at first… Now I wish I had co-teaching for every subject." General Education Teacher 2 proclaimed, "My view on co-teaching has pretty much stayed the same; we have remained consistent across the board." Both GnEd2 and GnEd5 indicated their perceptions of co-teaching had stayed the same and shared a common belief that co-teaching is about communication with your partner. General Education Teacher 6 added:

I don't think my perception on it [co-teaching] has changed. I like it. I think it

works, and it can benefit the students as long as the two teachers are working

together. You have to have the support from your administration, though.

General Education Teacher 7 declared co-teaching is beneficial for all students and would

like to continue to use co-teaching as a service delivery model.

Special Education Teacher 3 stated, "I was for it [co-teaching] in the beginning,

and I'm still for it now." In agreement, SpEd2 remarked, "I think co-teaching is

something I would like to do for years to come but would need to learn more about co-

teaching and the best way to implement the differentiated instruction in the regular

education classroom." Special Education Teacher 1 believed co-teaching to be a great

service delivery model for students. However, SpEd1 continued, "I have been able to do

a lot of delivery with one teacher where with the other teacher I don't do any instruction

other than small group, so it [co-teaching] has continued to be a challenge in that

classroom."

According to ADMIN1, "I think co-teaching is the way to go, and we should not

have any other options." Administrator 1 continued, "With co-teaching, you still have

the opportunity to pull students out into a small group when needed, but most of the

instruction is done together as a team." On the other hand, ADMIN2 disagreed with

ADMIN1:

I think it [co-teaching] has great value, but I do think there are students it may not

be the best for depending upon how high your level of need is. Sometimes being

mixed in with all of the other students is not your least restrictive environment.

You [a student with a disability] could be better serviced by being pulled out and

having one-on-one support from a special education teacher. I think the majority

of students with disabilities are going to benefit more from being immersed in

with their peers and learning and collaboration that goes on in the general

education classroom versus being pulled out away from the general education

learning environment. I think it [co-teaching] is effective; I don't know if it is for

100 percent of kids, but it certainly is for the majority.

Participant ADMIN3 added, "I have a very positive perception of co-teaching. I think

students enjoy having two different perspectives in the classroom, and I think students

enjoy having some variety to their lesson." Neither ADMIN4 nor ADMIN5's

perceptions changed from the beginning of implementation, and both administrators

described co-teaching as an excellent opportunity for students and teachers to grow.

Teacher question five: Administrative support. How has your administration

supported you with co-teaching and what support would you need going forward?

Participants GnEd2, GnEd4, and GnEd7 mentioned having the opportunity to

attend professional development on co-teaching and being provided a book on co-

teaching. General Education Teacher 2 suggested in the future, administration could

support co-teaching by providing a common plan time for co-teaching partnerships and

possibly providing substitute teachers once per quarter to have a full day of planning with

their partners. According to GnEd5, "We are very lucky our administration supports us

in everything we do in our building, so they have been just as supportive with co-

teaching." General Education Teacher 6 shared, "I would like for our administrators to

come into the classroom and observe a little more to see why co-teaching is working."

Participant GnEd7 commented on administrators being supportive and flexible in letting teachers try co-teaching.

All three special education teachers agreed their administrators had been supportive with co-teaching in its initial year of implementation. Special Education Teacher 1 commented:

They [administration] have been supportive of anything we have wanted to do or try and have even changed a few schedules if we needed it. They have been pretty hands-off with the attitude of, "Go do what you need to do." As far as future suggestions? Help identify those teachers that are a little more willing to share the classroom. The students see what is happening in the classroom and when the students see one teacher taking the lead all the time, then they never fully respect the other teacher like they should.

Special Education Teacher 2 shared one way administration could be more supportive would be to come into the co-taught classroom more to watch lessons and provide feedback for growth.

Administrator question five: Support for teachers. What would you do differently to support your co-taught teams moving forward?

Both ADMIN1 and ADMIN2 supposed the support teachers need from them is instructional support. Administrator 2 shared, "Supporting co-teaching hasn't been one of the primary functions I have had through my position, but what I do offer would be through instructional leadership, providing feedback, and coaching." According to ADMIN1:

Many times, in the special education world, they've [special education teachers]

been focusing on behavior and their specialty areas of different disabilities and

they may not know the state standards, where the general education teacher may

not know how to work with the specific disability and the behaviors. My job

would be to provide training to help bridge the gap and show the teachers how

their worlds overlap.

Participant ADMIN3 explained co-teaching partnerships might need support in the

different models of co-teaching and in providing teachers with the time to plan in order to

execute the different models of co-teaching effectively.

Administrator 4 shared the same thoughts on providing time for co-teaching

teams to plan, collaborate, and review student data. In a STEAM school with a lot of

project-based and personalized learning, ADMIN4 mentioned finding time to collaborate,

plan, and coordinate projects is an area where teachers could be supported by

administrators. Administrator 5 explained, "In a building such as ours, I just get out of

their way, whatever they need I make sure they have it as best as I can." In addition,

ADMIN5 spoke on the importance of letting special education be part of creating the

building's master schedule so co-teaching can happen.

Teacher and administrator question six: Co-teaching and STEAM. What is

your overall perception of co-teaching in a STEAM school with an emphasis on

personalized learning? Do you want to continue using co-teaching as a service delivery

model?

All of the general education teachers interviewed at the end of the school year

agreed co-teaching has been beneficial and they all would like to see co-teaching

continue. General Education Teacher 4 specified, "By using co-teaching we are able to raise our kids to higher heights than one teacher can do alone… I think we are contributing and helping kids more." According to GnEd5, "Co-teaching would be fantastic in any type of setting… It [co-teaching] is something that would help all students." General Education Teacher 2 commented co-teaching is highly effective and would like to have the opportunity to continue co-teaching. General Education Teacher 7 added, "You can model conversations with adults and take a 1:23 teacher-student ratio to a 1:12 ratio, allowing you to meet with small groups and individuals more frequently."

Participants SpEd1, SpEd2, and SpEd3 all shared they enjoyed co-teaching and would like to continue using it as a service delivery model. Special Education Teacher 1 explained, "I see a growth in confidence and communication skills with our students… I would love to see a combination of co-teaching and pull out services, just not enough hands to make it all work." According to SpEd3, "You are still going to have those kiddos who will need pulled out every so often." Special Education Teacher 3 added, "I see the progress my students have made, and I think co-teaching would be great to continue in every area we can." Participant SpEd2 commented, "I love co-teaching in a STEAM school… I love the collaborative piece between the two teachers, and I think it is a great way to service students with those specialized needs."

Administrator 1 alleged about the STEAM school:

The entire school is built around the personalized learning model; we make certain the students find their niche within the STEAM field. The school has found a unique way of blending students' interests together. We have to figure out the students' interest and passion, then figure out how they learn. The co-

teaching model has made that available for all students to be looked at through a personalized learning lens in the general education classroom.

Administrator 2 found co-teaching to be highly effective and believed it to be the direction schools should be heading, specifically in an environment focused on STEAM and driven by personalized learning. According to ADMIN3:

In a STEAM school where they are doing more personalized learning and where students are facilitating their own learning, I think having two teachers in the classroom really gives them the ability to dive deeper into some areas to challenge all kids.

Administrator 5 shared that with the building being a STEAM school, administrators would like to see co-teaching during science. Although ADMIN5 understood that English language arts and math are areas assessed by the state and why those content areas are the focus for co-teaching, he would like to see more focus on co-teaching for science. Administrator 4 proclaimed, "When teachers come together and really learn from each other and draw from each other, using their unique strengths and talents, that's just going to provide better learning for all students."

Journaling

Participants SpEd1 and SpEd2, along with participant GnEd2, completed a series of journal entries. Special Education Teacher 1 shared the journey of the implementation of co-teaching throughout the initial school year. Special Education Teacher 2 and GnEd2 were a co-teaching partnership; both teachers documented the beginning of implementation. The pertinent information relating to this case study is documented below. Special Education Teacher 1 and GnEd2 focused on three areas while journaling:

(1) planning and execution, (2) teamwork, and (3) STEAM. Both teachers documented their perceptions of each area on the same dates.

Planning. General Education Teacher 2 and SpEd2 explained how they use a shared electronic plan book (Planbook.com, 2018). Special Education Teacher 2 commented about how the shared plan book allows the team to communicate lessons and discussion questions. On October 3, 2017, GnEd2 entered, "Planned via Planbook and with the librarian to incorporate a more structured resource on online information which students could include in their writing." According to SpEd2, the co-teaching team collaborated with the librarian to provide more support of students. On October 10, 2017, GnEd2 added, "Through Planbook, both teachers were prepared for the interactive Smartboard lesson today." On the same day, SpEd2 noted how the co-teaching team needed to visit on how she could be more helpful in the planning and preparation needed for mini-lessons.

Execution. On September 11, 2017, SpEd2 entered, "My goal in the future is to make it to GnEd2's room more promptly to ensure I am there for the entire mini-lesson." On September 13, 2017, GnEd2 shared how she would like to improve upon time management. She found it helpful to have two teachers conferencing with students; however, even with two teachers, it was still difficult to meet with every student. General Education Teacher 2 made a goal for herself to design lessons that would be more conducive to the allotted time.

On September 21, 2017, SpEd2 shared how GnEd2 led the lesson and modeled the process while she floated around the room assisting students who struggle with following multiple steps. On the same day, GnEd2 entered, "I really enjoy when SpEd2

pipes in and mentions little tidbits of information that are helpful and supportive of student learning." Special Education Teacher 2 added how they had started meeting each day after writing class to discuss the pros and cons of the lesson, allowing for relevant discussions and planning to take place for the next day.

Teaming. In the first journal entry recorded on August 22, 2017, GnEd2 shared how both teachers worked together to engage students by providing different learning perspectives. On September 11, 2017, GnEd2 noted, "One area I would like to improve upon is helping SpEd2 become more of a leading role in our classroom mini-lessons." Special Education Teacher 2 complemented GnEd2 on a nice job including her in the classroom discussion and the lesson.

On September 13, 2017, SpEd2 wrote, "Teamwork is slowly improving, meeting the same time each day allows each of us to be on the same page." On September 21, 2017, both GnEd2 and SpEd2 commented on how they were able to work together through nonverbal cues to communicate the needs of individual students. On October 10, 2017, GnEd2 shared how the co-teaching partnership continued to grow and they were starting to "feed off" of one another's discussion points.

STEAM. August 22, 2017, GnEd2 shared the lesson incorporated arts and creativity; therefore, both teachers were able to model for students and then assist when the students needed writing prompts. On September 11, 2017, both teachers noted using science in daily writing by using sensory for details. General Education Teacher 2 documented on October 3, 2017, "Technology and different online resources were introduced during the lesson allowing students to learn in ways that best suit them." In

the final entry on October 10, 2017, SpEd2 explained how students used historical

features to write.

Participant SpEd1 recorded her personal journey throughout the implementation

of co-teaching outlined in this case study. Special Education Teacher 1 started

documentation on August 10, 2017, and the last entry was made on May 11, 2018. Forty-

five journal entries were made. For the purpose of this case study, information

significant to the case study in four main areas of planning, executing, teamwork, and

STEAM are recorded below.

Planning. Special Education Teacher 1 shared how during the first few days at

the beginning of the school year, she did not provide services to students and that

included the students in the co-taught classroom. On August 10, 2017, SpEd1 noted, "As

co-teacher, I'm having a hard time not being in the classroom day one and presenting

myself as an important part of the classroom." On August 11, 2017, SpEd1 commented

on how she was still working on scheduling students with disabilities: "The big decision

here is what students will receive co-teaching and what students still need resource

[special education classroom] instruction." On the same date, SpEd1 also noted wrote, "I

have forced my way into the grade-level plan times I will be co-teaching with, so I can be

part of the planning collaboration." On August 17, 2017, SpEd1 mentioned once again

reaching out to her co-teaching partners to find a good time to meet and come up with

ways she could co-plan with each of them.

Special Education Teacher 1 noted on September 29, 2017, "I got to do some

collaborating this week with xth grade teacher, yth grade teacher is difficult." On

October 11, 2017, SpEd1 explained she did not have full access to a project assignment,

so she had to "play catch up" and struggled knowing how to accommodate for the student(s) after the fact. On November 9, 2017, SpEd1 journaled, "We [xth grade teacher] keep trying to collaborate on new plans, but can't seem to find the time." On December 7, 2017, SpEd1 entered:

> This is a pretty lonely job sometimes. Feeling out of place, knowing what I can do and where our school is headed with STEAM and co-teaching, but the collaboration isn't there nor is it considered a must support and priority to make this happen. Even though I work well with the general education, I don't get to be with them to understand the big picture.

Another entry was made on December 15, 2017, pleading for collaboration with general education teachers.

On January 18, 2018, SpEd1 noted lots of progress had been made in xth grade. She stated, "[I] really had a great time teaching with the co-teacher and working together on planning a new project for students." Special Education Teacher 1 explained the xth grade teacher was good about asking for input and a great collaborator. An entry was made on March 8, 2017, stating new items and assignments had been given to the general education teachers, which caused collaboration to slow down and be pushed aside. On March 28, 2018, SpEd1 shared having a "heart to heart" with the yth grade teacher about the desire to take a more active role in the classroom. After the conversation, the general education teacher agreed to have SpEd1 plan the next big project for the class.

Execution. On August 14, 2017, SpEd1 commented on jumping right in and working with small groups of students consisting of both general education and special education students. Special Education Teacher 1 noted on August 15, 2017, "Today I

was more of a glorified classroom manager… just roaming the room looking for on-task behavior." In an entry made on August 22, 2017, SpEd1 shared how she was still having a difficult time feeling part of the classroom and felt like she was mostly monitoring classroom management and providing little instruction.

On August 28, 2017, SpEd1 noted a student's behaviors kept her from co-teaching in several classes and left the general education teacher "frustrated as I have stations that I run in the co-taught classroom." On August 31, 2017, SpEd1 entered:

Feeling extremely frustrated with co-teaching. I still have yet to have any extra responsibilities rather than classroom management and running a station. It is hard to sneak in something to add or say sometimes because there isn't always a chance to say something without cutting the teacher [general education] off.

Also, if I correct the class, am I stepping on the general education teacher's toes?

On September 29, 2017, SpEd1 commented she was still dealing with multiple student behaviors that were taking her away from her co-teaching classrooms.

An entry was made on October 6, 2017, with excitement on getting to teach a lesson and improvement being made in xth grade. Special Education Teacher 1 explained, "So many students that need assistance, but don't have an IEP… It [co-teaching] is so beneficial to all our students." On November 21, 2017, SpEd1 was discouraged and felt she was not making a difference. Specifically, SpEd1 shared, "I have identified several students whom I think would benefit from more direct instruction but have not been given the opportunity without removing them from the classroom." Special Education Teacher 1 shared on December 7, 2017, that she had become fascinated with executive functioning skills. She noted how it had her questioning the

schedule and how co-teaching could be even more beneficial with a different schedule and setting.

On January 11, 2018, SpEd1 stated, "We are having students [with disabilities] who are not in co-taught classes wanting to not be pulled [for special education services] from their [regular education] classroom to be in the co-taught classes." On January 25, 2018, SpEd1 shared how she would like to pull kids with disabilities part of the time into the special education classroom. She also noted students with disabilities continued to struggle with executive functioning skills. Special Education Teacher 1 questioned how to teach these skills in a co-taught classroom without the students falling behind.

On February 9, 2018, SpEd1 entered:

Co-teaching and IEP goal setting should go hand-in-hand, right? I'm learning you have to be intentional in providing IEP goals with every project-based learning activity. Knowing the IEP goals is like knowing the state standards, special education teachers need to be experts in both to truly implement in a co-teaching setting.

Special Education Teacher 1 shared on April 4, 2018, the need for a more in-depth study on the benefits of co-teaching. She noted seeing many obstacles, but having the peer interaction within the classroom was most beneficial to students with disabilities. Special Education Teacher 1 shared, "Just read about why heterogeneous groups play such an important role in student learning peer interactions… I need to find ways to increase this in the co-teaching setting." On April 30, 2018, SpEd1 explained how it was hard to watch students struggle through the problems on the state assessment without being able to prompt them.

Teaming. Special Education Teacher 1 shared on August 14, 2017, "At this time I'm still trying to learn what is expected of me and how to help my students [with disabilities] and the general education teacher." She added the general education teacher had been very inviting, and the students had not questioned SpEd1's presence in the classroom. On August 15, 2017, SpEd1 commented she sent communication to her two general education partners asking for them to "boss" her around because she was needing work to do. An entry was made on August 31, 2017, questioning how to have safe and difficult conversations with co-teaching partners.

Special Education Teacher 1 shared on September 29, 2017:

Yth grade teacher is difficult. I have been watched the whole time. I am in the room, then had the teacher [general education] correcting or piggybacking on my correction of students. Still learning my role, students are more receptive.

On October 6, 2017, SpEd1 noted, "Still searching for teacher approval and direction. Lots of fear to make a decision and a mistake. Starting to address this with teachers." A journal entry dated January 11, 2018, mentioned with a new semester came a new attitude. Special Education Teacher 1 shared how she made her concerns known with her co-teaching partners and made the time to stop into their classrooms to see what was going on so she would not feel so lost during co-teaching. By the middle of February, SpEd1 commented on not doing a lot of teaching in one class and really not liking co-teaching in the other class at all.

STEAM. On August 23, 2017, SpEd1 stated, "At this point, I really feel like I am missing out on the STEAM, Project Based Learning portion of teaching." On November 9, 2017, SpEd1 shared a project in yth grade was going really well, but she

was concerned with students struggling to break down the project to be successful. Special Education Teacher 1 commented, "If I take them [students with disabilities] to give directions in the special education classroom, is that still co-teaching? I think it is but how do I do it without affecting student confidence?" On November 21, 2017, SpEd1 shared feeling like she was not doing anything STEAM-related and had a desire to help, but the schedule and lack of personnel prevented this from happening.

On February 1, 2018, SpEd1 entered, "If students are going to progress in STEAM activities the Executive Functioning Skills are huge, with the inquiry and the ability to question, we just aren't there." In an entry made on May 5, 2018, SpEd1 shared that she continued to research executive functioning skills and made observations on how she could help students grow in this area. Special Education Teacher 1 explained STEAM could not flourish without executive functioning skills.

Co-Teaching Fidelity Checks

Co-teaching fidelity checks were conducted by the school district's Executive Director of Special Services. Each partnership scheduled times for the fidelity checks to take place. As part of this case study, five co-teaching partnerships were observed mid-year, and three of those original five co-teaching teams were observed for fidelity of co-teaching at the end of the implementation school year. The other two of the original five teams dissolved as co-teaching partnerships sometime between the beginning of the year implementation and before the mid-year fidelity checks.

During a co-teaching fidelity check, the observer first looks for the co-teaching models used. Second, the observer focuses on the following: co-teaching approaches that increase instructional intensity and facilitate appropriate student participation;

differentiation through accommodations, modifications, and assistive technology; professional relationships and parity between the two teachers; instructional environment conducive to co-teaching; and classroom and behavior management. Each content area has additional subcategories the observer looks for during the visit.

After the fidelity checks were completed, the observer provided the co-teaching team with feedback outlining areas of strength and weakness. The observer then made suggestions for the team and at times challenged them to try different models in their classrooms. For the purpose of this case study and to retain anonymity, each team was assigned a letter (Team A, Team B, Team C, Team D, and Team E) for sharing the results of the co-teaching fidelity checks.

Mid-year fidelity checks. During the mid-year co-teaching fidelity checks, multiple co-teaching models were observed.

Models of co-teaching used. All five teams were observed using team teaching at some point during the class period observed. In this model, the teachers co-instruct and both contribute to the lesson (Friend, 2016b). Team B used parallel teaching, where the teachers divide the students into two different groups (Friend 2016b). Teams B and C used the one teach/one assist model. In this model, students are left in a single group while one teacher leads instruction and the other teacher provides brief support and interaction with individual students (Friend, 2016b).

One teach/one observe was used by Team C. In this model, one teacher gathers observational data while the other teacher leads instruction (Friend, 2016b). Station teaching was observed being used by Teams D and E. In station teaching, students are

divided into at least three groups, each teacher takes a group and leads instruction, while students complete independent work at stations not assigned to a teacher (Friend, 2016b).

Co-teaching approaches. Feedback was provided to teams about co-teaching approaches by the Executive Director of Special Services. It was noted Team A interacted and communicated well together, creating an excellent example for how to think through learning. A recommendation was made to Team C to try different co-teaching models where the learning strategist had a more active role in the lesson. In Team D's observation, the learning strategist led small group instruction and review, while the content expert checked individual work and provided feedback to students for corrections.

Professional relationships. The observer noted during Team A's observation that the content expert spoke more during the instructional phase, but the overall balance was "perfect" for the lesson. During Team D's co-teaching fidelity check, the observer stated, "A visitor to the classroom would have a hard time discerning which one is the regular education teacher versus the special education teacher… These teachers team together very well." The observer noted during Team E's observation the learning strategist worked with students off to the side while the content expert instructed the rest of the class. When providing feedback to Team E, the observer asked if she could return on a day when the learning strategist would have a larger role in the whole group instruction.

Instructional environment. Team B was complemented by the observer on their use of tables for testing, carpet for instruction, and three groups spread throughout the classroom to utilize different models of co-teaching. Team D's desks were formed into groups, and tables were available for small group instruction. Team E was noted to have

the class divide into groups with both teachers working with students on opposite ends of the classroom, while small tables made a third group where the students independently took a quiz on their electronic devices.

    Differentiation. Team A was observed to modify worksheets for those students needing a more simplified version as part of their IEP accommodations. The observer noted in Team B's observation:

> Students had their paper folded to show fewer math problems at once. Decimal division instructions included movement. Students helped determine groups by self-monitoring their level of confidence on the newly taught concept.

Team C demonstrated differentiation through the use of varying learning strategies and outlets, electronic devices, worksheets, math problems on the board, and whole class movement in demonstration of an array.

    Classroom and behavior management. Flexible seating was recorded to have been used in Team A, B, and D's classrooms. According to Tucker (2017b), "The physical design of most classrooms exacerbates learning differences" (p. 83). In Team A's classroom, it was observed that students were given a specific amount of time to transition; however, some students had difficulties and needed prompting. Likewise, during Team C's observation, students did not transition well between activates. During Team C's observation the observer wrote, "The energy level of the teachers and the students was low." The observer noted in Team D's classroom several students were in and out of the classroom, but students re-entered the classroom with very little distraction. Team E was noted to have smooth transitions by providing students with verbal prompts beforehand.

End-of-year fidelity checks. Multiple co-teaching models were observed to have been used during each of the three team's observed observations.

Models of co-teaching used. Team A was observed to use teaming and alternative teaching. In alternative teaching, the majority of students stay with one teacher while the other teacher instructs a small group of students for a variety of purposes (Friend, 2016b). Both Team B and Team C were observed using teaming, one teach/one assist, and one teach/one observe.

Co-teaching approaches. During Team B's observation, a note was made stating the learning strategist circled the classroom checking student notes while the content expert taught the lesson. The observer commented on Team C's observation, "The instruction was not explicit; students didn't know what the expectations of the lesson were." According to Fisher and Frey (2018), "Without a clear learning destination in mind, lessons wander, and students become confused and frustrated" (p. 83). The observer also noted the instructional intensity could have been higher if the learning strategist was utilized more.

Professional relationships. The observer noted the conversations taking place between Team A's partners had students "hanging onto every word." During Team B's observation, the content expert did all the talking.

Instructional environment. During Team A's observation, the students were given the choice by the learning strategist to choose a space that worked best for them. No feedback was provided in the area of instructional environment for Teams B and C.

Differentiation. Team A was observed using the five senses to teach students about descriptive writing. The observer noted, "I was very impressed by the creativity

going into the students' writing after the mini lesson was given." During Team B's observation, the content expert switched roles with the students and they became the teacher and the teacher became the student. The teacher as the student asked the students as the teacher various clarifying questions to support learning.

Classroom and behavior management. In Team A's co-taught classroom, when the volume in the classroom went up, all the content expert had to say was, "I'll wait," and the students were ready for learning. The observer noted in Team C's classroom that transitions were noisy and slow.

Summary

Chapter Four included an analysis of the experiences of seven regular education teachers, three special education teachers, and five administrators during their first year of implementing co-teaching as a service delivery model for students with disabilities in a STEAM elementary magnet school in a Midwestern school district. Presented in this chapter was a summary of chronological interviews, also included in the chapter were journal entries documented by two special education teachers and one regular education teacher and co-teaching fidelity checks completed by the school district's Executive Director of Special Services.

Chapter Five includes a detailed summary of the perceptions of teachers and administrators who participated in the case study. Information pertinent to factors impacting the implementation of co-teaching as a service delivery model in a STEAM elementary magnet school are provided. Findings and conclusions based upon the information gathered through the case study are presented, along with implications for practice. Finally, Chapter Five includes topics recommended for future research.

Chapter Five: Summary and Conclusions

In 2004, a second revision to the IDEA was enacted that focused more on the least restrictive environment, while the 1997 reauthorization had focused on student exposure to the general education curriculum (Colson & Smothers, 2018). The IDEA states two things about least restrictive environment: first, students should be in the general education classroom to the maximum extent appropriate, and second, students should only be removed from the general education setting when the students' needs cannot be met through the proper use of supplementary aids and services (Morin, 2016).

One way a student with disabilities can access the general education classroom is through co-teaching. Co-teaching has been defined in many different ways. Friend (2016b) described co-teaching as a means of providing required specialized instruction for students with disabilities while ensuring access to the general education curriculum in the least restrictive environment. This definition established the framework for this case study, with delivery of special services in a setting where the foundation of instruction is driven by science, technology, engineering, the arts, and mathematics (STEAM). The environment was also one where learning is personalized for students with and without disabilities.

The purpose of this case study was to elicit the perceptions of general education teachers, special education teachers, and building- and district-level administrators of the initial implementation of co-teaching in a STEAM elementary magnet school enriched with personalized learning. Further, examination focused on the benefits and detriments of co-teaching in a STEAM school for students with and without disabilities, the ability for students with disabilities to thrive in a learning environment driven by personalized

learning, co-teaching as a service delivery model for inclusion, and strategies administrators can use to support co-teaching.

To obtain these perceptions, qualitative data were collected throughout the first full school year of the STEAM school's initial implementation of co-teaching. Semi-structured interviews were conducted three times during the initial implementation of co-teaching at the beginning, middle, and end of the school year. The interview structure was a person-to-person encounter, and a third party conducted the interviews.

Journaling of two special education teachers and one general education teacher was also used to gather insight for this case study. In addition to interviews and journaling, co-teaching partnerships where observed twice during the implementation year by a district administrator using a co-teaching fidelity check. Feedback from the observations was recorded and provided to the co-teaching team members. Within Chapter Five, the findings of the case study are presented, along with conclusions, implications for practice, and recommendations for future research.

Findings

The three methods (interviews, journaling, and fidelity checks) were selected to elicit data to answer the study's four guiding research questions. The results are summarized and then applied to the corresponding research questions. Supporting literature from Chapter Two is included to provide additional associations and comparisons related to previous research and studies.

Research question one. Based on the perceptions of elementary school STEAM teachers, what are the benefits and detriments for students with and without disabilities when co-teaching is implemented with fidelity?

There were several benefits and detriments of co-teaching noted by both the teachers and administrators. A number of advantages and disadvantages were shared and mentioned throughout the study. Once the data were analyzed, only those shared by a majority were recorded in the findings.

Benefits. A common finding was that most of the general education teachers and special education teachers believed what was good for one student was good for all students, and the participants shared how they found co-teaching to be suitable for both students with and without disabilities. This belief was shared by Kramer and Murawski (2017), who found teachers believe the academic and social needs of students both with and without disabilities are better met in a co-taught classroom. For example, GnEd2 reported co-teaching to be beneficial for children of all abilities due to the fact students have the opportunity to receive instruction from both the content expert and the learning strategist. The teachers spoke of the benefits of co-teaching for all students and only distinguished between students with and students without disabilities in a few cases.

Another shared benefit of co-teaching was having two teachers in the classroom to bring different perspectives and teaching styles. Special Education Teacher 2 explained, "There is an extra set of perspective, an extra set of hands… Students learn from the modeling and cooperation of the two teachers in the classroom." Participant GnEd6 spoke about the benefit of having two teachers working together to meet the needs of all students in the classroom, which is better than a traditional single-teacher classroom. Several teachers shared how in a co-taught classroom, when one teacher is providing large-group instruction, the other teacher can move around the classroom checking for understanding, providing feedback, and answering questions. Beninghof

(2016) credited the movement of co-teaching in education to teachers who are recognizing the benefits of bringing together two individuals with different talents to provide the best instructional outcomes.

A third benefit identified by participants explicitly for students with disabilities was the confidence gained when students with IEPs are not pulled out of the general education classroom. General Education Teacher 5 shared that with co-teaching, students who would otherwise be pulled to receive services in the special education classroom are now able to stay in the general education classroom and "feel like they are a part of the classroom community." This benefit aligns with a study conducted by Perez (as cited in Adams, 2015), who found in a co-taught classroom, students with disabilities are given more opportunities to interact and socialize with their peers without disabilities, resulting in more positive attitudes toward learning.

Detriments. Teacher participants in this case study emphasized finding the time to collaborate and plan together for co-teaching poses a challenge. As noted in Chapter Two, Adams (2015) revealed when co-teachers are not given the time to co-plan and work together, they struggle. Through journal entries, SpEd1 noted on multiple occasions the frustration of finding the time to collaborate with the general education teacher; something always seemed to come up and planning together did not happen, leaving SpEd1 feeling ill-prepared. These findings were consistent with the notion that successful co-teaching is rooted in collaboration; without effective communication, co-teaching will likely flounder (Kramer & Murawski, 2017).

Based on the responses given, a second shared detriment of co-teaching was the relationship between co-teaching partners. General Education Teacher 2, GnEd5, and

GnEd7 all commented on how an initial challenge of co-teaching was getting to know their co-teaching partners and their teaching styles. Specifically, GnEd2 explained, "If you are not 100 percent aligned on what is going on you are not going to carry out a lesson, and the whole process is going to be rough." General Education Teacher 7 shared how it was hard to set his ego aside and welcome the co-partner in with open arms. Special Education Teacher 1 journaled about the desire to play a more active role in instruction in the general education classroom but not being given the opportunity. This challenge reflected MacDougall's (2017) mention of how co-teaching is viewed as a partnership, and as with any partnership, it takes work and problems will arise. General Education Teacher 6 explained how the interactions between teachers can affect students in a negative way if the two teachers do not have a strong relationship.

The special education teachers in this study revealed another challenge was meeting the needs of all students. Special Education Teacher 3 commented on how there has to be a balance when it comes to working with all the students in the classroom and meeting all the different needs. Special Education Teacher 2 shared, "The challenge is making sure your students with disabilities are getting what they need." General education teachers seemed to focus more on the range of abilities in the classroom and the concern that even with two teachers, it can be difficult to meet all the students' needs.

The general education teachers also shared how at times the special education teachers were pulled from their co-teaching assignments when unexpected things came up such as the behavior of students outside of the co-taught classroom. When the special education teacher had to leave the room, the general education teacher was left alone. As stated in Chapter Two, when one teacher needs to respond to a student need, the other

teacher can pick up with little instructional time lost (Murdock et al., 2016). However, GnEd2 explained:

> In a school driven by STEAM, there are lots of things that are hands-on, analytical, abstract, and conceptual, so when a special education teacher is pulled from a scheduled co-taught lesson, it makes it difficult to continue with the lesson and still meet the individual needs of the students.

Special Education Teacher 1 shared through journal entries that student behaviors would keep her from co-teaching at times, leaving the general education teacher without the special education teacher in the classroom as planned.

Research question two. In what ways does co-teaching enable students with disabilities to thrive in a learning environment driven by personalized learning?

Both the teacher and administrator participants shared positive comments when it came to students with disabilities being co-taught in a personalized learning environment. Administrator 1 pointed out how similar an IEP is to personalized learning and added when IEP goals are addressed in the general education classroom, the goals become more closely aligned to the grade-level content. As explained by Butler (2016), the field of special education has been personalizing learning for a long time.

Another common response was that personalized learning allows all students, both with and without disabilities, "voice and choice" when it comes to their learning styles. Kelly (2016) explained with the addition of personalized learning, schools are now providing a tailored education to all students that was once only available to those students in special education. Goodwin and Hein (2017) stated, "They get outside their own heads and consider what's happening in their students' minds so that, like Isaac

Newton watching an apple fall from a tree, they'll have some eureka moments of their own" (p. 80). Special Education Teacher 3 explained that when co-teaching is used in a personalized learning environment, students with disabilities can see how their peers problem solve, so just being in the general education classroom where personalized learning is taking place is a benefit.

Research question three. What are elementary STEAM teachers' perceptions of the benefits of co-teaching used as a service delivery model for inclusion in a STEAM school?

During the beginning-of-the-year interviews, before the start of co-teaching, five of the seven general education teachers and all three special education teachers believed the effectiveness of the use of co-teaching as a service delivery model would depend on each student's individual needs. The participants shared how they felt a combination of co-teaching and small group instruction in the special education resource room would best meet the needs of students with disabilities. When configuring the delivery system used when determining educational placement for students with disabilities, IEP teams consider several different factors to determine the best setting for services (Wright & Wright, 2017).

The teachers' perceptions of co-teaching as a service delivery model changed slightly at the end of the initial implementation year. General Education Teacher 4 shared this change, "I have always been in a one-teacher classroom, so I was nervous at first… Now I wish I had co-teaching for every subject." General Education Teacher 6 commented that co-teaching can benefit students when the two teachers are collaborative and work together. Other participants agreed co-teaching as service delivery model

benefits all students when the co-teaching partners communicate and work well together. Kramer and Murawski (2017) confirmed an integral part of what makes co-teaching work is when a collaborative support system, flexible instructional approaches, and data-driven decision making are utilized.

Research question four. What are strategies administrators can use to provide support for the co-teaching model in a STEAM school?

Three common themes arose among teacher participants when it came to strategies administrators can use to support the co-teaching model in a STEAM school, including professional development, provision of feedback, and the freedom and flexibility to try new strategies. Specifically, teachers would like further training and professional development on the different models of co-teaching. Cook and Friend (1995) outlined the six common teaching approaches for co-teachers to maximize the unique perspectives and strengths of both the general education teacher and the special education teacher. Friend (2016b) delineated the six approaches to co-teaching used to integrate specially designed instruction into the general education classroom.

General Education Teacher 2 shared it would have been beneficial if the administrators had provided more training on the different models of co-teaching and had then come in to observe and provide feedback on what the team was doing well and where they could use more training. Several general education teachers and all the special education teachers also shared they would like administrators to observe their co-taught classrooms more often and provide more feedback. The participants consistently asked for more visits from the special education administrators. Hussin and Hamdan (2016) explained most administrators do not have a background in special education.

The observation of co-teaching teams can be a valuable asset to the effectiveness of its use as a service delivery model, while also sending the message that administrators value the teachers' investment in co-teaching (Nierengarten, 2013).

Teacher participants shared that another way administrators could provide support would be by giving teachers freedom and flexibility in co-teaching. General Education Teacher 5 spoke of allowing the teachers to work together to decide how to implement co-teaching to best meet the needs of students with and without disabilities in their classrooms. Co-teaching lends itself to daily opportunities for professional growth through the feedback and constructive criticism a co-teaching partner can provide. Mandel and Eiserman (2016) found this kind of feedback to be more effective than the input from a routine administrative observation. When it comes to co-teaching teams trying new and different strategies, administrators should be a "safety net" and allow teams to take risks (Nierengarten, 2013).

Conclusions

Conclusions were developed based upon an analysis of participant responses to specific interview questions aligned with the research questions guiding the case study. Co-teaching fidelity checks were also taken into consideration when drawing conclusions, along with the additional use of electronic journaling completed by three of the participants. This section includes common perceptions gathered during the initial implementation of co-teaching. The following themes are the result of an analysis of the research data gathered.

The benefits of co-teaching far outweigh the detriments for students both with and without disabilities. Teachers and administrators in this study agreed students

with and without disabilities alike benefit from the co-teaching model. While

participants were upfront about the challenges faced by students during co-teaching, the

benefits superseded the challenges. While there were varying examples shared by the

participants, there was consistency in the benefits. Participants spoke of the confidence

students with disabilities gain through co-teaching. This observation related to Kramer

and Murawski's (2017) research on how teachers believe the social and academic needs

of students with disabilities and those without are better met in a co-taught classroom.

Teacher participants shared that all students in the co-taught classroom benefited

from having an additional teacher to share another perspective and to provide a second

set of eyes, ears, and hands. By putting two heads together, teachers created instructional

plans that included both higher and lower levels of complexity allowing for more hands-

on application (Beninghof, 2011). Students were able to receive small group and one-on-

one support in a co-taught classroom that a traditional one-classroom teacher could not

provide.

When co-teaching is used as a service delivery model, students with disabilities

are included in the general education setting, creating a more enriched and diverse

learning environment for students with and without disabilities. Villa and Thousand

(2016) stated, "Inclusive education is both the vision and practice of welcoming, valuing,

empowering, and supporting the diverse academic, social/emotional, language and

communication learning of all students in a shared environment" (p. 18). Teachers and

administrators felt the inclusion of all students in the general education classroom was the

best thing about co-teaching

Co-teaching partnerships can contribute to the success of co-teaching.

Murdock et al. (2016) recognized co-teachers must be good communicators, share similar teaching philosophies, spend time planning together, and be willing to drop their ideas to go with the other teacher's plan. In agreement with Murdock et al. (2016), participants in this study recognized the importance of good communication, shared philosophies, and a common plan time. Hattie (as cited in Scherer, 2015) concluded, "The co-planning of lessons is the task that has one of the highest likelihoods of making a marked positive difference on students' learning" (p. 7). Co-teaching is an essential part of meeting the individual needs of students, but when co-teachers are not given time or do not plan and work together, co-teaching partnerships and students will struggle (Adams, 2015).

One special education teacher co-taught with two different general education teachers and had two very different experiences during the implementation of co-teaching. In one case, both teachers collaborated and worked well together, while in the other classroom, the partnership was not as strong, and the experience was ultimately not nearly as positive. Murawski and Bernhardt (2016) proposed that after providing the initial professional development on co-teaching, teachers still need to be allowed to develop their co-teaching partnerships when possible. Giving teachers a choice implies willingness and ownership (Nierengarten, 2013).

There are similarities between the benefits and challenges of co-teaching in a STEAM school driven by personalized learning and a traditional co-taught classroom. When analyzing the responses shared throughout the initial implementation of co-teaching, many examples of the benefits and challenges teachers encountered were consistent with the benefits and challenges outlined in the research reviewed in Chapter

Two. Therefore, co-teaching in a STEAM school driven by personalized learning in no way differs from the co-taught classroom in a traditional school setting.

There has been a paradigm shift in education from the traditional educational philosophy to the more modern idea where the focus is now on the process of learning as much as the results (STEAM Education, 2017). Kallick and Zmuda (2017) surmised the days are gone when education was one-size-fits-all. Before personalized learning, a personalized education was only available to students with disabilities through their IEPs, and now a personalized education is provided to all students (Kelly, 2016).

One general education participant shared how implementing personalized learning with students who have disabilities is no different from using personalized learning with students who do not have disabilities. Administrator 2 defined personalized learning as "an opportunity for students to pursue their interests, driven by problems, curiosity, and inquiry." If anything, co-teaching in a STEAM school driven by personalized learning may be even more conducive to co-teaching given the experience the special education teacher already has in customizing learning. Kelly (2016) called special education teachers the experts in personalized learning, IEPs, small groups, and flexible classroom design, which are strategies special education teachers have always used to meet the needs of their students.

There is a need for the special education administration to play a more active role in the professional development and the sustainability of co-teaching. Both general education teachers and special education teachers expressed the need for more visibility of the special education administration in co-taught classrooms. During initial implementation, the Executive Director of Special Education was in the co-taught

classroom two times for the middle-of-the-year and end-of-the-year fidelity checks. The director also attended the beginning-of-implementation professional development training with the co-teachers.

Analysis of the teacher interviews revealed teachers want to see and hear from the special education administrators more often. According to McClure and Cahnmann-Taylor (2010), "Co-teachers need sustained dialogue and support as they work to collaboratively develop their co-teaching" (p. 122). Ploessl and Rock (2014) suggested the special education administrator should be the one proficient in providing professional development for co-teaching teams, as most administrators do not have backgrounds in special education (Hussin & Hamdan, 2016).

Implications for Practice

The general education teachers, special education teachers, and administrators who participated in this case study found co-teaching to be beneficial for both students with and without disabilities when used as a service delivery model. The unusual factor in this particular case study was the implementation of co-teaching in a STEAM elementary school driven by personalized learning. Personalized learning creates a learning environment and educational programing that is individualized to meet the diverse variety of student needs (Glossary of Education Reform, 2015). As mentioned by the majority of participants, personalized learning allows students to work at their own pace, show what they know through different avenues, and have more hands-on learning opportunities.

An analysis of the data collected for this study indicated co-teaching promoted a wide variety of teaching methods when utilizing Cook and Friend's (1995) six

approaches to co-teaching. In addition, students with and without disabilities benefit from receiving instruction from both the content expert (general education teacher) and the learning strategist (special education teacher). Co-teaching allows two teachers to combine their talents to hit on the four major components of engagement in every lesson: emotion, student interest, an understanding of the importance, and a sense of efficacy (Beninghof, 2011).

This information is valuable when planning for future co-teaching classes in a STEAM elementary school driven by personalized learning. One suggestion would be to consider placing a general education teacher and a special education teacher together full-time and using different methods of grouping when determining what students both with and without disabilities the co-teaching team will instruct. Administrators and teachers need to collaborate, organize, and determine what group or groups of students will achieve the best results in the co-taught classroom.

Johnson (2014) found by ability grouping students, new leadership qualities are revealed in students other than only the high performers; students who do not always participate start to demonstrate creativity and skills the teachers did not know they had. With strategic planning, scheduling, and organizing, a mixture of homogeneous and heterogeneous grouping could be implemented through the use of the co-teaching partnership. With a full-time co-teaching pairing, some of the challenges expressed by participants could be eliminated. Problems like not having time to co-plan, meeting various student needs across all content areas, both teachers being viewed as equals in the classroom, and the learning strategist being pulled out of the classroom could be avoided.

Another implantation would be to provide administration with training as it related to co-teaching so they become more informed on how to best implement and sustain co-teaching.   An administrator who is tasked as the instructional leader and the one who evaluates co-teaching partnerships must have an understanding of the principles of co-teaching (Murawski & Bernhardt, 2016). Nierengarten (2013) suggested administrators are key in both the planning and implementation of successful co-teaching by being visible and active.

Recommendations for Future Research

This qualitative case study was designed to follow the journey of the initial implementation of co-teaching in a STEAM elementary magnet school. Throughout the implementation, research, and investigation process, gaps were identified where further studies would be beneficial. This section includes suggestions and recommendations of studies that could help fill gaps on the implementation of co-teaching.

The data for this study were qualitative, consisting of fidelity checks, semi-structured interviews, and electronic journaling. For future studies, the use of both qualitative and quantitative data in a mixed-methods study could provide more information for research on the implementation of co-teaching. Quantitative data, such as student assessment results, could reveal the effectiveness of co-teaching with different student subgroups.

A qualitative study on the perceptions of students with and without disabilities on co-teaching would provide administrators and teachers with insightful information when determining if and when co-teaching should be used as a service delivery model.

Students could offer a different perspective and perhaps provide information that has yet

to be considered.

Another recommendation for future study would be the implementation and

effectiveness of co-teaching in a traditional elementary school setting. In the STEAM

elementary school focused upon for this study, the teachers are accustomed to taking a

more inquiry- and problem-based approach to learning. The foundation of the school is

rooted in STEAM, and the general education teachers already personalize learning for all

students. This may not be the case in a traditional elementary school setting, and

customizing learning for all abilities may not be something familiar to traditional

classroom teachers.

Summary

Co-teaching allows students with disabilities to receive the specialized instruction

necessary to meet their individual learning needs while accessing the general education

curriculum (Shin et al., 2016). Like most concepts in education, co-teaching has its

challenges and benefits (Beninghof, 2011). This case study was designed to follow the

initial implementation of co-teaching as a service delivery model in an elementary

STEAM school driven by personalized learning. Participants for this study were selected

based on their involvement in the initial implementation of co-teaching.

Participants included seven general education teachers, three special education

teachers, and five building- and district-level administrators. The participants were

interviewed three different times throughout implementation, once at the beginning of the

school year, again in the middle of the year, and finally at the end of the school year. The

individual discussions were recorded, transcribed, and analyzed to provide data for this

study. In addition to participant interviews, journaling throughout the process was recorded by three of the participants, and the special education director completed co-teaching fidelity checks.

Chapter One included the background of the study, the conceptual framework, and the statement of the problem. The purpose of the case study and the four research questions used as the focus of the study were also included. The significance of the study and key terms and definitions were also provided in Chapter One. Finally, the limitations and assumptions of the study were listed.

Chapter Two included a more thorough discussion of the conceptual framework of this study, co-teaching as a service delivery model for students who have an IEP. Following the framework, a substantial review of the literature and previous research was included with a focus on STEAM education, personalized learning, inclusion, benefits and challenges of co-teaching, the different models of co-teaching, and supporting co-teaching. The literature review of previous studies in Chapter Two was used to identify key data points used to steer the rest of the study.

In Chapter Three, the methodology used for the study and the problem and purpose were provided. The research questions guiding the study were reintroduced, and the use of qualitative research design was formulated. The ethical considerations and identification of the population and sample used for the study were offered.

Chapter Four included an analysis of the data gained through the use of interviews, journal entries, and co-teaching fidelity checks. The interviews were documented in chronological order starting with the beginning of implementation and concluding with the end-of-the-year interviews.

In Chapter Five, the research questions guiding the study were answered, and the findings were presented with corresponding data aligned to the literature and previous research outlined in Chapter Two. Also, conclusions were drawn, and the implications for practice were given. Finally, recommendations for future research were presented concerning the use of co-teaching as a service delivery model.

In summary, the benefits of co-teaching far outweigh the detriments for students with and without disabilities. Additionally, co-teaching partnerships contribute to the success of co-teaching. It was established that there are similarities between the benefits and challenges of co-teaching in a STEAM school driven by personalized learning and co-teaching in a traditional school setting. The final conclusion gained through the current literature and teacher interviews, journaling and co-teaching fidelity checks support the following gains from this case study:

1. There is a need for special education administration to play a more active role in the professional development and sustainability of co-teaching.

2. Personalized learning, once only available to students' with disabilities is now available to all students.

3. Implementation of co-teaching is the same for both a traditional classroom and a classroom in a STEAM school with an emphasis on personalized learning.

Appendix A

Institutional Review Board Approval

LINDENWOOD

LINDENWOOD UNIVERSITY ST. CHARLES, MISSOURI

DATE: June 27, 2017

TO: Ashley Copley
FROM: Lindenwood University Institutional Review Board

STUDY TITLE: A Case Study of the Implementation of Co-Teaching in a STEAM
                    Elementary Magnet School in a Midwestern State
IRB REFERENCE #:   [1082364-1]
SUBMISSION TYPE: New Project

ACTION: DETERMINATION OF EXEMPT STATUS
DECISION DATE: June 27, 2017

REVIEW   Exemption category # *1*
CATEGORY:

Thank you for your submission of New Project materials for this research study.
Lindenwood University Institutional Review Board has determined this project is
EXEMPT FROM IRB REVIEW according to federal regulations. We will put a copy of
this correspondence on file in our office.

If you have any questions, please send them to IRB@lindenwood.edu. Please include
your project title and reference number in all correspondence with this committee.

This letter has been electronically signed in accordance with all applicable regulations,
and a copy is retained within Lindenwood University Institutional Review Board's
records.

Appendix B

Informed Consent for Participation in Research

LINDENWOOD

INFORMED CONSENT FOR PARTICIPATION IN RESEARCH ACTIVITIES

"A Case Study of the Implementation of Co-Teaching in a STEAM Elementary Magnet School in a Midwestern State"

Principal Investigator Ashley Lane Copley
       Telephone: ▮▮▮▮▮▮▮▮   E-mail: alc759@lindenwood.edu

Participant_____Contact Info _____

1. You are invited to participate in a research study conducted by Ashley Copley under the guidance of Shelly Fransen, Dissertation Chair. The purpose of this research is to investigate the process and outcomes of the implementation of co-teaching used as a service delivery model in a STEAM magnet elementary school.

2. a) Your participation will involve
   - An informational meeting where you will be given an overview of the case study.
   - Three interviews that will be recorded during the first school year of co-teaching–one at the beginning of the year, one mid-year, and one at the end of the year.
   - If you are a general education or special education teacher participating in the study, you will be observed three times during the first year of the implementation of co-teaching using the school district's approved fidelity check observational form–once at the beginning, again mid-year, and finally at end of the school year.
   - In addition, you may volunteer to keep a journal of the journey through the implementation of co-teaching.
   - Once all the data are collected, the data analysis will take place and you will be made aware of the findings.

   b) The amount of time involved in your participation will be three and one-half hours. Please allow 30 minutes for the informational meeting, 30 minutes for each of your three interviews, and 30 minutes for each fidelity check. In addition, if you would like to volunteer to journal your journey with the implementation of co-teaching, you would also need to add the time you spent recording your thoughts.

Approximately 15 participants will be involved in this research: three special education teachers, seven general education teachers, two building principals, and two district-level special education directors. All participants will be from the same school district and tied to the same STEAM elementary magnet school.

3. There could be a chance a co-teaching partnership may not be working. The participant may experience uncomfortable feelings in answering questions about relationships with other adults.

4. The possible benefits to you from participating in this research are the feedback gained from how co-teaching is implemented in your school; specifically, what you and other participants view as the benefits and challenges of co-teaching.

5. Your participation is voluntary and you may choose not to participate in this research study or to withdraw your consent at any time. You may choose not to answer any questions that you do not want to answer. You will NOT be penalized in any way should you choose not to participate or to withdraw.

6. We will do everything we can to protect your privacy. As part of this effort, your identity will not be revealed in any publication or presentation that may result from this study and the information collected will remain in the possession of the investigator in a safe location.

7. If you have any questions or concerns regarding this study, or if any problems arise, you may call the Investigator, Ashley Copley, at ⬛⬛⬛⬛⬛⬛ or the Supervising Faculty, Dr. Shelly Fransen, at ⬛⬛⬛⬛⬛⬛. You may also ask questions of or state concerns regarding your participation to the Lindenwood Institutional Review Board (IRB) through contacting Dr. Marilyn Abbott, Provost, at mabbott@lindenwood.edu or 636-949-4912.

I have read this consent form and have been given the opportunity to ask questions. I will also be given a copy of this consent form for my records. By participating in the interview, I consent to my participation in the research described above.

Appendix C

Co-Teaching Fidelity Check

Teachers: _____   Date of Observation: _____

Strategies of Co-Teaching Used: _____

#	Content Area	Middle Assessment Feedback	Ending Assessment Feedback
	Instructional Environment		
1	Students with disabilities are spread throughout the classroom vs. clustered.		
2	Furniture and other classroom equipment have been arranged to foster co-teaching (e.g., desks moved to form groups).		
3	Students and teachers are arranged in the class so that instructional groups are separated as much as possible from each other to minimize noise and distraction.		
4	Teachers have positioned themselves to foster student attention and to minimize distractions (e.g., back-to-back, seated instead of standing).		
5	Classroom displays and decorations convey an inclusive belief system (e.g., student work is displayed, individuals with disabilities are part of photos, etc.).		
6	Teachers use classroom equipment/supplies to divide groups and reduce distractions.		
	Co-Teaching Approaches		
7	Teachers and students appear accustomed to implementing the selected co-teaching approach.		
8	The co-teaching approach being used appears to facilitate appropriate student participation and behavior.		
9	Instructional intensity is greater than it would be if only one teacher was present.		
	Differentiation		
10	Instruction is based on principles of active student participation.		
11	Students are using a variety of materials, selected based on their learning needs.		

12	Students are using instructional technology as necessary to foster learning.		
13	Students are using assistive technology as necessary to foster learning.		
14	Appropriate accommodations are provided to students.		
15	Teaching procedures are clear, structured, and responsive to student needs.		
16	The evaluation of student performance is comprised of a variety of techniques designed to encourage success.		

#	Content Area	Middle Assessment Feedback	Ending Assessment Feedback
	Classroom and Behavior Management		
17	Pace of instruction is brisk.		
18	Transitions between activities occur with a minimum loss of time.		
19	Students appear to have been taught transition strategies.		
20	Instruction is well-organized (e.g., each teacher knows his/her assigned roles, procedures for planned activities, routines, etc.).		
21	Students have options for moving or standing as needed.		
22	A positive behavior support system is in place and implemented consistently.		
	Professional Relationship(s)		
23	Talk time in the classroom is approximately equal or otherwise equitable.		
24	Teachers interact with each other during instruction in ways that further the goals of the lesson.		
25	Teachers both interact with all students for instructional purposes.		
26	Teachers both interact with all students for classroom management purposes.		
27	Both teachers address classroom chores (e.g., distributing materials, getting supplies, etc.).		
28	Students interact with and respond to teachers approximately equally.		
29	Parity is evident between the teachers.		
30	If paraprofessionals are present, they work under the direction of the teachers for review or other supplemental instruction.		
31	Inclusive language is used by both teachers in class (us, our, we).		
32	Time is allocated (or found) for common planning.		

Appendix D

Interview Questions for Teachers

Beginning of the Year

1. Tell me about yourself (grade level taught, number of years teaching, number of years with the district, number of years teaching in this STEAM magnet school).

2. Do you have any prior knowledge or experience in co-teaching? If so, in what capacity?

3. What do you perceive are the benefits and challenges of co-teaching for students with and without disabilities?

4. In what ways do you believe co-teaching will enable students with disabilities to thrive in a learning environment driven by personalized learning?

5. What service delivery model (small group/resource room, consultative, co-teaching, self-contained/sped classroom) do you perceive is most beneficial for students with disabilities? Why?

6. What resources or trainings have been provided to help with the implementation of co-teaching? In what ways has your administration prepared you for the co-teaching environment?

7. Can you describe some of the specific benefits to students with disabilities that you believe co-teaching provides that traditional teaching methods do not? Likewise, can you describe some of the potential concerns/problems you believe co-teaching creates?

Middle of the Year

1. What do you perceive to be the benefits of co-teaching for students without disabilities? Students with disabilities?

2. What do you perceive to be the challenges of co-teaching for students without disabilities? Students with disabilities?

3. What do you perceive to be the benefits and challenges of an environment of personalized learning for students with disabilities?

4. Have you had to make amendments/adjustments to the IEPs of students with disabilities after initial implementation of co-teaching as a service delivery model? If so, why were the changes made?

5. How have your principals and special education directors supported you with co-teaching? What else could they do to better support co-teaching?

End of the Year

1. Do you believe co-teaching to be beneficial to both students with and without disabilities? Why or why not?

2. What did you find to be the biggest challenge during the initial implementation of co-teaching in a STEAM school? Are there other challenges you would like to share?

3. What is your perception of personalized learning and students with IEPs? What does this look like in a co-taught classroom?

4. What is your current perception of co-teaching used as a service delivery model? Has your perception changed since the beginning of the school year?

5. How has your administration supported you with co-teaching? What support do you need going forward?

6. What is your overall perception of co-teaching in a STEAM school with an emphasis on personalized learning? Do you want to continue using co-teaching as a service delivery model?

Appendix E

Interview Questions for Administrators

Beginning of the Year

1. Tell me about yourself (what is your position, how long have you been in education, what did you teach while in the classroom, how long have you been in admin, how long in the district)?

2. Do you have any prior knowledge or experience in co-teaching? If so, in what capacity?

3. What do you perceive as the benefits and challenges of co-teaching for students with and without disabilities?

4. In what ways do you believe co-teaching will enable students with disabilities to thrive in a learning environment driven by personalized learning?

5. What service delivery model (small group/resource room, consultative, co-teaching, and self-contained/special education room) do you perceive as most beneficial for students with disabilities?

6. How do you prepare teachers for co-teaching? What training is provided at the beginning and throughout the school year? How do you ensure your teachers are a good "fit" for co-teaching?

7. What do you anticipate as the top three challenges your co-teaching teams will face during the initial implementation of co-teaching?

Middle of the Year

1. What do you perceive to be the benefits of co-teaching for students without disabilities? Students with disabilities?

2. What do you perceive to be the challenges of co-teaching for students without disabilities? Students with disabilities?

3. What do you perceive to be the benefits and challenges of an environment of personalized learning for students with disabilities?

4. What challenges have your co-taught teachers faced so far?

5. What have you learned about co-teaching so far?

End of the Year

1. Do you believe co-teaching is beneficial to both students with and without disabilities? Why or why not? If so, in what way? Test scores? Behavior modifications?

2. What did you find to be the biggest challenge during the implementation of co-teaching in a STEAM magnet school? Are there other challenges you would like to share?

3. What is your perception of personalized learning and students with IEPs? What does this look like in a co-taught classroom?

4. What is your current perception of co-teaching used as a service delivery model?

5. What supports have your co-taught teachers needed from you? What would you do differently to support your co-teaching teams moving forward?

6. What is your overall perception of co-teaching in a STEAM school with an emphasis on personalized learning? Do you want to continue co-teaching as a service delivery model?

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Vita

Ashley L. Copley completed her undergraduate studies at College of the Ozarks in 2005 with a Bachelor of Science in Recreational Administration. Coming from a family full of educators and having a passion for teaching and learning, Ashley knew she had to go back to school to become a teacher. In 2006, she was hired on provisional certification to teach special education in kindergarten through fourth grade. In 2008, Ashley obtained full teacher certification through the University of Missouri-Saint Louis. In 2011, she graduated with a Master's in Educational Administration from Lindenwood University, followed by an Educational Specialist in School Administration from Lindenwood University in 2017.

Ashley has served in public education for 13 years. She spent six years as a special education teacher working primarily with children with moderate to severe disabilities. Ashley has spent the past eight years in special education administration. In 2015, she began her tenure with Nixa Public Schools in Nixa, Missouri, where she is currently the Assistant Director for Special Services.

Ashley is an active member of the Missouri Council of Administrators of Special Education and the National Council for Exceptional Children. She is also a member of the Local Administrators of Special Education. Ashley continues her studies in educational leadership as she serves the students and teachers of her community.