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Examining the Impact of a Professional Learning Community on Teachers' Awareness of Neurodiversity in the Classroom

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EXAMINING THE IMPACT OF A PROFESSIONAL LEARNING COMMUNITY ON
TEACHERS' AWARENESS OF NEURODIVERSITY IN THE CLASSROOM

by

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DEDICATION

This dissertation is dedicated to my mom for everything she has done to give me the life I never dreamed of. No one will ever be able to do what you have done to give me my best shot, even with all the odds you faced.

To my dad for his love, support, and always challenging me with conversations that make me think deeper.

To my bonus dad/stepdad for choosing to be another father to me when he was only a young 20s something and loving me as his own every day since.

To my grandmother for being the first teacher I watched go through her career and showing me how fulfilling it is.

To my husband for staying with me and supporting me through every change life has ever thrown us. You are the wind beneath my wings, and I could not have done this without you. Thank you for your love and continuous encouragement.

Finally, to myself. For trusting my process and completing a goal that felt impossible.

Never be so clever, you forget to be kind.

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ABSTRACT

In this action research study, the researcher sought to explore the influence of Professional Learning Community (PLC) participation on the recognition and awareness of general education teachers on neurodiversity in their classrooms. Additionally, the study aimed to investigate the effects of the teachers' awareness on their instructional approaches. The participants of this study hail from a variety of cultures and languages from around the world. Conducted over a six-week period in an international school in southern Germany, the participants demonstrated an enhanced understandings of neurodiversity through their engagement in the PLC sessions. The data collection tools used in the study were field notes, pre- and post- Likert scales, pre- and post- interviews, and weekly reflections by the participants. The study revealed that the increased awareness led to a positive impact on the support provided to students and showcased the beneficial outcomes of the PLC experience for teachers. Additionally, the research shed light on the significance of providing teachers with autonomy and the ability to choose their professional development opportunities.

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CHAPTER 1

INTRODUCTION

If we are to achieve a richer culture, rich in contrasting values, we must recognize the whole gamut of human potentialities, and so we weave a less arbitrary social fabric, one in which each human gift will find a fitting place.
                                        - Margaret Mead, Sex and Temperament in Three Primitive Societies

Disability activism has made major change in how society views and discusses ableism and disability. Singer (1998), Walker (2020), and Armstrong (2010) all note the impact of disability activism on the development of research of and vocabulary around neurodiversity. Eiler and D'Angelo (2020) explain disability activism to be a collective active movement against disability oppression. The societal perspective of human worth is often connected to capitalism and what a person is worth based on what they can do or sell. The views on disability have been no different. That is, capitalism and society's view of disabled people have been from an exclusionary deficit-perspective (Eiler & D'Angelo, 2020). To that end and much of the whole, society views neurodiversity with a deficit lens and defines divergent people by "what they can't do rather than by what they can do," (Armstrong, 2010, p. 15).

There are two models to consider in reference to disability. These are the medical and social models of disability. Eiler and D'Angelo (2020) argue that these models of disability are important perspectives to understand for appreciation of disability activism. The medical model is understood as the primary function relative to diagnose individuals' disabilities and rectify them. If medicine cannot rectify the disabilities, it will in turn

determine how much of society these individuals can participate in (Eiler & D'Angelo, 2020). The social model of disability was meant to be a direct opposition to the medical model. Michael Oliver's (1983) theory poses that it is not the impairment that creates the disability, but instead the society, and asserts that society should adapt and include those who are disabled, rather than the opposite (Eiler & D'Angelo, 2020).

The notion of neurodiversity, as a theory, entered the conversation in the late 1990's through the work of Judy Singer and Harvey Blume. The theory started with Singer's interest and passion as an advocate for autistic people, specifically her daughter (Singer, 1998). Singer's original dissertation surrounded diversity within the autistic community and recognizing the strengths of autistic people. However, the definition of neurodiversity has changed over time. Neurodiversity is the umbrella term used to describe differences in brain function and ability. The changes have included the addition of multiple disorders, including autism spectrum disorder (ASD). The other disorders considered under the neurodiversity umbrella are Attention Deficit Hyperactive Disorder (ADHD), intellectual disabilities, anxiety disorders, mood disorders, dyslexia, etc (Armstrong, 2010). An important aspect to note is that while neurodiversity has included these disorders, it is not claiming these to be autism or the same as autism.

The story of neurodiversity begins within the discussion of what it means to discover one's diversity. The language used, especially in academia, frames disability and neurodivergence with a deficit lens or an impairment (Morrison et al., 2019). Therefore, the goal of disability activism within the Neurodivergent community is to shift the paradigm and language discourse (Armstrong, 2010; Walker, 2021). Walker (2021) explains the paradigm as a "lens in which one views reality" (p. 14).

As neurodivergent ideas began to form, a main driving interest in those studying and discussing it was the move towards digital activism. After going online, Singer (1998) saw the depth of the discussions and topics. Walker (2021), Pearson and Trevisan (2015) also noted the rise in digital activism and the impact it has had. Pearson and Trevisan (2015) specifically notes blogs, Twitter, and Facebook being vital to the changing of policy and engaging others in activism.

The current understanding is that there is a correct way of developing in both physical and neurological (Ferenc, Byrka, & Król, 2021). The notion of a correct neurological development is what has become understood as being neurotypical. Singer (1998) offered some historical context of the term "normal" in her original thesis, noting that the term normal only entered the English language in 1840. Prior to this vocabulary, the closest notion of the word normal was the use of the word "idea" (Singer, 1998). Armstrong (2010) explains how the current culture and language used around disability creates a perceived "mental disorder" through the given social or historical expectations.

Understanding that neurodivergence is seen as a disability, it becomes important to develop a perspective of what it means to be normal or able. This ableist perspective can even be seen within the disabled community. After attending a forum where disability activists and academics alike spoke, Pritchard (2018) noted some issues within the accessibility for all at the event. They penned a thought-provoking response when stating, "if we wish to strive for better access and equality for all disabled people, then we need to ensure that as disabled academics and activists we are practicing what we preach," (Pritchard, 2018, p. 498). So, to make an impact in the large pond of ability

versus disability, we must have a better understanding of how others may think and use that in educating the next generation.

It is important to note that the terminology around neurodivergent people is multi-faceted. The previous consensus around how to describe people focused on using person-first wording, such as "a person with autism." However, there is a growing ideology that pushes back on this because the previous terminology can sound as though the person has an illness or disease (Fung, 2021). The newer terminology has the intention of describing the diagnosis as an identity instead. Some examples of this would be referring to people as autistic, dyslexic, dyspraxic, etc. (Fung, 2021). However, using either person-first or identity-first language is a personal decision, and both are meant to demonstrate respect towards neurodivergent people. The choice of how neurodivergent people are called is ultimately up to them. For the purposes of this study, I will use identify-first language in discussing neurodivergent people.

Problem of Practice

I am an educator at an International Baccalaureate school in Stuttgart, Germany. I teach a combined early years (ages 3-5) class. The school has two campuses with an average of 900 students in total. The community is primarily composed of German and American students, who are English-speaking. The campus where I work has two main languages, English, and German, and so, there are a high number of language learners. Teachers within the school come from various parts of the world and on average have over five years of teaching experience. The teacher turnover rate is quite low for my campus. The staff have anywhere between two and 25 years of experience in the school.

Many of the students come from military families, and so it is not uncommon for those students to spend only 2-5 years at the school.

In my experience, there have been multiple teachers in my community who have expressed interest in understanding the different diagnoses of our students. This interest in learning may provide us the opportunity to better understand others who are undiagnosed in our classrooms. An example of this is Karen (pseudonym), who is an experienced teacher with 20+ years teaching. She has struggled with the relevance of professional development as it relates to neurodivergent students. Karen explained to me during a planning meeting that she feels confident her students are learning, but questions how she can better support her students who show common signs of neurodivergence, with or without a relevant diagnosis.

While historically, the school has not had a strong student learning support system in place, it now employs both a psychologist and a learning specialist. These two staff members often reach out to offer support to teachers, like Karen, but there is not always enough time for the discussions to happen regularly or develop stronger applications within the classroom. Other teachers have expressed frustrations about this lack of access to the support systems in place, as well.

A teacher's experiential knowledge of supporting students' needs does grow as their career progresses, so it is expected that a teacher with more experience should have a better understanding of different disorders or disabilities; however, research has shown that there is at least one student with features of Attention Deficit Hyperactive Disorder (ADHD) in a classroom (Hosseinnia et al., 2020) and Autism Spectrum Disorder (ASD) is recognized as the most common neurological disorder in children (Lindsay et al.,

2013). These two points led the question of is it worth the risk of under developing teachers around these and other neurodiversities. Yet with the commonality of neurodivergence, a teacher receiving minimal regular professional development around best practices leaves both teachers and students lacking the support they may need.

The problem of practice this study seeks to explore is the awareness level that general education teachers possess to understand and implement best practices for creating an inclusive classroom environment for neurodivergent students (neurodivergent students are identified as students who are autistic, have attention deficit hyperactive disorder, attention deficit disorder or dyslexia, etc.).

Research Question

To what extent does participation in a Professional Learning Community (PLC) have on the awareness level of 9 teachers seeking to foster an inclusive classroom setting when working with neurodiversity and neurodivergent students at a K-10 setting?

As a result of participating in a PLC that is focused on working with neurodiversity and neurodivergent students, how have the pedagogical approaches changed among 9 educators in a K-10 setting?

Purpose Statement

The purpose of this study is to examine to what extent does participation in a PLC have on the awareness level and pedagogical approaches of 9 teachers seeking to foster an inclusive classroom setting when working with neurodiversity and neurodivergent students at a K-10 level.

For the purposes of this study, a PLC is defined as a social learning space where teachers are organized and work towards a shared goal that allows participants to interact

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and grow professionally (Hagenah et al., 2022). Moreover, for the purposes of this study, awareness is defined as the teachers' ability to understand the characteristics of neurodiversity within a classroom setting and reflect on their practice. Finally, for the purposes of this study, neurodiversity is defined as the vast differences in brains and neurological functions amongst the general population and neurodivergent is defined as "having a mind that functions in way that diverges significantly from the dominant societal standards" (Walker, 2020, p. 34). Neurotypical is defined as a person whose neurological, cognitive processing corresponds to the established societal norms (Legault, Bourdon, & Poirier, 2021).

Theoretical Framework

This action research study is rooted in social constructivist theory and Theory of Action for Teacher Leadership, (York-Barr & Duke, 2004). It is also grounded by learner centered curriculum theory, or inquiry-based learning.

Social Constructivism and Social Learning Theory

Vygotsky is credited as the founding theorist of social constructivism, which describes the student learning, the teaching approaches, and how this impacts one another (Walker & Shore, 2015). Social constructivists believe that knowledge and learning are built upon or improved by a collective process of creation (Bereiter, 1994). In other words, working in a social constructivist classroom, teachers will act more like facilitators or coaches, rather than information transmitters (Walker & Shore, 2015).

Social learning theory focuses on understanding, predicting, and reshaping a person's behaviors (Bandura & Hall, 2018). Bandura (1969) also explained that Social Learning Theory posits the idea that people will modify each other's behaviors through a

reward and punishment process. This compares to Social Constructivism as people are working together to decide the acceptable behaviors, learning from one another, and from life experiences.

Methodology

In an investigation conducted around teacher awareness, Lindsay et al. (2013) explained that the teachers with whom they worked noted the need for training, through formal workshops or even informal training from knowledgeable teachers within their school community. Inspired to do this, I developed a mixed methods study on teacher professional development around the specific topic of neurodiversity. Teachers met for a professional development PLC meeting on a weekly basis. I worked with the student learning support team at my school (Special Education teacher, school psychologist/counselor) to plan some parts of the PLC meetings to be intervention style and to give facts and strategies around different common neurodivergent disorders (Autism, ADHD, dyslexia, etc.). After the intervention session, there was a "pastoral" style discussion for the last 30-45 minutes of the meeting. The student learning support team included specifically the school Special Education teacher and the school psychologist/counselor.

Prior to the start of the study, the teachers completed a Likert scale and met for an interview with me as the researcher to gather prior knowledge data on what teachers know, understand, and believe about neurodiversity and neurodivergent students. The participants completed this same scale and joined in a post interview at the end of the study to gain understanding of what was learned because of the PLC intervention. The participants also journaled weekly, reflecting on each PLC session. Finally, the

participants answered pre-planned and prepared journal questions to create weekly reflections after each PLC session.

Finally, I participated in the interventions as a participant-observant. I also completed observations as field notes to record what happens in each session. These field notes helped to paint a picture of the setting in each session, the mood of the participants, and a realistic record of how the communication worked between staff.

Significance of the Study

This study is important for my school and my practice, since we have a population of neurodivergent students that grows each year. Near my school, there is a United States military base, which also has their own school. However, due to shortages in staffing and restrictions on attendance, this school is unable to help students who may need extra support. The US government aids the families through other off-base programs or helping families pay to send their students to a school with better resources. The goal of this research is to help the teachers within my community by offering guidance in using the tools available within our community.

Additionally, there is also potential for this to be a guide for other international school environments. Herr and Anderson (2015) explain that action research is usually not statistically generalizable, however, the knowledge can be transferred. If this study shows promise, it could be used as a model for other schools to provide continued education for their staff. The context of using PLCs can be beneficial for all teachers and may also contribute to the literature on PLCs.

Summary of the Findings

The findings of the study showcased how the participants were impacted by their participation in the PLC. Each participant was impacted slightly differently, but the overall reach was that all were able to feel more confident in recognizing and addressing neurodiversity in their classrooms. After analyzing the data, there were five major themes that were revealed. These themes were evolving perspectives of neurodiversity, greater appreciation for and positive impacts of professional development, enhanced awareness or mindfulness of others, planning and implementation for inclusive teaching, and shared learning.

The participants indicated through each of the data collection tools that they had improved their understanding of neurodiversity as a concept. The participants shared how neurodiversity impacted their classroom practices as well through their weekly reflections and interviews. The positive impact of the PLC was also indicated through the request of more support and collaboration from the participants in their weekly reflections. Finally, the participants shared how the impact of having their voice and choice in the discussions and their own professional development encouraged them to continue learning.

Positionality

Jenset et al. (2017) noted that "although teacher candidates have always learned about learning theories in teacher education, the actual learning of the pupils- and how the teacher candidates can analyze, interpret, and diagnose individual pupils' learning- may not be emphasized enough" (p. 192). For me, this lack of investment in my undergraduate studies and experiencing a variety of neurodivergence in my classrooms

led me to investing in my own learning about how to best support those students, whether they qualify for external support or not.

In my experience teaching in three different countries (U.S., Taiwan, and Germany), there has seemed to be a common gap regarding teacher understanding of neurodivergent students. From a social justice perspective, a common way of viewing people whose brains work differently is one that comes from the deficit view (Morrison et al., 2019). This viewpoint has implications regarding student success in school. Therefore, rather than celebrating the neurodiversity seen, often schools "medicalize and pathologize those differences by saying, 'Johnny has autism. Susie has a learning disability. Pete suffers from attention deficit hyperactive disorder.'" (Armstrong, 2010, p. 2). The viewpoint that needs to be fostered is one that is celebratory in nature when working with neurodivergent students. My position as a teacher requires me to research and apply instructional best practices for all students in my classroom. Though I believe the increased awareness will improve the instructional methods teachers use in the classroom, as the participant-researcher, I can view myself and my own practices with the same critical lens in my study.

I believe that often people believe that equity applies only to race, language, social status, etc., however, this topic applies in multiple other contexts as well. Special education in a neurotypical environment and the recognizing of the mental health of our students is just as important in the discussion of equity in schools. There are multiple different next steps that can be taken to address gender equity, racial equity, etc. within this context also. A first step towards equity is simply engaging with this topic and doing

the work to ensure your classroom, school, and community are doing what is possible to develop best practices and open conversations.

Dissertation Overview

Chapter One has introduced the study and the framework for it. Following this chapter, the rest of the dissertation will provide the detailed information for the study, as well as the results and summary.

Chapter Two will provide a detailed review of the relevant literature related to the study. This literature includes neurodivergence, PLCs function and implementation, disability activism and the history of special education, deficit-perspectives of those with learning disabilities, and the growing conversations around terminology of disabilities.

Chapter Three will cover the methodology of the study. This will include the PLC set-up and schedule, questions for teacher's reflection notebooks, as well as pre- and post-PLC Likert scale questions. This chapter also details the participant selections, data collects, and analysis tools.

Chapter Four includes the findings from the study. This will explain themes that found in the study, and the data collected. All conclusions made will be detailed in this chapter.

Chapter Five serves as the summary of the dissertation. It will include the implications for future practice and provide recommended action post-study. These findings will be contextualized through the unique perspective of the international school in Germany.

Definition of terms

1. **Neurodiversity**: the vast differences in brains and neurological functions amongst the general population (Walker, 2020).

2. **Neurodivergent**: "having a mind that functions in way that diverge significantly from the dominant societal standards" (Walker, 2020, p. 34).

3. **Professional Learning Community**: a social learning space where teachers are organized and working towards a shared goal that allows participants to interact and grow professionally (Hagenah et al., 2022).

4. **Awareness**: teachers' ability to understand the characteristics of neurodiversity within a classroom setting and reflect on their practice

5. **Neurotypical**: a person whose neurological, cognitive processing corresponds to the established societal norms (Legault, Bourdon, & Poirer, 2021).

CHAPTER 2

LITERATURE REVIEW

Through their education programs in a university setting, teachers learn about curriculum and theories of educational approaches. This learning is continued through professional development when they become qualified teachers. Moreover, during their career, they will meet with a special education teacher or a learning support specialist regarding students who are diagnosed with disorders or disabilities that require extra support (Gebhardt et al., 2015). These meetings discuss concepts related to general strategies teachers can incorporate with their students with disabilities or disorders. Teachers will also use a detailed explanation of a student's specific needs and strategies to be implemented for them, which is called an Individualized Education Plans (IEPs). The IEPs are key plans in helping diagnosed students be successful.

All students benefit from teachers using multiple instructional strategies, however, students who are diagnosed with different disorders also require specific instructional strategies. Yet, many general education teachers are not given specific training or continued education on how to approach classrooms with possible undiagnosed students. Also, the problem of stigma around receiving a diagnosis and the possibility of a parent's reluctance would cause these students to come into the classroom to teachers who may be under prepared to teach them (Miškolci et al., 2021).

To that end, this literature review will focus on learning through a social constructivist, social learning theory, and inquiry-based learning. It will also address

research on Professional Learning Communities (PLCs) and best practices for these. Moreover, this review will look at undiagnosed disorders in the classroom, specifically addressing Autism and ADHD, but including other disorders or disabilities that fall under neurodivergence. Finally, this review will discuss what research says about inclusive classrooms and how teachers can support all students.

Literature Review Methodology

In gathering information, I used online sources such as Google Scholar and the University of South Carolina's online library. I reviewed books written by neurodivergent-identifying people, as well as books written with the intention to describe different aspects of neurodivergence. I focused on finding information regarding neurodivergence and the main components of it, as well as how neurodivergence is represented, supported, or discussed in an educational setting.

Theoretical Framework

This action research study is rooted in constructivist theory, social learning theory, and inquiry-based learning. This study is also grounded in the learner centered curriculum theory. Constructivism is based on the thought that learners create their own meaning based on their own prior knowledge, believing that learning is social, and that people learn through their own experiences with others and their environment (Applefield et al., 2000). Constructivism is traced back to theorists such as, John Dewey, Piaget, and Vygotsky. However, it is important to note that constructivism cannot be represented by one voice or universal perspective (Applefield et al., 2000; van Hoover & Hicks, 2017). This is important as it identifies that there are multiple understandings and approaches to learning, which is the focus of the theory itself.

Constructivism

Brophy (2002) explains that constructivism is a theory of learning more than it is a theory of teaching. Constructivism can be seen as a vision for life and society. The constructivism paradigm asserts that "people construct their own understanding and knowledge of the world through experiencing things and reflecting on those experiences" (Adom et al., 2016, pp. 2).

There is no single one way to define constructivism, yet there are four main tenets to constructivism. A summary of these tenets by Dolittle and Hicks (2003) are

Tenet 1: knowledge is not passively gathered but is actively cognizing work by the individuals.
Tenet 2: cognition is an adaptive process with the goal of making a person's behavior more viable within a particular goal or environment,
Tenet 3: cognition helps to make sense of one's experience and not to create an external reality,
Tenet 4: knowledge has roots in multiple areas: biological, social, cultural and language based.

Through a constructivist perspective, there is a learner centered model of learning at work, with students actively making new meaning for themselves (Clark, 2018). Constructivists intentionally incorporate multiple learning strategies into the learning environments. These could include authentic activities, reflective practices, collaboration, and context/content dependent knowledge making (Mergel, 1998), allowing the learner to construct their own picture of knowledge (Pritchard & Woollard, 2010). In other words, students will naturally create personal meaning and gain knowledge through experiential learning, by participating in hands-on and active learning events (Chuang, 2021).

Social Constructivism

Another aspect to constructivism is the idea of social constructivism. Vygotsky is credited widely as the founding theorist of social constructivism. Vygotsky is seen as one of the most important educational psychologists of the 20th century. Originally from Russia, his theories around the development of the mind extended far beyond his provincial home. His work focused on case studies and was grounded in his previous experience as a teacher. Though he died early at only 37 from tuberculosis, his hopes for the continuation of his studies were clear, with his priorities and methods as well (Barrs, 2021).

Social constructivism is a process that integrates the student learning and the teaching combined (Walker & Shore, 2015). Social constructivists believe that knowledge and learning is built upon or improved by a collective process of creation (Bereiter, 1994). Vygotsky believed that the mind is formed through interaction with others (Barrs, 2021). Social constructivism can often be seen as an alternative to traditional learning. That is, when working in a social constructivist classroom, teachers will act more like facilitators or coaches, rather than information transmitters (Walker & Shore, 2015; Logan, 2015).

Within the field of education, there is great emphasis on the social context of the learning. As students work independently, social constructivism argues that they can incorporate what they know from their culture and language. However, when working with others who are more knowledgeable in a concept or topic, students can gain thinking skills and other community concepts, such as social skills and new perspectives (Pritchard & Woollard, 2010). This indicates that students are building on their own knowledge by gaining not just information but social perspectives as well.

Vygotsky (1978) explains student learning through the zone of proximal development (ZPD). The ZPD has been defined as the distance between the student's actual development level when solving a problem individually and the level of potential development when working on problem solving with more capable peers (Eun, 2019). The ZPD has helped to guide researchers toward focusing on how individual cognitive processes occur in human interactions. (Eun, 2019). Vygotsky has also explained that verbal communications between students or between students and teachers is a powerful force in helping students acquire conceptual knowledge (Walker & Shore, 2015). Through the ZPD, students are actively challenged with learning materials that would be difficult for them to complete alone but they would be able to learn it when working with someone else (Chuang, 2021).

Inquiry-based programs

Inquiry-based learning uses a learner-centered approach, which is based on student interests or curiosities (Walker & Shore, 2015). An example of an inquiry-based curriculum is the International Baccalaureate's Primary Years Programme, which is the curricular program that is used by most of the teachers who participated in this study. Benefits of this program include improved achievement, improved knowledge application and thinking skills, improved problem-solving skills, and improved attitudes towards learning (Saunders-Stewart et al., 2015).

Using an inquiry-based, learner-center approach, teachers can allow more diversity that may not be seen within a traditional classroom setting (Walker & Shore, 2015). Teachers will be able to address students' interests and needs in their everyday lessons and activities. A key aspect of learner-centered or inquiry-based activities is the firsthand

experiences with reality that students will face through their learning (Schiro, 2013). These experiences lend to a constructivist approach to learning, as going through the experiences allow for space in how the students gain knowledge. Learner-centered, inquiry-based schools also believe that students grow and learn through their own intellectual, social, emotional, and physical experiences and at their own rates, rather than in a uniform way (Schiro, 2013).

Learner-centered education has taken the stage in early years and primary education classrooms (Ang, 2016). Furthermore, there is a call for more learner-centered education and inquiry-based classes in higher education as well (Cleveland-Innes & Emes, 2005). This suggests that higher education teachers would need to adjust in nurturing the growth of the students. Teachers take on three critical roles in this format of a school: observer and diagnostician of learners, provider of the environment for learning, and facilitator of student learning (Schiro, 2013).

For teachers to become successful learner-centered educators, they need to better understand the concepts, knowledge, and skills to approach in an inquiry-based lesson (Polly & Hannafin, 2011). In creating a successful transition to this learning approach, this process also requires the school leadership and staff to go through this process of gaining the skills needed to be learner-centered (Polly & Hannafin, 2011).

In the context of this study, which is addressing how teacher support and growth can impact student learning, Wyse et al., (2016, pg. 311) explains a concern relating to curriculum development and effective teaching:

There is concern that attempts to codify teaching will develop into a 'technicist'

vision of effective teaching. Such a vision may quickly lead to lists of essential

capabilities and competences to be developed through professional development that
do not take into consideration the overarching need of teachers to be able to be
responsive to the needs of diverse students in complex and uncertain contexts.

Neurodiversity

Society generally accepts one typical way to learn, process, and reason through life.
This creates a version of the typical brain and person, and those who operate outside of
this typical are considered atypical (Vishwanath, 2020). The process of recognizing
differences in the human ability can lead to people being put into different boxes or
categories by others based on where they fall on the typical or atypical litmus test. This
process of categorizing people based on ability and measuring them using a single
standard ruler can cause a loss in human potential, Vishwanath (2020) explains. Jurecic
(2007) validates this by explaining that we must be able as a society to recognize that
some differences are biologically constructed, while others will be culturally constructed.
Society must be able to step outside of the hypothetical ruler used to measure the
standardization of people and recognize that diversity exists in how people think.

Many of the diagnoses that relate to neurodiversity are considered a disability. Which
brings a discussion around the social model of disability, which was defined by Oliver
(1983), cited by Fung and Doyle (2021), as socially constructed oppression. den Houting
(2019) continues this definition by explaining that this means society views a
neurodivergent person as disabled since the environment they are in does not
automatically accommodate for their needs. Essentially, it is not the impairment that
limits their success, but it is the environment not being made for them or allowing for
diversity to accommodate for them.

Neurodiversity has been defined in this study as the vast differences in brain and neurological functions amongst the general population. Fung and Doyle (2021) explain that neurodiversity is a concept that regards differences in brain functions and behaviors as a type of normal variation in the human population. This indicates that diversity is normal, rather than being abnormal. As an aspect of diversity, both Fung and Doyle (2021) and Jurecic (2007) note that neurodiversity has not been as clear in the advocacy process as other demographic diversities, such as race, gender, sexual orientation, religion, and educational backgrounds. Vishwanath (2020) takes this claim a step further by noting that race and gender discrimination specifically receive stricter levels of review than discrimination because of disability. This means that the intersectionality of disability and other diversities is important, but the attention given to neurodiversity alone does not receive the same level of investigation and support as other demographics.

The neurodivergent movement and disability activists are often calling for change to support people affected by society's view of disability. In addition, there is variety within the neurodiverse community, which can cause higher-functioning individuals to have limited access to the same supports as their lower-functioning counterparts (den Houting, 2019). High functioning is those who can generally function well in society by copying the behaviors of others, or masking. Low functioning is defined as those who cannot function in society without extensive support or help. It is also noted that these calls for services that are aimed at improving the subjective quality of life of neurodivergent people, while also still respecting their ways of being and living. This means not wanting to change the individual on a personal level but ensure that the environment can support them. Some other main goals of the activism include helping others to recognize the

characteristics of neurodiverse people, fighting for the civil rights of neurodiverse people, and ensuring that high-functioning people also have access to the appropriate services needed (Fung & Doyle, 2021).

While the term and idea of neurodiversity originated from Judy Singer (1998) and her research related to her daughter's autism diagnosis, the current consensus of what is classified as neurodiversity or neurodiverse includes a variety of diagnoses. These are autism spectrum disorder, Attention Deficit Hyperactive Disorder (ADHD), intellectual disabilities, anxiety disorders, mood disorders, dyslexia, etc. (Armstrong, 2010; Fung & Doyle, 2021). Two of the more common disorders known and discussed (ASD and ADHD) are outlined below.

ADHD and ASD

Attention Hyperactivity Deficit Disorder (ADHD) causes attention problems, impulsivity, hyperactivity, and can cause impairment in everyday life (Madsen et al., 2017). There is much debate over the commonality of the diagnosis. ADHD is now the most diagnosed childhood mental health disorder (Owens, 2020b). However, there is more debate over the under-diagnosis of ADHD as well, specifically in girls, Madsen et al. (2017) explains. Girls with ADHD tend to exhibit lower levels of disruptive behavior and higher levels of inattentiveness, and internalizing symptoms than do boys, which make them less likely to disrupt the classroom and may be more readily overlooked.

One essential piece to the diagnosis and management of ADHD in schoolchildren is the support of classroom teachers (Hosseinnia et al., 2020). Yet, teacher knowledge is not sufficient in understanding and supporting ADHD in the classroom, and so there is a need for intervention (Hosseinnia et al., 2020), such as professional development training.

Autism Spectrum Disorder (ASD), like ADHD, is also considered one of the most common neurological disorders in children, affecting communication and behavior, with characteristics such as patterns of behaviors, interests, and activities (Lindsay et al., 2013; Sun et al. 2015). Students with ASD may have trouble understanding their relationships with peers and others in the school environment which can result in stress and anxiety (Lindsay et al., 2013). There are multiple types of ASD, including: childhood autism, Asperger's syndrome, atypical autism, and pervasive developmental disorders (Sun et al., 2015). The Diagnostic and Statistical Manuel of Mental Disorders (DSM) 5 is the current common assessment that supports diagnosis of ASD, placing all the different categories of ASD into the collective title of autism spectrum disorder or ASD (American Psychiatric Association, 2013). The purpose of developing a collective title was to work towards giving more accurate diagnoses, identifying symptoms easily, and assessing the severity levels with more ease (American Psychiatric Association, 2013). As the understanding of ASD as an umbrella term has continued, it has been reported in developed countries at increasing rates, in both western and eastern societies (Sun et al., 2015).

Undiagnosed disorders- assessment and in-class support

Schools require screenings for hearing and seeing, but it is not universal to require a screening for students who may have trouble in social settings, (Smith et al., 2015), which can allow undiagnosed students to slip into classrooms without the knowledge of schools and without the support they may need. Students like these slip through the cracks easily especially since their peers who are showing with more severe disabilities can secure accommodation and noticing by the staff (Schechter, 2018). That is not to say

that these students do not deserve the support, but that they are able to guide themselves through schooling without it, which is often referred to as masking.

Although teachers are not clinical professionals in psychiatry, they can be important pieces in diagnosing behaviors, as they are with students every day throughout each year, observing repeated observations of behaviors and actions (Smith et al., 2015). This opportunity to view behaviors and actions every day, and in settings that parents and clinicians may not be able to observe, allows teachers to have the opportunity to recognize common behaviors and move to support them (Davis, 2018). However, teachers may not always receive support or have their opinions valued in this context, as they are not mental health professionals (Smith et al., 2015). This lack of support or inclusion would seem to lead teachers to be more hesitant about sharing their thoughts about a possible undiagnosed disorder.

Vishwanath (2020) details how the lack of equal education for neurodiverse students can lead to a struggle with underemployment or criminal justice later in life. Jurecic (2007) cites Mike Rose explaining how The Language of Exclusion is commonly seen in schools. The Language of Exclusion includes labeling students which reinforces the idea that some students may not have a rightful place in academia due to their disability. The analysis of how schools and society as a whole view neurodivergence shows the value that society places on both the potential and the contribution of neurodiverse people (Vishwanath, 2020). In education, the goal should be to reduce and resist the singular explanation for poor school performance, which would not diminish students solely based on their diagnosis or future diagnosis.

The fear of labeling and use of exclusionary language is happening worldwide, not just in the United States (U.S.). In Sun et al. (2015), the researchers examined the underdiagnosis and prevalence of autism spectrum disorder (ASD) in Beijing, China, finding that when using the Childhood Autism Spectrum Test (CAST) in a translated form from English to Mandarin, the CAST was able to diagnose ASD with the same prevalence as other developed countries. Other research such as, Baren-Cohen et al. (2009), found that in many developed countries, the prevalence of ASD had increased from 30.8 per 100,000 in 2000 to 100 per 100,000 in 2009.

There are a few different strategies or testing methods used commonly to assess a student's mental health or for assessing disabilities. This is important to understand, as mental health is a continuously changing and growing field of study, and so a key strategy for testing and diagnosing students is the teacher's observations and knowledge of different disorders that may present themselves in the classroom (Smith et al., 2015). \. The assessments range in variety and include, but are not limited to, the Autism Spectrum Screening Questionnaire (ASSQ), Childhood Asperger Syndrome Test, Krug Asperger's Disorder Index, Strength and Difficulties Questionnaire (SDQ), and the Childhood Autism Spectrum Test (CAST) (Sun et al., 2015; Lindsay et al., 2013). While the DSM-5 diagnostic criteria for ASD includes that an individual may show signs at any age, it is also clear that in their early childhood age they must also have had evidence of the impairment (Smith et al., 2015). To receive the diagnosis of ADHD according to the DSM-5, an individual must show six out of nine symptoms of inattentiveness, hyperactivity, or impulsivity in multiple settings (Hosseinnia et al., 2020).

The ASSQ has 27 questions, while the Childhood Asperger Syndrome test has 37 questions that are scored with two options: present or absent (Smith et al., 2015). The Krug Asperger's Disorder Index has a total of 32 items, which allows that the first 11 items are designed for screening and the remaining 21 are only administered if a specific threshold is crossed within the first 11 items (Smith et al., 2015).

The CAST was developed in the UK and was specifically designed for elementary aged students, aged four to 11. The CAST has 37 questions that are parent-completed, with 31 of them being scored. It has been shown that a cutoff number of 15 can support a diagnosis of ASD (Sun et al., 2015). Sun et al. (2015) was the first study to translate the CAST into Mandarin Chinese and test the efficacy cross-culturally. To develop a universal screening in elementary schools, there should be substantial time put into developing questionnaires that are general in purpose, easy to use, and technically adequate (Smith et al., 2015).

A common way of supporting students is through an Individualized Education Plan (IEP) or a 504 Plan. Both were created in the US under Section 504 of the Rehabilitation Act of 1973. The US-based Individuals with Disabilities Education Act (IDEA) allows for students who are eligible to have modifications to the curriculum, specifically through an IEP (Schechter, 2018). While these are not international plans, these can translate to other countries and cultures. For example, Rakap et al. (2019) researched how completed IEPs are in Turkey. The findings of this study showed that many of the IEPs for students already diagnosed within Turkey lacked many of the legal and recommended components (Rakap et al., 2019). The recommendation discussed from this study said assessing the transition process from grade level to grade level (including from elementary to middle

school) and supporting those students as they move on, as well full involvement from the parents with the IEP process (Rakap et al., 2019). These recommendations can be used worldwide in developing a plan for supporting students, both diagnosed and undiagnosed.

Since teachers are key parts of the diagnosis and support of students who are currently undiagnosed. Training, knowledge, and opinions are key factors in how the inclusion of these students into their classrooms goes (Miškolci et al., 2021). Each child deserves a strong education support system and teachers who are knowledgeable about their needs. Inclusive classrooms are designed to support all student's needs, including mental disabilities, physical disabilities, sexual orientation, race, socioeconomic class, etc.

Inclusive Classroom

The inclusive classroom is a rather common phenomenon in today's world (Malins, 2015). With the use of the least restrictive environment approach to schooling, more students with mild to moderate learning disabilities are staying in the mainstream classroom. Teachers must change some of their approaches to curriculum and instruction to provide the learning environment for all students.

What is inclusion?

The main purpose of inclusion is to allow and ensure effective learning for all students within the same classroom, even if they are working at different academic achievement levels (Garrote, 2020). Malins (2015) adds to this definition by inclusion of others, but also the treatment of others with respect and equity. Teaching others to be inclusive can be a difficult task at times, as it is in human nature to learn more towards a homophily process. Homophily is the peer selection process that lends people towards

finding peers who have similar characteristics as themselves (Garrote, 2020). This challenge of creating a classroom where all students are safe, welcomed, and supported can be a difficult task.

Inclusive classrooms in countries that have a diverse population, such as the U.S. and Canada, neurodiversity may be found more commonly (Malins, 2015). Whereas cultures that may still be learning how to navigate more diversity within the context of their homogenous society (Sun et al., 2015) may have trouble implementing inclusive classrooms. This can be seen in the lack of inclusion of people with classic autism in the mainstream in China (Sun et al., 2015). As vital workers, it is key for educators to embrace and create spaces and practices that liberate opportunities rather than limiting them and closing the idea of diversity in human experiences (Meyer, 2007), which will continue to teach and educate the public on how society can modify to include people who are neurodiverse in equitable ways.

There are multiple models of inclusion that can happen in the classroom. These models help to guide teachers and students along the learning journey and to find a balance for all in the classroom. The important focus of a teacher's approach is that knowledge that what child experience in the classroom may come from curriculum, but also what they may experience would come from the hidden curriculum. The hidden curriculum is the curriculum that may not be written, but is still taught in some manner (Malins, 2015).

Fostering Inclusive Classrooms

Race, class, gender, socioeconomic status, etc. compose a Diversity, Equity, Inclusion, and Justice (DEIJ) group's main focuses. However, it is important to

underscore that there are some differences that are biologically made and others that are culturally constructed (Jurecic, 2007). Vishwanath (2020) also explains that race and gender discrimination receives stricter levels of attention and review than disability discrimination does. Fung and Doyle (2021) refer to this as demographic diversity, whereas neurodiversity is closer in relation to cognitive diversity. In having an inclusive classroom approach, teachers often aim to address the demographic diversity, but not cognitive diversity as often.

Teachers need to enter the inclusive classroom with an open mindset and ensure that they are not viewing the students who have disabilities as "extra work" but rather as a part of their classroom community (Saloviita & Schaffus, 2016). One approach to inclusion within the classroom is special education students stay in a general education class for majority of the day. Teachers will work with all students in the classroom, but for some time of their day, the special education students would leave the classroom to receive targeted support from the special education teacher. If students with disabilities spend their entire day in the general education classroom with non-disabled classmates, this is considered a least restrictive environment (Tyler, 2021).

Another approach that is commonly used for supporting students in inclusive classrooms is the use of co-teaching, where there are two or more professionals instructing a diverse or blended group of students in a single space (Alnasser, 2021). Co-teaching can be a difficult practice for teachers to master, but it can also be very powerful in supporting a diverse range of students. This method can allow students to receive the general curriculum and receive the specialized instructional strategies offered by a special education teacher (Alnasser, 2021). If co-teachers can work together, it poses the greatest

potential for improvement in student achievement for students with disabilities (Fennick, 2001). However, when considering doing co-teaching or collaboration between teachers, it is important to note that the way that teachers work together is important (Gebhardt et al., 2015). One study reported on by Gebhardt et al. (2015) showed that special education teachers working in co-teaching environments with general education teachers often took a backseat role in the classroom.

Challenges of inclusive classes

Gebhardt et al. (2015) studied the relationship and cooperation between co-teachers in inclusive classrooms (general education teachers and special education teachers) in Austria. They found in this study that inclusive practices are better implemented in secondary education than primary education. They also found that teachers are not necessarily properly trained in providing strong inclusive instructional practices (Gebhardt et al., 2015). This has been reiterated by other studies as well, such as Argyropoulos and Nikolaraizi (2009), Wasburn-Moses (2009), Leko and Brownell (2009), and Stivers, (2008).

In his book, *Classroom Management in Teacher Education Programs,* Davis (2018) explains that in teacher education programs, there is not much emphasis on teaching behavior management. Much of what is taught regarding behavior management is taught in special education programs more so than in general education programs (Davis, 2018). This idea of classroom management having a stronger focus in special education programs does leave the stigma on special education as being "other" when compared to general education (Davis, 2018).

Another challenge of inclusive classrooms is ensuring the classrooms are a welcoming environment for all students. In their study, Garrote (2020) assessed how a student's academic achievement and social interactions affected their homophily or interactions with others like them in inclusive classrooms. Garrote (2020) found that academic achievement was not significant on the homophily that students had. This confirmation then allows us to understand the intricate aspects of inclusive classrooms and the need to build a community that is open to and accepting of all people who enter.

Professional Learning Communities

The use of Professional Learning Communities (PLC) in the educational world has become a growing practice in recent years. There are many definitions of what constitutes a PLC but there are many commonalities within these descriptions. That is, a main idea of a PLC is that it is a group of professionals that are meeting with a common and shared vision that should result in a change in the environment (Schuck et al., 2013; Richmond & Manokore, 2011; Thornton & Cherrington, 2019; Brodie, 2021). Brodie (2021) also highlights that PLCs are meant to create sustainable spaces for ongoing professional development (PD), which will look different from the PD that teachers typically received.

Goals of PLCs are vast, but generally the aim of a PLC is to improve the practice of teachers by learning from one another, outside experts, or university-based educators with long-term PD (Richmond & Manokore, 2011). According to Rosenholtz's (1989) research, the membership in a PLC helped to improve a teacher's curriculum, and practice, as well as impact the teacher's motivation to try new practices. Moreover, Brodie (2021) argues that the purpose behind PLCs is to position teachers as the

professional agents in their own PD and give decision-making about what they need to learn to the teachers based on what their students need or their own personal interests.

Some of the studies around PLCs have ended with development of stages or levels of success with a PLC (Hipp & Huffman, 2010; Martin-Kniep, 2008). These studies have a few common aspects between them about what each stage/level reveals, including a beginning stage (not initiated), a developing phase (initiation), established (implementation) and systemic (institutionalization).

Hipp and Huffman (2010) also have detailed dimensions for PLCs, which are a supportive and shared leadership, shared values or vision, collective learning and application, shared personal practice and supportive conditions. Supportive conditions for a PLC have been defined by Thornton and Cherrington (2019) as respectful, trusting relationships, structural conditions (such as necessary time), the size of the group, and any related resources that they may need. Bielaczyc and Collins (1999) also outlined four essential aspects of a PLC, which include: diversity of expertise among members, shared objective that advances the community's knowledge, emphasis on learning, and methods of sharing what is learned.

The impact of PLCs can be best seen when willingness and time put into a PLC will result in sustainable communities (Thornton and Cherrington, 2019). With these, it is not a question of how important the work can be, but instead of how those involved can best build, support, and maintain a community within all the complexities of different settings (Richmond & Manokore, 2011).

Summary

Upon reviewing the research around neurodiversity, inclusive classrooms, and teacher professional development, there is a clear need for improvement in how teachers are provided professional development around these topics and beyond. There is more push towards ensuring that teachers are not only receiving consistent education but also that the education is practical and supplies teachers with a strong toolbox. There is much research on the "what" and "why," of neurodiversity, but this research bank continues to grow, specifically looking to fill in the gaps around the "how" in implementing a more open- and accommodating society and school environments.

CHAPTER 3

RESEARCH DESIGN AND METHODOLOGY

In my experience in multiple countries, there are a growing number of students who may show symptoms or be diagnosed with neurodivergence in some manner but receive all instruction in the general education classroom in the least restrictive environment. With this approach, students receive most of their interventions from the classroom teacher, with a few perhaps receiving extra support outside of the classroom.

As the classroom teacher who attempts regularly to implement these interventions, I have found myself getting overwhelmed with trying to understand best practices for neurodivergent students, as well as the neurotypical in my class. When general education teachers are better prepared to face neurodiversity in their classrooms, the ideal situation could arrive with teachers being more capable of supporting their students overall. Armstrong (2010) explained that all people are neurodivergent in some fashion, which lends to the idea that teachers need to be better prepared for the differentiation necessary to support their students.

Research Questions

To what extent does participation in a Professional Learning Community (PLC) have on the awareness level of 9 teachers seeking to foster an inclusive classroom setting when working with neurodiversity and neurodivergent students at a K-10 setting?

As a result of participating in a PLC that is focused on working with neurodiversity and neurodivergent students, how have the pedagogical approaches changed among 9 educators in a K-10 setting?

Action Research Design

Since action research is typically seen as local knowledge that makes the change in the setting of the research itself (Herr & Anderson, 2015), this study is action research because it should have an immediate impact on my practice and the practice of learning in my school. The use of an action research approach allows the research to be inductive and gather data to build the practice towards the theories. It is important to remember that action research is holistic and cannot be used to study objectively (Herr & Anderson, 2015; Merriam & Tisdell, 2016).

This study is a practitioner research study, as it was organic to my school but was also initiated specifically for the purposes of this dissertation (Herr & Anderson, 2015). The research design was set to use semi-structured PLC meetings weekly for one hour a session for six weeks. These PLC meetings were semi-structured, as there was a time of information giving from professionals related to neurodivergence, and then time for questions and conversation development between the staff members. During this time, teachers were able to investigate and deepen their awareness and understanding of neurodivergent students better preparing their classroom practice.

Data Collection Measures, Instruments and Tools

This study began and ended with participant interviews and Likert scale questions to gain insight into their base level understanding of the topic before intervention and teacher's general understanding of the topic after. During the PLCs, the researcher also

took qualitative field notes. Finally, throughout the study, the participants reflected on their learning each week through survey questions.

Pre- and Post- Structured Interviews (Appendix A and B)

Interviews allow for in-depth conversations with the participant and researchers (Efron & Ravid, 2019). Prior to the start of the study, the practitioner-researcher held introductory interviews to gather information about the current awareness and understanding teachers have of neurodiversity. When the PLC was complete, I held another interview to gain more insight into how the intervention had or had not changed the teacher's awareness and understanding of neurodiversity. The goal of using this method was to gain an understanding of the participants' experiences with their own perspectives (Efron & Ravid, 2019).

Pre- and Post- Likert Scale (Appendix D)

Likert scales are a form of surveys, which are best used to gather participants' opinions, perceptions, and attitudes (Efron & Ravid, 2019). A Likert scale survey was used pre- and post- study to gain more insight into the staff members ratings of their own awareness and knowledge before and after the study. The pre-study Likert scale was used to help make informed decisions about how the PLC sessions will be run and what information will be shared (Efrom & Ravid, 2019).

Teacher Written Weekly Reflections (Appendix C)

I utilized the teacher's written weekly reflections as well. This took place by asking staff to keep a small "reflection" on their thoughts, feelings, and wonderings based on what they have learned or discussed in the PLC meetings. Efron and Ravid (2019) explained the importance of journal keeping as an opportunity for the teachers to

document their behaviors and the behaviors of others, as this helps to show patterns that may occur in their learning environments.

This was done with a link emailed to the staff after the session has finished for that week. At the end of each session, the participants were given five to 10 minutes to write their reflections. If they did not want to use that time, they were asked to complete the reflection on their own time before the next session. There were three guided, open-ended questions and one open-ended question with no guidance. The set-up of these questions was meant to provide participants with some structure to their responses.

Field Notes Observational Record

During and immediately after the PLC sessions, I recorded and noted the discussions and interactions from during that day's PLC session. These observations were unstructured, which is defined by Efron and Ravid (2019) as not being based on an agenda, but instead where the observer looks for relevant events that take place during the observation. Whatever if significant to the study was included in the observational record.

Since I was a participant-observant, I kept field notes of the sessions and what I observed in each meeting. This helped me to paint a picture of how each session worked and what the mood felt like, questions I heard or asked and gave a realistic example of how the communication methods worked in supporting the learning of the teachers. These observations were detailed with the intent to paint a strong understanding of the setting, the mood, and the discussions happening with the staff. As a reminder, to protect the identity of the staff members, I used pseudonyms.

The pre- and post- interview, pre- and post-Likert-scale, and weekly staff reflections allowed me to assess the staff members' awareness related to neurodivergence as the PLC progresses from start to finish. The reflections allowed for continued understanding of changes in how the staff members had potentially changed their thinking or ideas towards neurodivergence in the classroom. The field notes allowed me to dive into the methodology, the experience, and the relationship between the staff members and the environment of the study. These methods also allowed my research to be descriptive (Merriam & Tisdell, 2016) which will paint a picture for the readers.

Setting and Participants

Participants

The participants were selected through convenience sampling. Convenience sampling is the process of selecting a sample of participants based on time, money, location, availability, or respondents, in other words the sample is chosen because it is convenient (Merriam & Tisdell, 2016). The participants recruited were teachers within my school community. Many of these teachers are from all around the world and bring diverse cultures into their classroom context. These teachers work in either a primary or middle years setting at the school.

During the school year, each Wednesday, there are planned and scheduled meetings for three hours after regular school hours for that day. The students leave at 12:30pm on Wednesdays and staff meetings begin around 1:30pm (13:30). These meetings finish around 4:30pm (16:30). The school leadership provided three weeks of the meeting hours for this study. The participants agreed to use three other hours of their personal time after school to continuing participating. These additional times were

decided together as a group to allow for maximum group participation. Teachers are meant to be life-long learners, and participation in this study allowed teachers to work on their own learning while only giving up a small amount of their personal time and maximizing the meeting times for staff.

Confidentiality is important to ensure there is no social desirability bias in the staff members responses. I assured them that their comments and private survey reflections will not be shared with leadership or anyone else other than myself, and in the study their names would be removed. Participation in the study is completely voluntary, and they can ask to be removed from the study at any time. Before ending the recruitment meeting, I expressed the purpose of the study clearly to ensure that staff members could truly reflect on their interest in participation.

Participant Profiles

Participant one is a newer teacher but has been working in the school for five years in other capacities. This participant is a non-native English speaker, however, is native in German and a second language. English is their third language. The participant holds multiple degrees in education and has worked in multiple grade levels in the Primary Years department.

Participant two is a mid-career teacher, who has been in the school for over ten years. English is their native language, and they are from The United Kingdom (UK). This participant has had experiences teaching in both the UK and Germany. They have taught in multiple grades in the Primary Years department.

Participant three is a US American who has recently studied to become a teacher, but teaching is their second career. They are fluent in English and in German, but English

is their first language. They have been with the school for five years. They teach in both the Primary Years and Middle Years departments.

Participant four is a German native, who has had teaching experiences around the world, including in the USA. They teach in the Middle Years department, but also lead the curriculum development for the German teachers. They have also taught on both campuses of the school in different capacities.

Participant five is a new teacher, however, has been working with the school for 11 years in other capacities. They are neither English nor German native speaking but speak both fluently. Originally from a Spanish speaking country, this participant has studied and lived in a variety of countries bringing multiple perspectives. They work in the Primary Years department.

Participant six is from Canada and has been in education for 10 years. They have worked with the school in a variety of roles at both campuses for the last 7 years. They are a native English speaker, and a German language learner. This participant has also lived in other countries around the world, providing a variety of perspectives. Participant six works in the Primary Years department.

Participant seven hails originally from South Africa and is a native English speaker. This participant has been in education for almost 20 years but working in this school for only two years. This participant is also the only participant that currently holds an admin/leadership role, as well as working as a teacher in the Primary Years department.

Participant eight is a mid-career teacher with almost 20 years working in the school. The participant is from the UK originally but has spent most of the last 25 years

in Germany. They speak both English and German, and work in the Primary Years department.

Participant nine is also a non-English and non-German native speaking participant. Originally from Mexico, participant nine has now been living in Germany for 20 years. They have worked in education for 21 years and been with the school for 17 years. They work in the Primary Years department.

The Setting

The setting of the study was an international school in southern Germany. The school has two campuses, and this study was focused on the smaller campus. This campus was a pre-kindergarten to grade 10 school. The school has a high military population, with many staff also being military families. The population of the staff has multiple nationalities, including American, British, Canadian, and German. To protect the identity of the participants and setting, pseudonyms are used throughout the study.

The director of the campus of school that the study took place at requested that I only submit my University of South Carolina IRB approval for their review and to have on file for themselves. Per German law, we also have a work's council, who act as a worker's union, and protect staff members. The work's council was informed of the study, as well as the director of the whole school and the school strategic manager.

<div align="center">

Procedure

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I worked with the student learning support team at the school (Special Education teacher, school psychologist/counselor), as they are the experts in the topic. As a team, we planned the beginning of the PLC meetings to give facts and strategies around different common neurodivergent disorders (Autism, ADHD, dyslexia, etc.). After the

informational time, there was a "pastoral discussion" style discussion for the last 30 minutes of the meeting. During this time, the teachers had the ability to discuss and ask questions about certain behaviors or strategies to gain more insight to how this knowledge could impact their classroom.

Working with the SLS team, a 30-minute presentation that was related to best practice in supporting neurodivergent students was created. The presentation was meant to give teachers information about a diagnosis and some best practice that general education teachers can use to support students who may show symptoms or have been diagnosed.

In the second half of the professional development sessions (30 minutes), the teachers had the opportunity to discuss and reflect on their practice in relation to neurodivergent students. This space was a place for discussion and questioning. Teachers could ask questions related to specific students, as this pastoral meeting time is usually used as a place to discuss students already. These questions and information about students will be protected by using pseudonyms.

After the questioning period, I asked the teachers to reflect immediately with the questions in the reflection "journal." This reflection was done digitally, and a link was shared each week for the participants to use to respond. As I want this to help the staff as well, I ensured that each member of the staff had a copy of their answers, either digitally or a hard copy.

Ethical Considerations

The Belmont Report requires that ethical considerations be fully addressed by research that is involving human subjects (OHRP, 2018). By disclosing the research

goals, purpose, and desired outcomes of the PLC during the consent process, the researcher was able to protect the autonomy of the participants. Additionally, the issue of positionality to the researcher was explored and concerns expressed by the participants were addressed prior to obtaining consent.

The risk to the participants in the study was minimal. However, a risk that could cause harm was if responses related to delicate working relationships, feelings of vulnerability, or candid observations about the work site were disclosed to other people within our organization. For this, the researcher took extra care during the study to ensure privacy and separate the identity of the participants from their responses. All names within the study are pseudonyms.

Neurodiversity PLC Schedule

Table 3.1 PLC Schedule

Week	Topic
1	Neurodiversity- what is it and what does it mean?
2	Autism- what does it mean to be on the spectrum, truly?
3	Attention Deficit Hyperactive Disorder- how it manifests and the strategies to support those with it
4	Dyslexia/Dyscalculia/Dyspraxia- what are each diagnosis and how can we support each
5	Anxiety Disorders- how this manifests as neurodivergence in the classroom
6	Intellectual Disabilities- degrees of support and modifications that school can make for these students

<center>**Data Analysis**</center>

While the data was being collected, it was also analyzed. This was done in this manner as analysis and collection should be a simultaneous process in qualitative

research (Merriam & Tisdell, 2016). The data analysis process included searching for key words and coding the staffs' responses. This was the first step of the qualitative data of the research. The researcher looked for frequently used words that the staff members wrote in their reflections and created a graphic that shows the main words stated. This data was used as the brush that painted the narrative data collection picture and will create a quick summary understanding of the main points and main takeaways of the study in the words of the participants.

The narrative portion of the data was written into a formal story-like summary, including the observations and teacher reflections connected to each session. This is a second portion of the qualitative data gathered during this study. This data collection is detailed enough to give a strong understanding of the growth and learning in professional development. The field notes were highly descriptive and included aspects such as, descriptions of the setting, people, and activities; direct quotes from those who are participating in the study, and the researcher's comments (Merriam & Tisdell, 2016). This also highlighted areas of improvement and any concerns expressed by the staff members. The goal was that this data explained how this research worked realistically for the staff, and the potential impacts that were made in the teachers' practices.

The final data analysis of the Likert scale showed a graph of the staff members pre- and post- study answers. This data provided a more quantitative understanding of the growth the staff made in the study and a clear assessment of the success of the study.

All data has been kept confidential, and all personal indicators removed, so that others in the organization will not be able to identify the staff members.

CHAPTER 4

FINDINGS FROM THE DATA ANALYSIS

Introduction

The participants of the Professional Learning Community (PLC) were generally not experienced with neurodiversity. Some staff members remembered learning about Special Education through their degree and licensure programs, but never had much other formal training on the topic. Multiple participants expressed that their understanding of neurodiversity was that it was a newer "hot topic" in education but were intrigued by the impact it may have on their classroom.

This study aimed to understand how a PLC could impact the participants' awareness of neurodiversity in their classrooms and how this impacted their teaching and instruction. The participants joined in a 6-week long PLC that focused on the different diagnoses that fit into neurodiversity, and discussing different methods of support that they could provide. The problem of practice that this study aimed to address was the awareness level that general education teachers possess to understand and implement best practices for creating an inclusive classroom environment for neurodivergent students.

Research Questions

To what extent does participation in a PLC have on the awareness level of 9 teachers seeking to foster an inclusive classroom setting when working with neurodiversity and neurodivergent students at a K-10 setting?

As a result of participating in a PLC that is focused on working with neurodiversity and neurodivergent students, how have the pedagogical approaches changed among 9 educators in a K-10 setting?

Purpose of Study

The purpose of this study is to examine to what extent does participation in a PLC have on the awareness level and pedagogical approaches of 9 teachers seeking to foster an inclusive classroom setting when working with neurodiversity and neurodivergent students at a K-10 level.

Analysis of the data

Multiple data collection tools were used for this study representing both quantitative and qualitative, making it a mixed methods study. Merriam and Tisdell (2016) explain that qualitative data analysis "involves consolidating, reducing, and interpreting what people have said" to answer the research question (p. 202). Quantitative data analysis is the more traditional data collection that utilized numerical data to answer research questions. The data analysis helps to inform the implications of the study and wider school community. The collection tools used were weekly reflections, field notes, pre- and post- Likert scale, and pre- and post- interviews.

The following steps outline the data analysis approach:

- The participant interviews were recorded and transcribed using transcription software. The pre- and post- interviews, weekly responses, and pre- and post-Likert scales were then collated by participant and printed. The printed documents were given to the participants for review to ensure that all written information was correct and represented them properly.

- The participant documents and the written field notes were then coded in search of meaningful data pieces that were related to the purpose of the study and the research questions (Merriam & Tisdell, 2016). Some examples of codes were collaboration, communication, perspectives of neurodiversity, shared vocabulary, and compassion.

- The data was then analyzed to ascertain if any common themes emerged. As a result of that process, five themes emerged which are evolving perspectives of neurodiversity, greater appreciation for and positive impacts of professional development (PD), enhanced awareness and mindfulness of others, planning and implementation for inclusive teaching, and sharing learning.

The following sections will describe how the participants expressed their learning, understanding, feelings, and concerns related to these themes.

Findings of the Study

The PLC sessions were conducted in a small classroom setting, with snacks available and a semi-circle chair setup around a projector screen. At the front of the room sat the leader of the sessions, which was one of the Student Learning Support staff. The classroom was a familiar one to most of the participants, as they have either been in the room for visits with the teachers or for duties done with the students there. The participants entered the environment and were greeted before choosing their spot within the semi-circle to sit. I sat in the back of the room just behind the semi-circle at a small desk where there was space to take notes but close enough to feel part of the conversations still.

Theme 1: Evolving Perspectives of Neurodiversity

Throughout the study, there were clear signs that the participants perspectives of neurodiversity and understanding of the concept were developing and changing. Some examples of this include the participants original personal definitions of neurodiversity and the participants pre- and post- Likert scale results (see appendix E). These results showed that six out of the nine participants felt they grew in their understanding of neurodiversity.

The major comments made refer to neurodiversity as thinking or learning differently from the norm, specifically with receiving a diagnosis (participant 1, 2, 3, 4, 5, 6, and 9). Through the sessions, however, the participants showed their understanding of neurodiversity to move more towards a spectrum versus being different diagnosis that have major differences. Participant 1 stated,

When you talk that it's a spectrum, if you are illiterate on the subject as there was before, you think of a spectrum like a rainbow, you think that is a rainbow like the kids colored in the school. You have blue, you have red, you have yellow, and it's just like eight different faces, so to speak. And then when we had these sessions with the SLS team and you, you realized that your diversity is a spectrum, but it's a spectrum like when you choose color on the computer, you can go pixel for pixel and it changes just ever so slightly, but every slight change comes with its own implications and complications to deal with.

A topic that the participants were asked to reflect on is the idea that neurodiversity could be considered an advantage. One of the questions asked during the first session was what the participant's thought neurodiversity was: an advantage, a disadvantage, or both. Most participants answered that it was an advantage but could not explain why they felt that way. Those who were unable to delve deeper into their why indicated that they felt it was the right answer, even if they did not have the words to explain. This led to a conversation, detailed through field notes, around what it means to have an advantage in neurodiversity. This conversation touched on how having a brain that may see things differently can be seen as a "superpower" rather than a limitation, however, it can also still be a limitation. This being because of how a person must function when in the world when living with a disability. In this discussion, physical disabilities were also discussed in the sense that they are a limitation of the person's abilities in society as it stands currently. However, their disability can also be an advantage as they may have life experiences or opportunities that others may not.

In their weekly reflections and through the field notes, many of the participants expressed that they feel there may be many people who are neurodivergent but are "masking" to fit in. This in turn can make it difficult to recognize who may be "flying under the radar," so the speak. Since this is the case, the participants expressed they may

not have a clear understanding of how many students may identify as neurodivergent. This perspective touched on the participants thoughts regarding the way that an official diagnosis may impact a family. One of the session leaders explained how each family is slightly different and this could mean that a student may not even know their own diagnosis. She then explained the importance of addressing the behavior, rather than focusing on the diagnosis.

From the idea of addressing behavior rather than diagnosis, there was a repeated discussion was how to know when a student is neurodiverse instead of simply struggling with a concept or a grade year for another reason. This showed that participants were truly interested in methods to best support their students, both those who are struggling with academics but also those who are neurodiverse. However, this topic emphasized that there may not always be an easy diagnosis for these situations. Participant 4 noted in their post-interview that even if their student does not have an official diagnosis, they feel that learning in these sessions have helped them to be more proactively aware of the needs of others.

Participant 8 also brought up the idea of if different diagnoses that we already know of, such as anxiety, fitting into neurodiversity. This curiosity was also repeated by other participants. Multiple participants explained in weekly reflections that their understanding of neurodiversity was that to be classified as neurodiverse, the diagnosis needed to be something that was not as commonly seen as anxiety, such as ASD. The idea that anxiety disorders can fit into neurodiversity was discussed with much concern, as we all experience anxiety. Participants 3, 5, 6, and 9 explained their surprise about anxiety being considered in the neurodiverse umbrella, as noted in the field notes, by

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asking what the logic in this is. The student learning support (SLS) team explained that there are differences between the diagnosis of anxiety versus experiencing anxiety about something. It was then communicated how having an anxiety disorder impacts your life in a much deeper way than simply experiencing anxiety over something, such as a test. With this understanding that having an anxiety disorder diagnosis that changes how you approach everything, the participants wondered how this new understanding could affect their own personal lives.

With a kinder idea of how to approach to their students, the participants thought about how they could be better prepared for moments of anxiety in their classrooms. Participant 9, especially, noting in their weekly reflections how they experience anxiety and have watched others in their family experience severe anxiety as well. They wondered how knowing this new information could change their approach not only to students in their classes, but also to themselves in accepting that they are not "broken."

A final perspective of neurodiversity that came about what the idea of self-advocating and the way that educational language around neurodiversity has changed. Participant 7's response in their interview about the topic of self-advocation and changes in understanding is worth noting at length,

> I think when I hear the word neurodiversity or neurodiverse, I think of the journey that educators and education as a whole have gone through from using language to describe students with needs in ways that create negative labels. And so, for me, the term neurodiversity is more inclusive and allows for a broader spectrum while honoring that students are different and can think differently and perceive the world differently. And then the nuance, then it is the educator's responsibility to identify the nuance, or the psychologists or the educational psychologists or the psychiatrists to determine the nuanced aspects of what that neurodiversity means for that child. And so, I think like for me, when you say a

neurodiverse child, it's much less threatening than when we used to use terms like autistic or Asperger's or ADHD. I mean, those are still valid diagnoses. But I think for those students that are not formally diagnosed, it's more appropriate to use terms such as neurodiverse, neurodiversity than those that we used in the past. And I also think like, Neurodiversity allows for the connection to diversity, equity, inclusion and justice because then it just becomes a part of our community in that everyone has some form of diversity from another whether that be in like physical, mental, social and emotional and so then it becomes less targeted and more like inclusive, an inclusive term for all of our students who have different diversities from each other.

This sentiment of an acceptance or shift in understanding has been also reiterated by other participants, with participant 5 indicting that they feel the view of education and society now is more accepting. There is a rise of self-advocacy where people are willing to speak more towards empowering the needs of all students, rather than singling students out by their differences. Self-advocacy can be described as standing up for yourself and making your voice heard with your needs and wants. With more people being open to discussing their diagnosis in neurodiversity and what this means for them. Participant 5 explained more that they feel that society is more open, and student focused. This focus on the student is changing how we study, understand, and communicate about supporting diverse needs in the classroom and in the real world.

Theme 2: Greater Appreciation for and Positive Impact of Professional Development (PD)

An interesting data point that came from the pre- and post- interviews is the perspectives of professional development (PD) opportunities within the school in the past. Some participants indicated frustration or irritation with the options that they were given in the past, while others felt their PD opportunities were meaningful for them. A common trend amongst all participants, as was documented in their weekly reflections

and post-interviews, was having the ability to tell the researcher about their ideas in how

the PD could be improved to incorporate their wants and needs in professional learning.

A few participants indicated that some of the internal PDs that have been in

session before were engaging and brought about conversations that felt impactful for the

school's progress, but then the participants felt the PDs fell flat for a variety of reasons.

However, a common reason for frustration in the participants was that the work done in

the PDs was set up similarly to a PLC, but nothing ever came from them. The participants

felt that the learning and the work they did in these sessions was impactful, but the school

was known for upper leadership deciding not to use the learning from the sessions

anymore. Participant 9 stated,

> But seriously, not just these focus groups that I worked in, for example,
> six years in a focus group and this year was dissolved. Oh, we're not doing
> that anymore and we never put it in practice. So, for me, that is losing my
> time and maybe losing also a really cool resource that we have been
> working on.

Another complaint the participants had regarding the quality of PD sessions

provided previously was connected to the time allotted for the sessions. This was shown

in the participant's responses around how their time is best used for professional learning.

There is the idea that the participant's time is "wasted" on PDs that may not impact their

teaching and instruction. Participants suggested that they felt they were not heard, so they

stopped showing more interest in PDs that were offered. They did not expect to be given

the opportunities to learn about topics within their own interest or that were relevant to

their classroom needs.

However, the positive feedback heard in reference to professional learning and

PDs included the ideas of international mindedness. Participant 5 explained the

importance of international mindedness and the shared view that they have experienced in professional learning settings. They highlighted that in this international environment, it is important to recognize how we are different but also how we are similar. The learning comes when multiple perspectives and opinions can talk and discuss topics that impact the work.

However, all participants expressed, across all data tools, that they enjoyed this study's PD sessions and wanted to continue them. The participants asked not only for more sessions on the topic of neurodiversity for their own understanding and knowledge, but also for these sessions to expand to others within the school. With the inclusion of others across the school, the participants hoped for stronger learning environments for all students and a clear set of shared vocabulary for the teachers in the school when discussing students.

Theme 3: Enhanced Awareness or Mindfulness of Others

In studying neurodiversity in the PLC sessions, the participants all noted how they became more aware of others and the diversity of the human brain. Whether in their weekly reflections or noted in their post-interview, all participants highlighted that from the beginning of the sessions to the end they realized that they need to be more aware and mindful of the students who are coming into their classrooms. Participant 4 shared an example of how they handled a situation with an emotional student. They noticed that the student was alone and crying during a not particularly high-stress situation but still one that the participant noted was stressful. Instead of writing that student's feelings off" as being too much to deal with, the participant tried to talk with the student and think of

ways to offer them comfort in this situation. This ended with the participant and their student coming to an agreement on a solution for the problem. Upon reflection, the participant felt that their participation in the sessions gave them more proactive responses to their students. They felt that without these sessions, they may have been more reactive to the student's emotions and respond in a way that may not have helped to develop or improve the student's self-management and communication abilities.

Within the same conceptual idea of awareness, Participant 1 detailed how joining in on the PLC sessions gave them an awareness of the neurodiversity in all humans. The PLC sessions impacted their perspective on how important it was to recognize that all students are important no matter the challenges. They realized the importance of viewing their classroom as all students deserving of opportunities to learn in an equal amount. Participant 1 states quite plainly the job of teachers by saying, "we should be more understanding of our responsibilities… teachers, and educators, that child (neurodiverse student) deserves as much attention as everybody else."

Through reflections and discussions, it was also noted how the study impacted the participants awareness of undiagnosed students. The participants may not be able to diagnose students, but many felt that they had an easier time recognizing students who they were concerned about, and so their qualitative data collection on these students was stronger. Along this line, participants also noted how their understanding of neurodiversity and the presentation of it impacted their conversations with parents. The participants felt they were better prepared to answer the parent's questions or concerns when discussing, but also that they were able to explain to parents what their concerns as the teachers were in relation to student's learning or social situations.

The participants awareness or mindfulness of neurodiversity was documented through all data tools, including the Likert scale. In fact, participant 9 answered all Likert scale questions with a substantial increase from pre- and post- study answers (see appendix E). In discussion with this participant, they explained that their participation in the study gave them the opportunity to learn about something they knew about but did not think about as often in their teaching. Through this study, they were able to find that they now have a professional goal of learning more about one or two different neurodiverse diagnosis on a deeper level. This plan for digging deeper through professional learning, whether through the PLC or on their own, was reiterated by multiple participants. Participant 1, 3, and 4 especially explaining that through learning more about diagnosis that are commonly seen in the school, they can be more mindful of how strategies or tools can be used to support all students and not only those with diagnoses.

In another session, the SLS team and the staff discussed how to empower students who are neurodivergent. A common discussion that came up was the idea that students, especially older students, would use their neurodivergence as a "crutch." The SLS team explained that our jobs as their teachers is not to judge or pass opinions on their neurodiversity, but instead to encourage and empower them to find their strength with their neurodiversity. It was explained that while this is a difficult concept at times, it is the key to helping these students in a world that is not set up for them. The main takeaway from this session was these students and those around them need to understand that they are not broken people, but people functioning in a world that is not made for them.

The session described above was a heavy one on the staff. Many explained in their weekly reflections how this learning impacted their awareness but also empathy towards these students. Participant 1 explained,

> We should not forget that behind every name, every face is a person…is
> the whole universe. The way we behave and the things we say. And how
> we treat individuals. Do not only affect a given moment in the classroom
> or in the auditorium, but they can also have far more severe consequences
> in affecting and influencing and shaping the future of, say, individual. So,
> I put a lot of emphasis in to remind myself that.

In a different session, the SLS team showed some statements from the students who meet with the team regularly. The student statements were specifically referencing their experiences with learning in schools and interactions between them and peers or teachers. These students explained what it felt like to not be heard or understood. They also detailed their concerns about finding and keeping friendships. With hearing some of these concerns from current students, the participants were a bit taken back and shocked, as they did not think the students would feel that way. The conversation delved deeper into how the staff can support their students better. In this time, it was realized how much work and effort would need to go into this conversation. This was a major start to the theme of continued discussion and communication around this topic.

Finally, in another session, the staff addressed some of the cultural boundaries or cultural expectations that may keep people from reaching a diagnosis. This included discussing how your cultural understanding of these different disorders may present

challenges. This is an important part of the learning within the community as the study was completed in an international environment. Within this environment, there are both teachers and students from many countries, languages, and nationalities. The concept of creating space for students to live in an authentic way based on their culture, but also receive the support they may need for neurodiverse challenges is one that many staff members wanted to spend more time on. A smaller, but important note is that during these discussions, the difference in neurodivergent diagnosis for both male and female was also reflected on. Many participants were surprised to learn that males are more commonly diagnosed, but also how this may be connected to societies view of a cis-gendered girl rather than a physical difference.

Theme 4: Planning and Implementation for Inclusive Teaching

Using Case Studies

During the study, the participants regularly detailed how surprised they were with the knowledge that the different diagnosis still had similar support plans. Through their weekly reflections, post-interviews, and the field notes taken by the researcher the participants expressed a strong interest in learning around the different supports that teachers can provide, especially in the form of learning through case studies.

In the first PLC session, the participants discussed a case study of an Autistic student with an IEP. This student's school had a fire drill planned. The student advocate in the school wanted the teacher to prepare this student, as it was requested by the parent. The teacher felt that the student being prepared for the fire drill, unlike the others, would cause more problems for them. The student advocate then had to consider the next best

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steps. Upon reading this study, the participants were asked what they would do or think in this situation.

Much of the agreement in this beginning session was that the student should not be prepared for the fire drill with the headphones provided prior, simply because they are neurodivergent. The argument against this was commonly "if we tell the student earlier, how will they build resiliency in the real world?" Participant 7, however, shared a strong point by saying,

> We're in the business of protecting kids and not causing trauma to them-maybe having the noise cancelling headphones near him always. We should also adapt the IEP.

Participant 7 continued their explanation by also stating that it is important for the mental well-being of the staff for the leadership in this situation to perhaps schedule a meeting with the teacher and discuss if that teacher is doing okay. When faced with these points to consider, the environment and mood of the room changed. The teachers all realized that they were not sure if perhaps they were jumping too quickly to their decision. With further discussion, the participants came to understand and begin to accept the question being does the staff have to push the student into these situations? If you do not have to, should you as a teacher cause risk to your students through not preparing them for something like this?

After the discussion, many participants still felt conflicted about the idea of preparing the student beforehand, however, they also explained their openness to the solution since they understood how it may impact the student on a deeper level. Participant 6 noted in their weekly reflection that they felt this study allowed them to gain

an understanding of what to do with students during drills, and how they can accommodate "simple things" and there still be meaningful learning.

The participants regularly requested more case studies, both in school examples and external examples. As participant 8 explained in their post interview, "The strategies can be used for so many of our children. They are part of the best practice tool kit," and participant 9 added by stating in one of their weekly reflections "I found interesting the strategies that you can put together to help the children succeed in any of these situations (or diagnosis)."

Applying knowledge (accommodations and modifications)

Many of the participants were intrigued by learning the differences between accommodations and modifications. Participant 6 explained that an aspect to their learning of accommodations versus a modification was that they did not realize that as teachers they were able to provide an accommodation to students without it being written in a formal Individualized Education Plan (IEP). This participant explained that they grew in their understanding of an accommodation by deepening how they viewed what a teacher can or cannot do without needing higher level support.

However, there were also many responses during the sessions that asked for knowledge about when to implement different strategies. The final Likert scale question also addressed instructional methods and the ease of use and helpfulness of them. In the post- Likert scale, all but one participant felt they improved in their understanding of these instructional methods, while the final participant felt they were unchanged in this

manner. Participant 5 explained some of their professional goals around neurodiversity in the classroom in their post-study interview by stating,

> I think one of my main goals would be to be able to implement like when I have a concrete idea of how to implement things that can be beneficial for children with neurodiversity in our classroom. So one of the goals would be to be able to implement as many of those things as possible in the classroom space and also planning wise and the instruction and just the ways we see things and just maybe run ideas through my mind before I do them I do before I teach a lesson just always like keeping the back of my mind that we don't all learn the same way or that we don't all pay attention the same way and just be more flexible in general with the students and their needs.

This feedback from this participant showed that while the theoretical knowledge was part of their current understanding of neurodiversity, they still struggled with the practical application of when to provide the supports a student might need.

Finally, in support of this data for continued learning, one participant indicated on their post-Likert scale that they did not feel their data collection abilities for neurodiversity were changed from their participation in the PLC sessions. This is consistent with other data found through weekly reflections and the interviews, as participants also indicated not feeling a deep enough impact in their instructional practices. In these reflections, participants explained that they feel they need more study and discussion around best practices for the classroom.

Theme 5: Shared Learning

A main theme also seen in the weekly reflections and interviews from the participants was to have refresher courses or opportunities to continue learning together around neurodiversity. The participants regularly explained the value of talking with one another about their concerns related to students, but also to talk with the professionals in

the school who specialized in Special Education (the Learning Support Team). Participant 5 detailed how they felt the discussions and information dissemination could focus on how teachers can identify needs in their classroom with greater detail and accuracy, rather than feeling around in the dark of trying strategies and methods alone before finally receiving feedback from the Learning Support Team.

Participant 9 noted that the study impacted their own awareness, but that they are hopeful that others in the school environment can also learn from a professional development like this. They even expressed an interest in having the parents learn from the school through parent sessions on what it means to be neurodiverse and how they can support their students. However, Participant 9 also notes that they felt this was not enough for them to get the breadth of knowledge they had hoped for. There was a consistent expression amongst the group for the continued discussion and dissemination of knowledge.

This continued dissemination of knowledge also showed through the participants recognition of the need for a shared vocabulary. Participant 7 explained at length the impact of the shared vocabulary in their post-interview by reflecting on what it means for the school by lacking these terminologies. They explained,

> I think many of the sessions brought up the fact that we maybe still don't
> have a shared vocabulary at school when we're talking about different
> neurodiversities or a shared approach. And clarity not only from like the
> RTI model or MTSS model, but also like what does that mean? For all of
> us that we have a common understanding and application. And I think it
> was really interesting because it also brought up a lot of questions that I
> was asking our colleagues in the other campus around what our shared
> understanding is. Because you can't say, oh well, my understanding is
> different, so I'm going to do it differently here. I don't think that they'd
> benefit students, especially if they're transferring from our campus to the

data level and then they're transferring back. Like I think that for the cohort that engaged in your PLC, potentially now we have a more shared understanding or common understanding of what these new universities are. And now that you're doing the next step of the PLC, you're able to potentially reach more people.

The notion of knowledge dissemination proved to be important to the participant group. Multiple participants noted how important the continued discussions were for the improvement of the school overall. There were mentions of sharing this information with the staff members who were not present that were repeated through the weekly reflections in each of the weeks. Participant 1 highlighted the potential impacts that continued discussion would have on the improved learning and knowledge of the staff members, particularly in reference to the international setting. They explained that within the international setting, people are often leaving and moving around, only staying in one location for three to seven years. This impacts the knowledge that they bring, and with having a continued discussion around topics like neurodiversity allows the school to ensure the students are receiving an education that represents the school's beliefs and values. Participant 1 also explained that the impact of having these continued conversations encourages the teachers in developing their planning and instruction, as they are learning and talking regularly about different strategies or activities from one another.

Another aspect that was discussed in post-interviews from Participant 7 was how the continued discussion or knowledge dissemination could impact the resourcing and purchasing with the school. They argue if teachers were given the time and space to continue discussing how neurodiversity is presenting in their classrooms, they would be able to reflect on how the resources the school provides are supportive or not to these

students. With deeper conversations and continued learning experiences for teachers, the school would have a clearer idea on what to purchase or how curriculum development would be impacted.

Participant 7 also discussed how these conversations could impact the enrollment of students. They mention how the knowledge that would come from teachers continually talking about neurodiversity and learning how to support these students in their own classroom would impact how inclusive the enrollment could be. Inclusive enrollment is an important aspect for the school community, as the school serves a large US American military population. These students are not always able to attend the schools on the military base, so the international school is where they often are sent. However, the international school can accept or deny students based on the level of support they require and the staffing possibilities to accommodate this. With stronger inclusive knowledge, the teachers would be better prepared to serve the community that applies to the school, allowing for higher numbers in student population.

The idea of a shared vocabulary also refers to the understanding of how to name or call neurodiverse peoples when having discussions. In an early session, the discussion around language we use impacted the participants by challenging what they understood about how to name or call different diversities. Participants 5 and 6 both noted this change in their weekly reflections. Participant 5 noted in their reflection how this was impactful for them as a non-native English speaker. They explained that understanding how to name the different neurodiverse diagnosis helped them also to have a deeper understanding of the person. For example, if an Autistic person was happy to be named as an Autistic person, this may come from their perspective on how Autism impacts

having who they are. The shared understanding and respect surrounding how to name or "call" yourself had an impact on how the staff was able to dig deeper into understanding their students.

A notion that was seen in most of the participants responses attended to the idea of having the title of neurodiverse as an umbrella. Many participants highlighted how using their umbrella term instead of looking up on specific disorders, while not being clinicians able to diagnose students, helped them to see how this could impact more than only one student. This shared vocabulary allowed for clearer discussions between staff members as well. Participant 2 noted that the sessions were able to give them the vocabulary needed to "run through all that they do" instead of looking diagnosis by diagnosis.

Interpretation of Results

Chapter 2 provided a summary of literature that connects to neurodiversity and professional learning communities. The study was rooted in the constructivist theory, inquiry-based learning, and the learning centered curriculum theory. These theories or learning styles were important to the study as the participants would be learning through their experiences with others. The participants spent time learning through a Professional Learning Community (PLC), making these learning opportunities social experiences, a key point of constructivist learning (Applefield et al., 2000).

Brophy (2002) explained that constructivism as a theory can be understood as a vision for life and society with Adom et al., (2016) giving the idea that people construct their own understanding and knowledge of their world from experiences. This is related

to the study's structure as the participants all brought forth their own experiences dealing with neurodiversity, but also learned about how different supports may work from discussion and trial experiences with their students in the classroom. The idea of constructivism also ties into the cultural understandings of neurodiversity that can be deeper discussed from this study, which were noted by the participants when reflecting on what it means to be more aware of neurodiverse students.

The study focused deeply on the social context of learning by learning in a group from people who were more knowledgeable about the concept. This allowed the participants to gain not only knowledge, but also develop deeper social perspectives as well. The participants learning through a PLC was an important aspect to how they took their learning and applied it back to their classrooms, as could be seen in their interest in having case studies that were based within the school context. The social aspect of a PLC gave the participants opportunities to discuss in a comfortable and judgement-free environment, but also to provide feedback to one another and co-create the knowledge around neurodiversity in their classrooms.

The discussion portion of this study lends to the inquiry-based learning that has a learner-centered focus (Walker & Shore, 2015). The participants were able to dig into topics that were relevant to the overarching concept of neurodiversity, but also topics that were related to their classrooms and school environment. This deep dive into the interests and opportunities to learn more about topics that are related to their teaching and instruction was reiterated by the staff members throughout their reflections as being a positive experience. Their drive towards inquiry-based, or learner centered approaches in professional development also connects back to the idea of giving voice and choice to

teachers when having professional learning. The data from this study showed the learner-center focus used in this context with adults allowed the participants to increase their interest and understanding of the topic. The case studies allowed for the inquiry-based learning to take place, which gave participants the opportunity to dive deep into topics that were relevant to their current context.

In connection to the research on neurodiversity and inclusion, the participants understanding of what neurodiversity looks like in general grew immensely throughout the sessions. There were many conversations throughout the PLC about what it truly means to be neurodiverse and fit into the societal knowledge about neurodiversity. Neurodiversity was defined in this study as the vast differences in brain and neurological functions amongst the general population. There are multiple diagnoses that fit into the umbrella of neurodiversity, which were addressed in the PLC sessions. These include Autism Spectrum Disorder, Attention Deficit Hyperactive Disorder, Anxiety Disorders, Dyslexia, Dyspraxia, Dyscalculia, and intellectual disabilities.

The study data showed that the participants were able to recognize and identify students who may be struggling to mask their neurodiversity to fit into their world. The research explains that even though teachers are not clinicians, they are with the students every day and are observing the repeated behaviors or actions (Smith et al., 2015). The aim of the PLC sessions was to increase the participants awareness, so they can recognize common behaviors and make the move to support them (Davis, 2018). The findings of this study show that the participant's awareness increased, and so did their interest in learning about the ways they can support these students.

The data also showed that this awareness of neurodiversity and the different strategies that teachers can use to support students also allowed the participants to be able to provide other supports for their whole class. In the PLC sessions, there were conversations about neurodiversity being not necessarily a negative but instead brings about an opportunity to see the potential of neurodiverse people. Vishwanath (2020) also explained the importance of ensuring that schools have opportunities to develop their view on neurodiversity to ensure that these students are not diminished because of a diagnosis or behavior, but instead that their potential and contribution to society can be reached. All participants recognized the importance of their knowledge around neurodiversity, so that they can support the students who are in need, while also showing neurotypical students what acceptance and support look like. From an inclusion perspective, this thinking allows teachers to be able to be more aware of needs and could offer support as students are going through a diagnosis process (Smith et al., 2015).

Conclusion

This study collected data on the awareness and understanding of teachers around neurodiversity, as well as how their instructional practices may have been impacted by their learning in a mixed methods research style. The data collections methods were pre- and post-study interviews, pre- and post- study Likert scale, weekly reflections from the participants, and field notes from the researcher. These sources of data revealed five themes, which provide insight into how staff development around neurodiversity can impact their student's learning for both diagnosed and undiagnosed students. The data also revealed how teachers felt about receiving professional development that was targeted and where they had more voice and choice. In response to this data, the

leadership team must consider how they can adjust the weekly meeting schedules to address the voice of teachers but also the needs of the school.

As the researcher for this study, I indeed learned how professional development on neurodiversity impacted the awareness of teachers when working with neurodiverse students. The findings from this study will be used to develop an action plan that provides staff more opportunities to learn and reflect together on neurodiversity in their classroom, continued assessment for neurodiversity and supports necessary, and finally providing opportunities for staff voice and choice in their professional development.

CHAPTER 5

DISCUSSION, IMPLICATIONS, AND RECOMMENDATIONS

Introduction

The problem of practice for this study is specific to teacher's learning. The learning of teachers being directly connected to the learning of the students. Teachers need to have the space to develop new skill sets, but also to develop new understandings. The problem of practice for this study was addressing the awareness levels of general education teachers in understanding and implementing best practices to create an inclusive classroom environment for neurodivergent students.

In this study, the intervention that was implemented by the researcher was a Professional Learning Community (PLC) for 6-weeks that highlighted the different diagnoses related to neurodivergence. The PLC addressed a variety of concerns that are related to neurodivergence in the classroom, such as how to support the students who may be undiagnosed, how to support those who are diagnosed, what are some concerns to watch out for, how to communicate concerns to parents, etc. Data collection that was taken during the study were interviews, Likert scales, weekly reflections from the participants, and field notes from the researcher.

Research Questions

The research questions from this study were two-fold. There were:

1. To what extent does participation in a PLC have on the awareness level of 9 teachers seeking to foster an inclusive classroom setting when working with neurodiversity and neurodivergent students at a K-10 setting?

2. As a result of participating in a PLC that is focused on working with neurodiversity and neurodivergent students, how have the pedagogical approaches changed among 9 educators in a K-10 setting?

Overview of the Study

In this study, there were a few major themes that came from the data. These themes were seen throughout the different data sources, but most commonly in the weekly reflections and post-interviews. The themes that were discovered through the data were perspectives of neurodiversity, perspectives of professional development, continued discussion or communication, awareness or mindfulness of others, and planning and implementation.

Through these themes, the growth of the participants in their general awareness of neurodiversity in their classrooms or in the school community can be seen clearly. The participants also took a Likert scale both pre- and post- study. The Likert scale results showed that all staff members had some amount of growth during the PLC sessions. While not all participants grew in the same way, they all showed that there was growth in some capacity.

This chapter will discuss the implications and future research that could come from this study. These implications are more specific to the setting of the study, as this is an action research study. However, there are some implications that can reach outside the

community studied. This chapter will also address the limitations of the study and the suggestions that may improve the work. Finally, this chapter will provide ideas for continued research related to these findings.

Implications of the Findings

The following implications offer insight into how the study's findings may be used to provide learning opportunities for the school setting to provide staff learning opportunities and how addressing neurodiversity in the school can be improved. It is followed by an explanation of action steps to put these implications into practice.

PLCs as a hope for PD development

A key impact of this research for the school setting that the study was done in was the interest in continuing the learning and discussions around neurodiversity from the participants. Each participant throughout their reflection asked for their time together to continue but also to reach out to others in the school environment. As an impact of this, the leadership team accepted the PLC as one they would like to support, and requested the researcher continue it even after the study had stopped. Leadership provided the time for the PLC to happen during the staff's working hours and collaborated on the next steps in the study to deepen staff learning.

The findings were important not only for this PLC to continue, but also gave space for other conversations about PLCs happening within the school. PLCs are groups that meet and have a shared vision, but also should result in a change in the environment (Schuck et al., 2013; Richmond & Manokore, 2011; Thornton & Cherrington, 2019; Brodie, 2021). The participants of this study hoped to see a change in their environment

by providing the same opportunities for learning about neurodiversity to other staff members. Davis (2018) explains that the lack of behavior management strategies taught to general education teachers in pre-service learning leads to a stigma on students who present as different from the norm. This was seen by the participants in their own experiences, which led them to want opportunities for all staff to have a chance to participate in meaningful learning from this PLC.

Staff training on neurodiversity

Through a foundation in a constructivist approach to learning, the staff in this school setting view their students as people who are actively making new meaning for themselves (Clark, 2018). This gives space for staff to understand and implement multiple learning strategies into their learning environments to provide meaningful learning opportunities for all students (Mergel, 1998). However, when the constructivist viewpoint is applied to assessments for neurodiversity, it allows an understanding of what and how assessments can inform the staff about the learners in the school without necessarily limiting these students. By providing assessments that build on the staff's understanding of who their student is in the world, the learning of the students overall should improve.

As seen in a variety of research noted in chapter two, there are many different types of assessments for diagnosing neurodiversity. However, these are not screenings that teachers are able to provide as they are not clinical practitioners. However, teachers can still be an important piece of diagnosing behaviors since they are with students daily (Smith et al., 2015). With this knowledge, a second implication that is relevant for this

school setting is creating or adopting a thorough assessment method for students who are suspected as neurodiverse. This would include purchasing an assessment tool that supports in diagnosing, training the relevant staff members on how to administer it, and then providing training to staff on what the process looks like. There is currently a process for referral laid out for staff to follow when a staff member is concerned for a student's social and academic needs, but this study has highlighted the need for continued training and explanation of this to others.

The next steps would also include providing PD for all staff on neurodiversity and the different strategies to support students in their classroom. The PD for all staff is important, as teachers are large part of supporting students receiving a diagnosis and key supporters for students while in school (Smith et al., 2015). Since not all staff would be capable of assessing students, the relevant staff members with the possible ability to assess students formally may be a variety of staff, including but not limited to the school psychologist, the special education teacher (student learning support teacher), the curriculum coordinator, the assistant principal, or the child protection officer.

Providing PD with staff representation

For teachers to become successful learner-centered educators, they need to understand how to implement the concepts, knowledge, and skills to approach their learning. This means that the school leadership and the teachers need to go through an inquiry-mindset process of learning themselves (Polly & Hannafin, 2011). The last implication related to this study and the school setting is the needs for continued teacher learning that has purpose, is directly connected to their work, and represents their voice

and choice. The findings showed that the participants felt positive about their participation in the study, but also how it impacted their jobs in a practical way. Bielczyc and Collins (1999) provided four essential aspects to a PLC, as well. These were diversity of expertise among members, a shared objective that advances the community's knowledge, emphasis on learning, and methods of sharing what is learned. The aspects that the participants explained which indicated the success of this PLC for them were directly connected to these four essential aspects as explained by Bielczyc and Collins (1999). There were repeated messages about continuing learning in a way that felt meaningful, and not just to participate in something that never comes to show in their jobs. The emphasis on learning within the PLC made a large impact in the participant's interest in continuing the sessions after the six weeks were complete.

By providing the staff with opportunities to engage in a PLC of their choice, the leadership will be empowering the staff towards professional learning that is meaningful and should have longer reaches. The previous research on the success of PLCs clearly explains what made PLCs successful. Hipp and Huffman (2010) explained that PLCs require supportive and shared leadership and shared values. They continue by detailing that having collective learning and application are the goals, which are reached through sharing personal practice and having supportive conditions. By giving opportunity for choice in the learning, and shared leadership over the options for learning, staff and leadership together may find a shared vision for school improvement.

Brodie (2021) provided feedback on how PLCs are meant to change professional development (PD) settings, by creating a sustainable space for ongoing PD for teachers. The participants clearly indicated a general interest in PDs that were ongoing, but also

important for their jobs. The PD sessions that staff have been engaged in before may not have provided the full learning experience that they were hoping for, whereas this PLC did provide that, and the participants were excited by it.

Action Steps

Action Step 1: Allow Staff More Time for Pastoral Discussions that Address Neurodiversity

As explained in the findings and the implications, the teachers in my school are looking for more opportunities to discuss their students in pastoral ways. This study provided the 9 participants that space, and they fought to continue it. Luckily the entire school had dedicated time this year to PLCs led by other staff members in the second half of the first semester. This allowed my leadership to let my PLC group continue after the study was complete, with a few others added to the group as well.

In reflecting on this interest from staff, there are a few steps that leadership could continue these discussions in a meaningful way. Currently, we hold pastoral meetings twice a semester. These meetings are usually only one and half hours long, so they are packed tight with each teaching team introducing, explaining, and providing their approaches for students in their classrooms. Each team usually tries to keep their talking to 10 minutes, but this is not always the case. The Student Learning Support team (SLST) also attends all these meetings to provide more insight. To enhance the work that we already do around this, a suggestion is to hold meetings more than twice a semester and give more of a focus toward the pastoral meetings, rather than the general discussion of students it currently is.

An example of a focused pastoral could be that teachers are asked to think about a student in their class who they are concerned with in relation to communication skills. This allows for a variety of discussions, since communication could be connected to their language ability, their temperament towards talking to others, their personal interests and how these can be enhanced, etc. Teachers could use that time to hear from others, talk about some of the support strategies for communication skills, and try to share their knowledge. The SLS team would also be able to touch on what neurodiverse symptoms could also be affecting a student's ability to communicate.

Action Step 2: Adopting Assessments for Suspected Neurodiverse Students and Staff Training

For this school context, we do currently have some assessment methods that are used to help assess students. However, not all staff understands these assessment methods, and only certain staff members can conduct them. While there are some legal things to take into consideration when deciding who can assess students, the staff professional development component would enhance all staff's understanding of neurodiversity and disability overall. Leadership could provide once a semester training for all staff who are interested in learning about the assessment methods that SLS team would use with students who are recommended for their support, as well as what teachers may need to watch out for that can help with narrowing the students who truly need SLS team support. As our admission is an open admission and there are no screenings that happen beforehand, providing the staff with development opportunities that keep them in tune with current research and best practice for neurodiversity is important.

Action Step 3: Continued Staff Development with Staff Voice and Choice as a Main Component

This action step is one that has been seen in research before, as mentioned. However, in this context, it is not something we have seen enough of. When the staff members were allowed to talk and dive into the topics of interest they had in the second half of the first semester, there was a positive reaction. Overall, even though the options were not as vast as they could be, people were excited to learn together. They were able to choose between three different workshops put on by others in the school. Even if there was no promise of a certification, the staff enjoyed the time dedicated in their working hours to learn.

For leadership to continue this positive correlation in staff development, there should be time given each year to staff choice in professional development. Similarly to the process that took place in this school after the study had completed, leadership can build time into each school year for four to six weeks where teacher leaders, leadership themselves, or another staff member offers a professional development that connects to the mission and vision of the school. Staff can then choose from these topics and learn in a setting that they feel they have had a say in.

Recommendations for Future Research

There were several limitations to this study. The first is this was a small sample size. The sample was collected through volunteer sampling method, so the sample represented only a limited amount of the population of staff in the school. An example of

this was that the sample was made of mostly primary years teachers, with one full-time middle year's teacher, and one who worked in both primary and middle years.

A recommendation for future research would be to continue the learning around staff having voice and choice in their professional development. There is already a large discourse on this concept, but there are still many opportunities to try it in an international perspective. A question that came from the findings that connects to this concept is how would providing teacher leaders in the school opportunities to lead PLC sessions yearly impact the knowledge of all staff. A follow up question from this is how providing teacher leaders with opportunities to lead in their school community would impact staff happiness and staff retention.

A suggestion on how to complete this would include a mixed-methods research study to enhance the data collection for this topic. Mixed-method research is meant to use the strengths in both quantitative and qualitative research to enhance school improvement (Efron & Ravid, 2020). This study could focus on the reflections from the staff participants about their experiences in the PLC sessions provided by other teacher leaders, but also using quantitative methods to truly measure their general success and happiness. This could also be a long-term study to connect with staff retention.

Another recommendation that came from this study is to address how neurodiversity within cultures is represented and what the impact on differing cultural interpretations has on teachers in an international environment. This question can also build on what the impact would be for students in these international environments when learning from and being cared for by staff members from a variety of cultures.

An approach to a continuation of this study this way could include the entire school community: staff, parents, and students. With the intention being to give a qualitative reflection on what it means to be neurodiverse in an international world, and how the school can best support not only the learning of the staff and the students, but also the parents as they navigate raising children in an international and ever-changing world.

Summary

This study aimed to understand how teacher's awareness of neurodiversity would impact their classroom environment and their instructional practices. The study utilized PLCs lead by teacher leaders in the school as a form of professional development. There were nine participants from both primary and middle years programs who participated in this study. The PLC sessions lasted for an hour and a half over a 6-week cycle. Throughout the study, there were multiple forms of data that were collected, including pre-and post-study interviews, pre-and post- study Likert scales, weekly reflections by participants, and field notes from the researcher.

At the conclusion of the study, the data analysis process brought five themes that offered some answers to the study's research questions. These themes were (1) perspectives of neurodiversity, (2) perspectives of professional development (3) awareness and mindfulness of others, (4) planning and implementation, and (5) continued discussion and communication. The study's findings revealed not only the positive impacts of knowledge and awareness of a topic to a teacher's experiences with their students, but also showed that with further development there may be impacts on the

professional learning and voice and choice in a teacher's experience within the school

setting.

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APPENDIX A: Interview Questions- Pre-intervention

1. When you hear the word neurodiversity or neurodiverse, what do you understand or think about?

2. Tell me a little about your experiences with neurodiversity or differently abled people. How does neurodiversity play a part in your classroom currently? Ex: planning for neurodiversity, implementing strategies to support neurodiverse students, etc.

3. What types of professional developments (if any) around neurodiversity or disabilities in general have you been able to participate in? If you have not had any PD, why do you think this is?

4. Have you had any PD sessions around neurodiversity that have had an impact on your instruction or planning? OR If you have not had any PDs, then what types of things would you be interested in learning about around neurodiversity or differently abled students/people?

5. Tell me about your experiences working in a PLC.

6. How has your participation in a PLC impacted your teaching and instruction?

APPENDIX B- Interview Questions- Post- Intervention

1. Tell me about somethings that you learned from the PLC sessions.

2. Has there been a time during the six weeks of the PLC that you found yourself
   using the information and knowledge gained during the PLC? If so, please
   explain.

3. How did the PLC impact your planning and instruction?

4. How did participation in a PLC impact your understanding of neurodiversity?

5. Tell me about your professional goals regarding neurodiversity now.

6. Any other comments or wishes to express related to the study.

APPENDIX C- Teacher Written Weekly Reflections

1. What are some things you learned that were new today?

2. How do you see yourself using this research, strategies, or awarenesses in your classroom?

3. Do you have any questions or are there any themes you would like to discuss in the coming PLC session? If yes, please write your questions or interests for the PLC planning team to reflect on.

4. Any other thoughts, questions, or concerns.

APPENDIX D- Likert Scale Findings

There were levels 1 to 5, with 1 being the lowest indicator or "I do not know anything about this topic," and 5 being explained as "I can teach others about this topic myself."

Question 1: I understand what it means when I read "neurodiversity," (or another topic based on the PLC discussions).

Question 2: I feel I address neurodiversity within my classroom well.

Question 3: I can identify when I need to refer a child for external support related to neurodiversity.

Question 4: I feel confident in my data collection methods that allows me to identify students who I suspect are neurodivergent.

Question 5: I incorporate instructional practices that support neurodivergent students that are clear, easy-to-use, and are helpful to both the students and me.

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Table D.1 Pre- and post- Likert scale findings

Participant		Q1	Q2	Q3	Q4	Q5
1	Pre	4	2	4	3	2
	Post	4	4	4	4	3
2	Pre	3	3	2	2	4
	Post	5	4	5	4	5
3	Pre	4	4	4	3	3
	Post	5	3	5	3	3
4	Pre	4	3	3	1	3
	Post	5	4	4	3	4
5	Pre	4	3	3	1	2
	Post	4	3	3	3	3
6	Pre	4	3	4	2	3
	Post	5	4	5	4	4
7	Pre	5	4	4	3	4
	Post	5	4	5	4	5
8	Pre	2	2	2	2	2
	Post	4	3	4	3	3

9	Pre	1	1	1	1	1
	Post	4	4	4	2	3