

ABSTRACT

Anita Boyd, APPLICATION OF UNIVERSAL DESIGN FOR LEARNING IN CO-TAUGHT SETTINGS AT A RURAL HIGH SCHOOL: FOSTERING POSITIVE PERCEPTIONS AROUND INSTRUCTIONAL DELIVERY FOR STUDENTS WITH DISABILITIES (Under the direction of Dr. Dan Novey). Department of Educational Leadership, May 2022.

The primary purpose of this study was to determine the impact of the application of the Universal Design of Learning framework in co-taught math classes at the high school level. The study was initiated due to the historically low academic performance of students with disabilities on end-of-course math assessments. A mixed methods approach was used to gather data to generate findings and conclusions. This study sought to improve student learning in mathematics by applying Universal Design for Learning professional development and studying the impact on teacher and co-teacher attitudes. In addition, this Dissertation in Practice implemented UDL multiple means of representation, action, expression, and engagement and studied changes in teacher pedagogies and student learning. The study findings indicated that teachers perceived the positive possibilities for higher job satisfaction, retention, and the likelihood of increased improvements in the effectiveness of instruction. Findings and conclusions connected to student impact were the potential to foster an increased understanding of instructional material and concepts presented, a rise in academic success, and a higher level of self-esteem. Due to the short period of this study and the limited number of participants, further study is recommended over a longer duration of time and with an expanded pool of participants.

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CO-TAUGHT SETTINGS AT A RURAL HIGH SCHOOL: FOSTERING POSITIVE
PERCEPTIONS AROUND INSTRUCTIONAL DELIVERY FOR
STUDENTS WITH DISABILITIES

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by

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APPLICATION OF UNIVERSAL DESIGN FOR LEARNING IN
CO-TAUGHT CLASSROOMS IN THE HIGH SCHOOL SETTING: FOSTERING POSITIVE
PERCEPTIONS AROUND INSTRUCTIONAL DELIVERY FOR
STUDENTS WITH DISABILITIES

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DEDICATION

It is with heartfelt thanks and appreciation that I dedicate this research to my husband, Jake and daughter, Claire. Without the support of you both I could have never completed this journey. Jake, your unwavering faith in me, provides motivation and pushes me to persevere in the most challenging of situations. Thank you for your unending belief in me! Claire, thank you for being one of my biggest fans and for understanding when I had to spend countless hours at the computer researching and writing. The love and support you both provided allowed me to stay focused and see this research to completion. You both have my love and gratitude forever and always!

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CHAPTER 1: INTRODUCTION

Outlining the most appropriate supports for students with disabilities can be a daunting task for Individualized Education Plan Teams within school districts; although sometimes challenging, this is a task that is legally required by the Individuals with Disabilities Education Act (IDEA). Bulat and Hayes (2017) state that having a disability can be one of the most marginalizing factors in a child's life and acknowledge that finding ways in education to meet the learning needs of students with disabilities can be challenging, especially in schools, districts, regions and countries with severely limited resources. In a survey conducted by *Education Week*, results indicated that less than one in five general education teachers feel "very well prepared" to teach students with mild to moderate learning disabilities (Mitchell, 2019). This is additionally alarming, considering more than a billion people, or 15% of the world's population, have some category or type of disability (Bulat & Hayes, 2020). The *Education Week* survey also revealed that only 30% of general education teachers feel "strongly" that they can successfully teach students with learning disabilities, and only 50% of those surveyed believe students with disabilities can reach grade-level standards (Mitchell, 2019). Using these statistics as a baseline for teachers' perceptions across our country, I cannot help but begin to wonder if this reflects not only our national teachers' perceptions but also our state and local teachers' perceptions.

As reflected in the federal headcount submitted on December 1, 2018, Carolina School District – a pseudonym – serves 233 students through Individualized Education Plans (IEPs), which is approximately 19% of the district's student enrollment (North Carolina Department of Public Instruction [NCDPI] - Accountability Data Sets and Reports, 2018). This number reflects students identified within the fourteen areas of eligibility outlined under the Individuals with Disabilities Education Act.

Compared to other public school units across North Carolina, Carolina School District is one of the smaller districts; although, regardless of size, the district is still charged with supporting students with disabilities in an equitable manner, just the same as its larger districts.

Carolina School District, a pseudonym that will be used to protect confidentiality, is comprised of four traditional schools serving grades Pre-K through twelfth grade. Respectively, pseudonyms will be used to identify each of these schools moving forward in this research.

Carolina Primary School is home to Pre-K through third grade, Carolina Elementary School serves students in fourth and fifth grades, Carolina Middle School serves students in sixth through eighth grades, while Carolina High School is comprised of grades ninth through twelfth.

Based on continuous low proficiency scores for students with disabilities in grades 9-11, there is a need to focus study efforts on strategies to increase proficiency scores in the areas of English and Math at the secondary level. A heightened focus on co-teaching implementation support began in 2017. Continued professional development is needed to support both the general education teachers and special education teachers to assist in co-teaching improvement efforts. Given that about 70% of our students with disabilities are in co-taught classes, additional professional development to support the co-teachers to further understand learner variability can enhance and improve their instructional practices. Continued training to support co-teacher teams to ensure appropriate instructional practices will provide teachers with additional confidence when it comes to addressing learner variability in the co-taught settings, as much benefit lies within these environments. Researchers Deiker (1998) and Murawski (2006) note critical components fostered in co-taught settings such as students with disabilities having an increased positive attitude, increased interaction with non-disabled peers along with exposure to higher-level concepts than found in more segregated settings. It is also important to note that less than

10% of our co-teachers at the high school have participated in any formal co-teaching or training focused on learner variability. In addition, administrators at the secondary level can benefit from ongoing professional growth opportunities to ensure appropriate supports for the co-teaching teams. Based on informal feedback and limited co-teaching training opportunities, the additional training will enhance current co-teaching practices being employed at the high school. The next step for professional development at Carolina High School will come in the form of training that will provide both special education teachers and general education teachers in co-taught settings with a course consisting of seven introductory modules that will provide an introduction to Universal Design for Learning (UDL). This introduction will include an overview of the UDL framework and allows for a deeper understanding of learner variability.

The UDL framework, as described by CAST, consists of concrete tools that can be used to address learner variability through the why, what, and how of learning. These guidelines provide guidance on multiple means of engagement, representation, action, and expression. This framework assists in creating customization of instructional goals, assessments, methods, and materials to address individualized learning.

Background of the Focus of Practice

When compared to state expectations for the 2018-19 school year, students with disabilities (SWD) continue to perform at a significantly low rate, specifically at the high school level in Carolina School District, grades 9-12 (NCDPI- Accountability Data Sets and Reports, 2020). Individualized instruction is provided on a daily basis depending upon needs outlined in students' Individualized Education Plans (IEP) as required by the Individuals with Disabilities Education Act (IDEA). Given this daily dose of personalized education for the SWD subgroup, these students are progressing at a low proficiency rate that has prompted the district's

designation as needing Targeted Support and Improvement (TSI) through federal designation standards based on analysis of all end-of-course (EOC) tests. Tests are aligned to the North Carolina Standard Course of Study in English Language Arts/Reading (ELA/Reading) and Mathematics and the Essential Standards in Science for all public schools in North Carolina. In addition, each of Carolina School Districts' four schools were designated as a Targeted Support and Improvement School, qualifying in the subgroup of students with disabilities (SWD) in grades 9-12. Upon review of specially designed instruction supports across the district, the high school proficiency scores for students with disabilities were in the low to significantly low range, including an alarming 84.2 % of students with disabilities not proficient in the area of NC Math for the 2018-19 school year according to North Carolina Department of Public Instruction (NCDPI) Accountability Services Division (see Table 1). In addition, Carolina School District was on the Targeted Support and Improvement (TSI) list for the students with disabilities subgroup for grades 9-12 (see Table 2). ESSA (Every Student Succeeds Act) requires that states establish a methodology for identifying low-performing schools that are consistently underperforming for three consecutive years, and one of those two identification categories is TSI (North Carolina Department of Public Instruction – Accountability, 2015). North Carolina indicates student proficiency on state standardized testing through five levels, and any student scoring below a level 3 is considered not proficient in that subject area.

When determining my focus of practice, I communicated to our district's Executive Director of Curriculum and Instruction my desire to continue an intense focus of support at the high school level. Through this focus, I want to provide supports to improve academic outcomes for students with disabilities in co-taught classes. The feedback I received was encouraging, and due to continued low proficiency scores in grades nine through eleven for students with

Table 1

End-of-Course Mathematics Assessment Results 2018-19

School Name	Grade Span	Subgroup	Subject	Not Proficient	Percent Level 3	Percent Level 4	Percent Level 5
Carolina High School	09-12	Students with Disabilities	NC Math I (9-12)	84.2	10.5	5.3	<5

Note. NCDPI Accountability Services Division North Carolina EOC Assessment Scores.

Table 2

Targeted Support and Improvement Schools (TSI) Consistently Underperforming Subgroups

School District	School Name	Grade Span	Qualifying Subgroups For TSI-CU
Carolina School District	Carolina Elementary School	03-05	SWD
Carolina School District	Carolina Middle School	06-08	SWD
Carolina School District	Carolina High School	09-12	SWD
Carolina School District	Carolina Primary School	PK-2	SWD

Note. 2019-20 Identification List.

disabilities, there was an overwhelming need for additional support as indicated through the district's designation as a Targeted School of Improvement (TSI) (see Table 2) through Every Student Succeeds Act (ESSA) requirements facilitated by the North Carolina Department of Public Instruction (NCDPI).

Additionally, the Carolina School District has participated in the North Carolina State Improvement Project (NCSIP) for the past five years. As a participant in this project, the district has identified three areas noted for improvement supports. Co-Teaching is one of those areas of needed support, and within the grant, professional development in the area of UDL has been outlined. Given the large number of students in co-taught classes at Carolina High School, it was evident that the students in grades 9-12 in co-taught class settings would benefit from teachers participating in this training.

Context of Study

The site selected for this research is Carolina High School, with an enrollment of 412 students in grades 9-12. Out of the 412 students, 76 are provided individualized instruction through an Individualized Education Plan. The number of students with disabilities in co-taught classes is outlined for both Math and English (see Figure 1). Carolina School District is located in a rural county on the east coast of North Carolina. According to Data USA (2018) statistics, the county is comprised of the following demographics: 74% White, 18% Black, 4% Hispanic and Other 4%. The county's economy is based on tourism, recreation and agriculture. More than half of the teachers at this high school live in neighboring counties and do not reside within the district.

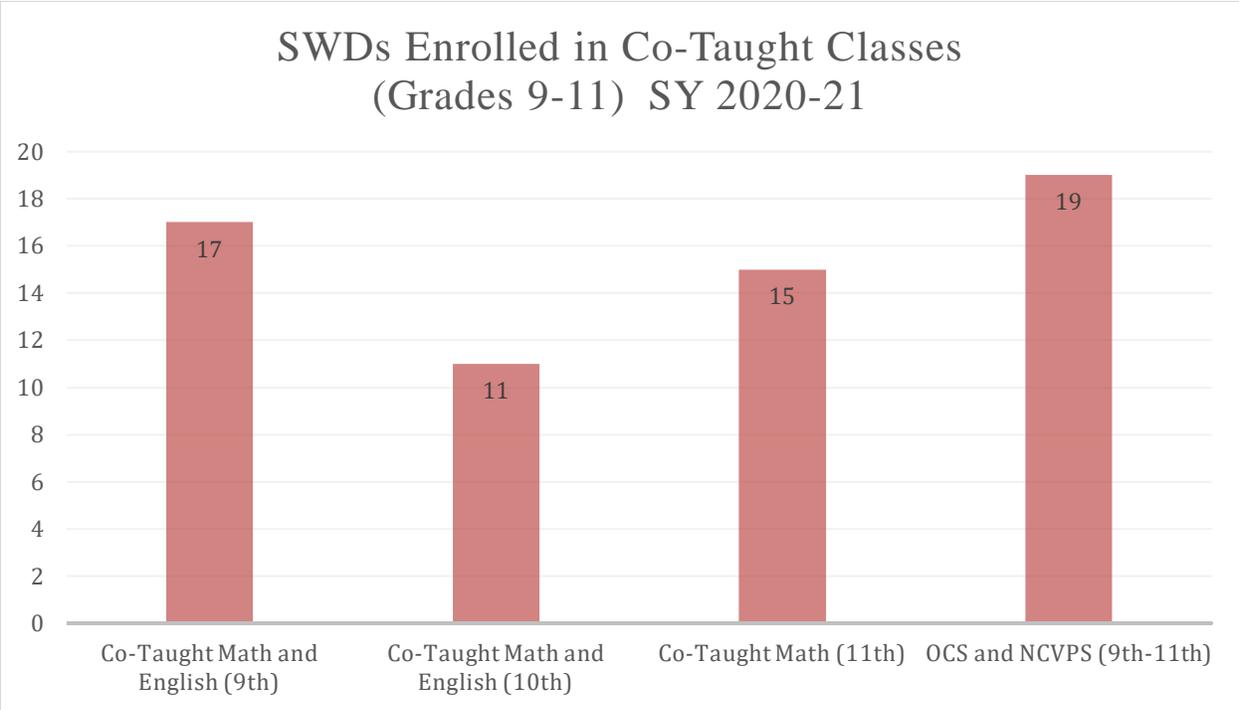


Figure 1. Number of students with disabilities in co-taught classes in grades 9-11.

This study is centered upon the students in co-taught classes at the high school level and teaching practices of those educators providing inclusive instruction. It is worth noting again that approximately 70% of our students with disabilities in grades 9-11 are in co-taught classes at the high school. Due to a high volume of turnover and transition within our co-teacher teams, fewer than 10% of these teachers have participated in any formal co-teaching or learner variability training. Providing the co-teacher teams with Universal Design for Learning professional development brings training to further the educators' understanding and application of teaching practices. This professional development will benefit diverse learners to allow access and meaningful participation and enhance specially designed instruction. The participant group will consist of three general education teachers, four special education teachers, one high school-based administrator who serves as an assistant principal, and a district-level administrator. Student participants will be determined by parent consent obtained from the student with disabilities subgroup in the co-taught classes for Math and English in grades nine through eleven at Carolina High school.

Description of Change

The goal of implementation of the UDL professional development is to positively impact teacher attitudes when approaching instructional design for co-taught classes to support learner variability. Information regarding the impact of UDL training will be monitored and measured through survey data, interviews, and ongoing analysis of a variety of classroom assessments. Moreover, this research seeks to determine the impact of UDL professional development relating to instructional delivery as it is connected to learner variability. This potential change in teacher attitude and instructional impact could ultimately be reflected in increased student achievement scores analyzed over an extended period of time.

Statement of Focus of Practice

The educational benefit of appropriate instructional delivery within co-taught classes has the potential to change the trajectory of academic outcomes for students with disabilities at the high school level and the potential to create increased opportunities for the students throughout their high school career and positively impact post-secondary opportunities (Dieker, 1998; Murawski, 2006). Research conducted by Dieker (1998) and Murawski (2006) with a co-teaching focus concluded that students with disabilities had a more positive attitude, were provided with role models for behavior and learning, interacted more with nondisabled peers, and were exposed to higher-level concepts and discussions than was typically found in a segregated special education setting. The success of students with disabilities in a co-taught classroom is dependent upon many variables, including teacher attitudes, appropriate professional development, administrative support, teacher practices and dynamics, and proper scheduling.

IEP Teams are required to consider the least restrictive environment (LRE) for students with disabilities to receive instruction and must begin with the consideration of the general education setting as outlined by federal law. Public Law 94-142 mandates that students with disabilities be educated in the least restrictive environment. Schools have been required to make placement decisions for children with disabilities that are inclusive, educating these children in their home communities with same-age peers whenever possible. In keeping with this federal law, IEP Teams must consider the student a general education student first, and dependent upon the needs of the student to be met by individualized instruction, the team determines if inclusive education is appropriate.

As shared by the U.S. Department of Education (2020), subsequent legislation has continued to encourage inclusive practice, with approximately 64% of children with disabilities spending all or part of their school day in general education classrooms. The specific problem is students with disabilities in co-taught classrooms, grades nine through eleven, should be progressing at an increased academic growth rate at Carolina High School. Given that about 70% of our students with disabilities are in co-taught classes, additional professional development to support the co-teachers to further understand learner variability can enhance and improve their instructional practices. The foundation of this research is built upon the impact of teacher attitude and instructional delivery change after staff participation in UDL professional development that addresses learner variability in diverse learners.

Focus of Practice Guiding Questions

The questions guiding this study are as follows:

1. What impact does Universal Design for Learning professional development have on teacher attitudes within a co-teacher team in ninth through eleventh grades?
2. How does the application of Universal Design for Learning impact the instructional delivery of a co-teacher team in an inclusive Math class that includes students with and without disabilities
 - a. What changes have been observed in student outcomes when multiple means of representation are used?
 - b. What changes have been observed in student outcomes when multiple means of action and expression are allowed?
 - c. What changes have been observed in student outcomes when multiple means of engagement are used?

Overview of Inquiry

Co-teacher teams included in this research are both special education teachers and general education teachers. Also participating is the assistant principal, an assistant principal representing grades K-5. The professional development implemented in this study is a professional development module developed by CAST (Center for Applied Special Technology) that will be delivered in an online format. Both the high school assistant principal and I will be co-facilitating this module that will be completed within a three-month timeframe. This three-month window will begin in January 2021 and conclude in March 2021. I am using a mixed-methods approach to generate feedback from various data collection instruments. The professional development impact on teacher's instructional delivery will be measured by qualitative data in the form of interviews, lesson plan review, walk-throughs, observations and student assessment data. Quantitative data will be collected from students using a survey that measures outcomes utilizing a Likert scale. Data generated from these sources will be analyzed for conclusions, outcomes, and improvements. This data will be used to assist in determining how the next training session for Universal Design for Learning (UDL) will be delivered within the district for future training. Interview data will be used to answer the first research question pertaining to UDL impact in co-taught settings on teacher attitudes. Student surveys, lesson plan reviews, walkthroughs, and observations will be used to answer the second research question pertaining to UDL impact in co-taught settings on instructional delivery.

Another approval component of support comes from the district NCSIP Coordinator as the incorporation of the professional development intervention of Universal Design for Learning (UDL) is included in the district NCSIP implementation plan for the 2020-2021 school year. The UDL training aligns with the co-teaching component of the district's participation in the North

Carolina State Improvement Project (NCSIP) Grant that supports the district professional development for the teachers providing instruction in co-taught settings. The core focus of NCSIP is improving instruction for students with disabilities in North Carolina. The Carolina School District has been honored to be an active participant in the NCSIP Grant for the past five years. Along with the NCSIP alignment, the UDL training addresses needs to be noted by the district's TSI designation.

Inquiry Partners

Inquiry partners for this research will include the special education teachers and general education teachers who provide instruction within co-teaching teams at the high school in grades nine through eleven. Additionally, the administration team at the high school including the Principal and two Assistant Principals, will be involved with this research. They will provide support and feedback and work with the researcher as collaborative partners. At the district level, the Executive Director of Curriculum and Instruction will be involved to provide feedback and support regarding key components of the research. Other inquiry partners at the high school considered key stakeholders regarding scheduling would be two school counselors who work with the students to ensure appropriate class placement according to the least restrictive environment (LRE) as outlined in each student's Individualized Education Plan (IEP).

Professional Development support partners through the Center for Applied Special Technology (CAST) will be included as inquiry partners. It is my intention to incorporate Universal Design for Learning (UDL) Training designed by CAST into the district's involvement with the North Carolina State Improvement Project (NCSIP) and support TSI needs. This work focuses on increasing supports for co-teaching as one rung of instructional improvement for students with disabilities within the district. The district has been an active

partner with NCSIP for the past five years as a Best Practice Site. The regional coordinator for NCSIP assigned by the North Carolina Department of Public Instruction (NCDPI) and the district-based NCSIP Coordinator will also be included as inquiry partners who monitor the progress of goals outlined in the NCSIP Grant throughout the school year.

Theoretical Framework

Burgstahler (1994) claimed that the strategy of co-teaching not only offers educational opportunities for students with disabilities but also for general education students. He stated that having both a general education teacher who has specialized in a specific content area in addition to a special educator who can provide individualized strategies to students can prove beneficial to the entire class. “Piaget described children as motivational learners who construct knowledge of their world through experience, accommodation and assimilation” (Ormrod, 2011). Within a co-teaching model, teachers have more opportunities to integrate hands-on learning experiences and create an active learning environment for all students that have been suggested to benefit students with disabilities (Burgstahler, 1994).

When reviewing a theoretical framework that supports the co-teaching approach, an aspect of educational psychology that can be applied to this instructional strategy is the idea of multiple intelligences. Gardner’s Multiple Intelligence Theory defines “intelligence,” which differs from that generated by a traditional test producing an IQ score. Both John Dewey and Howard Gardner share the same understanding of methods of learning and teaching as tools are both a child’s strengths and interests (Achkovsak-Leshkovska & Spaseva, 2016). Dewey and Gardner’s theories support that this method is intrinsic within the child’s own nature, and as a result, it is necessary for the teacher to use a variety of methods that are complementary to the topic and to the child’s specific cognitive style and identity (Achkovsak-Leshkovska & Spaseva,

2016). Gardner adheres to the idea that humans manage to interpret and understand their surroundings through logical and mathematical analysis, spatial representations, musical involvement, the use of bodily movement, communicating, understanding of natural surroundings, and especially taking an interest in nature (Noordburg, 2018). Further, Gardner states that intelligence can be differentiated into many inter-correlated modalities which directly can connect to the co-teaching strategy within an educational setting (Pomazi et al., 2016).

Another theoretical framework applicable to this study is cognitive dissonance as it relates to teacher attitudes and beliefs toward students with disabilities in co-taught classes. Saul McLeod (2018) defines cognitive dissonance as a situation relating conflicting attitudes, beliefs or behaviors. “Teachers can hold deficit beliefs about students from diverse backgrounds, and in high stakes test-influenced environments, these deficit beliefs may reveal associated practices that reproduce academic disparities” (Nelson & Guerra, 2014). These deficit beliefs can also be applied to students with disabilities as it is often the case that these students are among other subgroups such as those other than white ethnicity, English Language Learners (ELL), or low socioeconomic status. Students who fall into these subgroups are predisposed to the consequences of cognitive dissonance theory. Leon Festinger first investigated cognitive dissonance theory in 1957 and suggested that we have an inner drive to hold all our attitudes and behavior in harmony and avoid disharmony or dissonance (McLeod, 2018). Through the cognitive dissonance theory, Festinger concluded when there is an inconsistency between attitudes or behaviors, there must be a change to remove the dissonance (McLeod, 2018). It is the intention of this research to investigate whether UDL professional development will positively affect teachers’ attitudes toward the instruction of students with disabilities in inclusive educational settings.

Definition of Key Terms

Co-Teaching - Described as a service delivery as a means to provide students with additional scaffolds, supports, and specialized instruction within the general education setting (Friend, 2014; Stein, 2016). Murawski (2009) describes essential co-teaching components as two or more adults who are both teaching professionals who are working collaboratively to deliver substantive instruction to a heterogeneous group of students in the same physical space. In secondary settings, students with disabilities have the benefit of working with a professional certified content specialist, as well as a professional who can modify instruction to meet the individual learning needs of the student (Dieker, 2001).

FAPE - Free and Appropriate Public Education, is provided at no cost to parents as outlined in IDEA requirements for students with disabilities. School districts must allow parents to review and examine records, participate in IEP meetings and have access to complaint procedures. Parents must be given notice of any proposed changes to their child's placement or program. Parents who disagree with the school's findings are allowed to request an Independent Educational Evaluation (IEE) at no expense to them. Parents also have the right to pursue due process.

IDEA – The Individuals with Disabilities Act is a federal law that makes available a free appropriate public education to eligible children with disabilities throughout the nation and ensures special education and related services to those children. The IDEA governs how states and public agencies provide early intervention, special education, and related services to more than 6.5 million eligible infants, toddlers, children, and youth with disabilities. Infants and toddlers, birth through age 2, with disabilities and their families receive early intervention

services under IDEA Part C. Children, youth, and young adults ages 3 through 21 receive special education and related services under IDEA Part B (About IDEA, 2020).

IEP - Individualized Education Plan, the term individualized education program or IEP means a written statement for each child with a disability that is developed, reviewed, and revised in a meeting in accordance with §§300.320 through 300 (About IDEA, 2020). *Inclusion* - An idea and a philosophy that is embedded into a belief system that embraces the reality that diverse individuals are included within a positive learning environment (Stein, 2016). Co-teaching and inclusion are often used synonymously; however, they are far from the same terminology and should not be used in such a manner.

LRE – Least Restrictive Environment is terminology that refers to the maximum extent appropriate, children with disabilities, including children in public or private institutions or other care facilities, are educated with children who are nondisabled; and special classes, separate schooling, or other removal of children with disabilities from the regular educational environment occurs only if the nature or severity of the disability is such that education in regular classes with the use of supplementary aids and services cannot be achieved satisfactorily (NC Policies Governing Services for Children with Disabilities, 2020).

NCSIP - North Carolina State Improvement Project is defined as a project focused on improving instruction for students with disabilities using evidence-based practices.

UDL - Universal Design for Learning is described as an instructional design framework that can be used to design curriculum for students with and without disabilities, and has the potential to support meaningful inclusion of students with intellectual disability in general education settings (Rao et al., 2017).

Assumptions

When working with students with disabilities, it is important that teachers see the value of inclusion and educating all students within a co-taught environment. In addition, many teachers may see the value of inclusion; however, they may feel ill-equipped to provide instruction to students who could be working far below their respective grade's proficiency scale. To effectively implement co-taught instruction within the classroom, both teachers, the special education teacher and the general education teacher, must exhibit a commitment to work collaboratively to support all students regardless of ability level. It can also be assumed that the general education teacher would adhere to the belief that it is both teachers' job to meet all students where they are, even if that is far below grade level, and provide individualized instruction. Additionally, there is the assumption that the teachers will provide honest feedback regarding UDL implementation and have a desire to incorporate UDL guidelines into their instructional practices.

Scope and Delimitations

This inquiry will include general education and special education teachers who were scheduled by administration as co-teachers in grades 9-11. These participants were selected based on availability for instruction of assignment. Due to the small staff size, participants were assigned to either Math or English co-taught classes by administration. This research aligns with the school district's strategic plan for professional development outlined as follows: The LEA/School regularly looks at school performance data and aggregated classroom observation data and uses that data to make decisions about school improvement and professional development needs. All teachers develop individual professional development plans based on classroom observations and self-assessments. The Carolina School District has an enrollment of

412 students, with 76 of those students being identified as having an identified disability and are being served through an individualized education plan. This study is unique to the Carolina School District and results cannot necessarily be generalized elsewhere but could be used to help inform practice.

Limitations

General education teachers often enter the classroom with limited training in supporting students with disabilities and are in need of professional development to support collaboration with a special education teacher. The limited training can also be noted about the special education teacher as it relates to working with a general education teacher in a co-taught environment. Typically teachers arrive in a co-teaching setting with minimal training and experience.

Administrative support is also needed to ensure inclusive classrooms are operating in an effective manner. It is important that the administration understands that co-teaching is not just placing students with disabilities in the same classroom as their typically developing peers but providing educational supports to allow all students to access the educational environment. There is much uncertainty associated with COVID-19 surrounding schedule, virtual and face-to-face instruction, and the additional stress that has accompanied the pandemic. The small size of Carolina School District also brings challenges, such as participants and inquiry partners being the same, that could prompt unintended biases. There are several variables within this research study that could produce skewed results that including the following: the teacher's level of comfort and experience going into a co-teaching partnership, the student's disability, and the student's previous level of exposure to core content area. Since beginning the work of planning this research to include UDL professional development implementation, a national pandemic

developed and affected our nation in a way no one could have predicted. The COVID-19 or Corona Virus has interrupted people's lives nationally, some to an extreme and others not as extreme.

Significance of Inquiry

The difference between co-teaching and inclusion is important when determining how to implement strategies and interventions for students with disabilities in a general education classroom. Elizabeth Stein (2016) outlines that the term inclusion is a belief system that embraces the reality that diverse individuals are included within a positive learning environment. In addition, Stein incorporates Marilyn Friend's description of co-teaching as a service delivery that provides students with additional scaffolds, supports, and specialized instruction within the general education setting (Friend, 2014). These definitions are important as the significance of this study surrounds the improvement of teacher supports through UDL training to address learner variability in co-teaching teams at the high school level. Supports necessary are appropriate scheduling, administrative support, planning time, and foundational knowledge of the UDL framework. The foundation of this study is increasing academic outcomes for students with disabilities in co-taught classrooms through a comprehensive approach to increased co-teacher support. UDL has the potential to support the meaningful inclusion of students with intellectual disabilities in general education settings (Rao et al., 2017).

UDL is a framework that has the potential to expand inclusionary options for students with disabilities in general education settings, with a focus on providing flexible pathways that support all student's mastery of learning goals (Rao et al., 2017). A quantitative measurement of the effectiveness of the intervention will be the increased performance score of ninth through eleventh-grade students with disabilities on the end of course tests in the areas of English and

Math. Student scores on benchmark testing per quarter will also be used to measure increased academic outcomes.

A goal of this study is to provide teacher supports that will allow for the discovery of learner variability that will enable the teacher to individualize the instruction to meet the student's unique learning style and need. Individual student learners have a variety of strengths and needs that must be valued and nurtured in order for the student to experience personal successes, which is noted as learner variability and is at the heart of Universal Design for Learning (Stein, 2016). However, for educators to have the latitude to explore learner variability, it is essential other co-teaching support structures are in place to include appropriate scheduling, administrative supports, and adequate planning time.

Advancing Equity and Social Justice

Given the enrollment at Carolina High School of 412 students and 76 being identified as students with disabilities, equating to 18% of the enrollment, this brings attention to the need for advancements and improvements in instruction for students in inclusive classrooms. It is important to note that instructional equity surrounding students with disabilities has grown since 1975, when passage of the Education for All Handicapped Children Act, now known as the Individuals with Disabilities Education Act (IDEA), was enacted. When the least restrictive environment is considered for a student with a disability, the regular education setting should always be considered first by IEP teams. Knowing that co-teacher teams within the co-taught settings have a deeper understanding of learner variability through UDL training is reassuring that student diversity will be honored within that instructional environment.

“UDL honors the growth potential by thinking ahead of the learners that educators serve” (Fritzgerald, 2020, p. 11). Meyer et al. (2014) write:

From a practical viewpoint, it means that UDL curriculum designers or teachers can plan for expected variability across learners and provide a curriculum that has corresponding flexibility. The lesson or curriculum should then have the flexibility and affordances to amplify natural abilities and reduce unnecessary barriers for most students and enable teachers to customize easily for each learner (p. 10).

Advances in Practice

It is my goal that the application of UDL practices into instructional delivery in co-taught classes in ninth through eleventh grades will increase the engagement of students with disabilities within the classroom environment fostering positive educational outcomes. Both special education and general education teachers will use the knowledge gained through the UDL training to address learner variability in instructional design and delivery. The involvement of administration in the UDL training is needed to further co-teaching practices. The dynamics of co-teaching teams are ever-evolving, and turnover and transition can often lead to teachers feeling as if they are starting over each school year. A goal of this inquiry is to provide teacher participants with training in learner variability that can be transferred to any educational setting with the most diverse learners. An additional benefit will be the potential to provide UDL training to other schools within the Carolina School System. Other districts may use this research and follow the inquiry approach to bring UDL training to staff and administrators supporting students with disabilities in co-taught settings. Moreover, the research may add more to the literature on the application of UDL in co-taught classes at the high school level.

Summary

This study and my focus of practice center upon increasing academic outcomes for students with disabilities whose instruction is delivered in co-taught classes. The context of this

study is a high school in a small, rural school district with an enrollment of 412 students, of which 76 are identified as students with disabilities.

Inquiry partners for this study include four general education teachers, four special education teachers, and three administrators. Each inquiry partner will participate in the UDL training module that will begin in January 2021 and conclude in March 2021. Using a mixed methods approach, I will collect both quantitative and qualitative data to answer my research questions.

The theoretical framework of this study includes Gardner's Multiple Intelligences, Cognitive Dissonance, and Learner Variability. Gardner's Multiple Intelligences supports the effectiveness of co-teaching. Cognitive Dissonance Theory is connected to teachers' attitudes and beliefs toward instructing students with disabilities in co-taught classes. The framework to support the application of Universal Design for Learning within the inclusive classroom is based on learner variability as it relates to multiple means of representation, expression, and engagement. The literature in the next chapter will provide research-based information pertaining to different elements that are necessary for successful co-teaching implementation along with the application of the UDL framework. The connectedness of these elements working together provides a foundation for effective co-teaching practices which can foster positive outcomes for students with disabilities.

There are assumptions and limitations within my research to be mindful to include the assumption that the teacher participants see the value and benefit of inclusive education for students with disabilities. In addition, a commitment to work collaboratively with their co-teaching partner along with the general education teacher viewing the instruction of students with disabilities as his or her job also. Limitations related to this research connect to the fact that

there has been limited professional development on inclusive practices at the high school level, which produces a greater need. On-going administrative support is critical to ensure adjustments with student scheduling and teacher planning time are honored when necessary to ensure appropriate co-taught instructional opportunities.

The UDL framework honors the individual learner and any learning differences present. Application of this framework can positively impact not only students with disabilities but students at all levels, whether they are struggling, average learners, or those achieving beyond grade-level expectations. The significance of this research is to increase academic outcomes for students with disabilities; however, the recognition of learner variability and the possibility of a positive whole class impact is not only exciting but motivating.

Chapter 2 will expand on the literature and research surrounding critical components needed to support and foster effective co-teaching practices in a classroom environment. These components are essential as they all work together to provide co-teaching teams with the required infrastructure to appropriately support students with disabilities in inclusive settings.

CHAPTER 2: REVIEW OF LITERATURE

The educational benefit of appropriate instructional delivery within co-taught classes has the potential to change the trajectory of academic outcomes for students with disabilities at the high school level and the potential to create increased opportunities for the students throughout their high school career and positively impact post-secondary opportunities (Dieker, 1998; Murawski, 2009). Research conducted by Dieker and Murawski with a co-teaching focus concluded that students with disabilities had a more positive attitude, were provided with role models for behavior and learning, interacted more with nondisabled peers, and were exposed to higher-level concepts and discussions than was typically found in a segregated special education setting (Dieker, 1998; Murawski, 2009). The success of students with disabilities in a co-taught classroom is dependent upon many variables, including teacher attitudes, appropriate professional development, administrative support, teacher practices and dynamics, and proper scheduling to name a few.

Wilson (2017) notes that in the past several decades, federal legislation, combined with cultural expectations, has led to increased integration of individuals with disabilities into classrooms, schools, and communities. Since 1975, when Public Law 94-142 mandated that students with disabilities be educated in the least restrictive environment, schools have been required to make placement decisions for children with disabilities that are inclusive, educating these children in their home communities with same-age peers whenever possible.

Subsequent legislation has continued to encourage inclusive practice, with approximately 64% of children with disabilities spending all or part of their school day in general education classroom (U.S. Department of Education, 2020). The specific problem is students with disabilities in co-taught classrooms grades nine through twelve should be progressing at an

increased academic growth rate. It is important to note that there are many critical elements needed for an effective co-teaching model to implement in a classroom setting. Through my literature review I share findings and research related to scheduling, co-teaching practices, administrative support, professional development and Universal Design for Learning application,

Theoretical Framework

The co-teaching strategy offers not only educational opportunities for students with disabilities but also general education students. Having both a general education teacher who has specialized in a specific content area and a special educator who can provide individualized strategies to students can prove beneficial to the entire class. “Piaget described children as motivational learners who construct knowledge of their world through experience, accommodation and assimilation” (Ormrod, 2011). Within a co-teaching model, teachers have more opportunities to integrate hands-on learning experiences and create an active learning environment for all students that have been suggested to benefit students with disabilities (Burgstahler, 1994).

When reviewing a theoretical framework that supports the co-teaching approach, an aspect of educational psychology that can be applied to this instructional strategy is the idea of multiple intelligences. Gardner’s Multiple Intelligence Theory defines “intelligence,” which differs from that generated by a traditional test producing an IQ score. Both John Dewey and Howard Gardner share the same understanding of methods of learning and teaching as tools for both a child’s strengths and interests (Achkovska-Leshkovska & Spaseva, 2016). Dewey and Gardner’s theories support that this method is intrinsic within the child’s own nature, and as a result, it is necessary for the teacher to use a variety of methods that are complementary to the topic and to the child’s specific cognitive style and identity (Achkovska-Leshkovska & Spaseva,

2016). Gardner adheres to the idea that humans manage to interpret and understand their surroundings through logical and mathematical analysis, spatial representations, musical involvement, the use of bodily movement and communicating and understanding natural surroundings and especially taking an interest in nature (Noordburg, 2018). Further, Gardner states that intelligence can be differentiated into many inter-correlated modalities which directly can connect to the co-teaching strategy within an educational setting (Pomazi et al., 2016).

Another theoretical framework I want to apply to this study is cognitive dissonance as it relates to teacher attitudes and beliefs toward students with disabilities in co-taught classes. Saul McLeod defines cognitive dissonance as a situation relating to conflicting attitudes, beliefs, or behaviors (McLeod, 2018). “Teachers can hold deficit beliefs about students from diverse backgrounds, and in high stakes test-influenced environments, these deficit beliefs may reveal associated practices that reproduce academic disparities” (Nelson & Guerra, 2014, p. 36). These deficit beliefs can also be applied to students with disabilities as it is often the case that these students are among other subgroups such as those other than white ethnicity, English language learners, or low socioeconomic status. Students who fall into these subgroups are predisposed to the consequences of cognitive dissonance theory. Leon Festinger first investigated cognitive dissonance theory in 1957 and suggested that we have an inner drive to hold all our attitudes and behavior in harmony and avoid disharmony or dissonance (McLeod, 2018). Through the cognitive dissonance theory Festinger concluded when there is an inconsistency between attitudes or behaviors, there must be a change to remove the dissonance (McLeod, 2018).

Scheduling

Scheduling and co-planning are key components to successful implementation of any co-teaching model within a classroom environment. The presence or absence of either of these two

components can attribute to implementation success or failure. “Historically, special education has addressed the needs of students with disabilities independent of students enrolled in general education (Englert & Tarrant, 1995; Robinson & Buly, 2007; Winzer, 2009). It is also worth noting that separate special education classes promoted division of instruction that often created disconnects between students’ receiving instruction in both special education and general education classes (Tannock, 2009). With the revision of the Individuals with Disabilities Act came a renewed focus on students with disabilities being educated alongside non-disabled peers to the most appropriate extent possible within the regular education classroom environment.

There has been much research over the years conducted to study and analyze the effectiveness of co-teaching. It is with the utmost importance that students with disabilities within Carolina School District are provided with opportunities to increase academic growth within co-taught classes, which ultimately will lead to increased positive academic outcomes. With the increased participation in general education class instruction through the application of co-taught instruction, students have the potential to benefit both academically and socially. Dating back to over twenty years ago, studies have been carried out from various viewpoints. “From the perspective of administrative support, Walther-Thomas (1997) found that school administrators facilitate teachers in addressing issues, provide staff development, utilize resources, manage classroom size, and balance class rosters.” Likewise, researchers Walther-Thomas et al. (1996) added: “As instructional leaders, effective principals provide the vision, incentive, recognition, and moral support to teachers during challenging stages in the co-teaching implementation process” (p. 258).

In order for effective co-teaching practices to occur, both teachers should be working toward a common goal, and for that common goal to be clearly outlined, co-planning should be

taking place. This occurs through collaborative planning in which both teachers share their expertise and come to shared agreements about how the instruction will occur (Idol, 2006; Rice et al., 2007; Sileo, 2011; Tannock, 2009). Due to the already demanding workday of teachers, it is essential that co-teachers get creative with how the co-planning time is structured and what resources are used to ensure this time is used in a productive manner. Technology can be an asset where the planning is concerned; documents can be exchanged for review and feedback. Teachers can utilize technology resources such as Google Docs and Google Classroom to share lesson plans and ideas for upcoming classroom instruction.

Co-teaching implementation looks different at the various grade levels. What can be accomplished at the elementary level will likely need significant variation in the middle and upper grades. Research conducted by Keefe and Moore (2001) reflects that teachers at the elementary level have concerns about sufficient planning time, administrative support, resources, professional development, and teacher willingness that provide parallels among teachers in various grade levels; these commonalities surfaced in a focus group study of general and special education co-teachers in elementary and high schools. Based on my seventeen years of experience in the K-12 educational setting, experiences co-teaching at the primary and elementary levels are much more easily accepted as a common teaching practice. Murawski (2009) found at the middle school level, in a meta-analysis that an overall moderate effect for student progress favored co-teaching. The student outcomes from the implementation of co-teaching practices in a classroom are dependent upon many additional variables that can include teacher relationships, differences in teacher ideologies, teacher classroom management styles, and overall willingness to share in the classroom ownership. It is only over time that teachers can

develop these relationships to foster positive student outcomes, which ultimately leads to another topic connected to teacher retention that will be covered later in the chapter.

Based on the focus group study conducted, “student engagement, participation, student-teacher interaction, student-student interaction, and positive self-image were all indicators of increased student involvement in a study of middle school co-teachers (Magiera et al., 2005). In the middle to upper-grade levels, the content and curriculum grow more challenging. The special education teacher often does not have the depth of knowledge and expertise in the specific subject area to take on more of a lead teacher role. I have observed that this often results in the special education teacher becoming more of an assistant to the teacher and offering more one-on-one support to individual students. Marilyn Friend asserts that the one teacher and one assistant model is often prevalent within co-taught classrooms beyond the elementary grades due to the lack of content knowledge expertise. Even with increased levels of professional development for co-teachers relating to the various models of co-teaching implementation without the content knowledge, the level of involvement provided by the special education teacher will only be limited. As a result, there is much importance placed on the assignment of special education teachers within classes where the teacher relationship has the potential to grow, the teachers exhibit flexibility in increasing co-teaching capacity, and are willing to learn content that may be unfamiliar. This type of growth mindset is essential for co-teaching relationships to flourish and provide students with enhanced individualized instruction with the potential to address multiple intelligences for not only the special education students but the general education students also. For example, station teaching has the potential to incorporate activities that involve multiple modes of instructional delivery from hands-on activities that tactile learners can benefit from that

can, later on, be reinforced by a more lecture-style approach for the visual and or auditory learners (Benninghof, 2012).

In a study focused on co-teaching and inclusion, Malian and McRae (2010) found that both general and special educators agreed that the “desire to try new things” was important to co-teaching relationships. In this study, most teachers were in their first year of a co-teaching partnership. In addition, the area that emerged from this study with the highest percentage of similarity was the co-teachers beliefs regarding parental involvement. “Co-teachers of students in inclusive classes are keenly aware of the importance of parental interactions with the educational and special education process. This consistency of belief underscores the relevance of an appropriate education for all students in inclusive classes.” This belief of appropriate education, when viewed through the lens of the least restrictive environment, varies from person to person; however, with the focus on educating the whole child, the co-taught classroom offers many benefits and can generate powerful academic outcomes when appropriately implemented.

Co-Teaching Practices and Dynamics

Implementation of a successful co-teaching model within a classroom environment requires several components. One essential component is the appropriate co-teaching model for both the lesson to be taught and alignment with the personalities of the co-teacher team. An element that can be the most challenging within co-teacher teams is the reluctance to relinquish control to another teacher within the same teaching space (Thompson & Schademan, 2019). According to the Thompson and Schademan study centered around five effective co-teaching practices between pre-service and mentor teachers, learning to negotiate and share authority in the classroom successfully is a critical element within a co-taught team. In addition, Thompson and Schademan (2019) found that “successful co-teaching pairs shared authority in linguistic,

physical, and interactional spaces of their practice, which resulted in both teachers' roles becoming mutually valuable and visible to students.”

In addition to structural aspects of co-teaching experiences, teacher attitudes may also play a role in their co-teaching practices (Gurgur & Uzuner, 2011). Although co-teaching can carry a negative connotation, teacher attitudes about co-teaching have generally been positive over time (Scruggs & Mastropieri, 2017). Although there are many components of co-teaching to learn, new special education teachers may benefit most from focusing on engaging in effective collaboration with their general education co-teachers and providing explicit instruction to students with disabilities (Scruggs & Mastropieri, 2017).

Another critical dynamic of the co-teaching unit is the ability for both teachers to exhibit strong communication with one another. Both teachers must be able to listen to their co-teaching partners and communicate their views and suggestions, especially during planning time together (Scruggs & Mastropieri, 2017). It can be beneficial for the co-teacher team to divide responsibilities within the instructional delivery of a lesson while learning strategies from one another. Scruggs and Mastropieri found that the special education teacher could take the lead in preparing materials for peer-mediated instruction. In contrast, the general education teacher could focus on teaching the procedures for a specific strategy. This shared partnership with instructional delivery practices could alleviate difficulties when co-teacher teams are approached with perhaps the most significant barrier to a fully collaborative relationship between general education and special education teachers: knowledge of the content being taught (Scruggs & Mastropieri, 2017).

Effective special education teachers collaborate with a wide range of professionals, families, and caregivers to ensure that education programs and related services are effectively

designed and implemented to meet the needs of each student with a disability (McLeskey et al., 2017). Collaboration is widely recommended in special education for accomplishing a wide range of goals. As a result, the co-teaching model naturally lends itself to supporting students with disabilities. Collaboration is not explicitly mandated in the Individuals with Disabilities Education Act (IDEA), nor is it generally part of formal policies related to educating students with disabilities. However, the requirements of the law and established school practices strongly infer that through collaboration, the practical education of students with disabilities is achieved (McLeskey et al., 2017).

Professional Development

Co-teaching is a strategy that can be delivered through various approaches within a classroom. The use of co-teaching as a strategy to provide inclusive educational opportunities for students with disabilities maintains popularity and continues to grow across the world (Friend et al., 2010). Co-taught classrooms are one method that meets expectations of inclusive education where individualized instruction can be provided within the general education setting for both students with and without disabilities (Friend et al., 2010). Although co-teaching is a widely implemented approach to inclusive education and the education of students with disabilities, there continues to be confusion surrounding this approach and a lack of evidence regarding current attributes of co-teaching practices, regarding the use of specific and varied approaches by co-teachers (Pancsofar & Petroff, 2016). As a result, continued study is needed surrounding continuous professional development for staff implementing co-teaching and for the administrators charged with monitoring the implementation (Pancsofar & Petriff, 2016).

Due to the rising number of students with disabilities being taught in the general education setting, Hussar Aud noted that in the 2008-2009 school year, approximately 6.5

million children aged 3 to 21, representing 13% of all public school enrollments, were receiving special education services (Aud et al., 2011). More than half of those children spend most of their day in general education classes, which he noted as a marked increase from past decades (Aud et al., 2011). The co-teaching model provides an alternative to being pulled out of the general education classroom for students with disabilities; these students stay in the general education classroom setting and receive high-quality instruction from both the general education teacher and the special education teacher (Pancsofar & Petroff, 2013).

The co-teaching model does present unique challenges to teachers. Research suggests that co-teaching is time-consuming and requires strong interpersonal and collaborative skills by both the general education and special education teacher (Bouck, 2007; Fennick & Liddy, 2001; Luckner, 1999). Given the many challenges of co-teaching implementation in the classroom setting, ongoing professional development is a high priority. Collaboration between special educators and general educators is crucial to a working co-teaching model. Research has shown that a more significant percentage of special education co-teachers have taken pre-service courses in collaborative teaching during their teacher preparation courses than the general education teacher (Austin, 2001). The research noted by Cramer and Nevin (2006) found that teachers in general and special education reported being underprepared for inclusive education practices to include collaboration with special educators and implementation of a co-teaching model.

It is often the case that in-service training professional development opportunities through school districts are the most commonly experienced preparations for co-teaching (Fennick & Liddy, 2001). Literature noted in several studies suggests that teachers require training in additional skills that may not have been provided in their beginning teacher

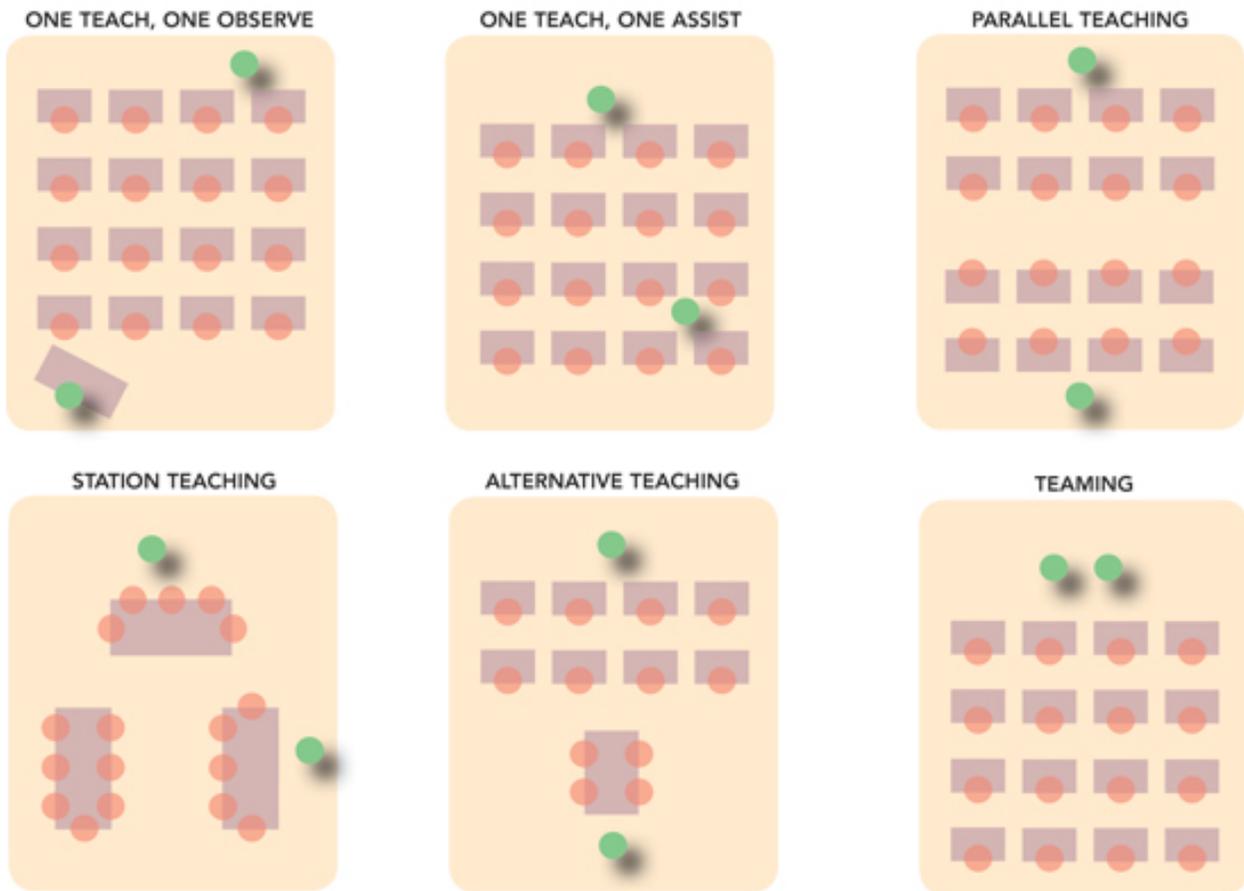
preparation programs (Walther-Thomas et al., 1996). District professional development efforts should include co-teaching models, supervised practice, problem-solving, and planning (Walther-Thomas et al., 1996). The literature recommends that school districts provide ample professional development opportunities focused on co-teaching for existing teachers; the limited empirical research in this area suggests that most teachers need more frequent in-depth training geared toward co-teaching implementation (Pancsofar & Petroff, 2013).

Pancsofar and Petroff completed a research study of 129 teachers from across five districts in the Mid-Atlantic state. In this study, teachers completed an online survey outlining questions about teacher demographics and co-teaching experiences, interests, and attitudes. Through this research, co-teachers reported significantly more frequent opportunities to learn about co-teaching during in-service training, greater confidence and interest in co-teaching, and more positive attitudes regarding co-teaching than did non-co-teachers (Pancsofar & Petroff, 2013). In addition, this survey also found that special educators reported significantly more frequent opportunities to learn about co-teaching models and implementation during pre-service and in-service training, greater confidence and interest in co-teaching than did general education teachers (Pancsofar & Petroff, 2013).

Marilyn Friend, who is considered a pioneer in co-teaching, outlines the definition of co-teaching as the inclusion of professionals planning and delivering instruction using six approaches and variations of them, with selection based on student needs and instructional intent (Friend et al., 2010). Friend notes the following approaches: One teach, one observe, Station teaching, Parallel teaching, Alternative teaching, Teaming, and One teach, one assist (see Figure 2). Co-teachers utilizing one of these six approaches will allow the co-teacher team to address the individualized education program (IEP) goals and objectives of students with disabilities

CO-TEACHING APPROACHES

● Teacher ■ Desk/Table ● Student



SOURCE: *Co-teaching: Concepts, Practices, and Logistics*, Marilyn Friend, Ph.D., August, 2006

Note. (Friend et al., 2010).

Figure 2. Co-teaching approaches.

while meeting the needs of other diverse learners within the classroom setting (Friend et al., 2010).

While work continues to provide ongoing co-teaching professional development, a critical need exists for teachers, administrators, and other key stakeholders involved in co-teaching to increase their capacity in co-teaching implementation (Friend et al., 2010).

Administrative Support

In outlining the various factors that impact co-teaching effectiveness in the classroom, the importance of administrative support cannot be overlooked. “The importance of administrators’ impact on practice, tone, and culture in schools has been documented in the literature” (Horrocks et al., 2008). Even more specifically, the attitude and experience of school administrators related to individuals with disabilities have a clear impact on special education practice (Horrocks et al., 2008). Walther-Thomas (1997) stressed the significance of a school principal’s role as the model of special education support in the school, stating that the principal “performed multiple roles in establishing the credibility of new special education services” (p. 404). It is also worth noting that, for the most part, school administrators have positive attitudes about the inclusion of students with disabilities, but their own beliefs and experience with individuals with disabilities has a strong impact on implementation of practice (Horrocks et al., 2008).

Research studies connected to co-teaching practices consistently emphasized the importance of administrative support for co-teachers (Cook & Friend, 1995; Scruggs & Mastropieri, 2017; Walther-Thomas, 1997). In order to appropriately and positively support co-teaching practices, the administrators must understand what makes co-teaching effective for student achievement and provide a context in which practice can be successful (Kamens et al.,

2013). In addition, Kamens et al. (2013) suggest that administrators must also understand and communicate the benefits of co-teaching for teachers and students with and without disabilities.

Praisner (2003) completed a study that found no significant relationships between administrators' years of experience in general or special education and attitude; however, the more preparation administrators were involved with related to the education of students with disabilities, the more positive their attitudes were toward inclusion. Strong and effective leadership is paramount to the success of co-teaching as a service delivery model for inclusive practice (Kamens et al., 2013). The research conducted by Kamens et al. (2013) also found that in order for co-teaching to be effective, administrators must create a school culture in which co-teaching is the administration communicates valued and clear expectations.

Further revealed in Kamens et al. (2013) research was the emergence of several patterns related to administrator support for co-teachers. The theme with the highest level of re-occurrence relating to administrative support for co-teaching was to provide opportunities for professional development. Another support type that emerged from the study was providing opportunities for co-teachers to observe other co-teachers; however, not a lot of detail was provided relating to follow-up. Observation was yet another type of support noted by teachers completing the survey. Included in the observation types were formal, drop-in, and informal.

Administrative support can also begin in the new school year preparation process with scheduling where personalities and teacher knowledge of content is concerned. "The effectiveness of co-teaching also includes the content expertise of the teachers, their level of teaching experience, availability of joint planning time, and co-teacher compatibility" (Friend et al., 2010). A critical factor in effective co-teaching implementation is the impact of administrative support on this practice (Friend et al., 2010).

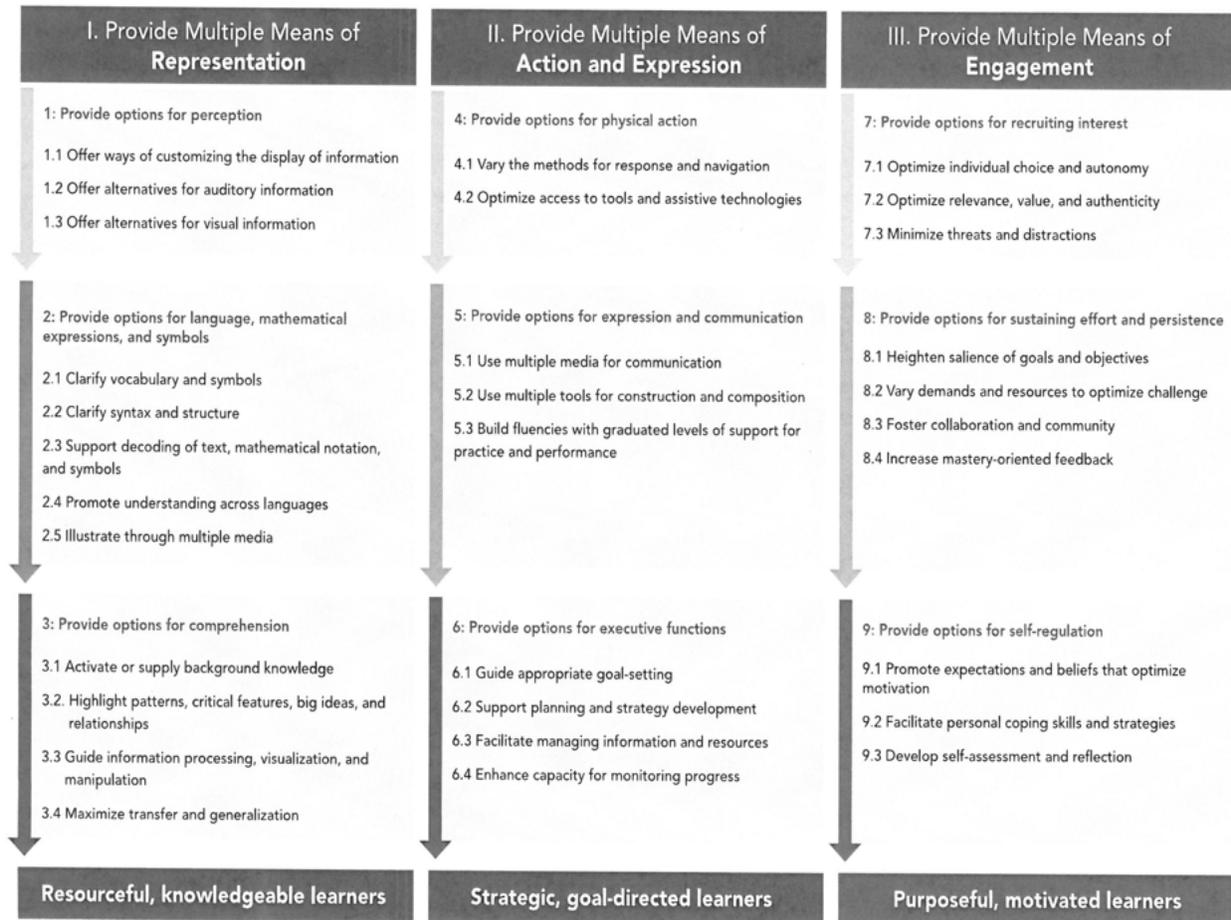
Universal Design for Learning Application

Universal Design for Learning is described as an instructional design framework that can be used to design curriculum for students with and without disabilities and has the potential to support the meaningful inclusion of students with intellectual disabilities in general educational settings (Rao et al., 2017). Challenges presented within a co-teaching pairing can best be overcome by using three perspectives and actions: embracing various co-teaching models, embedding UDL, and implementing deeper scaffolds through explicit instruction and specially designed instruction (SDI) (Stein, 2016).

Meyer et al. (2014) defined and outlined the foundational principles that explain the UDL framework as principles that inform and guide work in educational research and development. In the nearly 30 years since CAST coined the term Universal Design for Learning and articulated the principles, UDL has become internationally recognized as an effective tool for designing and implementing inclusive learning environments. UDL has also gained national attention in the world of education due to the Individuals with Disabilities Act reauthorization in 2004 that directly supports the development and use of technology with UDL features and the incorporation of those concepts in the development of educational standards, assessments, curricula, and instructional methods to support the instruction of students with disabilities (IDEA, 2004). As described by CAST, the UDL guidelines offer suggestions for instructional delivery that can be used with all learners for instructional accessibility to allow for meaningful participation and complement individualized instruction (see Figure 3).

A key component for educators in the application and usefulness of Universal Design for Learning is to understand learner variability. Stein (2016) explains this term as learners possess a variety of strengths and needs that must be valued and nurtured in order for the individual to

Universal Design for Learning Guidelines



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 APA Citation: CAST (2011). *Universal design for learning guidelines version 2.0*. Wakefield, MA: Author.

Note. (CAST, 2011).

Figure 3. Universal design for learning guidelines.

experience personal successes both in and out of the educational environment. This notion is at the core of UDL. The concept of learner variability applies to all students, explicitly giving thought to those in the margins to include students with disabilities, English language learners, gifted and talented students, or anyone who does not fit into the typical learner category (Rose & Meyer, 2002).

IDEA instructs teachers, “to the extent possible, (to) use universal design principles in developing and administering any assessments” (Section 300.160) and through technology (Section 300.704) to maximize its use to provide access to the general curriculum (Kennedy et al., 2013). The reauthorization of the Elementary and Secondary Education Act specifically notes UDL as it relates to assessment; curricula, and instructional supports; technology, including technology for science, math engineering, and technology; and for students with disabilities (SWD) and English Language Learners (Kennedy et al., 2013). Using the UDL framework to support students of varying learning styles within co-taught classes requires professional development opportunities for teachers who are task with providing co-taught instruction. As outlined by Fixsen, professional development continues to be the critical practice for educators to expand their skillset and implement those skills in the classroom (Kennedy et al., 2013). Additionally, in today’s inclusive classrooms, planning for students’ variability requires effective training to support teacher development in understanding the practices and frameworks needed to facilitate learning for all learners (Kennedy et al., 2013).

Harn et al. (2013) suggest that implementation fidelity of core components may be optimized when effective practices are adapted to match variables within the classroom and educational settings. With UDL, educators can define domains to address and undertake a process of intentionality and proactively consider the elements of instructions to modify (Cook &

Rao, 2018). Using the UDL framework of representation, expression, and engagement, UDL provides teachers with clear guidelines for incorporating flexibility and scaffolding to meet individual needs by removing barriers (Cook & Rao, 2018).

Summary

The literature asserts that many essential components are needed for effective co-teaching practices to occur. Prior to initiating co-teaching, school administrators must understand the co-teaching supports necessary for inclusive education. Through this administrative support, scheduling and professional development provide another layer of classroom support to the teachers responsible for co-taught instruction. This component fosters successful co-teaching practices and allows for the establishment of constructive dynamics within the co-teacher teams.

John Dewey and Howard Gardner's theories support the need for multiple intelligences to be addressed with multiple methods of learning and teaching as tools for student connection that are complimentary to a child's cognitive style and identity (Achkovska-Leshkovska & Spaseva, 2016). Gardner also notes the distinction that intelligences can be differentiated into many inter-correlated modalities which can directly connect to co-teaching practices (Pomazi et al., 2016).

The literature also addresses the rising numbers of students with disabilities who spend large portions of their day in general education classes. With this comes a need for increased professional development support for teachers. Marilyn Friend suggests co-taught classes are one method of instruction that meets the expectations of inclusive education where individualized instruction can be provided within the general education setting. Pancsofar and Petroff (2016) outline that the co-teaching model provides an alternative to being pulled out of the general education classroom for students with disabilities. Work by Marilyn Friend proposes that to

appropriately support effective co-teaching practices; teachers require training in additional skills that may not have been included in pre-service teacher training programs.

Additionally, administrative support is another critical element necessary for effective co-teaching practices to be implemented with fidelity. Research conducted by Horrocks brings attention to the importance of administrative attitudes and experience related to inclusive practices and co-teaching of students with disabilities. Research studies connected to co-teaching practices consistently emphasize the importance of administrative support for co-teachers (Cook & Friend, 1995).

This study aims to determine how the UDL professional development impacts teachers' attitudes and instructional delivery in co-taught classrooms. The aforementioned components must be recognized as essential to create and foster productive co-teaching partnerships. Through an educator's recognition of multiple intelligences and the inter-related nature of learner variability, applying the UDL framework to instruction in co-taught classes can provide each student with the individualized instruction needed to support and foster student success.

Chapter 3 will provide a detailed outline of the methods of inquiry for this research. It will also include a description of the action research that will occur during Phase I, II, and II of the study. Finally, the data collection process for both qualitative and quantitative data sources will be explained along with the implementation of the Hexagon Tool for Phases of Research, Program, and Implementation.

CHAPTER 3: METHODS OF INQUIRY

The educational benefit of appropriate instructional delivery within co-taught classes has the potential to change the trajectory of academic outcomes for students with disabilities at the high school level and the potential to create increased opportunities for the students throughout their high school career and positively impact post-secondary opportunities (Dieker, 1998; Murawski, 2006). Research conducted by Dieker (1998) and Murawski (2006) with a co-teaching focus concluded that students with disabilities had a more positive attitude, were provided with role models for behavior and learning, interacted more with nondisabled peers, and were exposed to higher-level concepts and discussions than was typically found in a segregated special education setting (Dieker, 1998; Murawski, 2006). The success of students with disabilities in a co-taught classroom depends on many variables, including teacher attitudes, appropriate professional development, administrative support, teacher practices and dynamics, and proper scheduling.

The specific problem was that students with disabilities in co-taught classrooms, grades nine through twelve, should be progressing at an increased academic growth rate. The focus of this research was to foster positive perceptions surrounding instructional delivery for students with disabilities in co-taught settings at the high school level and will be addressed through the implementation of UDL professional development. Fostering positive perceptions of students with disabilities through recognition of learner variability and adjustments to instructional delivery could ultimately improve academic outcomes for this diverse group of students. This change could be measured over an extended period through monitored data collection. For this study, data were collected to analyze student feedback on instructional delivery both pre- and post-implementation of the UDL professional development. In addition,

once the training is completed, data will be collected from the staff participants to review lesson plans, observations, and walk-through data to determine the level of participant learning. This research aimed to determine how the UDL training impacts teacher perceptions of instructional delivery for students with disabilities and affects instructional delivery.

Focus of Practice Guiding Question(s)

This study was guided by the following questions:

1. What impact does professional development on Universal Design for Learning have on teacher attitudes within a co-teacher team grades 9 through 11?
2. How does the application of Universal Design for Learning impact the instructional delivery of a co-teacher team in an inclusive Math class that includes students with and without disabilities?
 - a. What changes have been observed in student outcomes when multiple means of representation are used?
 - b. What changes have been observed in student outcomes when multiple means of action and expression are allowed?
 - c. What changes have been observed in student outcomes when multiple means of engagement are used?

My research generated data that outlined findings correlated to what extent the UDL professional development had on both teacher and student participants related to student outcomes, including instructional delivery and student outcomes. This information will allow for advancements in teacher professional development support in co-taught classes for both special education teachers and general education teachers.

Study Question One

Data for this first question was gathered using teacher interview feedback that analyzed the impact of UDL professional development on teacher attitudes in co-taught settings. I used the teacher interview data to formulate conclusions based on the responses that determined the impact on teacher attitudes.

Study Question Two

In Phase III, data for this question was gathered using both pre- and post- student surveys. The surveys were analyzed to identify common conclusions and differences in students' feedback. Additionally, lesson plans, walk-throughs, and observations were used from staff participants to gather qualitative data that provided further clarification and insight about the impact of UDL training on instructional delivery.

Inquiry Design and Rationale

I selected a mixed methods research design to conduct this inquiry that was focused on increasing academic outcomes for students with disabilities in co-taught classes at the high school level in a rural school district. I used a mixed methods design that included data collection through interviews, surveys, and student assessment data. One of the critical reasons I chose this approach was my desire to compare different perspectives drawn from the qualitative data collection. The research was divided into three phases of inquiry to allow for need, evidence, fit, usability, capacity, and support to further UDL implementation within Carolina School District. Phase I consisted of obtaining participant consent, registration of participants, and pre-assessment surveys. Phase II consisted of the professional development opportunity that began in January and concluded in March with the collection of participant feedback through weekly department meetings with the participant team. Phase III involved staff participant interviews,

post assessment student surveys, and staff participant learning evaluations that included lesson plan review, observations, and walk-through data. This data collection continued through the end of the spring semester, May 2021. The research was divided into phases that allowed for guidelines during each phase that defined the purpose and direction for preparation, implementation and analysis of data collection. I used the Hexagon Tool to analyze each phase of research further. As described by the National Implementation Research Network, the Hexagon Tool could be used at any stage in a program's implementation to determine fit within the local context and assessment of program use. Program indicators analyzed through the use of the Hexagon Tool were evidence, supports, usability, need, fit, and capacity to implement. Furthermore, the Hexagon Tool was used as a planning tool to guide program selection and evaluate potential programs and practices for use within a district.

Context of the Study

Carolina School District is located in a rural county on the eastern coast of North Carolina. According to Data USA statistics, the county is comprised of the following demographics: 56% White, 26% Black, 8% Latino, and other 4%. The county's economy is based on tourism, recreation, and agriculture. The school site for this study is a public high school within the Carolina School District with an enrollment of 448 students consisting of ninth through twelfth grades. Out of the 448 students enrolled, 76 are identified as students with disabilities and are served through individualized education plans. More than half of the teachers at this high school live in neighboring counties.

My study was centered upon UDL professional development for teachers who provided instruction in co-taught classes at the high school level. Specifically, the study focused on the teacher attitudes and instructional impact of UDL training. Continued professional development

was needed to support both the general education teachers and special education teachers to assist in co-teaching improvement efforts. Given that about 70% of students with disabilities are in co-taught classes, additional professional development to support co-teachers to understand learner variability further will enhance and improve instructional practices. The participant group consisted of three general education teachers, four special education teachers, one high school-based administrator who served as an assistant principal, and a district-level administrator. Student participants were determined by parent consent obtained from the student with disabilities population in the co-taught classes for math at the high school.

Inquiry Partners

Inquiry partners for this research included four special education teachers and four general education teachers who served as the co-teaching teams at the high school in grades nine through eleven. Administrators who directly participated were two assistant principals and one district-level administrator. Additionally, the high school Principal and two assistant principals provided support and feedback as collaborative partners. The Executive Director of Curriculum and Instruction provided input at the district level. Other inquiry partners at the high school were two school counselors who worked with the students to ensure appropriate class placement according to the least restrictive environment (LRE) as outlined in each student's Individualized Education Plan (IEP). Due to the small size of the Carolina School District, inquiry partners were also participants.

Professional Development support partners through the Center for Applied Special Technology (CAST) were also important inquiry partners. I incorporated UDL training designed by CAST, and it was incorporated into the district's involvement with the North Carolina State Improvement Project (NCSIP). This work focused on increasing supports for co-teaching as one

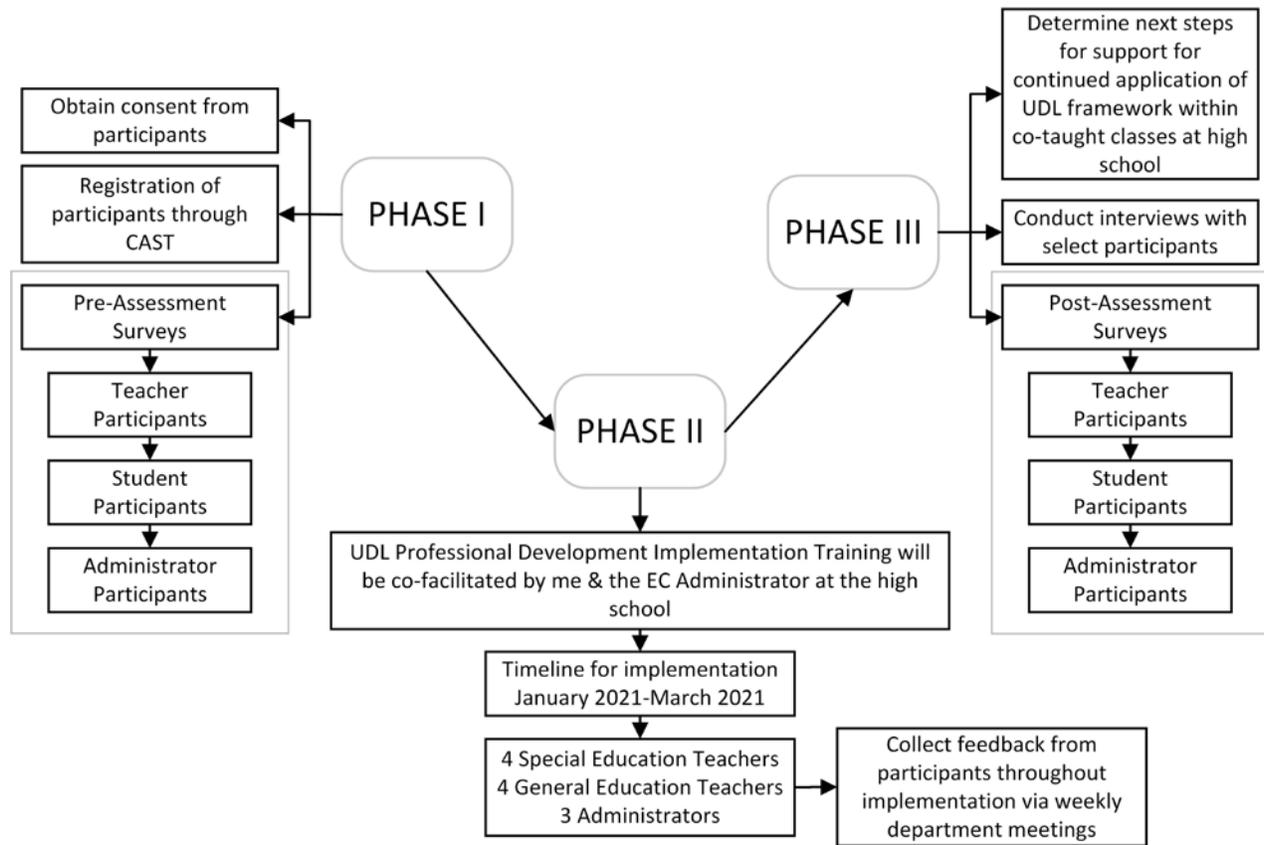
ring of instructional improvement for students with disabilities within the district. The district has partnered with NCSIP for the past five years as a Best Practice Site. The regional coordinator for NCSIP assigned by the North Carolina Department of Public Instruction (NCDPI) and the district-based NCSIP Coordinator were also included as inquiry partners who monitored the progress of goals outlined in the NCSIP Grant throughout the school year.

Ethical Considerations

As part of ethical considerations pertaining to this research, I completed CITI ethics training in spring 2020. As a result, approval by the Institutional Review Board (IRB) was obtained in February 2021 for this research. In addition, permission was obtained from the school site administrator, my district administrative mentor, and the Superintendent (see Appendix A). Adherence to confidentiality and privacy of all participants was respected during this study. Staff participants were asked to sign a consent to participate form, and student participants were asked to provide consent, and parent permission was obtained for his or her child to participate in this research. All data collected were stored on my work computer that is password protected and protected by anti-virus software. Additionally, the research data were saved on an external jump drive that was kept in a locked filing cabinet in my district office.

Inquiry Procedures

The research I conducted used a mixed methods approach and consisted of three phases (see Figure 4). During phase I, students agreed to participate in the research, and their parents provided permission to complete a pre-assessment UDL student feedback survey. In addition, staff participants were asked to sign voluntary consent forms that verified agreement for the use of their feedback and information gathered before, during and after the professional development implementation. This survey was used with student participants post-implementation during



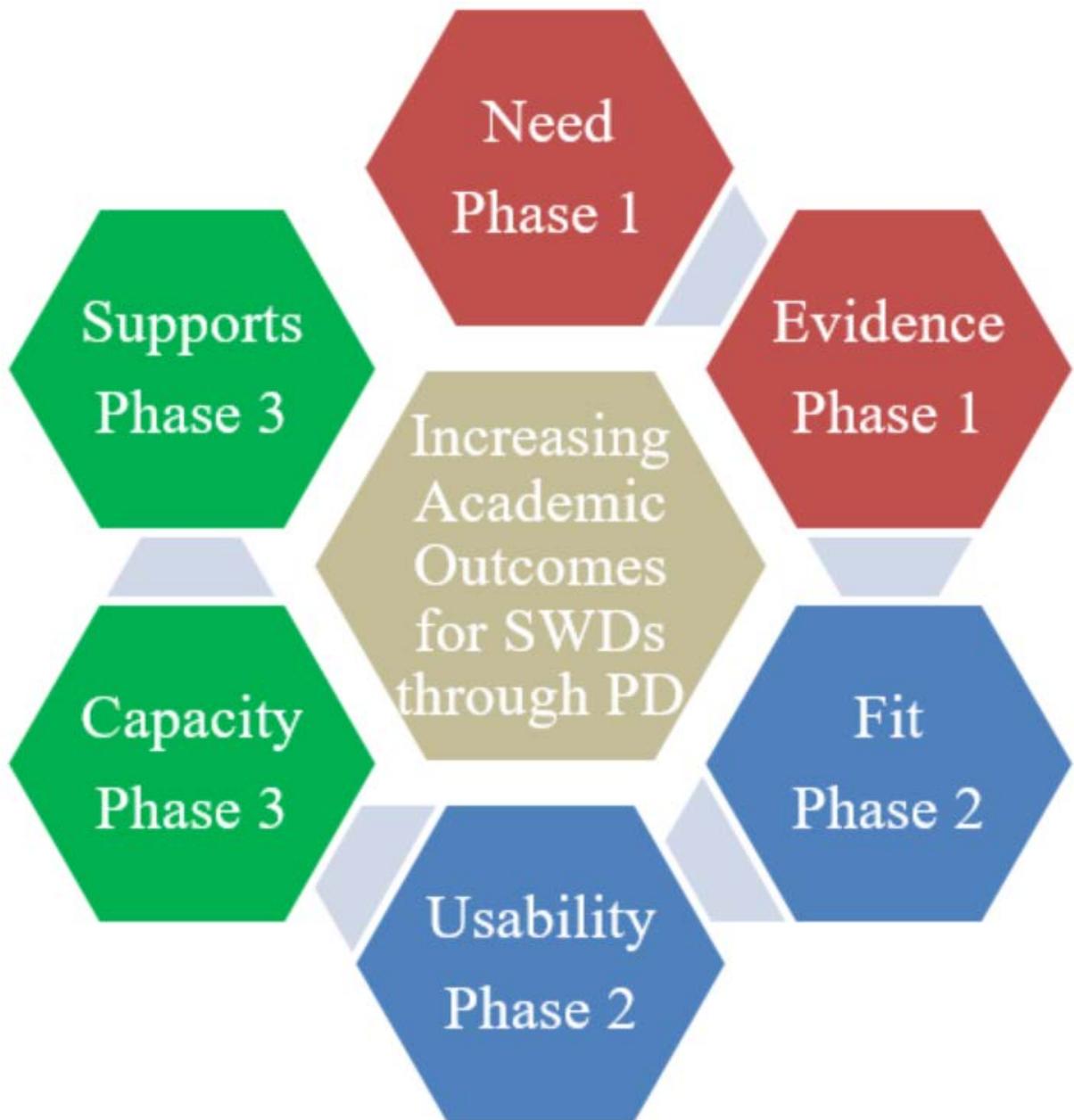
Note. Mixed Methods Inquiry.

Figure 4. Phases of research inquiry.

Phase III. I requested parent consent for student participation through a request form seeking parent signatures that confirmed permission for their child to participate in this research. I will use the Hexagon Tool for Phases of Research, Program and Implementation Site Indicators to explore and implement research (see Figure 5). The Hexagon Tool was used as a planning resource that guided selection and assessed the fit and feasibility of further UDL professional development implementation throughout the district. During this research, I applied Need and Evidence indicators during Phase 1, Fit and Usability indicators during Phase II, and Capacity and Support during Phase III (see Table 3). The Hexagon Tool was used during each phase of program implementation

The mixed methods approach was best suited for this focus of practice as the research occurred in a natural setting. As the primary investigator, I collected data using multiple methods that reflected my 17 years of experience as Special Education Teacher and Administrator. My goal was to analyze data that determined vital components essential for effective co-teaching practices in an inclusive setting, one that fosters academic growth for students with disabilities. It was my experience that much attention, resources, and professional development support were provided at a higher rate in the primary and elementary grades for students with disabilities while leaving a smaller level of assistance to be implemented for those at the high school level.

Creswell and Poth (2018) provided information that outlined the concept of methodological congruence advanced by Richards and Morse in 2012 that fit this study: advanced by— “that the purposes, questions, and methods of research are all interconnected and interrelated so that the study appears as a cohesive whole rather than as fragmented, isolated parts” (p. 50). This description captured the essence of my study because increasing academic



Note. (Metz & Louison, 2018).

Figure 5. Hexagon tool for phases of research, program and implementation site indicators.

Table 3

Description of Hexagon Tool Application for Research Phase I, II and III

Implementation Site Indicators	Program Indicators
<p>Need (Phase I)</p> <ul style="list-style-type: none"> • Identification of focus population and subpopulations • Use of multiple data sources and disaggregated data to understand needs and assets • Community perception of needs and assets 	<p>Evidence (Phase I)</p> <ul style="list-style-type: none"> • Outcome, fidelity and cost-effectiveness of data • Strength of evidence: for whom and in what conditions
<p>Fit (Phase II)</p> <ul style="list-style-type: none"> • Fit within school community, values and culture • Impact on other initiatives • Alignment with other priorities of the implementing site 	<p>Usability (Phase II)</p> <ul style="list-style-type: none"> • Well-defined program • Adaptations for context and populations
<p>Capacity (Phase III)</p> <ul style="list-style-type: none"> • Implementation costs • Resources needed for implementation 	<p>Supports (Phase III)</p> <ul style="list-style-type: none"> • Expert assistance • External resources for implementing site

Note. National Implementation Research Network, Frank Porter Graham Child Development Institute: <https://nirn.fpg.unc.edu/resources/hexagon-exploration-tool>.

outcomes for students with disabilities in co-taught classes in grades nine through eleven cannot be achieved by studying only a single strand of support. This cause changing element can only be done by the study of many relational components that are inter-woven and ultimately must be operating in synch with one another (Creswell & Creswell, 2018).

The study's goal was to develop an in-depth description and analysis of inclusive instructional practices and provide an understanding to prompt a positive change in academic growth for students with disabilities. To meet the goal, I analyzed scheduling, planning time, professional development, and the application of the UDL framework in co-taught classes in the ninth through eleventh grades in the area of Math. The results of my study yielded data to assist in improving instructional delivery for students with disabilities in co-taught classes related to the impact and implementation of the UDL framework.

Phase I

As an overview of Phase I, I completed the following steps: obtained consent from participants, registered participants for the UDL professional development through CAST, and gathered data from pre-assessment surveys for student participants. During this phase, the Hexagon Tool was used to assess needs and evidence further related to staff participation, student participation, and administration participation. This baseline data was gathered through the utilization of surveys for students.

Description of Participants and Recruitment Strategies

This research included students enrolled in co-taught classes, four special education teachers, four general education teachers, and three administrators. The data sampling that used consisted of participants who agreed to participate in this study. The general education teachers, special education, and administrators chosen for this research were directly involved with

instruction of students with disabilities or supervision of teachers who are delivering co-taught instruction at the high school level.

Instrumentation

Instrumentation used for this research included various resources and tools. At the onset of the research, I asked participants to provide consent to participate, and parent consent was requested for student participation. This documentation took place in the form of a written document requiring the participant's signature that authorized consent to participate. In Phase I, students completed a pre-assessment student feedback survey created by CAST that included 14 questions related to the students' own learning. The student feedback survey utilized the Likert Scale, which assigned a numerical value to each of the five responses that allowed the student to provide feedback relating to the teacher's current instructional practices. This instrumentation provided a baseline of data prior to the professional development implementation that measured the student's feedback related to the current teaching practices being delivered by his or her classroom teacher. During Phase II, professional development facilitated, and weekly department meetings were conducted that allowed staff participants to share experiences and activity application from the training in their classes. Data were collected by completing the seven modules comprised within the three-month professional development implementation. Phase III instrumentation included a post-assessment student feedback survey which was the same as the pre-assessment survey. Staff participant learning was assessed with the use of observations, lesson plan review, and walk-through data. Additionally, an interview protocol (see Appendix G) was used with select staff participants that assessed effectiveness of the training.

Pilot Study/Pre-Assessment

This pilot study was conducted to gather initial assessment data for two purposes: To establish a baseline to determine how effective email requests were to gather interview information from participants. This was especially important because the nation was embedded in a national pandemic due to COVID-19, and schools across the United States were closed. It is important to note that the Carolina School District closed on March 13, 2020, and did not re-open for the 2019-20 school year. As a result, it was a goal to determine the best way to establish communication with staff to obtain feedback in preparation for the research study. Another purpose of the initial pilot / pre-assessment was to gather feedback from general education and special education teachers who have experience providing instruction in an inclusive setting at the middle and high school levels. Given the current situation with the school closure due to COVID-19 and the level of stress teachers were experiencing, I decided to send out these interview questions via email and gather feedback electronically. For the initial pilot survey / pre-assessment, I generated questions connected to the various co-teaching models and teacher attitudes relating to professional development to support co-teaching practices. I developed the following three questions:

1. How does student grouping impact student performance in co-taught classes?
2. How does implementation of various co-teaching models impact student performance? And are you partial to using a particular co-teaching model?
3. What impact does professional development participation have on teacher attitudes within a co-teacher team?

These questions were sent to five special education teachers and three general education teachers; however, I only received two responses. Out of the two received, one was not

appropriate to include in this pilot study as the teacher would be a participant in my FoP study. This left one response out of eight, not exactly the results I was hoping for; however, the feedback I received was very insightful. This feedback came from one of the five special education teachers. While only one response prevented my determining a theme from a response group, the feedback was still found to be valuable.

In addition to the teacher interview through email, I also conducted a survey via Qualtrics and sent the survey to four special education teachers. This survey generated three out of four responses. After refining my research questions in the spring of 2020, I used the following survey questions to assist in gaining more information relating to my FoP:

1. How comfortable are you with implementation of remote learning to engage students in online learning opportunities?
2. How comfortable are you with providing students with remote instruction using multiple means of representation?
3. How comfortable are you with allowing students to respond to remote instruction using multiple means of expression?

The respondents had the following response options: extremely uncomfortable, moderately uncomfortable, slightly uncomfortable, neither comfortable nor uncomfortable, slightly comfortable, moderately comfortable, or extremely comfortable.

Initially, I felt that conducting the teacher interviews via email would decrease any pressure felt by the teachers to respond in a specific way. They would appreciate being given the latitude of responding via email rather than through a virtual or phone interview. This proved true for one of the eight respondents; however, without the other responses, I cannot say this with certainty. When analyzing the response rate, I found many variables to consider, such as if they

even received and read the survey or if they read the survey and simply forgot to respond despite my sending a follow up reminder email. The only data from these questions are from one respondent who was very candid and gave detailed information for each question. Based on the limited number of responses received, it was possible that the questions were unclear and needed further explanation. However, without follow-up, this cannot be proven.

In Pilot #2 / pre-assessment, I utilized a link in Qualtrics to survey special education teachers. The response rate was much higher, with 3 of the 4 responding. I asked respondents to indicate their comfort levels varying from “extremely comfortable” to “extremely uncomfortable” as response options in the survey.

In Pilot #1 which involved the teacher interview via email, I generated an introduction that explained the purpose of my questions and was transparent in the purpose of the interview questions that would be used to gather feedback from both middle school and high school teachers who have co-teaching experience. In addition, I communicated that all the information shared would be handled confidentially and asked that all responses be sent directly to me, not in a group response. In the second pilot conducted via Qualtrics, I also sent an introductory email to preface the teachers receiving the survey primarily since the survey was generated through the university. In this introductory email, I explained they would be receiving a survey requesting feedback on co-teaching as it relates to remote learning. I also asked that the survey be completed and submitted within a 48-hours of their receiving the survey. I used this assignment of a due date to many of the correspondences I send out to the Exceptional Children’s Department as I have found that this “deadline” increases their response rate on most matters.

In both the teacher interview questions and the Qualtrics survey, I utilized district email accounts and provided explanations about what the feedback being requested would be used for and reassured the respondents that all identifying information would be kept confidential.

Initially, the interview questions I used for the pilot were constructed before refining my research questions and leaned more toward assessing the implementation of the co-teaching models within inclusive settings. However, after the refinement of my research questions, I modified the pilot survey to be more applicable to my FoP with the UDL professional development. Namely, it fit more naturally towards remote learning. It is my hope that the UDL training will support and assist both the general education and special education teachers in providing instruction to the various learning styles of students both with and without disabilities.

The protocols used for both the interview questions and the survey included communication with the respondents regarding transparency of the feedback request along with information regarding confidentiality. As for the interview questions, I did not designate a “due date” for the responses and, in hindsight, feel that oversight could have contributed to some respondents forgetting to reply.

The interview questions and the survey were sent to current employees of our district who have provided instruction in an inclusive setting or are currently members of a co-teaching team at either the middle school or high school levels. Two of the special education teachers that were provided with the teacher interview questions have experience with co-teaching through the North Carolina Virtual Public School; however, neither of those teachers responded to the interview questions.

The results of both pilots / pre-assessments produced meaningful feedback that I will use to adjust and improve my overall inquiry methods. The response rates of both pilots / pre-

assessments are outlined in Table 4. Due to the low response rate from the interview questions, I was unable to determine any conclusions from the feedback. Despite only one teacher response, that respondent did provide insightful information specifically pertaining to the impact that professional development has on teacher attitudes within a co-teacher team. A portion of the respondent's feedback is as follows: "Immediately post-PD, there is a sense of excitement and candor amongst teacher participants, but it is soon stifled by the reality of the onslaught of daily activities and responsibilities." In that same response, the teacher further shared, "Within a month or two post-PD, regular education teachers return to taking on the bulk of instructional planning because, let's face it, they have to teach another group of students the same content; while EC teachers focus on the "students that need the most support" and the cycle continues not necessarily out of want, but need."

While I was a bit disappointed in the low response rate of the interview question pilot, I was very happy with the much higher response rate of the survey. When reviewing my interview questions, the request for narrative feedback can often be too overwhelming for some and might be viewed as just "too much to ask for in light of all the other responsibilities," while a survey can provide choices, and the respondent can simply click a button to give feedback. I initially utilized the emailing of interview question option to gather feedback when I was unsure whether a face-to-face interview could be conducted. Given the low response rate, I wanted to try a different avenue to acquire information in a second pilot project to determine if increased results could be generated. It was exciting to have received a higher response rate for this second attempt. It is also worth noting that all four respondents included in the survey responded to my introductory email within hours of receiving the email. The fourth teacher whom I never

Table 4

Pilot Pre-Assessment Data for Teacher Response Rate

FoP Pilot Response Rate and Survey Summary Data	Interview Questions Pilot / Pre-Assessment 1	Survey Pilot / Pre-Assessment 2
Number receiving	8	4
Number responding	1	3
Response Rate	13%	75%
Number of High School Teachers	6	0
Number of Middle School Teachers	2	0
Number of Elementary School Teachers	0	4
Number of General Education Teachers	3	0
Number of Special Education Teachers	5	4

received a completed survey from expressed in a reply email she never received the survey. I responded to her with more detail about what to look for and that the survey was generated by Qualtrics through ECU. Unfortunately, she never responded to that follow-up email and did not complete the survey. Another factor that may have produced a higher response with the survey was that I sent the survey during the teacher workdays while I sent the teacher interview questions when we were deep into remote learning and online instruction with our students. It is possible the varying levels of stress during each of these individual timeframes contributed to the variation in response rate.

Baseline Data Collection

Data were collected during Phase I and included student surveys, teacher surveys, and administrator surveys. This survey was used to gather information on student, teacher, and administrator perceptions of the UDL application in co-taught classes at the high school level in Math classes.

Data Analysis

I used data analysis and integration outlined by Creswell and Creswell through the application of a convergent design that consisted of three phases. First, I analyzed the qualitative database by coding the data and collapsed the codes into broad conclusions (Creswell & Creswell, 2018). Second, I analyzed the quantitative data in statistical results and percentages (Creswell & Creswell, 2018). The third step consisted of the mixed methods data analysis where the two data sets are integrated (Creswell & Creswell, 2018). The data gathered from the student surveys were analyzed to determine conclusions both from the pre- and post- survey information. This data provided outcome information to ascertain differences between student feedback pre-UDL training and post-UDL training. The teacher interview data provided qualitative feedback

that was used to generate conclusions. Additionally, lesson plans, walk-throughs, and observations were used as formative assessments to determine instructional impact connected to the UDL characteristics of multiple means of representation, action and expression, and engagement.

Summary of Phase I

At the onset of Phase I, I obtained consent from student participants that were done through parental consent due to the students' ages, teacher participant consent, and finally, consent from the Administrators involved in the professional development. Once consent was obtained from participants, I completed the registration process for each teacher and administrator who participated in the training session. Phase I was used to gather feedback from participants outlining their perceptions and current understanding of how instruction was presented and represented within the classroom environment, how students expressed what they learned and the use of multiple means of expression. This phase provided a baseline of qualitative data produced by the completion of the participants' surveys.

Phase II

During Phase II, I facilitated the UDL professional development training session that began in January 2021 and concluded in March 2021. This training was chosen in response to needed professional development support for general and special education teachers who taught in co-taught settings. Students with disabilities have consistently been low performing at the high school level in math. In addition, the need for continued co-teaching support in the school district is outlined in the North Carolina School Improvement Project plan, which is based on needs generated by the district NCSIP Implementation Team. In Phase II, I used the Hexagon Tool for Phases of Research and assessed Fit and Usability of the UDL professional development (see

Table 3). Data collection for Fit and Usability was gathered through weekly dialogue during the department meetings with staff participants that surrounded the UDL module the staff participated in during the three-month module. It was my goal to find out what impact the participation in the UDL professional development had on the attitudes of teachers who were providing instruction in co-taught classes at the high school level.

Inquiry Approach/Intervention

Once I received IRB approval for this research, I registered participants in an introductory course that was created and published through the Center for Applied Science and Technology. The course was self-paced and incorporated into the Exceptional Children's Department meetings weekly. The intervention for this research was the implementation of UDL professional development. This professional development course was published and delivered through the Center for Applied Special Technology (CAST). This course consists of seven introductory modules that introduce Universal Design for Learning, a framework for addressing learner vulnerability, and supporting all learners to gain the knowledge they need to become strategic, self-motivated, and goal-directed learners (CAST, 2019). Through this experience, participants will explore resources related to the theory and research of UDL, including research on learner variability, learn about the UDL guidelines to reach the wide variety of learners in their classrooms, and use UDL guidelines in practice. This professional development was accessed during department meetings for three months. The use of strategies and information gained was tried in the classroom and shared during the department meetings. The use of reflection upon practice is an integral part of this learning opportunity.

This training was initiated during the first week of January 2021, when registration occurred for the ten participants who are full-time staff members of the school district into the

UDL module. Participants consisted of four special education teachers, four general education teachers, an assistant principal from the high school, and myself. The course began in February 2021 with the introduction of the UDL professional development that included an overview of the learning opportunity to include an outline of the expectations for the three-month implementation. The course included 22.5 contact hours that translated into 2.25 continuing education credits for successful completion of the module.

Within the 22.5 contact hours, the instruction and learning activities were divided into 13 hours of facilitated learning during the weekly EC Department meetings and 9.5 hours of independent course interaction completed on Wednesdays during February, March, and April. Wednesdays were designated by the district as workdays for teachers and staff to complete professional development as assigned by the school administration.

The Hexagon Tool was used to assist with the planning and assessment of the professional development implementation. The Hexagon Tool was used for three program indicators and three implementation site indicators to explore and assess a program for fit and feasibility (Metz & Louison, 2018).

Summary of Phase II

Phase II consisted of the implementation of Universal Design for Learning professional development that aligned with the school district's involvement in the NCSIP grant that supported students with disabilities. This training supported the improvement of co-teaching efforts at the high school level. Increasing the educators' knowledge of learner variability and providing opportunities to apply UDL practices in the participants' classrooms and analyze student outcomes are at the heart of this professional development.

Phase III

During Phase III, both qualitative and quantitative data were collected. The students completed qualitative data in the form of post-assessment surveys using the same survey used for pre-assessment. Thomas R. Guskey indicated that participants should like their professional development and should also learn from the training (Guskey, 2016). As outlined in Guskey's evaluation level two, participants learning data can be gathered using multiple methods. Various methods were used to assess the participants' learning gained from the professional development, new knowledge and skills, including lesson plans, observations, and walk-throughs. A couple of assessment tools were used to gather this data and including the UDL Implementation Guide to complete walk-throughs (see Appendix F) and the Universal Design for Learning Observation Tool (2020) (see Appendix E). In addition, this outcome data provided information that assisted in determining the next steps for support of the continued application of the UDL framework in the co-taught classrooms at the high school. This information was compiled and analyzed as it compares to the pre-assessment surveys that participants completed in Phase I. The Survey data was used to gather feedback from participants to determine if they felt that the UDL training was useful and applicable in a co-taught classroom. This data collection was used to assess the Capacity and Support needed to facilitate further district-wide UDL professional development.

Analysis of Approach

Upon completion of this professional development module, I provided the participants with surveys to find out how successful they felt the training had been based on their perceptions. Participants completed the survey and provided their comments, thoughts, and outcomes that they feel are connected to their involvement in the UDL professional development. The feedback received from the participants will determine the next steps for

additional professional development support. I planned to share the outcome data from this research with the district NCSIP Coordinator to help shape the next phase of professional development to support both our special education and general education teachers who provide instruction in co-taught classrooms.

Surveys and interviews were utilized with both students and teachers that assisted in analyzing the efficacy of the professional development participation. Through continued study of the use of the UDL framework in the classroom, it is my goal that teachers and students experience a positive change in instructional delivery practices that prompt improved outcomes for students. Outcomes may include improved academic outcomes, an increased sense of belonging in the classroom, and increased positive student-teacher relationships, and a sense of accomplishment that fosters intrinsic motivation. With improved student outcomes, teachers will continue to deepen their knowledge of the UDL framework and implement UDL practices that are aligned to multiple means of engagement, representation, action, and expression.

Summary of Phase III

Upon completion of phase III, I used the post-implementation survey with student participants to gather qualitative data in the form of survey feedback and staff interview responses to begin formulating outcomes to answer my research questions. I also used this data collection to triangulate conclusions generated from the research.

Inquiry Design Rigor

Creswell and Creswell (2018) include internal validity threats such as experiences of the participants that may threaten my ability to draw correct inferences from the data in the study. This correlates to the participants experience level and knowledge base of instructing students with disabilities in co-taught classes. Participants were selected based on the master schedule.

The same instrumentation was used by participants for both the pre and post-professional development implementation. As part of establishing trustworthiness in this research I took into account the ever-changing circumstances surrounding the environment where this study took place as it related to whether instruction occurred face-to-face or remotely due to the continued situation with the national pandemic, COVID-19. In doing so, I monitored the dependability of the data collection as it related to the varying instructional delivery means we were managing. In addition, I used peer debriefing to ensure data collection, analysis, and interpretation processes were valid and reliable.

Delimitations, Limitations, and Assumptions

Since beginning the work of planning this research to include UDL professional development implementation, a national pandemic developed and affected our nation no one could have predicted. The COVID-19 or Corona Virus interrupted people's lives nationally, some to an alarming extreme and others less significantly. However, it is fair to say that everyone has been affected somehow, regardless of size. The onset of this pandemic hit the United States in a big way in March 2020 when school districts across the United States began closing. Bringing a personal perspective to the matter, our school district closed on March 13, 2020, and students did not return to classrooms until August 2020. Students are not back to what could be classified as a normal routine, not what could be classified as "pre-COVID" normal. Individual individuals have experienced throughout the nation are students returning to school, some using a virtual platform continuing instruction through a computer or other technological device. Some students have returned to their classrooms on a partial week basis, with two days of in-class instruction and three days of virtual or remote learning. Regardless of the method, this new normal is difficult for our nation. We planned for social distancing, mask wearing, and daily

temperature checks during this study. Additionally, students at the high school followed these safety protocols and continued to do so until the Center for Disease Control lifted these safety restrictions.

General education teachers often enter the classroom with limited training in supporting students with disabilities and were in need of professional development to support collaboration with a special education teacher. The limited training can also be noted about the special education teacher as it related to working with a general education teacher in a co-taught environment. Typically teachers entered into a co-teaching setting with minimal training and experience.

Assumptions included teachers being receptive to the UDL framework, exhibiting an open mind to this educational approach, and engaging in the activities of research that would bring concepts of UDL into their classrooms. In addition, the honesty of application was essential to gaining a deeper understanding of the UDL framework. There was also the assumption that the teachers would provide honest feedback regarding UDL implementation and possess a desire to incorporate UDL guidelines into their instructional practices. Finally, an assumption that existed was that both co-teachers would see the value in inclusion and view instruction of students with disabilities as a shared responsibility.

Role of the Scholarly Practitioner

During this study, my role with the school district was the Lead Administrator for Special Education. I provided district supervision to the special education teachers, related service personnel, teacher assistants, and personal care assistants who served students with disabilities. Participants for this research included staff from the high school including eight teachers and one

administrator. I directly supervised the special education teachers and provided ongoing professional development to address areas of needed improvement.

Moreover, I worked directly with the coordinator of the NCSIP grant for the district. Through this involvement, we identified a minimum of two areas to increase support for students with disabilities. First, one of the grant requirements was to provide professional development aligned with identified areas of needed improvement; one of those two areas was co-teaching. The implementation of UDL training provided the teacher participants with a deeper understanding of learner variability that would translate into more robust instructional practices for our students with disabilities.

Summary

The UDL professional development course consisted of introductory modules that introduced UDL that outlined a framework for addressing learner variability and supporting all learning styles to gain the knowledge and skills needed to become strategic, self-motivated, and goal-directed expert learners. The participants will complete this self-paced session through support in a professional learning community that meets weekly within the special education department. In addition, there were group discussions, independent activities to be utilized in the teacher's classrooms, participation in a UDL Google classroom, and follow-up that reviewed, analyzed, and discussed the participants' UDL application.

The inquiry design for the research included a mixed methods approach. Data collection consisted of qualitative data in the form of student surveys. In addition, staff was asked to complete a progression rubric and teacher interviews. Quantitative data collection included student assessment scores. The qualitative data were completed prior to UDL professional development and after the module concluded.

Inquiry partners included four special education teachers, four general education teachers, building level administration, and district administration. Additional support was received from the CAST professional development team in the form of facilitation assistance as needed due to the professional development being conducted virtually. One of the two high school Assistant Principals and I supervised the UDL module delivery, which was divided into weekly sessions through the May 2021 completion date.

Two pre-assessment pilot studies were conducted to find out the response rate to interview questions through email. A brief Qualtrics survey was also conducted to gather information relating to teachers' comfortability level with the delivery of remote learning as it pertained to addressing learner variability through multiple means of expression and representation. Phase I consisted of obtaining participant consent, the registration process with CAST, and completion of pre-assessment surveys. Phase II began in January 2021 and concluded in May 2021. This phase involved module completion and feedback collection during weekly special education department meetings. Phase III consisted of interviews with select student and staff participants along with the completion of post-assessment surveys.

The Hexagon Tool for Phases of Research was utilized for the analysis of Need and Evidence of the need through pre-assessment surveys. Fit and Usability of the professional development were analyzed during Phase II through dialogue and discussion at weekly meetings through the May 2021 completion date. Finally, in Phase III, the supports needed to build capacity were analyzed and used to determine how the UDL module could be conducted at other school sites within the district.

Limitations and assumptions included a modified school day schedule that was attributed to the COVID-19 pandemic. The Carolina School District operated on various schedules during

this study, including two days a week of face-to-face instruction while the other three days were virtual learning for students. Some students participated virtually full-time, five days a week. In addition, the stress level for staff and students was elevated and proved overwhelming and only added to an already challenging situation. Chapter 4 will provide inquiry findings generated by my research that will reflect pre- and post-assessment data. Additionally, survey findings provided by participants will be shared to include feedback on commonalities and differences.

CHAPTER 4: RESULTS

This study aimed to analyze the impact teacher participation in UDL professional development would have on teacher attitudes and instructional delivery in co-taught inclusive classes aligned with the UDL guidelines of engagement, representation, action, and expression. Additionally, the study was conducted to determine the impact the UDL training had on teacher attitudes within co-taught classrooms as measured by UDL guideline implementation, teacher participant reaction, and learning. A mixed methods approach was utilized and included the following: student surveys, teacher interviews, lesson analyses, and a district professional development survey. This research was initiated due to approximately 91% of students with disabilities being served in co-taught classes at the high school level, coupled with a need for increased staff training to address learner variability within the educational setting.

Research Questions

The research questions were as follows:

1. What impact does UDL professional development have on teacher attitudes within a co-teacher team in ninth through eleventh grades?
2. How does the application of UDL impact the instructional delivery of a co-teacher team in an inclusive Math class?
 - a. What changes have been observed in student outcomes when multiple means of representation are used?
 - b. What changes have been observed in student outcomes when multiple means of action and expression are allowed?
 - c. What changes have been observed in student outcomes when multiple means of engagement are used?

Demographics

Staff participants for this study included three special education teachers, three general education teachers, one school-level administrator from CHS, and two district-level administrators. Even more importantly, five of these teachers work collaboratively to provide co-taught math instruction. The number of years of teaching experience of the study participants ranged from five to thirty years of teaching experience. While co-teaching experience ranged from zero to nineteen years of experience, as noted in Table 5. Student participants, who were in co-taught classes, completed feedback surveys both at the onset of the UDL professional development and after the training. All of the co-taught classes were in regular educational settings that included both students with and without disabilities.

Data Collection

The participants started the UDL professional development module during the second semester on February 17, 2021, of the 2020 - 2021 school year. The students completed their pre-professional development feedback surveys the week of February 22, 2021. The students completed the surveys on two separate days due to the COVID-19 scheduling change that resulted in students attending school for two days for in-person learning and three days of virtual learning. This modification to the student's weekly attendance required the feedback to be obtained in groups, resulting in a portion of students completing their surveys on Monday, February 22, 2021. I returned to the class to get the second portion of students to complete their survey on Thursday, February 25, 2021. The post-student feedback surveys were completed on May 17, 2021. At this time, all students were on a four-day school schedule; as a result, the survey acquisition process only took one day in May instead of two days in February.

Table 5

Overview of Teacher Participants' Classroom Experience

Teacher (*SET or GET)	Years of Teaching Experience	Years of Co- Teaching Experience	Years of Teaching Experience Math Specific
SET #1	17	17	17
SET #2	30	19	7
SET#3	20	10	0
GET #4	5	0	5
GET #5	29	15	29
GET #6	18	2	18

Note. *Special Education Teacher (SET); General Education Teacher (GET).

The professional development module began on February 17, 2021, and concluded on May 5, 2021. Prior to the beginning of this module, I created a schedule in collaboration with the CHS administrators and shared it with the teacher participants. The calendar was created using calendarlabs.com and was shared with all participants via email. This calendar of events outlined a monthly meeting schedule per week, and any exceptions to the schedule were communicated via email to all participants.

Participant Recruitment

Prior to the beginning of this study, I asked for the voluntary participation of co-teaching teams at CHS to engage in the professional development module, UDL 1: A Framework for Addressing Learner Variability: Theory in Practice. This module was a self-paced online course offered by CAST. While this online module was self-paced, I, as the Exceptional Children Program Director, provided facilitation of the course to foster collaboration, networking opportunities, and pacing support to ensure all participants completed within the 90-day timeline CAST requirement. This training module, “A Framework for Addressing Learning Variability: Theory into Practice,” was implemented on February 17, 2021, and concluded on May 5, 2021. The implementation team involved participants who provided instruction in co-teaching teams for math at the high school level, three special education teachers, three general education teachers, one building level administrator, and two district-level administrators.

Professional Development Selection

Our district participates in the North Carolina State Improvement Project (NCSIP). Through that initiative, areas of need are outlined, and a district implementation team determines goals as referenced in Appendix I, the district NCSIP developmental review. One of the three areas of identified improvement referenced in this review was co-teaching supports.

Upon gathering feedback from our co-teaching teams at CHS, an area noted as “additional support needed” was professional development beyond the co-teaching basics 101 courses provided by the North Carolina Department of Instruction. Ideally, NCSIP grant funding aims to build capacity within individual districts, and with that goal at the forefront of our decision-making, it was determined the high school should be provided the opportunity to participate in professional development related to learner variability in co-taught classes. Given approximately 91% of our high school students with disabilities are instructed in co-taught classes, as identified in their individualized education plans, the UDL training was selected for implementation.

Impact of COVID-19

Initially, the intention of the UDL participant cohort was to meet via a virtual platform on a weekly basis; however, the reality of conducting this professional development opportunity during a pandemic proved otherwise, and adjustments were required. Adjustments to the implementation involved the development of a Google Classroom that allowed for participation on an individual basis when school closures and quarantines due to sickness were needed. This adjustment proved to be beneficial and allowed for dialogue amongst participants who exhibited introverted characteristics and proved to be quiet during a synchronous online discussion session. The schedule throughout the district varied due to closures at specific schools throughout the school year, as noted in Table 6. This change in the weekly school calendar allowed for dedicated time on Wednesday morning of each week. This allowed the professional development participants to meet virtually to review the coursework, discuss and share information related to the course, and apply it to their co-taught classes.

Table 6

COVID Schedule Tracking Document 20-21 School Year for Carolina School District

Week beginning * **	CPS	CES	CMS	CHS
August 17	All Virtual	All Virtual	All Virtual	All Virtual
September 8	1-day, A/B	1-day, A/B	1-day, A/B	1-day, A/B
September 14	2-Day, A/B 4-Day PK	2-Day, A/B	2-Day, A/B	2-Day, A/B
November 5	K-1 4-Day 2-3 2-Day	2-Day, A/B	2-Day, A/B	2-Day, A/B
November 12	K-3 4-Day	2-Day, A/B	2-Day, A/B	2-Day, A/B
November 19	K-3 4-Day	4-Day	2-Day, A/B	2-Day, A/B
**11/23/2021	K-3 2-Day	2-Day	1-Day	1-Day
November 30	K-3 4-Day	4-Day	2-Day, A/B	2-Day, A/B
December 14	All Virtual	All Virtual	All Virtual	State Exams only
****1/19/2021	K-3 4-Day	4-Day	All Virtual	All Virtual
1/25/2021	K-3 4-Day	4-Day	2-Day, A/B	2-Day, A/B
2/3/2021	K-3 4-Day	All Virtual	2-Day, A/B	2-Day, A/B
2/16/2021	K-3 4-Day	4-Day	2-Day, A/B	2-Day, A/B
2/19/2021	K-3 4-Day	4-Day	2-Day, A/B	Virtual
3/4/2021	K-3 4-Day	4-Day	2-Day, A/B	2-Day, A/B
4/12/2021	K-3 4-Day	4-Day	4-Day	4-Day

Note. *EC/504 students with 4 day remote learning plans were allowed 4 day weeks beginning September 8. **Some families selected and all virtual learning option. ***Thanksgiving Holiday Schedule. ****January 18 Martin Luther King Jr. Day Holiday.

Prior to the school attendance change brought on by the pandemic, the original plan was to meet with the professional development participants in person to facilitate the training module; however, when that was not possible, we pivoted to the use of a virtual platform. At this time, there were also restrictions on the number of individuals that could be in one room at the same time, as social distancing was also a requirement. The use of virtual meetings eliminated this concern and offered the participants a safe mode to take part in this professional development opportunity.

Completing this study during the COVID-19 pandemic brought many challenges and required continuous flexibility. On March 13, 2020, the Governor of North Carolina, Roy Cooper, closed schools due to COVID-19, and schools are still struggling to regain a sense of normalcy. The UDL professional development involved in this study began in February 2021. Fortunately, this professional development module was scheduled to be conducted via an online format. Face-to-face training would not have been possible due to the social distancing requirements, and at times our district instructed staff not to conduct group meetings due to health concerns related to the pandemic. The adjustment for this training came in the form of “time of day” and having a pre-determined date each week to participate in the training due to the modified schedule the high school was operating under. The plan was to meet virtually on Wednesday morning of each week during the teachers’ planning time. At this point, the entire district was operating on a modified school week schedule in which students were not on campus but participated in virtual instruction.

There was also a need for development and use of the Google Classroom originally, this was not in the plan. However, as some staff became sick or were unable to participate virtually, the implementation of the Google Classroom allowed for self-paced participation and also

provided a platform to collect feedback and capture the online discussion. In addition, originally, the teacher interviews were to be conducted in person; however, I pivoted to the use of Google Meet to conduct all four of the teacher interviews. This turned out to be helpful in that the interviews were recorded and available for later review as needed. Another change involved was the manner in which I would evaluate the level of UDL implementation in classroom instruction by the teacher participants. Initially, I planned to use the UDL Observation Tool, please see Appendix E and the UDL Look For template, Appendix F. Due to the inconsistency of the COVID-19 impacted schedule and teacher quarantines, the use of the UDL Lesson Analysis was a more realistic tool to use for the measure of UDL guideline implementation purposes.

The 2020-2021 school year was spent moving in and out of virtual learning, COVID-19 closures, teacher, and student quarantines. As noted in Table 6, students attended school on a modified schedule while never returning to a five-day week the entire school year. Having the Wednesday workday proved beneficial to this study and ensured time was allotted for the professional development; however, the effects on students and staff of the inconsistency of schedule and routine proved challenging. Moreover, students and staff continue to deal with learning loss the uncertainties brought about by the pandemic and work to establish a new normal as we find our way in a unique time.

Data Analysis for “Pre-Professional Development” UDL Student Feedback Surveys

The UDL Student Feedback Survey developed by CAST was used to gather feedback from students in the co-taught math classes at the high school at the beginning of the professional development module in February 2021. I emailed each of the general education and special education teachers to schedule a time to visit their classes for the purpose of collecting feedback through the UDL student feedback survey. I used Google docs to create a master schedule so the

teachers could sign up for the date and time that would work with their class schedule. Due to the high school, students attending on an “A/B” day schedule required a visit to each class twice to acquire survey data from all the students. I visited each of the three co-taught math classes on two separate occasions and explained the purpose of the survey to the students. I also shared information with the students and parents regarding the informed consent to participate in the research form in Appendix B. I made myself available by phone, text, or in person to answer any questions about participation in the study.

The student survey and answer choices were read aloud to the students to allow for completion in February 2021. I explained the purpose of the research and shared information about the study. This allowed for opportunities for students to ask questions if they needed further clarification on a question. To manage the data collection from multiple classes and maintain anonymity for the student, I assigned each student specific letters related to their teacher team and a number. This allowed responses to be tracked and removal of any student surveys from the study that consent for participation was not obtained.

Data Analysis for Post Student Surveys

The same UDL Student Feedback Survey was used with students to gather feedback with the intention of comparing “pre” and “post” survey data after the teachers completed the professional development module in May. Following the same procedure, as I did for the “pre” student survey, I communicated with the general education and special education teachers to schedule a time to visit the classroom to acquire student feedback data via the same survey. This student data collection allowed for an analysis of change in feelings or thoughts from students based on their perspective using the Likert Scale. As shown in Appendix J, student feedback ranged from strongly agree to strongly disagree in the pre-surveys. Moreover,

Appendix K captured student feedback, using the same survey, at the end of the professional development module. To calculate the percentages for each response area, I tallied responses from both the February 2021 and the May 2021 surveys collecting this data on blank copies of the UDL Student Feedback. To protect the confidentiality of students and teachers, each survey form was identified using an alpha-numerical coding system.

Data Analysis for Teacher Interviews

The purpose of conducting teacher interviews for this study was to analyze teacher participant reactions about the UDL professional development. Four teacher interviews were completed through the use of the Google Meet virtual platform, and each interview was recorded for review and analysis. Teacher interview participants included two special education teachers and two general education teachers. The CAST Professional Learning Interview Protocol (2020) (see Appendix G) was used to capture information from each teacher participant around teacher demographic information, differentiated strategies, learner diversity, UDL design in the classroom, inclusive practices, and differentiation at the school level. I emailed each of the four teachers to schedule the virtual interview at a time that was convenient for each. All four of the teachers responded in a timely manner and promptly scheduled the interview. An analysis was completed of each interview to include a review of participant responses, and additional reviews were possible due to the interviews being recorded. Additionally, Google Voice to Text was used to create a written transcription of each of the four interviews for further review.

Conclusions that evolved from the participant responses captured in the interviews were as follows: (a) an absence of in-district professional development surrounding differentiated learning in the past, (b) none of the teachers interviewed received any co-teaching or differentiated learning style training in their teacher preparation training, and (c) an awareness of

the importance of UDL implementation was noted by all participants. These conclusions emerged from teacher participant responses that were captured in the Interview Protocol and are outlined in Table 7. It is important to note that none of the four math teacher participants received formal in-district UDL professional development until participation in this training module, as referenced through feedback in the first interview question. Moreover, one of the participants communicated that he and a group of co-teachers independently took part in a differentiated online training that was not district-funded. This action initiated by the group of teachers indicates an interest and desire to learn more about incorporating differentiation tools and resources to address learner variability.

Two responses that were noted by all four teachers included the need for planning time for co-teacher teams and the importance of administrative support. Scheduling was mentioned by two of the participants and connected it the critical component of planning. Additionally, one of the teachers shared her perspective on a critical component of administrative support being provided clear expectations of what is needed for effective co-taught instruction. Moreover, it can be determined these supports should organically yield stronger communication between the co-teacher teams and the administration.

Data Analysis UDL Lesson Analysis Framework Implementation

The lesson analysis worksheet was a tool used to determine the level of UDL implementation into a planned lesson that was applied in a co-taught math class during the month of May near the conclusion of the UDL professional development module. The co-teacher teams completed the lesson analysis worksheet in a collaborative manner, as outlined in Appendix L. The worksheet was created by CAST to assist teachers and administrators in determining the presence of each UDL guideline in the lesson. The teachers then used the

Table 7

Responses Generated by Participants' Feedback to the Interview Protocol

Interview Protocol Questions:	Responses
How did you learn about UDL (inclusive practices / differentiated strategies)?	No prior professional development Experience with UDL through graduate coursework UDL coursework non-school based
Describe the learner diversity you have in your classroom and school.	With and without disabilities Students need to remediate / expand learning
Describe a lesson you implement that uses UDL for inclusive practices and differentiated strategies.	Math Reference to the Lesson Analysis
How do you use UDL when you design lessons?	Meeting students where they are in their learning process Using UDL guidelines to address how students learn
In your opinion, how can UDL create a more inclusive environment in your classroom?	Eliminating a learning gap Helps teacher to recognize that students process information differently
Tell me more about UDL and use of inclusive practices / differentiation at your school.	Breaking down difficult concepts Asking student questions to determine what he / she does understand
What are some factors that facilitate your use of UDL, inclusive practices in your classroom / school?	Planning with co-teacher Proper administrative support
What are some challenges to UDL implementation? What additional support / resources do you need to implement UDL, inclusive practices in your classroom / school?	Scheduling Planning time with co-teacher Administration outlining expectations for co-teaching

analysis worksheet to determine what was working well and what could be improved in the lesson. This worksheet was not used in an evaluative manner; however, it was used as a resource for the educators to reflect on UDL implementation in the classroom environment. Each teacher was provided a copy of the lesson analysis worksheet two weeks prior to the due date and given the option to work collaboratively or independently. All the teacher participants chose to complete the worksheet in co-teacher teams.

Six teacher participants were given this assignment, and five participants returned the completed worksheet on or before the due date. As outlined in Table 8, the teacher participants' feedback indicated a high level presence of multiple means of Representation, Action, and Expression. At the final virtual meeting in May 2021, to conclude the professional development module, the focus of the session was to allow the teacher participants to share details relating to their lesson analysis worksheet. Math lesson goals that were discussed during this shared opportunity demonstrated an understanding of adding exponents and identifying parts of a circle. As represented in Table 9, the use of the worksheet allowed the teacher to break down the UDL guidelines to analyze student opportunities to access, build, and internalize information within the classroom environment. Additionally, Table 9 outlines a math lesson titled, "Rules of Exponents." In this lesson the co-teacher team notes where UDL components were present, not present or unsure about in the sample lesson they implemented in their co-taught class. Also, noted were samples of how the UDL component was utilized, such as through use of a choice board, assistive technology use, or other differentiated instructional resource.

Table 8

Presence of UDL Guidelines in Lesson Analysis Worksheet Completed by Teachers

Multiple Means of	Present	Not Present	Unsure
Representation	75%	17%	8%
Action & Expression	89%	11%	0%
Engagement	50%	50%	0%

Note. This table reflects the presence of UDL components by percentage as completed by the five teacher participants in this study.

Table 9

Lesson Analysis Worksheet Noting Co-Teacher Feedback at Completion of UDL Professional

Development

UDL Guidelines	Present	NOT Present	Unsure	Comments
I. Provide Multiple Means of Representation				If it was present, where was it present? If it was not present, what did you change?
1. Provide options for perception				
1.1 Offer ways of customizing the display of information	X			Google Classroom
1.2 Offer alternatives for auditory information	X			Google Classroom
1.3 Offer alternatives for visual information	X			Google Classroom
2. Provide options for language, mathematical expressions, and symbols				
2.1 Clarify vocabulary and symbols	X			Notebook – math definitions
2.2 Clarify syntax and structure		X		
2.3 Support decoding of text, mathematical notation, and symbols	X			Text to speech app
2.4 Promote understanding across languages		X		N/A
2.5 Illustrate through multiple media	X			Google Classroom, video, text, small group and sheet

Table 9 (continued)

UDL Guidelines	Present	NOT Present	Unsure	Comments
3. Provide options for comprehension	X			Sheets – notes Verbal Summary learning
3.1 Activate or supply background knowledge	X			Class notes/lecture, small group
3.2 Highlight patterns, critical features, big ideas, and relationships	X			Choice board
3.3 Guide information processing, visualization, and manipulation	X			Teacher check-ins
3.4 Maximize transfer and generalization			X	Not sure
II. Provide Multiple Means for Action and Expression				
4. Provide options for physical action		X		Felt it was not needed – other than move around class
4.1 Vary the methods for response and navigation	X			Notes, math problems, picture comprehension
4.2 Optimize access to tools and assistive technologies	X			Laptops
5. Provide options for expression and communication	X			Choice board options
5.1 Use multiple media for communication	X			Type responses, pictures, pencil/paper
5.2 Use multiple tools for construction and composition	X			In Google classroom – Google slides, notes

Table 9 (continued)

UDL Guidelines	Present	NOT Present	Unsure	Comments
5.3 Build fluencies with graduated levels of support for practice and performance	X			Teaching small group/pairs
6. Provide options for executive functions				
6.1 Guide appropriate goal setting	X			Teacher check-ins, chunk work completion
6.2 Support planning and strategy development		X		To some degree – haven't progressed that far
6.3 Facilitate managing information and resources	X			Teacher check-ins
6.4 Enhance capacity for monitoring progress	X			Teacher check-ins
III. Provide Multiple Means for Engagement				
7. Provide options for recruiting interest	X			Choice Board, multiple media
7.1 Optimize individual choice and autonomy	X			Choice Board
7.2 Optimize relevance, value, and authenticity		X		Part of curriculum
7.3 Minimize threats and distractions	X			Efficient routine of groups, seating, etc.
8. Provide options for sustaining effort and persistence	X			Teacher check-ins, progress feedback
8.1 Heighten salience of goals and objectives		X		Just beginning UDL Didn't progress there

Table 9 (continued)

UDL Guidelines	NOT			Comments
	Present	Present	Unsure	
8.2 Vary demands and resources to optimize challenge	X			Choice Board had enrichment choices
8.3 Foster collaboration and community	X			Kids worked in pairs or small groups- their choice
8.4 Increase mastery-oriented feedback		X		Just beginning – only feedback on process and steps
9. Provide options for self-regulation	X			Check off block in choice board and note 3 % accuracy
9.1 Promote expectations and beliefs that optimize motivation		X		Beginning UDL structure – motivation wasn't emphasized
9.2 Facilitate personal coping skills and strategies		X		Some feedback on progress and choices
9.3 Develop self-assessment and reflection	X			Chart choice board progress and accuracy

Note. This table represents the Lesson Analysis Worksheet that noted co-teacher feedback at the completion of the UDL professional development in May 2021. The title of this lesson was “Rules of Exponents” and the goal of the lesson was for students to demonstrate understanding of adding exponents. The co-teacher team described that the lesson would implement use of choice board for re-teaching and provide enrichment and practice opportunities before students took the formative assessment (CAST, 2020).

Data Analysis for Teacher Professional Development Evaluation Survey

Teacher participants were asked to complete the Carolina School District (CSD) professional development survey. This survey measured the participants' satisfaction with the training to allow for continuous educator improvement. The survey covered the following topics: the quality of the professional development, informing instruction, technology use with students, providing equitable services to students, and pace, to name a few. Table 8 outlines the teacher participant survey response data and reflects the level of teacher satisfaction relating to the UDL professional development. Additionally, Table 10 provides a comprehensive overview of the results generated by the professional development evaluation form.

This survey is aligned to Guskey's level one of professional development evaluation to include participants' reactions. As shown in Table 10, the response feedback is outlined by the percentage of participant responses for each question in the survey. The four teacher participants that delivered co-taught math instruction were asked to complete the survey, and all four teachers provided feedback via a completed survey. The survey is comprised of eighteen survey questions that require the respondent to provide feedback using a Likert Scale. Furthermore, the survey included the following components: four open-ended questions that allowed the respondent to provide narrative feedback based on his or her perspective surrounding the application of the training, the least useful component of the training, additional training needed for program implementation, and allowed for the opportunity to provide comments or suggestions. All four teacher participants completed the Likert Scale feedback portion of the survey; however, only two of the participants provided feedback to the open-ended narrative questions at the conclusion of the survey.

Table 10

Local Professional Development Evaluation Form Feedback from Teacher Participants

Question	Strongly Agree	Agree	Disagree	Strongly Disagree	Not Applicable
1. The staff development was of high quality.	25%	75%			
2. The staff development was timely.	25%	75%			
3. The staff development was relevant to my professional needs.	50%	25%			
4. The format and structure facilitated my understanding of the topic(s).	25%	75%			
5. The staff development enhanced my understanding of ways to use technology with my students.		25%	25%		50%
6. The staff development will assist my school and / or me in improving student learning/classroom instruction.	50%	50%			
7. The staff development helped me gain new information and skills.	25%	50%			25%
8. The staff development will assist me in making better informed decisions.	50%	25%			
9. The hands-on activities were helpful.	25%	25%		25%	25%

Table 10 (continued)

Question	Strongly Agree	Agree	Disagree	Strongly Disagree	Not Applicable
10. The staff development will assist my school and/or me in integrating technology into the curriculum.	50%	25%	25%		
11. The staff development will assist my school and/or me in providing more equitable access or services to traditionally underserved students.	50%	25%	25%		
12. The printed materials and /or electronic resources were (or will be) helpful.	25%	75%			
13. The instructor clearly communciate3d the subject matter.	25%	75%			
14. The instructor answered the questions of participants.	25%	75%			
15. The instructor was professional and approachable.	50%	50%			
16. This workshop was conducted at a satisfactory pace.	25%	75%			
17. The facilities/accommodations for this workshop were conducive to learning.		75%			25%
18. Overall, the staff development met my expectations.	50%	50%			25%

The professional development survey was one instrument used among four data collection instruments. This study used a mixed methods design and included two quantitative and two qualitative data collection instruments. As outlined in Table 11, the data collection instruments are shown along with the participants that provided data feedback for this study for each respective tool.

The surveys were provided to each teacher participant at the completion of the professional development module on May 5, 2021, and asked to turn in the completed survey on or before May 15, 2021. Two of the surveys were completed on May 12, 2021, and two of the surveys were completed on May 13, 2021. All four surveys were completed in their entirety; however, one participant omitted a response for questions three and eight. The evaluation form also consisted of three open-ended questions to allow for participant feedback that could not be captured through the Likert Scale responses.

Application of Hexagon Tool for Research Outcomes

Through this research, the Hexagon tool for phases of research, program, and implementation site indicators was used to assist in Need, Evidence, Fit, Usability, Capacity, and Supports analyses. Phase 1 consisted of analyzing the need and gathering evidence of a need for professional development related to differentiation. Due to the high percentage of students with disabilities participating in co-taught classes at CHS, the need for professional development was additionally substantiated by the low performance of students with disabilities on End-of-Course testing. In Phase 2, the UDL professional development module connected to the Fit and Usability components of the Hexagon Tool. As UDL guideline awareness and implementation correlated to supporting learner variability in co-taught classrooms. Phase 3 consisted of the Capacity and Support components that included: implementation costs, resources needed for implementation,

Table 11

Overview of Data Collection Instruments

Participant	Number of Participants Who Completed Data Collection	Data Collection Instrument for Mixed Methods Design	Quantitative	Qualitative
Students (14)	14	UDL Feedback Survey Pre-Professional Development	X	
Students (14)	14	UDL Feedback Survey Pre-Professional Development	X	
Teachers (6)	4	Professional Development Survey	X	
Teachers (6)	4	Interview		X
Teachers (6)	5	Lesson Analysis		X

Note. The study incorporated a mixed methods design of inquiry and this table provides an overview of each instrument used along with the number of study participants who completed data collection for the corresponding instrument.

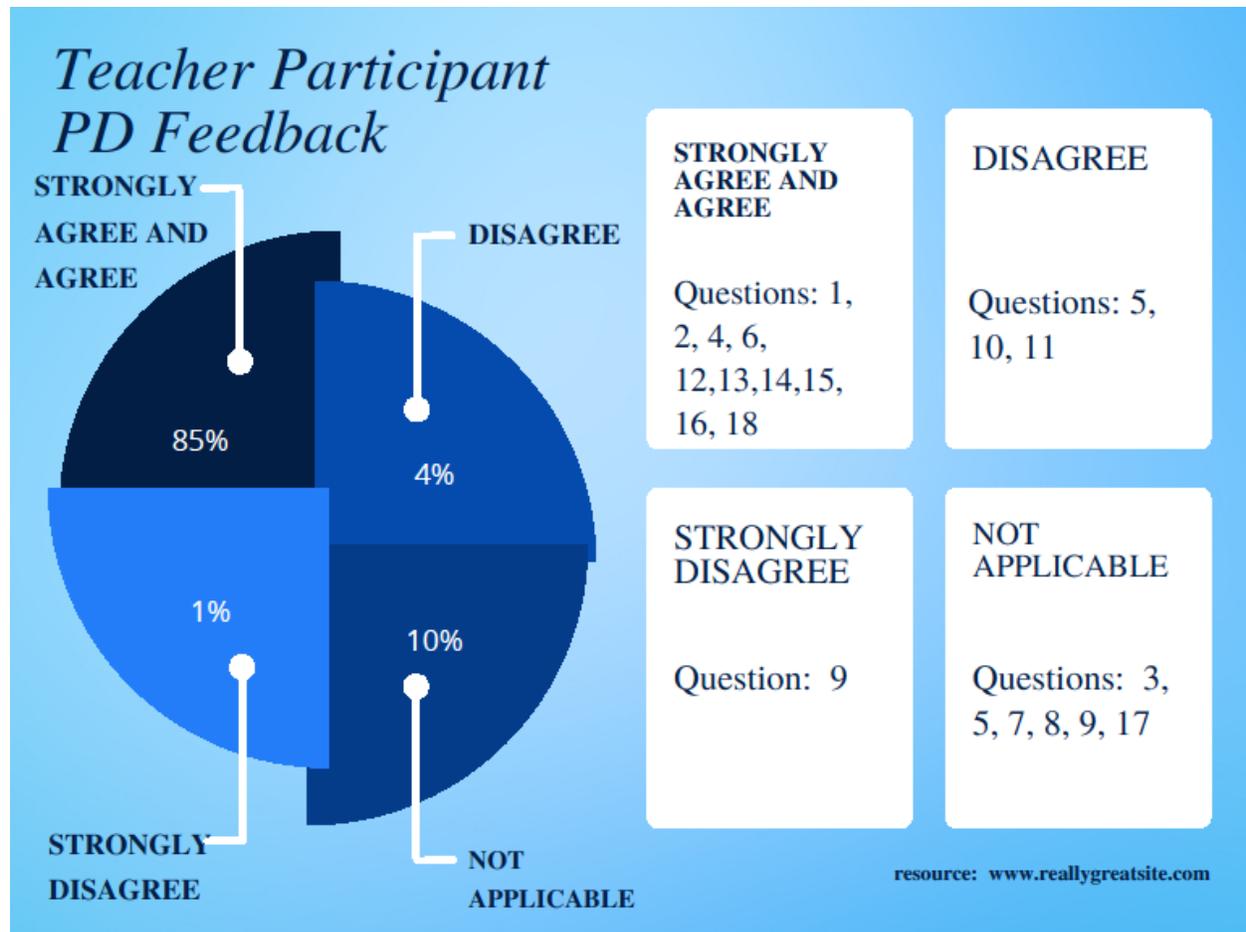
expert assistance, and external resources for the implementation site. As evidenced through the alignment with the implementation site’s 2021 – 2022 School Improvement Plan, the UDL initiative continues to align with school professional development priorities appropriately. Additionally, implementation costs will continue to be covered by grant funding through the district’s involvement in NCSIP. Supports will include expert assistance and external resources from CAST along with school-based educators from the implementation site and District Leadership Team.

Findings

This section is dedicated to data analyses surrounding each of the research questions for this study. Data was gathered through various modalities from both teacher and student participants during the research. To review the correlation between each research question and the data collection tool used, see Table 9. Further analysis is provided to explain the study findings and share information to assist those pursuing similar UDL professional development opportunities using teacher and student feedback as it relates to UDL professional development implementation. These findings can be used to expand this type of work and improve outcomes for students with disabilities at the high school level in rural school districts.

Overview of Findings Regarding Research Question 1

“What impact does professional development on UDL have on teacher attitudes within a co-teacher team in ninth through eleventh grades?” Feedback on this question was gathered through an analysis based on percentages ascertained from the Likert Scale that was used to gather data from the teachers at the completion of the professional development. Co-teacher feedback from the professional development evaluation reflected a positive impact of 85% who “strongly agreed or agreed,” as outlined in Figure 6. This teacher participant evaluation was



Note. This figure represents the teacher agreement as it correlates to the professional development evaluation completed in May 2021.

Figure 6. Teacher participant PD feedback.

aligned with evaluation level one of Thomas Guskey’s Five Critical Levels of Professional Development. Teachers’ feedback reflected positively in the following areas: high quality, timeliness, facilitated an understanding of the UDL concept, assisted in improving classroom instruction, resources were helpful and professional development met expectations. The results from this survey indicated a high rate of satisfaction from the participants, and one could hypothesize this heightened level of satisfaction could, over time, foster increased job satisfaction, increase teacher retention rates, increase the effectiveness of instruction in co-taught classes that could promote improvements in academic outcomes for students with disabilities.

UDL Student Feedback Surveys

The UDL Student Feedback Survey developed by CAST was used to gather feedback from students in the co-taught math classes at the high school at the beginning of the professional development module in February 2021. I emailed each of the general education and special education teachers to schedule a time to visit their classes for the purpose of collecting feedback via the UDL student feedback survey. I used Google docs to create a master schedule so the teachers could sign up for the date and time that would work with their class schedule. Since high school students attended on an “A/B” day schedule, I was required to visit each class twice to acquire surveys from all the students. I visited each of the three co-taught math classes on two separate occasions and explained the purpose of the survey to the students. I also shared information with the students and parents regarding the informed consent to participate in the research form in Appendix B. I made myself available via phone, text, or in-person to answer any questions about participation in the study.

During February 2021, I completed scheduled visits to the co-taught math classrooms explaining the purpose of the survey and sharing information about the study. I also read the survey to the students along with the answer choices. These accommodations allowed students opportunities to ask questions if they needed further clarification on a question. To manage the data collection from multiple classes and maintain anonymity for the students, I assigned each student specific letters related to their teacher team and a number. This allowed me to track the responses and also to remove any study surveys from the study that I did not obtain consent for participation. Data outlined in Tables 12, 13, and 14 reflect student feedback based on their perception of teacher use of UDL guidelines within the classroom. Student perception for questions that correlate to multiple means of representation are shown in Table 12. Student perception of teacher use of UDL guidelines connecting to multiple means of action and expression are shown in Table 13. Additionally, student perception for questions that connect to multiple means of engagement are shown in Table 13. Each table notes the student feedback based on student perception in February 2021 and also student feedback based on perception in May 2021.

Additionally, information gleaned from the teachers' lesson analyses generated data about the teachers' "proactive" use of UDL strategies to plan the lesson documented in the lesson analysis at the end of the professional development module in May 2021. Teachers worked collectively in co-teacher teams to document the use of representation, action, expression, and engagement in the model lesson. The professional development evaluation survey completed by the teacher participants reflected how the teachers viewed the training session, which is a representation of the teacher's attitude connected to instructional strategies for co-taught instruction.

Table 12

Pre and Post UDL Student Feedback Surveys – Multiple Means of Representation

Multiple Means of Representation	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
Q1 Pre (Post difference)	1 (+1)	4 (+2)	6 (-3)	2 (no change)	1 (no change)
Q12 Pre (Post difference)	2 (+1)	11 (-2)	1 (no change)	0 (no change)	0 (no change)

Note. This table outlines the differences in student responses from the pre-survey completed at the beginning of the study in February 2021 and compares them to the student responses from the post survey completed in May 2021 for questions related to multiple means of representation.

Table 13

Pre and Post UDL Student Feedback Surveys – Multiple Means of Action and Expression

Multiple Means of Action and Expression	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
Q4 Pre (Post difference)	0 (+2)	7 (+1)	5 (-2)	1 (no change)	1 (-1)
Q7 Pre (Post difference)	0 (+1)	3 (+5)	8 (-4)	2 (-1)	1 (-1)
Q11 Pre (Post difference)	0 (no change)	6 (+4)	6 (-3)	2 (-2)	0 (+1)
Q12 Pre (Post difference)	2 (+1)	11 (-1)	1 (no change)	0 (no change)	0 (no change)
Q13 Pre (Post difference)	1 (+2)	6 (-1)	4 (+1)	2 (-1)	1 (-1)
Q14 Pre (Post difference)	1 (+3)	6 (no change)	3 (no change)	2 (-1)	2 (-2)

Note. This table outlines the differences in student responses from the pre-survey completed at the beginning of the study in February 2021 and compares them to the student responses from the post-survey completed in May 2021 for questions related to multiple means of action and expression.

Table 14

Pre and Post UDL Student Feedback Surveys – Multiple Means of Engagement

Multiple Means of Engagementn	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
Q1 Pre (Post difference)	1 (+1)	4 (+1)	6 (-3)	2 (no change)	1 (no change)
Q2 Pre (Post difference)	2 (+2)	5 (+3)	6 (-4)	1 (-1)	1 (-1)
Q3 Pre (Post difference)	0 (no change)	0 (+7)	3 (+2)	7 (-6)	4 (-3)
Q4 Pre (Post difference)	0 (+2)	7 (+1)	5 (-2)	1 (no change)	1 (-1)
Q5 Pre (Post difference)	0 (+1)	3 (+4)	5 (+1)	5 (-5)	1 (-1)
Q6 Pre (Post difference)	0 (+3)	0 (+2)	3 (+5)	7 (-7)	4 (-3)
Q7 Pre (Post difference)	0 (+1)	3 (+5)	8 (-4)	2 (-1)	1 (-1)
Q8 Pre (Post difference)	1 (+3)	2 (+6)	6 (-4)	2 (-2)	3 (-3)
Q9 Pre (Post difference)	2 (no change)	5 (+4)	4 (-1)	2 (-2)	1 (-1)
Q10 Pre Post difference)	1 (no change)	5 (+6)	7 (-6)	1 (-1)	0 (+1)

Note. This table outlines the differences in student responses from the pre-survey completed at the beginning of the study in February 2021 and compares them to the student responses from the post-survey completed in May 2021 for questions related to multiple means of engagement.

Feedback generated for research question one indicates a significantly high utilization of the UDL framework reflected by teachers in the lesson analysis worksheet. This information compiled with the conclusions garnered from the teacher interviews provides what teachers share as important to the efficacy of UDL implementation in their co-taught classes. After further analysis of the findings for research question one, I conclude that UDL positively impacts teacher attitudes and could lead to higher job satisfaction with the potential to support teacher retention. In addition, job satisfaction and teacher retention have the likelihood to foster increased effectiveness of instruction in co-taught classes that, over time, could improve positive outcomes for students. Further study is needed to better determine the level of impact of UDL application on teacher attitudes.

Overview of Findings Regarding Question 2

How does the application of UDL impact the instructional delivery of a co-teacher team in an inclusive Math class?

- a. What changes have been observed in student outcomes when multiple means of representation are used?
- b. What changes have been observed in student outcomes when multiple means of action and expression are allowed?
- c. What changes have been observed in student outcomes when multiple means of engagement are used?"

Question two contained three sub-questions related to the three multiple mean UDL guidelines that included representation, action and expression, and engagement. Data collection for this question consisted of feedback from the student feedback survey in which the student responses in February 2021 were compared to the student responses in May 2021. Changes in

outcomes for this study were interpreted as a difference in response by students in the student feedback survey from February 2021 to May 2021. The student feedback sampling of 14 surveys was collected upon completion of the 90-day professional development implementation

Findings from the student survey for research question two indicated a substantial increase in which more students agreed with the assertions for survey questions three, seven, eight, and ten. One could hypothesize that this substantial increase could foster an increase in student understanding of instructional material presented, a rise in academic success, and could factor into fostering a higher level of self-esteem for the student. Additionally, this improvement in student outcomes could positively impact student attendance and overall school performance. It should be noted that additional student survey data would be beneficial to further analyze and better determine the potential for change over time. It is also important to note that my study was completed over a short period of three months and during a pandemic. Further study on UDL implementation is needed over an extended period of time to examine the impact of instructional delivery.

Moreover, the lesson analyses completed by the teacher participants reflected the integration of the UDL guidelines into a lesson designed and presented in a co-taught math class. Not only does the lesson analysis task the teacher team with noting whether these guidelines are “Present, Not Present, or Unsure,” but also to identify the resource used in support of the UDL implementation. The intentionality of the lesson planning exhibited throughout each of the lesson analysis worksheets noted use of resources such as: “Google classroom, text to speech application, small group instruction, video representation, choice boards, peer support, teacher check-ins, and establish efficient routines.”

Summary

The focus of this study correlated directly with my desire, dedication, and commitment to improve instructional supports for students with disabilities in co-taught classes in a rural school district. This research study is reflective of the work to do so and is grounded in two research questions. The information gained from this study will be used to further these efforts.

Data generated by the Lesson Analyses Worksheets showed a 75% presence of multiple means of representation in the lessons designed for this study which is valuable for all student learning styles, especially students with disabilities. As for multiple means of Action and Expression, lesson analyses data reflected an 89% presence. The third guideline represented was multiple means of engagement where a 50% presence was indicated. This information is helpful in identifying needed areas of support for future UDL professional development, training, and coaching opportunities.

Data provided by the teacher interviews yielded results that reflected an awareness of the importance of UDL implementation and the need for additional district-wide training. All four teachers noted they had not received any in-district training aside from the UDL module he or they participated in during the spring of 2021. Teacher participant feedback supported the need for the training, and comments reflected the value observed and experienced through UDL implementation. It is important to note that the four teacher participants have an average of 20.75 years of teaching. None received co-teacher or differentiated learning training in their college preparatory courses to become a teacher. One of the four teachers shared that she did not attend a teacher training program; however, she earned her teaching license through an alternative licensure program known as “lateral entry.”

The professional development survey generated information that will assist in shaping the delivery of the next UDL module cohort. Data represented a high percentage of “strongly agree” and “agree” responses. There were five questions on the professional development evaluation form that respondents noted as “not applicable.” The overall consensus among participants was strong agreement to agreement. In the next chapter, I will share reflections on the study, information about conducting this research during a global pandemic, and next steps to further this work at the high school and at other schools in the district.

CHAPTER 5: SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The importance of this study directly correlated to two important variables at CHS. First there was a large number of students with disabilities in general education math classes at the high school. Secondly, there was a need for professional development to support the co-teacher teams to better address learner differences. CHS implements a co-teacher model to ensure individualized instruction for students with disabilities who have the general education setting outlined in their IEPs. Co-teacher feedback at CHS generated responses noting little to no specialized professional development with a co-teaching or learner variability focus. A few of the co-teacher participants mentioned the basics of co-teaching professional development provided in the district several years ago; however, with teacher turnover in various disciplines, the number of teachers with this training is low.

As students with disabilities are enrolled in co-taught math classes at CHS in grades nine through twelve and the learning styles of students vary from student to student, it is important that co-teachers receive high-quality professional development that addresses learner variability within classrooms. Co-teacher math teams at CHS consist of a teacher licensed to teach math and a teacher licensed in special education. Professional development is needed for both teachers to learn about pedagogies related to the implementation of the UDL guidelines. Although the research on the implementation of UDL in public school classrooms is limited, the research does indicate challenges presented within a co-taught classroom can best be overcome by using three perspectives and actions: embracing various co-teaching models, embedding UDL, and implementing deeper scaffolds through explicit instruction and specially designed instruction (Stein, 2016). With appropriate professional development to support teachers in co-taught

settings, addressing learner variability becomes less of a daunting task and allows teachers to increase positive outcomes for all students.

Impact of the Literature

During the review of literature for this study, there was an abundant amount of literature surrounding co-teaching models and the framework for co-teaching; however, there seemed to be only limited literature related to the use of UDL in co-taught math classes. While Meyer and Rose (2014) coined the term UDL some thirty years ago, it was only in 2014 that they defined and outlined the foundational principles that explain the UDL framework. UDL has become internationally recognized as an effective tool for designing and implementing inclusive learning environments. The implementation of UDL guidelines has the potential to address learner variability in co-taught inclusive classrooms.

Gardner's Multiple Intelligence Theory (Pomazi et al., 2016) assisted in guiding this study about professional development and implementation of UDL. The application of Gardner's Multiple Intelligence Theory correlates with the application of the UDL, as both center around using a child's strength and interest as a learning tool. Likewise, it is necessary for the teacher to use a variety of methods that are complementary to the child's specific cognitive style and identity (Achkovska-Leshkovska & Spaseva, 2016). Gardner also notes the distinction that intelligences can be differentiated into many inter-correlated modalities which can directly connect to co-teaching practices (Pomazi et al., 2016). As a result, this emphasizes the importance of UDL implementation in co-taught classes, this implementation can address the inter-correlated modalities that make up learner variability.

Summary and Interpretation of the Findings

A conclusion that emerged from this study was the importance and essentiality of administrative support. This factor was noted by both general education teachers and special education teachers. Both general education and special education teacher participants noted, “administration outlining expectations for co-teaching” was a challenge to UDL implementation. Additionally, “proper administrative support” was a factor that facilitated their use of UDL in the classroom. This finding correlates with literature written by Horrocks et al. (2008), noting the importance of administrators’ impact on practice, tone, and culture in schools. Likewise, research conducted by Cook and Friend (1995), Scruggs and Mastropieri (2017), and Walther-Thomas (1997) consistently emphasized the importance of administrative support for co-teachers. This study and Horrocks et al. (2008) underscore the importance of administrative support. Additionally, this study generated a conclusion that underscores critical nature of administrative support and the consistent need for administrators to provide clear instructional expectations for both general education and special education teachers in co-taught classrooms.

Further research conducted by Kamens et al. (2013) revealed the emergence of several patterns related to administrator support for teachers. These patterns of needed and increased administrative support were related to professional development. This was noted as the theme with the highest level of reoccurrence relating to administrative support for co-teaching, and that was to provide opportunities for professional development. While my study connected to the application of UDL, it reflects the administrative recognition of the importance of training opportunities also. This recognition was reflected through the administrative support provided by both district level and school-level support of this study. Additionally, administrative support is confirmed as a critical component of co-teaching support through the research of Kamens et al.

(2013). Moreover, Friend et al. (2010) found that a critical factor in effective co-teaching implementation is the impact of administrative support. My study concurs with this finding and also provides additional support that indicates the importance of administrative support for both professional development and instructional delivery in co-taught classrooms. Another conclusion that emerged through this study was the importance of scheduling and common planning time with co-teacher teams. This is corroborated through research conducted by Idol (2006), Rice et al. (2007), Sileo (2011), and Tannock (2009), who outlined that for effective co-teaching practices to occur, both teachers should be working toward a common goal through co-planning. Their research goes on to reveal that to allow for this to occur, collaborative planning in which both teachers share their expertise and come to shared agreements about how the instruction should be carried out. Further study by Keefe and Moore (2001) reflects that teachers at the elementary level have concerns about sufficient planning time and administrative support. These commonalities also surfaced in this study among the co-teacher teams at the high school level. While this study was conducted exclusively with high school teachers, the participant feedback aligns with the Keefe and Moore (2001) research that confirms the importance of sufficient planning time and administrative support.

Another theme that emerged from this study was how the implementation of UDL guidelines to address learner variability met students where they were in the learning process. Although there is limited research on the use of UDL in co-taught classes at the high school level, the UDL framework has gained national attention due to the IDEA reauthorization in 2004 and endorsement in ESSA policy in 2015. Research conducted by Kennedy et al. (2013) indicates professional development continues to be the key practice for educators to expand their skillset and implement those skills in the classroom. Furthermore, their research confirmed the

importance of planning for students' variability, which requires effective training to support teacher development in the understanding of practices and frameworks needed to facilitate learning for all students. Study findings indicated that student perception outlined in the feedback surveys reflected a high level of teacher application of the UDL framework in the classroom environment and through instructional practices. Furthermore, my study reflected that UDL professional development impacted the following: (a) was relevant to teachers' professional needs, (b) assisted teacher participants in improving student learning and classroom instruction, (c) assisted teachers in making better-informed decisions about instructional practices, and (d) assisted teachers in providing more equitable access or services to traditionally underserved students.

Relevance was confirmed of the teacher participants' professional development needs through responses provided in the teacher participant professional development feedback survey. A high level of relevance was noted through the 85% rate of strongly agree and agreement. While only 4% reflected disagreement and 1% indicated strong disagreement. Additionally, 10% of participants noted 10% of the professional development as not applicable to their professional development needs.

Continued UDL application in co-taught classrooms has the potential to improve learning opportunities for diverse learners through use of multiple means of representation, action, expression and engagement. The UDL components address learner diversity that exists among students with varying levels of abilities and disabilities by providing more equitable instructional services. This type of instructional equity is created through the use of the UDL approach using a framework and guidelines to allow educators to make informed decisions about what practices are optimal for all learners (Hall et al., 2012). Teacher participants noted a high level of UDL

framework implementation through the lesson analysis they completed at the end of the professional development module in May 2021. This implementation supported the efforts of the teacher participants using their UDL knowledge to optimize the learning opportunities for all students.

At the onset of the UDL professional development, students from the three co-taught math classes were asked to complete a UDL Student Feedback survey. At the completion of the staff professional development module in May 2021, I secured 14 post-student feedback surveys from co-taught math classes. These 14 surveys were used to compare and contrast student responses at the beginning of the professional development and then again at the end of the training module and were obtained from the same students. This 14-question survey is a tool used to elicit students' perceptions of the teaching practices they experienced and how students perceived that teachers used the UDL framework in the classroom setting. The UDL Crosswalk form, created by Dr. Katie Novak, was used in this study to define and explain the correlation between the survey questions and the UDL framework guidelines: Engagement, Representation, Action, and Expression (see Appendix H). The survey required the students to rate each statement on a five-point Likert scale. The number of student responses were calculated in each category, converted those numbers to percentages, and compared the student responses from the pre-professional development feedback surveys to the student responses provided after the professional development was completed to analyze the differences in the student responses. To provide a detailed analysis of the data gathered through this survey, key data points will be shared along with a description of the connection to the UDL guidelines and research checkpoints.

The student survey data analysis was compared to the post-survey data and was generated from student responses gathered at the completion of the UDL professional development in May 2021. Upon review of the response comparison rate between pre- and post-survey data, there were several questions I will highlight. As outlined in Table 10, the analysis of the greatest positive impact related to the following questions: two, three, five, seven, eight, nine, ten, and eleven. All reflected an increase of 23% or greater in which students noted either “strongly agreed” or “agreed.” The degree of agreement equated to an increase in the teacher participant use of the UDL guideline of Engagement. Another noteworthy student response correlated to Engagement was the 43% and 50%, respectively, for questions three and six, decrease in students responding that they “disagree.” This decrease was a positive reflection on the use of the UDL framework as it related to student Engagement. It is important to note that Table 10 quantitatively reflects the change in student feedback data from February 2021 to May 2021. It is also equally important to note that the schedule changed for all the CHS students in April 2021 and permitted the students to return to in-person learning four days a week. Further research is needed using the UDL student feedback surveys during a traditional five-day school week as it relates to UDL framework implementation in co-taught classes.

Changes in Teacher Attitudes

Four teachers participated in the virtual interview process upon completion of the professional development in May 2021. The following themes emerged from the interviews: minimal professional development with a co-teaching focus on learner variability, the importance of common planning times, using the UDL framework to individualize instruction, and the presence of administrative support. This feedback will be shared with the district administrative team to determine areas of focus for further professional development to improve

teacher support. Findings from these data indicated additional co-teaching training is needed to continue further UDL implementation, common planning time should be given priority when scheduling is done, and a need for a consistent presence of administration were all noted as needs.

Continued district and school-level support would be beneficial, such as coaching and expectation rubrics for co-taught teams would benefit the instructional delivery methods within the classrooms. These supports were outlined as areas that co-teacher participants expressed were current needs based on their experiences and perspectives. These benefits also have the potential to positively impact students without disabilities as learner variability is a component of the challenges faced daily in the classroom. With this ongoing focus around professional development activities, the teachers will have increased opportunities to improve their skillset and knowledge to address the various learning styles of all students. Only one of the three teacher participants indicated they had previous professional development in the area of UDL. While this study focused on students with disabilities, the UDL guidelines can also be implemented with all levels of learners to impact instruction positively.

UDL Influenced Changes to Co-Taught Lessons

The UDL Lesson Analysis resource instrument was used in place of the in-class observation tool due to limitations based on the COVID-19 modified school schedule. The teachers completed the analyses template in teams based on a math lesson they implemented in their co-taught classrooms. High levels of Representation, Engagement Action, and Expression were noted by each teacher team. Examples of resources used for UDL application were: text to speech app, Choice Board, Teacher Check-Ins, Google Classroom, laptops, Google Slides, and picture Representation for vocabulary. The lesson analyses required co-teacher teams to analyze

a selected lesson to identify the presence of UDL guidelines within the lesson. Teachers noted if the guideline was present, not present or if they were unsure. Additionally, they were provided the opportunity to share information relating to “where” the UDL guideline was present in the lesson.

Teachers highlighted the incorporation of Google Classroom often within their instruction to allow students to present material in different formats and as an option to express themselves beyond sharing verbally in class. The use of Choice Boards also appeared frequently in the lesson analyses, which allowed students to choose various learning options within the classroom. In using the Choice Board, students were allowed to select a small group activity that was geared toward their learning needs. Using the Choice Board optimized individual choice and autonomy, and provided options for recruiting interest and varied demands to optimize challenges. This correlated to providing multiple means of Engagement and fostered an increased sense of belonging in the classroom.

Professional Development Evaluation Survey

The survey used for this study aligned with Thomas Guskey’s evaluation level one from his Five Critical Levels of Professional Development Evaluation and was conducted through use of a paper-and-pencil instrument. As outlined by Guskey, the level one evaluation measures participants’ reactions to the professional development. Additionally, this survey measured the initial satisfaction with the professional development, and feedback that will be used to improve the program design and delivery of the next professional development module.

A Likert Scale was used to gather teacher feedback on this particular survey. The response rate was predominantly “strongly agree” and “agree,” while one participant did disagree with three of the eighteen questions. The disagreement arose from questions relating to

the use of technology, integrating technology into the curriculum, and assisting in providing more equitable access to traditionally underserved students. Overall, the participants' responses indicated they were pleased with the professional development, and it met their needs. The last question asks the participants for an overall rating for which 50% of the teachers "strongly agreed" and 50% "agreed." Data were collected to analyze the participants' learning through the use of this survey. Teachers completed the professional development surveys upon completion of the professional development module. The surveys measured new knowledge and skills of participants along with degree and quality of implementation. The surveys and their data will be used to improve program content, format, and organization. Additionally, the survey data will be used to provide feedback to the district leadership team to determine the next steps for UDL implementation.

Limitations of the Study

This study consisted of a small number of teacher participants and was completed during a modified school week prompted by COVID-19. Teacher and student attitudes were impacted in various ways due to the lack of consistency in the schedule and the uncertainty of day-to-day activities caused by the pandemic. Student and teacher quarantines were common during this study, in addition to ever-changing guidance from the local, state, and federal governments. Additionally, another problem school administration wrestled with was how to respond to quarantines. Based on state Tool-Kit guidance, administrators were constantly addressing COVID situations that dealt with staff shortages, class, and individual quarantines, ensuring proper safety protocols were being followed to ensure the safety of students and staff. This magnitude of stress will most likely have varying levels of short-term and long-term effects on all involved.

Another COVID-19 modification for this study included data collection. The student survey section initially consisted of 62 participants; however, I was only able to get 21 pre- and post-student surveys to use as comparative data sources. Originally, the teacher interviews were going to be conducted in person, but due to the restrictions caused by COVID-19, Google Meet was utilized to conduct all interviews. This use of Google Meet for the interviews turned out to be helpful as this allowed for review as needed.

Another modification involved was the manner in which I would evaluate the level of UDL implementation in classroom instruction by the teacher participants. Initially, I planned to use the UDL Observation Tool, Appendix E and the UDL Look For template, Appendix F. Due to the inconsistency of the COVID-19 impacted schedule and teacher quarantines, the use of the UDL Lesson Analysis tool was a more realistic resource to use for the measure of UDL guideline implementation purposes.

Recommendations for Practice

Upon review of the data analyses based on the high satisfaction rate of the professional development survey, I would recommend a continued focus on UDL training at the high school. An additional attempt at professional development with less interference from COVID is recommended. Another recommendation for practice would be to provide professional development on each of the UDL components for a one year per component. This would allow more time for the teacher participants to explore and implement UDL guided practices per component. Furthermore, combining the three-year professional development cycle per component could also be coupled with coaching as the participants embed UDL into their daily instruction.

This research will be shared with the District Leadership Team for review to consider the appropriateness of similar professional development at other schools in the district. Based on the data provided from the teacher interviews, an additional recommendation would be to ensure administrative support was given heightened priority in co-taught classrooms giving specific attention to outlining clear expectations for both the general education and special education teacher in co-taught classes. A third recommendation would be to continue the use of the UDL Student Feedback Survey in co-taught classrooms administering the survey at the beginning and at the end of each math class. With continued UDL professional development and focus on addressing learner variability, the hope is, over time, student surveys would reflect a steady increase in Representation, Engagement, Action, and Expression within the classroom environment.

Continued collaboration with the NCSIP inquiry partners is recommended as this will ensure UDL support is a focus in co-taught classes at CHS through the development review process. This partnership will continue to provide a stable platform to review and make revisions to the UDL framework implementation. Additionally, keeping UDL as a focus of the NCSIP grant will allow for a continued focus on improving instructional practices in co-taught classes at CHS. Finally, this collaboration provides opportunities for stakeholders on the district NCSIP team to supply input and feedback of needs not only at CHS but also at the other schools in the district.

It is important to note that one teacher in the district who participated in the UDL professional development exhibited an interest in learning more related to UDL implementation and found value in this framework. This is evidenced by email communication from a CHS administrator that reached out to me at the beginning of the 2021-2022 school year. This

communication stated, “I just had a beginning teacher let me know how beneficial the UDL training was as an inclusion teacher. Will this training be available to all teachers at some point during the school year?” Future UDL implementation is recommended to allow this type of interest and excitement to permeate throughout all classrooms. It is recommended to seek additional feedback from teachers to explore the level of teacher interest. Furthering the implementation with follow-up data gathering will better equip educators to address the learner variability of each and every student that enters their classroom. Along with the further implementation, another recommendation for practice is on-going coaching at the district level to ensure appropriate teacher support.

Additionally, future recommendations for practice include that universities incorporate UDL training in the teacher and principal preparation programs. Further recommendations would involve UDL training for both special education and general education teachers. With the incorporation of UDL training at the university level, teachers would come into classrooms with the knowledge and skills to differentiate instruction with all students. Moreover, with the UDL training incorporated into principal preparation programs, principals would enter schools with the skillset to ensure appropriate support to teachers who are delivering co-taught instruction through the use of UDL guidelines.

Impact of the Study on Practice

To summarize this study, the Student Feedback Survey indicated a marked increase in Engagement based on how the students felt in the math co-taught classes after the completion of the UDL professional development. I believe, over time, increased student Engagement will improve positive student outcomes to include a feeling of inclusion and will also prompt an increase in academic outcomes as one impacts the other. Representation, action, and expression

also showed scattered increases, and with a continued focus on the implementation of the UDL framework, there is potential to see improvements in these areas also. The Lesson Analyses, Teacher Interviews, and Professional Development Surveys also reflected a high satisfaction rate with the UDL professional development and provided data that supplied administration with focus areas that teachers noted as critical to provide effective instruction in co-taught math classes.

It is important to note that another impact of this study brought about the development and implementation of UDL mini sessions at CHS for the 2021 – 2022 school year. These mini sessions were requested by the Principal based on School Improvement Plan survey data generated at the beginning of the school year. These sessions are designed and presented by staff teams that participated in the UDL professional development in 2021, along with other staff who bring expertise, an understanding of UDL, and passion and dedication for student success. I believe that all learners have the potential to overcome educational obstacles and succeed within the learning environment. With the support of committed educators such as the ones at CHS, along with a continued professional development focus on learner variability, increasing student success is obtainable for all.

Impact of the Study on Equity and Social Justice

Data collected in this study from the student feedback survey and the lesson analysis completed by the teacher participants indicated the implementation of the UDL framework in the co-taught math classes was being implemented by all professional development participants at varying rates of incorporation and proves promising for continued UDL implementation. Research conducted by Dieker (1998) and Murawski (2009) with a co-teaching focus concluded that students with disabilities had a more positive attitude, were provided with role models for

behavior and learning, interacted more with non-disabled peers, and were exposed to higher-level concepts and discussions than was typically found in a segregated special education setting. If students with disabilities in co-taught math classes at CHS continue being taught with UDL guided instruction, positive outcomes for those students have the potential to increase. Likewise, research by Rao et al. (2017) concluded that UDL is described as an instructional design framework that can be used to design curriculum for students with and without disabilities and has the potential to support meaningful inclusion of students with intellectual disabilities in general education settings. These findings suggest that with continued UDL implementation at CHS, students with disabilities in the math co-taught classes will benefit from the support UDL provides to address learner variability.

Recommendations for Future Study

There is limited research on UDL implementation in co-taught math classes at the high school level. Most recently, the endorsement of UDL within the ESSA (2015) federal policy has the potential to promote a stronger rationale for school leaders to review classroom assessment and implementation needs. Given the U.S. Department of Education reported in 2020 that approximately 64% of children with disabilities spent all or part of their school day in general education classrooms, the need for UDL support is critical. As Stein (2016) outlines in his research, challenges presented within co-teaching pairing can best be overcome by using three perspectives and actions: embracing various co-teaching models, embedding UDL, and implementing deeper scaffolds through explicit instruction and specially designed instruction. Future UDL professional development is needed to further educate and train teachers, both general and special education, about UDL implementation and improved student outcomes when learner variability is at the center of lesson planning on a consistent basis.

Moreover, further study would prove beneficial on the impact of teacher attitude and perspective and how they factor into UDL implementation. This research only touched on teacher attitudes through the use of student survey data. The concept around an increased UDL knowledge base and improved implementation could lead to more positive perceptions connected to the instruction of students with disabilities. In other words, more knowledge and ability to use the knowledge we have will lead to improvement in teacher attitude prompting an improved climate to support learner variability.

To promote further research, this study could be replicated but on a larger scale to include co-teacher teams in other discipline areas. The study could also be expanded into general education classrooms as learner variability exists with students across the district. Furthermore, this study could be extended to the primary and elementary grades to not only include high school students but all school-age students in the district. A longitudinal study could be conducted to examine how study participant perceptions change over time.

Conclusions

Facilitating this professional development and participating in the modules allowed me to learn alongside the teachers and provided opportunities for relationship building. Positive relationships and trust are essential components for professional growth to occur with staff. I credit this study with fostering a high level of relationship building with the co-teacher math teams at CHS. The data outcomes of the study generated the following: key conclusions to focus on for continued professional development improvements, student survey data that exhibits an increase in select UDL guideline implementation in the classroom, and lesson analyses completed by the teacher participants that provides self-reflection of the early impacts of how UDL can be integrated within their instructional delivery. It is also important

to note the study created a space for a district administrator to work alongside both general education and special education teachers. This study paved the way for focused support to occur with the intention of supporting teachers to support all students. These educators are motivating and provide inspiration to me as a leader through their dedication and passion for ensuring student success. The data generated from this study will be used to continue the work through improvements in co-taught instruction and to positively influence teacher attitudes by a consistent show of leadership support.

Scholarly Practitioner Reflections on Leadership

This study continues to foster and influence my professional growth and development as an educational leader. My ability to practice adaptive leadership has been strengthened through the work of the research coupled with the work that has gone into supporting co-teacher teams in the middle of a pandemic. At the onset of the UDL professional development, the school district was operating on a modified schedule for all high school students. CHS was educating students in two groups divided into an “A” Day and “B” Day group. This proved challenging as teachers were responsible for both in-person and virtual instruction on top of dealing with the social-emotional stressors of the COVID-19 induced situation.

During the weekly UDL professional development meetings, the teacher participants had an opportunity to share their perspectives on UDL implementation practices while managing all the challenges of COVID-19. While the teachers preferred to have all of the students present in the classroom five days a week, the social distancing requirements prevented that from occurring. This resulted in teachers using technology supports for those students learning remotely. During the Google classroom discussions, one of the special education teachers shared the following comment,

Everyone learns differently, and allowing students multiple means of input, Expression, and Engagement can overcome curricular obstacles such that students are not locked into a one size fits all type of learning. One size fits all can lead teachers to think there are limitations of the learner.

I found this comment to be powerful as it provides insight into the teacher's thoughts and directly reflects how the limitation of the learner mindset can shift to a model of thinking focused on the opportunity for a variety of learning styles. This comment is evidence of how perspective can lend itself to the possibility of robust opportunities for all learners. It is my hope this open mindset can also influence other educators at CHS to see the limitless instructional possibilities. Being an active participant and facilitator in this professional development, I was impressed by the open mindset of the group and their ability to find ways to support students in the ever-changing environment brought on by COVID-19.

As outlined by Northouse (2018),

An adaptive leader challenges others to face difficult challenges, providing them with the space or opportunity they need to learn new ways of dealing with the inevitable changes in beliefs, attitudes, perceptions, and behaviors that they are likely to encounter in addressing real problems.

This UDL professional development in the CHS teachers who participated in this study provided a space for learning to broaden the scope of thinking to support learner variability. This opportunity will continue to impact me positively both as a leader and an educator. Through this study, my understanding and application of adaptive leadership grew exponentially to include the importance of administrative support during professional development opportunities. This research provided me with the opportunity to work not only

with the special education teachers but also with the general education teachers who were in co-taught instructional settings. Through my informal classroom visits, conversations with teachers, communication, and ongoing dialogue, I gained a deeper appreciation for co-taught instruction. Facilitating this professional development and participating in the modules allowed me to learn alongside the teachers and provided opportunities for relationship building. Positive relationships and trust are essential components for professional growth to occur with staff. I credit this study in fostering both components with the co-teacher math teams at CHS. This opportunity will continue to impact me both personally and professionally. These educators are motivating and provide inspiration through their dedication and passion for ensuring student success for all.

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APPENDIX A: INSTITUTIONAL REVIEW BOARD APPROVAL

3/2/22, 12:51 PM

<https://epirate.ecu.edu/App/sd/Doc/0/GOFJ36I12MD4VBFICC8K6FD660/fromString.html>



EAST CAROLINA UNIVERSITY
University & Medical Center Institutional Review Board
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rede.ecu.edu/umcirb/

Notification of Initial Approval: Expedited

From: Social/Behavioral IRB
To: [Anita Boyd](#)
CC: [Daniel Novey](#)
Date: 2/12/2021
Re: [UMCIRB 20-003077](#)
Application of Universal Design for Learning in Co-Taught Classes at the High School Level

I am pleased to inform you that your Expedited Application was approved. Approval of the study and any consent form(s) occurred on 2/12/2021. The research study is eligible for review under expedited category # 7. The Chairperson (or designee) deemed this study no more than minimal risk.

As the Principal Investigator you are explicitly responsible for the conduct of all aspects of this study and must adhere to all reporting requirements for the study. Your responsibilities include but are not limited to:

1. Ensuring changes to the approved research (including the UMCIRB approved consent document) are initiated only after UMCIRB review and approval except when necessary to eliminate an apparent immediate hazard to the participant. All changes (e.g. a change in procedure, number of participants, personnel, study locations, new recruitment materials, study instruments, etc.) must be prospectively reviewed and approved by the UMCIRB before they are implemented;
2. Where informed consent has not been waived by the UMCIRB, ensuring that only valid versions of the UMCIRB approved, date-stamped informed consent document(s) are used for obtaining informed consent (consent documents with the IRB approval date stamp are found under the Documents tab in the ePIRATE study workspace);
3. Promptly reporting to the UMCIRB all unanticipated problems involving risks to participants and others;
4. Submission of a final report application to the UMCIRB prior to the expected end date provided in the IRB application in order to document human research activity has ended and to provide a timepoint in which to base document retention; and
5. Submission of an amendment to extend the expected end date if the study is not expected to be completed by that date. The amendment should be submitted 30 days prior to the UMCIRB approved expected end date or as soon as the Investigator is aware that the study will not be completed by that date.

The approval includes the following items:

Name	Description
Anita Boyd Proposal 11.23.20.docx	Study Protocol or Grant Application
assent template form	Consent Forms
informed consent aboyd.docx	Consent Forms
parental permission consent form	Consent Forms
UDL Interview Protocol.pdf	Interview/Focus Group Scripts/Questions
UDL Observation Tool.pdf	Additional Items
UDL Student Survey.pdf	Surveys and Questionnaires

<https://epirate.ecu.edu/App/sd/Doc/0/GOFJ36I12MD4VBFICC8K6FD660/fromString.html>

1/2

APPENDIX B: INFORMED CONSENT



Informed Consent to Participate in Research

Information to consider before taking part in research that has no more than minimal risk.

Title of Research Study: Application of Universal Design for Learning in Co-Taught Settings at a Rural High School: Fostering Positive Perceptions Around Instructional Delivery for Students with Disabilities

Principal Investigator: Anita Boyd (Person in Charge of this Study)
Institution, Department or Division: East Carolina University
Address: 308 Wadkins Blvd. New Bern, NC 28560
Telephone #: 252-474-4393

Researchers at East Carolina University (ECU) study issues related to society, health problems, environmental problems, behavior problems and the human condition. To do this, we need the help of volunteers who are willing to take part in research.

Why am I being invited to take part in this research?

The purpose of this research is to provide Universal Design for Learning (UDL) professional development to address learner variability in co-taught settings at the high school level. By doing this research, we hope to foster positive perceptions surrounding instructional delivery to students with disabilities in co-taught classes in grades 9-12.

Are there reasons I should not take part in this research?

You should not participate in this study if you are unwilling to be truthful about your experience in education.

What other choices do I have if I do not take part in this research?

You can choose not to participate.

Where is the research going to take place and how long will it last?

The research will be conducted at Pamlico County High School (PCHS). Participants of the study who work at PCHS will be asked to participate in weekly department meetings to review progress of professional development module training and provide feedback via interview after the professional development is completed.

What will I be asked to do?

You will be asked to do the following:

- Participate in weekly department meetings to discuss the professional development progression
- Answer interview questions at the conclusion of the professional development about your own participant learning

What might I experience if I take part in the research?

We don't know of any risks (the chance of harm) associated with this research. Any risks that may occur with this research are no more than what you would experience in everyday life. We don't know if you will benefit from taking part in this study. There may not be any personal benefit to you but the information gained by doing this research may help others in the future.

Will I be paid for taking part in this research?

We will not be able to pay you for the time you volunteer while being in this study.

Will it cost me to take part in this research?

It will not cost you any money to be part of the research.

Who will know that I took part in this research and learn personal information about me?

ECU and the people and organizations listed below may know that you took part in this research and may see information about you that is normally kept private. With your permission, these people may use your private information to do this research:

- Any agency of the federal, state, or local government that regulates human research. This includes the Department of Health and Human Services (DHHS), the North Carolina Department of Health, and the Office for Human Research Protections.
- The University & Medical Center Institutional Review Board (UMCIRB) and its staff have responsibility for overseeing your welfare during this research and may need to see research records that identify you.
- People designated by Wilson County Schools.

How will you keep the information you collect about me secure? How long will you keep it?

The information collected in this study will be securely kept on my password protected work laptop and kept in my locked office or secured at my home. I will keep this information until I successfully defend my research. All written interviews will be destroyed after a successful dissertation defense.

What if I decide I don't want to continue in this research?

You can stop at any time after it has already started. There will be no consequences if you stop and you will not be criticized. You will not lose any benefits that you normally receive.

Who should I contact if I have questions?

The people conducting this study will be able to answer any questions concerning this research, now or in the future. You may contact the Principal Investigator at 252-474-4393, Monday-Friday between 8:00 a.m. and 7:00 p.m.

If you have questions about your rights as someone taking part in research, you may call the University & Medical Center Institutional Review Board (UMCIRB) at phone number 252-744-2914 (days, 8:00 am-5:00 pm). If you would like to report a complaint or concern about this research study, you may call the Director for Human Research Protections, at 252-744-2914

I have decided I want to take part in this research. What should I do now?

The person obtaining informed consent will ask you to read the following and if you agree, you should sign this form:

- I have read (or had read to me) all of the above information.
- I have had an opportunity to ask questions about things in this research I did not understand and have received satisfactory answers.
- I know that I can stop taking part in this study at any time.
- By signing this informed consent form, I am not giving up any of my rights.
- I have been given a copy of this consent document, and it is mine to keep.

Participant's Name (PRINT)

Signature

Date

Person Obtaining Informed Consent: I have conducted the initial informed consent process. I have orally reviewed the contents of the consent document with the person who has signed above, and answered all of the person's questions about the research.

Person Obtaining Consent (PRINT)

Signature

Date

APPENDIX C: DISTRICT APPROVAL LETTER

PAMLICO COUNTY SCHOOLS



Lisa F. Jackson Superintendent

Steven B. Curtis Assistant Superintendent

507 Anderson Drive, Bayboro, NC, 28515
252-745-4171 (Phone) 252-745-4172 (Fax)
www.pamlicoschools.org

November 16, 2020

East Carolina University
Attn: University & Medical Center Institutional Review Board
600 Moyer Boulevard
Brody School of Medicine 4N-70 Mail Stop 682
Greenville, NC 27834

To Whom It May Concern:

Pamlico County Schools is excited to have Mrs. Anita Boyd complete her research study on the application of the Universal Design for Learning to foster positive perceptions of instructional delivery for students with disabilities at the high school level. We fully support her research for her dissertation at East Carolina University. The district supports Mrs. Boyd's application for ECU IRB approval.

We believe Mrs. Boyd's research will inform instructional practices for students with disabilities in co-taught settings at the high school level. Mrs. Boyd has agreed to share all information as needed or upon request.

The need to address learner variability specifically as it pertains to students with disabilities is aligned with the district's focus to improve instructional supports for students with disabilities in grades 9-12 as outlined in our school district improvement goals. Pamlico County Schools support Mrs. Boyd's research without hesitation.

Respectfully,

Mrs. Lisa F. Jackson, Superintendent
Pamlico County Schools

Pamlico County Schools does not discriminate in the employment, tenure, or promotion of employees on the basis of sex, race, religion, age, national origin or disability.

APPENDIX D: UDL STUDENT FEEDBACK SURVEY

Novak Education

UDL

[Access this tool in Google Docs to make a copy and edit!](#)

What is this tool for?

Providing mastery-oriented feedback is critical for deep learning and continual improvement in our students. However, feedback shouldn't be a one-way street. Just as you need to provide feedback to your students, you also need to solicit feedback from your students.

The survey on pages 3 - 4 can be used by your students to assess your current teaching practices and use of the UDL framework. You may also choose to create your own version of this survey in a Google form to collect responses digitally.

In this survey, we ask students to rate each statement on a 5-point Likert scale to determine where there may be teaching practices that you need to address. Average ratings below 4 may indicate that you need to work on the UDI- checkpoints associated with that question (see corresponding crosswalk in below chart). We encourage you to use this tool together with the UDI- Progression Rubric to help you understand where your UDI- teaching practice may stand (emerging, proficient, or progressing towards expert practice) and how to bring it to the next level.

Likert Scale

- Strongly Agree (5)
- Agree (4)
- Neither Agree or Disagree (3)
- Disagree (2)
- Strongly Disagree (1)

Feedback Crosswalk

Survey Question	UDL Crosswalk
I understand why everything I am learning in this class is important.	<ul style="list-style-type: none">● <u>Heighten salience of goals and objectives</u>● <u>Maximize transfer and generalization</u>
I feel safe and accepted in our classroom for who I am.	<ul style="list-style-type: none">● <u>Optimize relevance, value, and authenticity</u>● <u>Minimize threats and distractions</u>
My teacher really "gets" me and knows my interests, my life outside of school, and how I learn best.	<ul style="list-style-type: none">● <u>Optimize relevance, value, and authenticity</u>
In this class, I am provided with choices for how I will learn new knowledge and skills.	<ul style="list-style-type: none">● <u>Optimize individual choice and autonomy</u>● <u>Vary the methods for response and navigation</u>

Dr. Katie Novak | For more CJD tools and resources, visit novakeducation.com/resources

UDL

Survey question	
When I am having a difficult time in class, I know what strategies and resources to use to get back on track.	<u>Facilitate personal skills and strategies</u>
I love being a part of this classroom because the community feels like a family.	<ul style="list-style-type: none"> ● <u>Foster collaboration and community</u>
The class is designed so I always have the support I need to challenge myself.	<u>Build fluencies with graduated levels of support for practice and performance</u> <u>Varv demands and resources to optimize challenge</u>
My teacher is great at helping me to believe in myself as a learner who can meet high expectations.	<u>Promote expectations and beliefs that optimize motivation</u>
I receive helpful feedback and tips from my teacher to help me reach my goals.	<u>Increase mastery-oriented feedback</u>
I am provided with opportunities to reflect on my learning and think about what I need to work on to be a better learner.	<u>Develop self-assessment and reflection</u>
I am provided with choices in how I show what I have learned.	<u>Use multiple tools for construction and composition</u>
I am allowed to use tools and technology to help me learn and show what I have learned.	<u>Illustrate through multiple media</u> <u>Optimize access to tools and assistive technologies</u> <u>Use multiple media for communication</u>
I am encouraged to set goals for my learning using my own interests.	<u>Guide appropriate goal-setting</u>
I am learning how to keep organized and create action plans for completing my work.	<u>Support planning and strategy development</u> <u>Facilitate managing information and resources</u> <u>Enhance capacity for monitoring progress</u>

UDL

Please provide me with feedback about your learning! Read the statements below and then fill in the appropriate circle under your level of agreement with the statement. I truly value your voice and want to know how I can improve to be the best teacher I can be.

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
I understand why everything I am learning in this class is important.					
I feel safe and accepted in our classroom for who I am.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My teacher really "gets" me and knows my interests, my life outside of school, and how I learn best.		<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In this class, I am provided with choices for how I will learn new knowledge and skills.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I am having a difficult time in class, I know what strategies and resources to use to get back on track.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
I love being a part of this classroom because the community feels like a family.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The class is designed so I always have the support I need in order to challenge myself.	<input type="radio"/>	<input type="radio"/>		<input type="radio"/>	<input type="radio"/>
My teacher is great at helping me to believe in myself as a learner who can meet high expectations.					

UDL

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
I receive helpful feedback and tips from my teacher to help me reach my goals.					
I am provided with opportunities to reflect on my learning and think about what I need to work on to be a better learner.					
I am provided with choices in how I show what I have learned-					
I am allowed to use tools and technology to help me learn and show what I have learned.					
I am encouraged to set goals for my learning using my own interests.					
I am learning how to keep organized and create action plans for completing my work.					

APPENDIX E: UDL OBSERVATION TOOL

Universal Design for Learning Observation Tool¹

Partner with another teacher who participates in EAST so you can observe each others' classrooms and share your work. Use this form to record your observations. After each observation, meet with your partner to debrief, to finish the completion the observation tool, and to review and reflect on how you incorporate UDL in your classroom. Please submit both the observation you conducted, and a copy of the observation that your partner conducted in your classroom.

Name of Observer: _____ Name of Teacher Observed: _____ Date: _____

Check here if observed	Students experience ideas and information in multiple ways	What did you observe? Describe the evidence.
	Alternatives for the display of information <i>(e.g., visual, graphic, verbal, auditory)</i>	
	Support for processing language and symbols <i>(e.g., illustrate key concepts, clarify syntax and structure, define symbols and vocabulary)</i>	
	Options for comprehension <i>(e.g., provide or activate background knowledge, highlight big ideas and relationships, guide information processing, support memory and transfer)</i>	
Check here if observed	Students express their comprehension in multiple ways	What did you observe? Describe the evidence.
	Options for physical actions <i>(e.g., varied ways to respond, varied ways to interact with materials, use of assistive technology)</i>	

¹ This instrument was created based on the UDL Guidelines-Educator Checklist developed by CAST.

Check here if observed	Students express their comprehension in multiple ways	What did you observe? Describe the evidence.
	Options for expressive skill and fluency <i>(e.g., choices of media for communication, appropriate tools for composition and problem solving, scaffolds for practice and performance)</i>	
	Options for executive functions <i>(e.g., support for goal setting, planning, strategy development, and management of information and resources; build capacity for progress monitoring)</i>	
Check here if observed	Students have multiple opportunities for engagement	What did you observe? Describe the evidence.
	Options for recruiting interest <i>(e.g., students have individual choice and autonomy; materials are relevant, valued, and authentic; learning environment is free of threats and distractions)</i>	
	Options for sustaining effort and persistence <i>(e.g., goals and objectives are salient; varied levels of challenge and support; support for collaboration and communication; mastery-oriented feedback is offered)</i>	
	Options for self-regulation <i>(e.g., support for personal goal-setting and expectations, coping skills and strategies, and the development of self-assessment and reflection)</i>	

Check here if observed	Students express their comprehension in multiple ways	What did you observe? Describe the evidence.
	Options for expressive skill and fluency <i>(e.g., choices of media for communication, appropriate tools for composition and problem solving, scaffolds for practice and performance)</i>	
	Options for executive functions <i>(e.g., support for goal setting, planning, strategy development, and management of information and resources; build capacity for progress monitoring)</i>	
Check here if observed	Students have multiple opportunities for engagement	What did you observe? Describe the evidence.
	Options for recruiting interest <i>(e.g., students have individual choice and autonomy; materials are relevant, valued, and authentic; learning environment is free of threats and distractions)</i>	
	Options for sustaining effort and persistence <i>(e.g., goals and objectives are salient; varied levels of challenge and support; support for collaboration and communication; mastery-oriented feedback is offered)</i>	
	Options for self-regulation <i>(e.g., support for personal goal-setting and expectations, coping skills and strategies, and the development of self-assessment and reflection)</i>	

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APPENDIX F: UDL LOOK FORS

School _____	Lesson Focus _____
Class/Content _____	Grade _____ Date of Observation _____
Look Fors	Observation/Notes
<p>1. Student Choices: Students are provided choices in how they gain information and show what they know <i>to support and challenge diverse learners.</i></p>	
<p>2. Flexibility in Teacher Presentations: Teacher presents information using multiple methods to complement text and verbal presentations <i>in order to support and challenge diverse learners.</i></p>	
<p>3. Metacognition: Students are provided ways to understand how choices in learning are designed to help them learn, plan for ways to learn that work best for them, and reflect if the choices they make work for them.</p>	
<p>a. <i>Framing Choices</i> – materials or presentations <u>describe choices</u> students have in the learning process and <i>explain why the teacher believes they may be beneficial for students</i></p>	
<p>b. <i>Coaching on Choices</i> – discussions or guidance are provided to students individually or in groups on which learning choices may work best for them</p>	
<p>c. <i>Reflection on Choices</i> – materials or presentations provide a <u>method for students to reflect on and/or plan for effective choices</u> in learning and demonstrating knowledge</p>	

These UDL Look Fors can be used to measure school, department or team trends related to UDL implementation that could be observed if one walks into a lesson. They are intended to complement other look fors schools may use (e.g. Skillful Teaching) and are not intended to be a comprehensive list of effective instructional practices. This is not meant to suggest that all these should or could be observed in the same lesson.

APPENDIX G: INTERVIEW PROTOCOL

CAST Professional Learning

Interview Protocol

PREFACE:

Thank you for agreeing to be interviewed. We really appreciate your time and willingness to provide more information about inclusive practices at your school. We are interested in finding out what schools are doing to support diverse students and to what extent Universal Design for Learning is being used. I will be using the acronym UDL for Universal Design for Learning. All information you provide will be confidential and your name/school name will not be used.

In the UDL in 1B Schools survey, you described how you address UDL in your classroom. The questions I will ask during this interview are designed to give me more information about inclusive practices at your school.

Demographic Information:

- Role(s):
- Grade/ages levels:
- Training/licensure:
- How long have you been an educator (in various roles)?
- Where did you get your degrees/training in education?

1. How did you learn about UDL [or inclusive practices/differentiated strategies) ?
 - Have you had UDL [or inclusive practices/differentiated strategies) professional development at your school (or elsewhere?)
 - Did you learn about UDL [or inclusive practices/differentiated strategies] in your teacher prep program?
 - Have you studied it on your own? How long have you known about/used UDL?
2. Describe the learner diversity you have your classroom and your school.
 - Do you have students who speak different languages? Are from different cultures? Have disabilities? Come from varied socioeconomic backgrounds?
 - Does your school provide training or support about inclusive practices for diverse learners?
3. Describe a lesson you Implement that uses UDL for inclusive practices/differentiated strategies).
 - Tell me more about the UDL components [differentiated components] of this lesson.
 - Tell me more about how the UDL components [differentiated components] of this lesson support diverse students
4. How do you use UDL when you design lessons? (How do you Integrate differentiated components when you design the lesson]
 - Do you proactively use UDL while planning the lesson?

- Do you apply UDL to goals, methods, materials, assessments?
5. In your opinion, how can UDL create a more inclusive environment in your classroom (or in your school)? [In your opinion, how can teachers create a more inclusive environment in your school?]
 - How does UDL support achievement for diverse students in your classroom?
 6. Tell me more about UDL [use of inclusive practices/differentiation at your school].
 - Do your colleagues use UDL when they teach?
 - How is inclusive education supported at your school by administrators
 - What are the barriers to inclusive education?
 7. What are some factors that facilitate your use of UDL [inclusive practices in your classroom/school?]
 8. What are some challenges to UDL [inclusive practices] Implementation? What additional support/resources do you need to implement UDL [Inclusive practices] in your classroom/school?
 - For an interviewee who does not know about UDL or whose school does not use UDL ask: Is there interest at your school to learn about UDL and inclusive practices?
 9. Any other comments?

APPENDIX H: LESSON ANALYSIS WORKSHEET

Your Name: General Education Teacher and Special Education Teacher

Lesson Information:

Lesson Title (and URL if applicable): Rules of Exponents

Lesson Goal: Demonstrate understanding of adding exponent

Brief Description of the Lesson: Use choice board for re-teaching, enrichment, and practice before formative assessment

<u>I. Provide Multiple Means of Representation:</u>	Present	NOT Present	Unsure	If it was present, where was it present? If it was not present, what did you change?
1. <u>Provide options for perception</u>				
1.1 <u>Offer ways of customizing the display of information</u>				
1.2 <u>Offer alternatives for auditory information</u>				
1.3 <u>Offer alternatives for visual information</u>				

2. <u>Provide options for language, mathematical expressions, and symbols</u>				
2.1 <u>Clarify vocabulary and symbols</u>				
2.2 <u>Clarify syntax and structure</u>				
2.3 <u>Support decoding of text, mathematical notation, and symbols</u>				
2.4 <u>Promote understanding across languages</u>				
2.5 <u>Illustrate through multiple media</u>				
3. <u>Provide options for comprehension</u>				
3.1 <u>Activate or supply background knowledge</u>				

3.2 <u>Highlight patterns, critical features, big ideas, and relationships</u>				
3.3 <u>Guide information processing, visualization, and manipulation</u>				
3.4 <u>Maximize transfer and generalization</u>				

II. <u>Provide Multiple Means for Action and Expression:</u>	Present	NOT Present	Unsure	Comments:
4. <u>Provide options for physical action</u>				
4.1 <u>Vary the methods for response and navigation</u>				
4.2 <u>Optimize access to tools and assistive</u>				

<u>technologies</u>				
5: <u>Provide options for expression and communication</u>				
5.1 <u>Use multiple media for communication</u>				
5.2 <u>Use multiple tools for construction and composition</u>				
5.3 <u>Build fluencies with graduated levels of support for practice and performance</u>				
6. <u>Provide options for executive functions</u>				
6.1 <u>Guide appropriate goal setting</u>				
6.2 <u>Support planning and strategy development</u>				

6.3 <u>Facilitate managing information and resources</u>				
6.4 <u>Enhance capacity for monitoring progress</u>				

III. <u>Provide Multiple Means for Engagement:</u>	Present	NOT Present	Unsure	Comments:
7. <u>Provide options for recruiting interest</u>				
7.1 <u>Optimize individual choice and autonomy</u>				
7.2 <u>Optimize relevance, value, and authenticity</u>				
7.3 <u>Minimize threats and distractions</u>				
8. <u>Provide options for sustaining effort and persistence</u>				
8.1 <u>Heighten salience of goals</u>				

<u>and objectives</u>				
8.2 <u>Vary demands and resources to optimize challenge</u>				
8.3 <u>Foster collaboration and community</u>				
8.4 <u>Increase mastery-oriented feedback</u>				
9. <u>Provide options for self-regulation</u>				
9.1 <u>Promote expectations and beliefs that optimize motivation</u>				
9.2 <u>Facilitate personal coping skills and strategies</u>				
9.3 <u>Develop self-assessment and reflection</u>				

Note. (CAST, 2020)

APPENDIX I: NCDPI CAROLINA SCHOOL DISTRICT DEVELOPMENT REVIEW

Developmental Review for Year 2020-21	
Date of Review: September 22, 2021	
LEA Name and Code: Carolina School District	
Year Joined NC SIP: 2016	
Level of Engagement: (Check One)	<ul style="list-style-type: none"> • Best Practice___ • Demonstration___ • Network <input checked="" type="checkbox"/>___
A: NC SIP PROJECT IMPLEMENTATION	
* The LEA's site information was updated prior to Nov. 1st via the online interactive database including Reading/Math Schools and Reading/Math teachers.	<u>Met</u> , Partially Met, Not Met, Not Applicable
Professional Development Events are promptly added to the NCSIP calendar.	Met, Partially Met, Not Met, <u>Not Applicable</u>
Online PD Evaluation Forms are completed or entered after each Foundations of Math and Reading Research to Classroom Practice event.	Met, Partially Met, Not Met, Not Applicable
Feedback from the online surveys is used to inform future professional development.	Met, Partially Met, Not Met, Not Applicable
* The NC SIP Expenditure Form was completed and submitted to State Consultant by March 31 st .	Met, Partially Met, Not Met, Not Applicable
The FINAL NC SIP Expenditure Form was submitted to consultant by September 30 th .	Met, Partially Met, Not Met, Not Applicable

<p>* The LEA formed an NC SIP Advisory Team that met at least two times a year to review and revise (if needed) the NC SIP Implementation Plan as needed.</p>	<p>Met, Partially Met, Not Met, Not Applicable</p>																								
<p>List the participants of the NC SIP Advisory Team and their positions: (Goal: to advise and provide different perspectives)</p> <table border="1" data-bbox="203 625 878 1081"> <tr> <td>Superintendent</td> <td></td> <td>NC SIP Coor.</td> <td>✓</td> <td>List Other:</td> <td></td> </tr> <tr> <td>EC Director</td> <td>✓</td> <td>EC Inst. Coach</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Curriculum Sp.</td> <td>✓</td> <td>Asst. Principal</td> <td></td> <td></td> <td></td> </tr> <tr> <td>Principal</td> <td>✓</td> <td>Parent</td> <td>✓</td> <td></td> <td></td> </tr> </table>	Superintendent		NC SIP Coor.	✓	List Other:		EC Director	✓	EC Inst. Coach				Curriculum Sp.	✓	Asst. Principal				Principal	✓	Parent	✓			<p>Anita Boyd, EC Director</p> <hr/> <p>Crystal Dixon, Curriculum /Principal K-3</p> <hr/> <p>Sherry Meador, Curriculum, Principal 4-5</p> <hr/> <p>Christy Caroon, NC SIP Coordinator</p> <hr/> <p>Melody Huffman, Parent rep</p> <hr/>
Superintendent		NC SIP Coor.	✓	List Other:																					
EC Director	✓	EC Inst. Coach																							
Curriculum Sp.	✓	Asst. Principal																							
Principal	✓	Parent	✓																						
<p>*The LEA formed a District Implementation Team. Check all active members of the team. Add additional titles of those that are active members of the multidisciplinary implementation team. (Goal: to implement the plan/initiative)</p> <table border="1" data-bbox="203 1455 878 1835"> <tr> <td>Superintendent</td> <td></td> <td>NC SIP Coor.</td> <td>✓</td> <td>List Other:</td> <td></td> </tr> <tr> <td>EC Director</td> <td>✓</td> <td>EC Inst. Coach</td> <td></td> <td>EC teacher</td> <td>✓</td> </tr> <tr> <td>Curriculum Sp.</td> <td>✓</td> <td>Asst. Principal</td> <td>✓</td> <td>Reg. Ed teacher</td> <td>✓</td> </tr> </table>	Superintendent		NC SIP Coor.	✓	List Other:		EC Director	✓	EC Inst. Coach		EC teacher	✓	Curriculum Sp.	✓	Asst. Principal	✓	Reg. Ed teacher	✓	<p>Met, Partially Met, Not Met, Not Applicable</p>						
Superintendent		NC SIP Coor.	✓	List Other:																					
EC Director	✓	EC Inst. Coach		EC teacher	✓																				
Curriculum Sp.	✓	Asst. Principal	✓	Reg. Ed teacher	✓																				

Principal	✓							
District Implementation Team meets regularly.								Met, Partially Met, Not Met, Not Applicable <u>Select One:</u> <ul style="list-style-type: none"> • Quarterly_____ • Monthly_____ • Biweekly_____ • Weekly _____ • Other <input checked="" type="checkbox"/>_____
District Implementation Team has an established a two-way communication protocol with feedback loops between district and schools.								Met, Partially Met, Not Met, Not Applicable
Co-Teaching								
<u>Check applicable:</u> LEA sent staff to Co-Teaching for Teachers <u> 0 </u> LEA hosted Co-Teaching for Teachers <u> </u>								Met, Partially Met, Not Met, Not Applicable Total number sent: <u> 0 </u> Total number attended: <u> </u>
<u>Check applicable:</u> LEA sent Co-Teaching for Administrators <u> 0 </u> LEA hosted Co-Teaching for Administrators <u> </u>								Met, Partially Met, Not Met, Not Applicable Total number sent: <u> 0 </u> Total number attended: <u> </u>

LEA <i>sent</i> teachers and/or training team to revised Co-Teaching professional development.	Met, Partially Met, Not Met, Not Applicable
Participant List promptly uploaded to NC SIP Site.	Met, Partially Met, Not Met, Not Applicable
Plan for developing instructors or increasing capacity.	Met, Partially Met, Not Met, Not Applicable
Please list Co-Teaching Instructors in your LEA:	Names/Titles: All of the active principals for the 2020-21 school year. <hr/> EC Director, EC teachers, selected regular ed teacher <hr/> <hr/>
<p><u>Please address items not met and additional activities related to Co-Teaching:</u></p> <p>With COVID-19 restrictions, Co-Teaching professional development through NC SIP was not available. To supplement the NC SIP Co-Teaching training that most of our staff has already received, relevant educators were selected to participate in an online course <i>UDL: A Framework for Addressing Learning Variability: Theory into Practice</i>. This 23 hour course focused on helping educators address learner variability and support all learners to gain the knowledge and skills they need to become strategic and self-motivated individuals. Participants included three high school administrators, EC Director, MTSS/Student Services Director, four EC teachers, and five regular education teachers. The District Implementation Team has been problem-solving ways to support co-teaching at the upper grades and this professional development addressed some areas of need. Student surveys (41 pre, 22 post) were administered to explore his/her experience in the co-teaching classrooms. Teacher surveys were also collected. Data analysis is ongoing.</p>	

APPENDIX J: PRE-PROFESSIONAL DEVELOPMENT STUDENT SURVEY:

UDL STUDENT FEEDBACK SURVEY WITH STUDENT DATA



UDL Student Feedback Survey

Please provide me with feedback about your learning! Read the statements below and then fill in the appropriate circle under your level of agreement with the statement. I truly value your voice and want to know how I can improve to be the best teacher I can be.

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
I understand why everything I am learning in this class is important.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
I feel safe and accepted in our classroom for who I am.		<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
My teacher really “gets” me and knows my interests, my life outside of school, and how I learn best.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
In this class, I am provided with choices for how I will learn new knowledge and skills.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I am having a difficult time in class, I know what strategies and resources to use to get back on track.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I love being a part of this classroom because the community feels like a family.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
I understand why everything I am learning in this class is important.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
I feel safe and accepted in our classroom for who I am.		<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
The class is designed so I always have the support I need in order to challenge myself.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
My teacher is great at helping me to believe in myself as a learner who can meet high expectations.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
I receive helpful feedback and tips from my teacher to help me reach my goals.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am provided with opportunities to reflect on my learning and think about what I need to work on to be a better learner.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am provided with choices in how I show what I have learned.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am allowed to use tools and technology to help me learn and show what I have learned.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**APPENDIX K: POST PROFESSIONAL DEVELOPMENT STUDENT SURVEY:
UDL STUDENT FEEDBACK SURVEY WITH STUDENT DATA**



UDL Student Feedback Survey

Please provide me with feedback about your learning! Read the statements below and then fill in the appropriate circle under your level of agreement with the statement. I truly value your voice and want to know how I can improve to be the best teacher I can be.

	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
I understand why everything I am learning in this class is important.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
I feel safe and accepted in our classroom for who I am.	x	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My teacher really “gets” me and knows my interests, my life outside of school, and how I learn best.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>
In this class, I am provided with choices for how I will learn new knowledge and skills.	x	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I am having a difficult time in class, I know what strategies and resources to use to get back on track.	<input type="radio"/>	<input type="radio"/>	x	<input type="radio"/>	<input type="radio"/>
I love being a part of this classroom because the community feels like a family.	x	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The class is designed so I always have the support I need in order to challenge myself.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My teacher is great at helping me to believe in myself as a learner who can meet high expectations.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Strongly Agree	Agree	Neither Agree or Disagree	Disagree	Strongly Disagree
I receive helpful feedback and tips from my teacher to help me reach my goals.	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am provided with opportunities to reflect on my learning and think about what I need to work on to be a better learner.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am provided with choices in how I show what I have learned.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am allowed to use tools and technology to help me learn and show what I have learned.	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am encouraged to set goals for my learning using my own interests.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am learning how to keep organized and create action plans for completing my work.	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Note. (Novak, 2020). *Novakeducation.com* .

