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Teachers' Impact on Guiding Students with Dyslexia toward Proficiency in Reading Comprehension

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Abstract

Since dyslexic students often struggle with reading comprehension, this research study asks "Given that early identification and intervention help students with dyslexia understand reading, how can teachers guide students who have been diagnosed with dyslexia move toward proficiency in reading comprehension?" Using data collected from interviews, field notes, and student scores before and after intervention, the conclusion that there are four strategies that have been found to be effective in supporting reading comprehension for dyslexic students. The implications of this study can be used to educate teachers of dyslexic students about which strategies support reading comprehension and how to recognize the value of one strategy over another for dyslexic students.

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Teachers' Impact on Guiding Students

with Dyslexia toward Proficiency in Reading Comprehension

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Abstract

Since dyslexic students often struggle with reading comprehension, this research study asks "Given that early identification and intervention help students with dyslexia understand reading, how can teachers guide students who have been diagnosed with dyslexia move toward proficiency in reading comprehension?" Using data collected from interviews, field notes, and student scores before and after intervention, the conclusion that there are four strategies that have been found to be effective in supporting reading comprehension for dyslexic students. The implications of this study can be used to educate teachers of dyslexic students about which strategies support reading comprehension and how to recognize the value of one strategy over another for dyslexic students.

Teachers' Impact on Guiding Students with Dyslexia toward Proficiency in

Reading Comprehension

Learning to read is an exciting time for most students. However, for some students, it can

be a difficult process requiring academic intervention. One specific learning disability that

affects the development of literacy is dyslexia. According to Ness and Southall (2010),

> dyslexia is a specific learning disability that is neuro- biological in origin. It is
>
> characterized by difficulties with accurate and/or fluent word recognition and by poor
>
> spelling and decoding abilities. These difficulties typically result from a deficit in the
>
> phonological component of language that is often unexpected in relation to other
>
> cognitive abilities and the provision of effective classroom instruction. (p.36)

This disorder has been centered on the lack of cognitive and linguistic processes. Dyslexia is

apparent in students who have trouble with their reading and spelling skills rather than oral

language and listening comprehension. Students with a diagnosis of dyslexia typically succeed

in areas where reading is not of primary importance and steer away from areas that are more

difficult for them. They become stronger in math, science, and the fine arts to compensate for the

difficulty in their reading skills. Dyslexia can be found in individuals with various intellectual

abilities. A person with high intellect may also have dyslexia whereas an individual with low

intellect may also possess traits of dyslexia. Mather and Wendling (2012) state that since

dyslexia is a neurobiological disorder, it can occur in any individual with any level of

intelligence. It can also be found in people of all ages. According to Mather and Wendling,

"about 4% of the school population had been diagnosed with 'word blindness' which was an

earlier term for dyslexia. More recent studies suggest about 5% to 8% of the school-age

population have been diagnosed with dyslexia" (p.9).   With the growing number of diagnoses in

the educational field, it raises the question of how can teachers guide students with dyslexia towards proficiency in reading comprehension.

Dyslexia can affect young students in the early stages of reading as well as grown adults. It impacts the development of reading and spelling, but also impacts self-esteem, school, and professional performance. Since students are not diagnosed with dyslexia until grades three and four, it is crucial for teachers to identify markers for success in grades K-three that they can focus on as early intervention. If teachers are able to focus on those areas, it will prevent a few years lost until the child is diagnosed. It is imperative that students develop printed word recognition before they can understand and make meaning of a text. Mather and Wendling (2012) explain that "it is critical that children receive specific instruction in phonological awareness because this type of teaching makes a difference in beginning reading and spelling achievement" (p.135). If students are unable to become proficient in printed word recognition and spelling, they will, in turn, struggle with not only reading comprehension but all subject area comprehension. With the rigorous requirements for Common Core Learning Standards, students with dyslexia struggle with achieving the ELA standards because they lack in the basic reading skills. Providing evidence-based practices specifically designed for assisting students with dyslexia will guide them towards proficiency in both basic reading skills and later comprehension skills. These skills then play into the idea that educators need to identify and evaluate evidence-based practices for students with dyslexia that focus on increased reading comprehension skills. When examining this idea, teachers need to be aware of the lack of the cognitive and linguistic processes that contribute to dyslexia. Teachers need to use diagnostic evaluations to identify areas where the student is deficient. Students with dyslexia often have a higher ability to comprehend through listening, rather than comprehension through print. When the teacher identifies the areas that are deficient, he/she can

then move forward with providing strategies that will lead students in proficient reading comprehension skills. In addition to identifying struggling readers through the use of early predictors, it is also important that teachers are aware and accessible to evidence-based strategies. According to Carreker, Joshi, and Boulware- Gooden (2010), "what teachers know and can do is one of the most important influences on what students learn" (p.148). Many in-service teachers lack the knowledge and experience of providing effective reading strategies to struggling readers. The lack of knowledge and experience that these teachers have is why professional development is strongly encouraged in schools.

Reading is fundamental to function in today's society. Between reading a medicine bottle to applying for a job, people must be able to read to live their day to day lives. For some people, reading is effortful and takes longer. Many adults struggle with reading and writing due to their dyslexia because they were never diagnosed at an early age. If they had been diagnosed at an early age, they could have received intense intervention that would have allowed for growth in basic reading skills. The students that were diagnosed could then use the strategies that were taught to compensate for areas that were weak. According to Layes, Lalonde, Mecheri, and Rebai (2014) students with dyslexia have better comprehension when listening to a passage rather than reading. If teachers are able to teach these students strategies to help with phonological awareness and decoding skills it will then, as a result, develop comprehension skills. The child will learn to use the strategies and they will improve their reading ability as they continue to grow. Teachers continue to observe an increase in learning disabilities that are likely to remain through adulthood. The reading problems show a persistent deficit. This deficit raises the importance that teachers need to continue to research and explore effective ways to improve reading skills in students at an

early age. Academic success for students with dyslexia is dependent upon early identification and a thorough investigation of evidence-based strategies.

For over a century, both medical and educational institutions have researched the causes associated with those who struggle with reading. Dyslexia has come to the forefront as an explanation for some struggling readers. Still, there is much more that needs to be explored when it comes to providing guidance to these students so they can reach proficiency in reading comprehension. Although the first step to helping a person with dyslexia is to teach decoding and encoding skills, it is imperative that teachers also participate in evidence-based practices that improve both basic reading skills and promote comprehension. The students who are identified and have received the intense intervention at a young age will benefit from this study because they have been identified and have received support in slowly printed word recognition and spelling, so now they can work on areas that are weak such as reading comprehension. The other group that will benefit from this study is elementary school teachers because they work closely with students who are young enough to receive intense interventions.

The reason I chose this topic is because I have a child in my class who struggles with reading due to dyslexia. She has trouble decoding and encoding words in reading and writing. She was not diagnosed until she was in third grade, which has made it more difficult for her to meet the fourth grade standards. She continues to feel defeated with reading and writing content that is at fourth grade level. As her teacher, I know that I need to help her fill in that large gap. I need to implement more strategies that will promote comprehension skills. According to Mather and Wendling (2012), much of the research that has been conducted this far has been centered on the cognitive and linguistic processes that contribute to and underlie dyslexia. Furthermore, Mather and Wendling (2012) refer to Hulme and Snowling (2009) and their goal of diagnostic evaluation

which focuses on which process and processes are not working and how they affect and they demonstrate slow reading and spelling in students.

My research was focused around the question "Given that early identification and intervention help students with dyslexia understand reading, how can teachers guide students who have been diagnosed with dyslexia move towards proficiency in reading comprehension?" I used various tools in this study to determine if the four types reading strategies that help students with dyslexia. The tools I used to collect data included teacher and student interviews, pre and post assessments, and field notes/audio recordings. This research supported the findings that some classroom reading comprehension strategies were successful when used by dyslexic students. The research also revealed some strategies that are not typically used with struggling readers but were designed to meet the needs of students with dyslexia. Lastly, the data showed that some strategies do not increase the reading comprehension skills in dyslexic students, but make it more difficult for them. The implications for teachers includes implementing reading comprehension strategies with students who are dyslexic, as well as some strategies that need to be specifically designed to meet those students' needs. An additional implication for teachers is to pay close attention to the behavior and responses that students provide using the various strategies. The scores may show that the strategy helped, however the strategy could still frustrate the child. The strategy also may be effective only because the teacher has guided the student rather than the student using it by his or her own self.

Theoretical Framework

While studying the influence literacy has on students, it is imperative to look at the ways in which they receive it and how they take a text and make meaning of it. Before school, children

acquire literacy through various experiences. They listen to the oral language in their

environment and use it to make meaning of the world around them. These experiences are based

on the background from which the individuals come from. According to Freebody and Luke

(1990), "literacy is a multifaceted set of social practices with a material technology, entailing

code breaking, participation with the knowledge of the text, social uses of text, and analysis

/critique of the text" (p.15). Individuals need to participate in all four dimensions at the same

time in order to become proficient readers and writers. For struggling readers, simultaneously

controlling all four roles can be challenging. If a student has difficulty with identifying the

language, in turn, he/she has difficulty with making meaning of the text. This difficulty will then

affect how a student develops as a reader and writer. As stated by Leu (2000), "each act of

literacy reflects those aspects of literacy that the individual does and does not control in any

given context" (p.6). Since literacy acquisition is constantly developing, a student who displays

deficiencies in linguistic and cognitive processes will then struggle with new and novel literacy

events. An example of this struggle includes the ELA Common Core Standards. These standards

require inferential and textual responses. The students who already have difficulty with acquiring

written language will then have trouble with making meaning of it.

Once individuals understand communication through oral language, they then move into

communication through written language. As Kucer (2009) explains, the cues that individuals

use are the "vehicles through which ideas are constructed" (p.17). Throughout life, people of all

ages experience numerous literacy events ranging from grocery lists at the supermarket to

isolated words on traffic signs. These are all physical signs that readers use as an avenue to build

meaning. As students move through school they begin to combine the oral language they learn at

home with the written language they learn at school. Although language is unique, there is a rule-

governed system that individuals have to follow to make meaning of academic language. Students have to intertwine basic reading skills with new language structure and new concepts. These requirements then place new linguistic and cognitive demands on the student. Gee (2004) suggests, "within a language there exists two main varieties: vernacular and specialist" (p.33). Children learn a language from home and local community. Gee calls this the "primary discourse or vernacular" (p.33). Whereas when students reach school and combine non-academic language with academic language it becomes "secondary discourse or specialist" (p.33). When students reach upper grades, teachers hope that the students have a strong primary discourse so that they can focus entirely on secondary discourse. The secondary discourse helps students prepare to become writers, scientists, mathematicians, or social scientists. Upper graders are no longer spending much time on the basics, instead they have shifted to a more content- based literacy. This results in a larger gap between successful and struggling readers.

In conjunction with written language, students use mental processing to interpret meaning. Kucer (2009) explains this mental processing as a "cognitive dimension of literacy which is the focus of mental processes, strategies, or procedures that individuals engage in to construct meaning" (p.101). The students have to take the written cues and make meaning out of them. If the students are examining what they are reading and are unable to decipher the text, it will then affect how they perceive it. The process of perception combines how the mind gathers information to help make meaning. The first step of perception is for the eye to take in available print. The print is then placed in the short term memory, where it is processed from letters to words. After the brain has made meaning of the print, it is then put in long term memory (Kucer, 2009). Students diagnosed with dyslexia have trouble with the cognitive process because they struggle with the switch from print to the brain, to long-term memory. Since there is a lack of

cognitive processing, these students tend to fall behind and unable to meet the standards. Once a student begins to fall behind, they then have to receive intervention to help narrow the gap. Once these students are identified they are placed in this category of having a disability.

Generally, culture has been portrayed as a positive term. Cultures set rules, goals, and expectations for people to work towards in order to develop abilities. However, with the set criteria comes a group of people who cannot meet those expectations. These people are considered the disabled. According to McDermott and Varenne (1995), culture as a disability is "the power of culture to disable" (p.327). In other words, if we didn't have cultures or set rules, we wouldn't be aware of the problems that confront us each and every day. Culture is a way for people to develop abilities, but it is also a way for people to define others with a disability. Furthermore, the people who are unable to meet certain tasks are measured, documented, and pushed aside compared to those who can meet certain tasks.

There are three ways to look at culture as a disability. The first way is the deprivation approach. According to McDermott and Varenne (1995), this approach looks at culture as either the group can perform the set of tasks or they cannot. The group that cannot perform a certain task is unable to receive the reward that comes with completing the task. The second approach is the difference approach. This approach demonstrates that there are different cultures and each of the cultures can achieve competence in different skills. The last approach is the culture as a disability. This approach helps to show that culture, although a positive aspect, can also create problems. This is where McDermott and Varenne give the example of school being a source of a culture as a disability.

For the last 40 years, school performance has been part of an administrative society due to the constant race for academic achievement. Students who have been labeled with a learning disability are stuck in this system because they are always being compared to those who are doing better than them. McDermott and Varenne (1995) use Adam, a young student who has been labeled with LD, as an example of culture as a disability. They explain that if it weren't for the culture that he lives in now that focuses solely on success and failures, he would not be labeled as LD. Since so many people in his life contribute to his learning disability, Adam is now part of the problem of our culture. This theory connects to my topic because I have chosen to focus on students who have been labeled with a disability within the school system. This theory has now demonstrated that these students are considered a disability in a culture because they are unable to meet the standards that have been set. The students are looked at as failures because they cannot perform grade level standards as their more capable peers.

For students who display deficiencies in cognitive and linguistic abilities, they are automatically labeled with a learning disability. According to McDermott and Varenne (1995), "not only is our wisdom not total, there is yet much to be learned by others" (p. 325). Teachers who lack in implementing evidence-based strategies are restraining students with diverse learning abilities from becoming proficient in reading. This theory can be used to guide this study because instead of looking at these children as disabled, teachers can find ways to help them meet the certain criteria that have been constructed within schools. There is still much more for teachers to learn about dyslexia and how to help students that struggle with reading and writing due to this disorder. They can continue to implement new strategies and practices into their early age classrooms. This implementation will ensure that students are being identified and

receiving intervention before the gap gets too big. Teachers will then become aware so they can address the issue and then educate others about evidence-based strategies.

Research Question

Given that early identification and intervention help students with dyslexia understand reading, how can teachers guide students who have been diagnosed with dyslexia move toward proficiency in reading comprehension?

Literature Review

In order to complete a valid and precise study, it is imperative to evaluate and research the literature of this topic. The topic of my literature review is how teachers can guide students with dyslexia toward proficiency in reading comprehension. My first theme examines the inadequate teacher training. Not only does the insufficient teacher training come from colleges and universities for pre- service teachers but the valuable professional development opportunities for current teachers. My second theme examines both early predictions and interventions for students with reading disabilities. This theme specifically explores initial predictors or service available for students who lack these skills early on. My third and final theme for this literature review studies the most effective way to teach reading comprehension to students with dyslexia. These studies examined practices such as guided reading, explicit instruction, and using E-books as a tool to effectively teach comprehension.

Challenges of Preparing Teachers to Teach Reading Comprehension

An area of concern for successfully teaching reading comprehension is the preparation teachers receive prior to working in the field or the professional development teachers receive while teaching. Unfortunately, many studies have shown inadequate teacher preparation and

ongoing development to teach reading comprehension. Spear, Swerling, and Zibulsky (2013) argue that one of the most daunting tasks in pre-service teacher preparation is "lack of coverage of important components of reading in courses and textbooks" (p.1357).   Furthermore, colleges and universities should add more components of reading comprehensions and the strategies needed for students to reach proficiency in reading. Carreker, Joshi, and Boulware-Gooden (2010) agreed that in- service teachers showed a lack of knowledge and information that is essential to teach reading, specifically to students with disabilities and beginning readers. These studies continue to show a lack of training for pre-service and in-service teachers which can potentially help them in becoming knowledgeable or obtaining the expertise to teach reading comprehension to all students. Kropiewnicki's (2006) completed a study using the work of Durkin's (1978-1979) and Pressley, Wharton-McDonald, Hampston, and Echevarria's (1998) to show that, "teachers regularly assigned and tested comprehension, but rarely taught their students the strategies needed to comprehend" (p. 3). Students need to be provided with strategies to help with understanding various texts. The evidence from Kopiewnicki (2006) shows that teachers continue to teach lessons where the main skill is reading comprehension, but have failed to teach the strategies to become skillful in reading comprehension. In order to receive the proper training of effective reading comprehension strategies, pre-service teachers should be taught by experienced in-service teachers. As explained by Sampson, Linek, Raine, and Szabo (2013), "pre-service teachers most commonly cited their in-service supervising teachers as being the most powerful determiner of their instructional practice" (p.281). If supervising teachers are not demonstrating research-based best practices, teachers in training are at a disservice because they are being taught the most successful types of instruction that enable student growth in comprehension. The best programs that assist preservice teachers are the ones that demonstrate

proper steps and strategies in each area of reading and writing. According to Kent, Giles, and Hibbers (2013), regardless of how the instruction is drawn out, the quality of the teacher makes the greatest impact on the student. In this case, the preservice teacher is the student and if he/she is not receiving adequate modeling, feedback, and practice from the participating teacher, then he/she will not learn the proper ways to guide a student towards proficiency in reading comprehension. Not only do teachers lack in areas of how to apply new effective strategies, they also have limitations on the basic reading skills that lead later reading comprehension. Spear-Swerling and Zibulsky (2013) argue that teachers' knowledge about phonemic awareness and phonics has a large deficit. This deficit voices a huge concern because in primary grades, decoding words are fundamental to later reading skills such as comprehension. The inability to understand phonemic awareness and phonics also brings up the point that students with disabilities exhibit the same deficits. Carreker, Malatesha, and Boulware-Gooden (2010) say that literacy- based knowledge is crucial for teachers of all students, especially students with dyslexia. It is imperative that both general and special education teachers are teaching students the most effective strategies, but they are also capable of intervening when they notice an error and are able to address it in the most successful way.

Since both general and special education teachers' work with students with reading difficulties, it is important that they are knowledgeable about effective instruction, identifying struggling readers, and differentiating instruction based on the students' needs. Therefore, it has been suggested by Washburn, Joshi, and Cantrell (2010) that " teachers need to have a solid understanding of basic constructs of the English language, comprehension of the complete reading process, and an understanding of the nature of reading difficulties such as dyslexia" (p.22). Not only should teachers understand the basics of reading, but they should know the

specifics about dyslexia and how to work with a student that has been identified with this learning disability. In fact, Ness and Southall (2010) found that many organizations from the fields of education, special education, and language and literacy have stated the importance of teacher knowledge of reading disabilities in their standards and position statements. The addition of these statements stresses the importance of this knowledge. This knowledge is essential prior to entering the education field. Among the many organizations, the National Joint Committee on Learning Disabilities stated that all "graduates of teacher preparation programs must have knowledge of current definitions and characteristics of individuals with learning disabilities and how these disabilities affect students' development and educational performance" (p.37). Acquisition of these definitions and characteristics prior to entering the educational field allows for greater teacher performance and increased student achievement. Washburn, Joshi, and Cantrell (2010) completed a study using the work of Al Otaiba and Lake (2007) and found pre-service teachers became more proficient in reading instruction by participating in semester courses. Being exposed to continuous teacher knowledge and being able to work closely with struggling readers' permits the ability to intervene more often and effectively. In contrast, according to Ness and Southall, "if a teacher fails to understand the more complex issues inherent in struggling readers (students with dyslexia), they may struggle to provide effective remediation and instruction for students with disabilities (dyslexia)" (p.40). If teachers are not exposed to continuous learning opportunities and one-on-one interactions with struggling readers, they will never acquire the adequate knowledge and experience to support students with dyslexia. Although many studies have exposed the lack of knowledge in preservice teachers, there are still ways to support teacher learning.

Another effective way to train in-service teachers to teach reading comprehension is extensive professional development opportunities. According to Murphy and Haller (2013) professional development is "a wide variety of specialized training, formal education, or advanced professional learning intended to help administrators, teachers and other educators improve their competence, skill and effectiveness" (p. 518). Providing teachers the opportunity to enhance their instructional practices shows that more teachers seek the strategies to better educate their students in specialized areas. Spear-Swerling and Zibulsky (2013) agree that professional development is an important component of a teacher's ability to teach specific content knowledge and areas such as reading comprehension. Professional development should include focus on collaboration and research- based strategies. Spear-Swerling and Zibulsky concurred by stating that "a professional development model that included coaching and collaboration, as well as, research based information about reading, appeared to result in greater differentiation of classroom reading instruction than on involving research-based alone"(p.1357). Having only one component of professional development, whether it be research-based theory or coaching and collaboration, does not serve as a suitable program for pre-service and in-service teachers. Teachers need both elements of professional development to become effective practitioners and master the skills to teach reading comprehension. Murphy and Haller (2013) showed that teachers who did not experience theory as an in-depth component of their pre-service teacher preparation sought out assistance through professional developments offered by their schools or districts. Teachers need the opportunity to experience hands-on or face-to-face models, collaborate with others who effectively teach and implement reading comprehension, and have access to research-based practices to aid in guiding their instruction. Carreker, Joshi, and Boulware-Gooden (2010) completed a study that proved that teachers who received 120

hours of ongoing professional development gathered the greatest amount of literacy- related

content compared to those who only received 30 hours. Participating in more professional

development not only provides greater literacy-related content, but it also allows for ongoing

mentored teaching. An in-service teacher is able to collaborate with more experienced and

knowledgeable teachers. Although, Carreker, Joshi, and Boulware-Gooden's study proved that

teachers with 120 hours possessed more content knowledge, they still were unable to identify

phonemes, syllables, and morphemes. This identification indicates that professional development

should be closely examined for the depth in which it is used for.

There are many types of professional development opportunities for in-service teachers.

These PDs promote on-going learning opportunities for teachers. One study by Mecca (2014)

found that professional development does not necessarily need to be an expert run lecture about

effective reading instruction. There are now new ways of teacher learning through monitoring

and application of efficient reading instruction. Mecca states that

> PLC (Professional Learning Communities) allow teachers to identify students who need
>
> reteaching, students who have grasped concepts, and students who need enrichment, but
>
> it also creates an environment where teachers work together to plan and take
>
> responsibility for the success of all students at a particular grade level. (p.13)

These PLC offer great opportunities for teachers to collaborate and identify ways to increase

student achievement. However, as Mecca explains, many teachers argue that PLCs result in too

much time spent on analyzing the data, rather than conversing on ways to help. This argument is

why it is crucial that schools have continuous support that promote collaborative learning and

give teachers the chance to share new knowledge, implement new strategies, and reflect. Glassett

(2009) states that PLCs promote greater gains in teaching effectiveness. PLC focused on reading

comprehension strategies can help teachers assist their struggling students in various ways. Glassett concluded that teachers in PLC focusing on reading comprehensions strategies, used more of these strategies within their classroom and were able to think more deeply about their own instruction. Professional Learning Committees challenge teachers to work with one another and provide effective feedback. After comparing the traditional model of professional development with the PLC, Mecca (2014) states that teachers that were part of the traditional model saw it as one more thing to do rather than making the connection to their students' learning and their own pedagogy. In order for any professional development to be successful there are a set of features that need to be addressed. Sailors and Price (2010) state that teachers need to first be interested in the content of the PD, there needs to be support, the support that is given should be from a knowledgeable teacher, and teachers need the tools to apply the new content and have the opportunity to reflect on it. Although professional development has increased teacher knowledge within the classroom, it has not made a sustainable impact on teaching comprehension.

One type of professional development that has sparked teachers' interest over the last few years is the implementation of literacy coaches. According to Nueman and Cunningham (2009), coaching is "a form of professional development that involves ongoing classroom modeling, supportive critiques of practice, and specific observations" (p.538). This type of professional development pairs a practitioner with an expert who has an abundant amount of knowledge in the educational field. The literacy coaches are considered the experts because they have many years of experience. The research that Sailor and Price (2010) studied showed that both coaches that were selected were highly qualified per the guidelines of the International Reading Association. They both taught education at the university level, and were licensed literacy

specialists. Each of the coaches used demonstrations, co-teaching, and reflective feedback. When using a literacy coach, Neuman and Cunningham (2009) support the idea of literacy coach when they used the word of Poglinco and Bach (2004) and their report of higher engagement and motivation from teachers and overall improvements in their practice. Due to the use of an experienced coach, teachers were more engaged and had a more effective experience.

Based on the use of studies and research, many scholars have identified issues with pre-service teachers and their insufficient knowledge and preparation for effective teaching. Carreker, Joshi, and Boulware- Gooden (2010) state "what teachers know and can do is one of the most important influences on what students learn" (p.148). Teachers should have the knowledge and strategies to teach students of various abilities, especially abilities in reading, prior to entering the educational field. For those teachers that are in the field and still do not have the adequate amount of knowledge, they should receive extensive professional development. The professional development should offer teachers the ability to collaborate and practice evidence – based strategies to increase teacher effectiveness and student achievement. Teachers should seek out professional development that is related to their own students' needs. With the increased preservice and in-service training, teachers will be better prepared to teach students with various reading abilities.

Early Predictors and the Effects of Early Intervention on Students with Dyslexia

Reading development starts with the fundamentals of alphabet knowledge, phonological awareness, rapid automatic naming (RAN), word memory, and cognitive processing. The use of various assessments enable teachers to look closely at the early signs of reading impairments displayed in students. These early signs can be good predictors of the amount of comprehension achievement that will or will not be made in later grades. Thomson and Hogan (2010) state that

the early status of skills directly related to the key literacy components are highly associated with early progress in reading. If identified at an early stage, these predictors can help mark areas of risk in students' reading abilities. Thomson and Hogan go onto explain that the detecting of these phonological and linguistic factors will allow assessments to provide more accurate markers of risk. The screening tests that have been developed are used to measure the progress that has been made so far in students. Adolf, Catts, and Lee (2010) explain that Phonological Awareness Literacy Screening, Primary Reading Inventory screen, and Dynamic Indicators of Basic Early Literacy Skills (DIBELS) were developed to "track the progress of the phonological awareness, alphabet knowledge, and word reading skills so that effective treatment can be provided to those who exhibit delays in these area" (p.332). When assessing at the kindergarten level, it is important to start with letter knowledge because it is imperative that children are capable of identifying printed letters of the alphabet prior to identifying the sounds and decoding the words.

While most children learn to read easily, a considerable amount of minorities struggle to develop letter knowledge. Simmons, Taylor, Oslund, Simmons, Coyne, Little, Rawlinson, Hagan-Burke, Kwok and Kim (2013) used the research from Al Otaiba & Fuchs, and Velluntino (2016), and found that "letter identification assessed prior to kindergarten intervention predicted reading achievement at the end of second grade" (p.472). The ability to identify letters contributes to the students' ability to perform word identification, oral reading, and comprehension. Aldof, Catts, and Lee (2010) agree that the letter identification has the strongest link to high reading comprehension in future grades. A student must understand the formation of each of the alphabetic letters in order to comprehend reading passages. However, Adolf, Catts, and Lee acknowledge the fact that although some students that are identified as poor readers because they cannot recognize words, they may become good comprehenders later on, and

students who displayed good word recognition at a young age, may become poor comprehenders despite good word reading skills. Simmon, Taylor, and Oslund go onto prove that,

> letter name knowledge is foundational to reading and spelling in that it "boosts the development of major literacy- related skills, notably letter- sound knowledge and phonemic sensitivity skills, which in turn underlie the acquisition of the alphabetic principle and reading and spelling skills. (p.473)

Acknowledging the deficits in the area of letter recognition is not the only predictor of potential reading disabilities in students.

Another area of reading that many struggling readers possess is the lack of phonological awareness. Aldof, Catts, and Lee (2010) cited that many studies have shown convincing evidence that the knowledge of the alphabet and phonological awareness are the two key elements in predicting young children's reading skills. Phonological awareness involves onsets, syllables, rhymes, and phonemes when it comes to forming sound structure. Wanzek and Roberts (2012) concur that students with difficulties in basic reading skills such as word recognition and fluency lack mastery in phonological awareness which could significantly affect their ability to comprehend complex text in later years. Lacking these specific reading skills could be a direct correlation between the student's lack of instruction or reading deficit. Better outcomes in reading skills are associated with phonological awareness training along with letter- sound correspondence prior to first grade. It is imperative that students develop these skills prior to interacting with more complex text. This fact is supported by O'Brien, Van Orden, and Pennington (2012), when they state that "repeated exposure to print strengthens connections between word phonology and word spellings early in reading acquisition, and that word use in context strengthens semantic connections with spelling later in development" (p.396). Children

pick up phonology cues prior to reading through oral language. As later development occurs, readers make connections between the spelling/semantics and what has already been accumulated from earlier exposure.   Students usually receive phonological awareness and decoding in the general education classroom during regular classroom activities. However, for some students this process is difficult. According to Layes, Lalonde, Mecheri, and Rebai (2015), "pseudo- word identification is a trustworthy measure of phonological processing" (p.22). The identification of good readers from poor readers becomes more obvious during a pseudo – word identification test because it focuses strongly on phonological processing. A pseudo- word is a unit of speech or text that appears to be an actual word in a certain language, while in fact it has no meaning in the dictionary. Layes, Lalonde, Mecheri, and Rebai explain that phonological skills have been found significant in reading comprehension. Reading comprehension deficits are a direct consequence from a student's inability to establish adequate phonological awareness. Although these studies have shown that phonological awareness is an important predictor for early reading, Aldof, Catts, and Lee (2010) argue that these predictors are unreliable for later grades. The measures of reading are more heavily impacted by comprehension skills in later grades. This finding explains the importance of identifying the lack of phonological awareness at a young age so teachers can respond with intervention prior to later grades.

Students with dyslexia portray deficits in one or more of these features. They lack in the ability to store, manipulate, and retrieve the phonemes of language. Phonological awareness, according to Wiseheart, Altman, Park, and Lombardino (2009), is a main indicator for students with dyslexia. They demonstrate a linguistic weakness that affects their reading performance. Similarly, O'Brien, Van Orden, and Pennington (2012) state that "phonological coding deficit in written language is preceded and predicted by earlier phonological problems in spoken language

most notably in phonological awareness" (p. 382). Dyslexics use phonics to pronounce

unfamiliar words, so as a result they use phonological coding in reading, but not as well

compared to students without dyslexia. When it comes to reading, evidence has shown that

comprehension is affected because of the inability to analyze complex letter, word, and sentence

structure. O'Brien, Van Orden, and Pennington (2012) support this idea that students with

dyslexia show a stronger connection between sound and meaning and then compensate that for

their weaker skills in the connection of meaning and spelling. Students with dyslexia are

challenged with looking at print and making a connection to a sound and then understanding the

meaning. O'Brien, Van Orden, and Pennington support this claim when they state that

individuals with dyslexia are not only affected by word, but they are affected by non-word

phonology. Dyslexic readers need semantic context to help decoding non words, if they are

asked to read non words in isolation it is more difficult. Therefore, identifying deficiencies in

phonological awareness for both word and non-words for students with dyslexia is essential for

intervention for reading comprehension achievement.

Another factor that plays a role in the difficulty for students with dyslexia to become

proficient in phonological awareness is the lack of their working memory. Although lack of

phonological awareness plays an important role in identifying students with dyslexia, it is found

that working memory is just as much of a contributing factor. Squires, Gillam, and Reutzel

(2013) define working memory as a "dynamic system where sensory information about language

is temporarily stored and manipulated" (p.402). Students with poor working memory are

challenged because they are unable to perform more than one performance task at a time.

Squires, Gillam, and Reutzel explain that students may have difficulty seeing a letter, identifying

the sound, and replacing it with another letter to create a new word. To support these inadequate

skills, Wiseheart, Altmann, Park, and Lombardino (2009) explain that "children with dyslexia have a specific deficit in the phonological component of working memory, supporting the phonological deficit of dyslexia" (p.152). The deficit in working memory affects the ability for a student with dyslexia to successfully make meaning of text. He/she has to retain words and sentences long enough for meaning to be constructed. As stated by Carreti, Rea, and Arfe (2013), working memory is consisted of excluding information that is irrelevant and enabling the connection of information from the text. Working memory is most difficult for students with dyslexia because they cannot decipher and manipulate complex letter, word, and sentence structures. Squires, Gillam, and Reutzel (2013) support this claim by stating that "children that cannot phonetically recode oral language will struggle with print because it adds processing demands" (p.402). It is more difficult for students, who lack working memory skills, to process words and then associate them with information they already know. Layes, Lalonde, Mecheri, and Rebai (2015) acknowledge by stating "dyslexics take a long time in processing information, especially while reading because they must connect letter patterns with corresponding sounds. The working memory requires high stimuli and abilities to hold onto knowledge in short-term and long term memory. Layes, Lalonde, Macheri, and Rebai continue to explain that "if a student cannot hold onto an unfamiliar word in short-term memory long enough to repeat it, segmenting the word poses an immediate challenge" (p.28). The challenges that result from the inability to segment words and store them in short term memory is reading comprehension. A reader must be able to take information from his/her memory to help make meaning of text. It is vital that teachers identify that a child has trouble with retaining information because it will help them understand the reasoning of why a child can or cannot recognize letters or words and make

meaning of them. These studies conclude that working memory functioning helps to understand the underlying cognitive causes in students with dyslexia.

In addition to letter knowledge, phonological awareness, and working memory another early indicator for reading deficits is the use of Rapid Automatized Naming (RAN). According to Layes, Lalonde, Mercheri, and Rebai (2015) "RAN was found to be a powerful predictor in a number of transparent orthographies" (p.23). Since orthographies have a strong connection with phonology, it is imperative that students are proficient in these skills. Wolff (2014) found that RAN, when found in kindergarten, can identify phonological awareness and naming speed which relate to word identification and passage comprehension. Linking phonological awareness and speed with a student's ability to comprehend are good predictors of early reading achievement. Potocki, Sanchez, Ecalle, and Magnan (2015) argue that "comprehenders deficits experienced by less skilled comprehenders are not necessarily constrained by impairments in low level skills such as word sentence processing" (p.2). The way fundamental skills are involved in comprehension may evolve throughout children's development. Aldof, Catts, and Lee (2010) support this statement by explaining that,

> Although many screening batteries exist to identify children at risk for reading problems in the early elementary grades, few studies have examined early predictors of later reading comprehension. Because both the factors that account for variance in reading comprehension and the profiles of children identified as having reading impairments change over time, we hypothesized that different kindergarten measures would predict reading comprehension problems in eighth grade than in second grade. (p.338)

 Although studies have shown effectiveness of various indicators and their early signs of reading risks, these assessments should still be conducted. Predictors are the only way teachers can

identify which struggling students and determine strategies for intervention. Although

kindergarten measures should be taken into account, they should not be the only determining

factor in identifying comprehension deficits. Students' reading abilities change constantly as they

grow. As a result, they should be assessed every year to acknowledge any improvements or

declines.

Teachers that are able to identify the deficit in letter identification, phonological

awareness, word memory, and rapid automatized naming, can adjust their intervention

accordingly to help suit students' needs. The development of language within a student can

continue to develop past early identification screening. That is why it is imperative that teachers

have the resources and abilities to make instructional decisions and create intervention that meets

the needs of all students. Simmons et al. (2013) used the research from Connor et al. (2004) and

found that students with low reading skills benefit more from greater amounts of teacher-

managed explicit instruction compared to child- managed instruction. One type of teacher –

managed intervention that is used for struggling readers is the use of the Response to

Intervention (RTI). According to Squires, Gillam, and Reutzel (2013), "44 states have an RTI

framework to support early intervention by regularly monitoring students' progress and stepping

in to intervene at the first sign of trouble" (p.401). This framework is used to help struggling

learners, specifically in reading skills. Squires, Gillam, and Reutzel continue to explain that 80-

85 % of students will be successful in the first tier, 10-15% of children will need extra support

through small group and more target explicit instruction in tier 2, and finally up to 5% will

require intense intervention in addition to the general education curriculum. If identified at an

early age, teachers can adjust their teaching to focus on areas of weakness and identify students

who may have a learning disability. Squires, Gillam, and Reutzel support this with research that

given the right support at the third level of RTI, such as modifying classroom tasks, reducing

language concept complexity, and using frequent repletion can increase reading skills even for

struggling readers. Providing scaffolding helps reduce the cognitive and memory burden that is

placed on struggling readers. Wanek and Roberts (2012) agree with this statement and say that

interventions, such as RTI, in basic reading skills such as phonological activities and word

recognition, do positively affect comprehension abilities. The interventions are able to help

students who struggle in these areas focus on the fundamentals so they can then as a result

improve their cognitive ability to comprehend texts.

     For students with reading disabilities, intense intervention is vital in order to move

students towards reading proficiency. Wanzek and Roberts (2012) acknowledge this importance

by stating "explicit instruction in comprehension with many opportunities to practice reading and

understanding text may be the most important instructional intervention for improving student

learning" (p.91). Increased intervention in reading comprehension will then support students'

abilities to read and understand complex content area text in upper elementary grades. Wanzek

and Roberts also state that through the use of research, intervention on phonological activities

also improves reading outcomes on reading comprehension. Since there is a strong link between

phonology and semantics, students must have a strong foundation in the sounds of linguistic

language before they can become proficient in their metacognition. Simmons et al. (2013) found

converging evidence that shows that clear, organized intervention in phonemic awareness and

decoding for children provides evidence of students at risk of reading difficulty in early grades.

This type of intervention is clear and precise. Swanson and Vaughn (2010) explain that students

with reading disabilities use the resource room to focus on specific reading skills. In the study

used by Swanson and Vaughn, they prove that more explicit instruction needs to be implemented

in order to increase the lacking comprehension skills. The teacher knows what the student needs

and he/she teaches directly to that skill. This is seen in guided reading instruction and

individualized student instruction. Both interventions provide opportunities for students to

receive instruction based solely on their reading needs.

Effective Strategies for Students with Dyslexia in Reading Comprehension

The use of early predictors of students with reading difficulties helps guide teachers as

they formulate a step by step plan for an individual student's needs. After the student has been

identified by the use of predictors, interventions are implemented to help support and improve

the student in their reading skills. There have been various evidence- based strategies that have

been studied and proven to be effective in supporting intense intervention to students in need.

Guided reading and explicit instruction are widely used in many early general education

classrooms today. They promote the concepts of differentiated instruction and scaffolding.

Denton, Fletcher, Taylor, Barth, and Vaughn (2014) define guided reading as "small group

lessons in which the activities are based solely on text reading and instruction and is focused

primarily on reading for meaning" (p.269). Guided reading is used so teachers can group

students based on their reading abilities. The teacher can then focus on the specific skills needed

by each group of students. According to Denton et al. "guided reading teachers teach and

prompt students to use reading strategies that involve three sources of text information: meaning

cues from background knowledge, cues derived from students' understanding of English syntax,

and visual information derived from print" (p.269). Supplemental interventions such as guided

reading that have been used for extensive period of time have shown large positive effects for

students in primary grades. Explicit instruction is another way of teaching students reading

skills. Explicit instruction according to Denton et al. is direct explanation and modeling of

concepts and skills which also give opportunities for guided and independent practice. Struggling readers have difficulty comprehending challenging concepts, explicit intervention helps guide those students step by step towards reaching proficiency in reading. Wanzek and Roberts (2012) claim that interventions, such as guided reading and explicit instruction, address skills for increasing reading knowledge and understanding various texts, are recommended in order for the students to access the general curriculum more effectively. During the time of guided reading, students receive intervention based on the deficits in reading skills. Denton et al. found within their research that although guided reading does help with reading fluency and comprehension, students who receive explicit instruction performed four times better in reading comprehension than they would have experienced with guided reading. This type of instruction provides more systematic learning and works through each step in order for a child to master the reading skill. Spear- Swerling and Zibulsky (2013) argue against Denton et al. (2014) when they explain that devoting a majority of instructional time to one single component of literacy, like explicit instruction, would likely exclude attention to other important components. The explicit instruction, however, offers more systematic progress from less challenging to more challenging, teachers model how to perform the task, and finally students are able to try on their own. Students with reading difficulties show more improvement using this intervention because the teacher is showing intervention methods exactly how to do it. The research found in Denton et al. continue to prove that explicit instruction is the most suitable way to teach struggling readers because the teacher can still differentiate the instruction by determining what skill needs to be focused on for each student. The selection of instruction is determined by the students' reading level along with the analysis of assessments. Connor, Morrison, Fishman, Giuliani, Luck, Underwood, Bayraktar, Crowe, Schatschneider (2011) concur with the previous studies,

concluding that "explicit instruction of comprehension strategies are associated with gains in reading comprehension" (p.192). Explicit instruction helps promote student achievement, but it is not the only factor that contributes to student success. There have been strategies that have also been tested and analyzed to prove to be effective in contributing to proficiency in reading comprehension in both students with and without reading difficulties.

Another educational tool that is being used throughout many studies is the implementation of mobile technology. Students are knowledgeable of 21st century technology and comfortable using it. They can handle and manipulate various components of computers and other electronic sources. Technology has been brought to the forefront as being an effective tool for enhancing reading comprehension skills in students. One tool that has been proven to increase reading comprehension skills is the use of Headsprout Comprehension. Headsprout Comprehension is one type of computer-based instruction that promotes reading skills, specifically reading comprehension. According to Cullen, Alber-Morgan, and Schnell, Wheaton (2014) computer-assisted instruction has been demonstrated to be an effective intervention for increasing reading skills including word recognition, vocabulary, and comprehension (p.356). A program on the computer engages many struggling readers and allows them to work on lacking skills in a different way. Since students of the 21st century are more comfortable with the use of computer programs, this is a great way to help those students who are struggling with reading enhance their abilities to comprehend various texts. Reid, Strnadova, and Cumming (2013) concur by stating that technology used in the educational system provides limitless potential for individualizing teaching, learning, and communicating. Differentiated instruction is the best way to reach each individual student, so why not enhance the differentiation by implementing tools like technology to push students towards proficiency in reading comprehension. Students with

dyslexia have a hard time with decoding and encoding sounds and letters, which leads to trouble

with analyzing and manipulating longer complex sentences. One way to help these students is

the use of visuals and kinesthetic activities on the computer. Reid, Strnadova, and Cumming

support this claim by explaining that "students with dyslexia learn more effectively when

material is presented visually. These students can experience even more success when they have

the opportunity to interact in different ways to work on improving skills" (p.176). Interacting in

various ways with a text is a multisensory approach and is more engaging for those students who

may be reluctant because they have trouble decoding or understanding texts. Cullen et al. (2014)

discuss that the use of their study on Headsprout Comprehension provides students with dyslexia

a more engaging experience, frequent response opportunities, immediate feedback, and

reinforcement. This program is not used in the classroom as the only type of instruction. It is

used as a supplement that enhances reading achievement across a range of diverse learners.

Gonzalez (2014) uses the research from Hall et al (2000) to show that "computer- assisted

instruction can provide the needed extra time, guided practice, and supplemental instruction that

students with reading disabilities require to be more successful in the reading process" (p.112).

Students with deficiencies in reading skills need extended time to complete lengthier

assignments. They may need extra math practice and to be taught concepts using a variety of

instructional strategies. Reid, Strnadova, and Cumming (2013) explain that students with

dyslexia often have difficulty with the metacognitive parts of learning. Computer- based

programs such as "MindNotes" and "IThoughts" help (p.179). Students with dyslexia also show

signs of deficits in working memory. Reid, Strnadova, and Cumming state that "Dyslexia

Quest" has been proven to strengthen working memory along with phonological awareness in

those struggling readers. All of these scaffolds can be provided through the use of computer-

based programs. In addition to computer- based programs, researchers have found the use of E-books as a useful tool to help both struggling readers and non- struggling readers with reading comprehension.

  E-books are another effective tool that has been tested and proven to be a contributing factor to proficiency in reading achievement at various grade levels.   According to Gonzalez (2014), "E- books (electronic books) are a form of an interactive story which include multimedia effects such as written text, music, sound effects, and animation" (p.112). The largest attribute the e-book has is visual effect. Larson (2012) suggests that "one third of children ages 9-17 would read more books for fun if they had access to e-books" (p.281). The e- books provide engaging pictures, text, and sound that motivate more students to read. Fajardo, Avila, Ferrer, Tavares, Gomez and Hernandez (2012) agree and state that "students' attitude is highly receptive to the use of internet reading environments" (p215). The students can select and manipulate texts that are interesting to them individually. Larson (2012) also goes on to claim that,

  To become fully literate in today's world, students must become proficient in the new

  literacies of the 21st century technologies. As a result, literacy educators have a

  responsibility to effectively integrate these new technologies into the curriculum,

  preparing students for the literacy future they deserve. (p. 281)

Once teachers effectively integrate E-books into the curriculum, the E-books will provide scaffolds to assist students in the reading process. The E-books have embedded support within each book. The tools that embedded in the E-book help with fundamental reading skills and higher level reading skills, such as literal and inferential thinking. According to Gonzalez (2014) some features that support student learning are text- to-speech, embedded vocabulary support, and animated graphics. These scaffolds allow students to work at their own pace and zone of

proximity. They also are used as a supplement to the teacher instruction. If a student is

struggling with a specific skill, the E-book can be used as extra support on top of what the

teacher has explicitly taught. Larson (2012) similarly states that the teacher's role in the 21st

century literacy classroom has changed to that of a facilitator rather than the only source of

literacy knowledge. The students will work with the E-book and the teacher will be there to

guide them along the way. The teacher is not there to teach the skills, the E-book does this in

various ways to help meet each student's needs. The use of E-books can enhance a student's

critical thinking, reading comprehension, and overall reading experience.   Larson explains that

the E-book includes a feature that helps support the meta-cognitive process in struggling readers.

The use of notes/marks allows students to write notes in the margin as they are reading. The use

of notes and marks also promotes ongoing engagement and challenges the student to think about

he/she is reading. The teacher can review the student's notes/comments and assess his/her level

of comprehension. Gonzalez explains that E- books also provide narrative and expository texts

that allow for each student to use their prior knowledge to accurately answer inferential and

factual questions. Studies that have been examined by Fajardo et al. (2012) have also proven that

narrative texts are easier for students with and without reading disabilities. Students with

reading disabilities, such as dyslexia, have a better chance at connecting prior knowledge to

narrative texts than expository. These students are capable of making inferences from this type

of text.   E-books provide teachers with the tools to meet various reading needs within the

classroom. They also are used as a supplement for students who have been identified with a

reading disability.

Another strategy that has been the focus in research is the use of easy-to-read texts.

Easy-to-read texts eliminate the complexity of linguistic language so that students of various

reading disabilities can access and manipulate in ways that help them succeed. Fajardo et al.

state that "easy to read, or simplified, texts is one of the strategies used by educators to improve

the reading comprehension performance of students with reading disabilities" (p.212). The more

complex a sentence is, the harder it is for students with dyslexia to retain the information.

Students with dyslexia have a difficulty in working memory, so if a text has complex sentences it

makes it more challenging for recall. Fajardo et al. concur by explaining that,

> students with intellectual disabilities have problems retaining information, so by
>
> increasing the number of information units could hinder the process of making
>
> inferences, which concurrently reduce the amount of information units to with, could
>
> cause cognitive overload, leading to students with reading disability performing poorly
>
> on processing texts. (p.221)

Unfortunately with the increased push for students to meet the standards, easy-to-read texts don't

provide the complexity that the standards are asking for. Therefore, Mason, Davison, and

Scheffner Hammer (2012) argue that for students who struggle with learning from text,

remediation of these deficits is critical, especially with the curriculum shifts in general education.

Remediation should focus on areas that the student is struggling the most in. Mason, Davison,

and Scheffner then go onto explain that "the type of instruction should predominantly be content-

based instruction" (p.1134). Although, some researchers would argue that easy-to- read texts do

not provide the stamina that students need to meet reading proficiency, it is imperative that the

students have the basics before they can approach a high level content specific text. Easy-to-read

texts have also proved that they increase students' self-efficacy and reading motivation. Students

with dyslexia are reluctant to read because they struggle with longer texts. However, according

to Fajardo et al. (2012) once students learn the strategies and use the easy-to-read texts they gain

confidence in themselves as readers. As a result, they have self- perceived confidence and are

more willing to read and make an effort in answering various literal and inferential questions.

With the increased confidence, students are also more inclined to read content based texts using

the strategies they have learned from explicit instruction.

The last strategy that has proved to be effective in guiding struggling readers towards

proficiency in reading comprehension is the use of self-monitoring. Students use the terms

before, during, and after as a strategy to understand a text. Mason, Davison, Scheffner, Hammer,

Miller and Glutting (2012) say that students' acquisition is based on the "Strategy Development

Instruction (SRSD)," which means think before reading, think while reading, and think after

reading" (p.1134). SRSD is used to help students think about their learning during a reading

text. Mason et al. go onto prove that TWA (thinking before, while, and after reading) improves

performance for students with and without disabilities. Results from this study show that

students' reading comprehension improved in both written and oral answers. The results also

show that the students' overall cognitive abilities, learning behavior, and aptitude to perform

content area reading and informative writing all improve when using the TWA model. In

Wanzek and Roberts (2012) research, they concluded that practices including previewing a text

and connecting with student knowledge, self- regulating while reading, and summarizing what is

learned at the end of a reading, improved comprehension and vocabulary skills" (p.91). This

process helps with the cognitive component of learning because it promotes self- thinking.

Teachers can provide guidance during this process to ensure that students are meeting the

reading goals. Kropiewnicki (2006) also agrees that before, during, and after is an effective

strategy to use for all readers, especially students who struggle. Kropiewnicki states that the pre,

during, and after strategy has been proven to increase students' efficacy and achievement in

reading comprehension. The specific strategy focuses on making connections to prior

knowledge, questioning before and during the reading, inferring or drawing a conclusion, and

visualizing mental images based on the text. Students can also use TWA while the teacher is

doing a read aloud. Hudson and Browder (2014) state that students in special education

classrooms demonstrate improvement when read alouds are being used. They are able to have a

discussion before the reading, during the reading, and after the reading. Sometimes responding

to questions orally is better for students with dyslexia because they are not challenged by the

complex linguistic language from a text. Throughout the before, during, and after reading

strategy, students can use graphic organizers to organize their ideas which then helps them form

responses to literal and inferential questions. This strategy promotes ongoing engagement with

the text. Since students with dyslexia struggle with their working memory, this strategy enables

students to continuously think about what is happening throughout the text. Before reading,

students are guided to activate their prior knowledge of the topic. Then, they can think about and

discuss the theme of the text. Finally, students can take the information gained from these

previous strategies and form literal and inferential responses related to their comprehension.

Research has shown the importance for prepared pre-service teachers and the

effectiveness of professional development for teachers to support struggling readers. Universities

and colleges need to make ardent efforts to provide pre-service teachers the training and

experiences they truly need to effectively teach diverse learners. Without necessary components,

pre-service, and in-service teachers lack the understanding and knowledge to teach struggling

readers, specifically those with dyslexia. In addition to prepared pre-service and in-service

teachers, it has been shown that teachers need to be alert to the early indicators of students with

reading disabilities, especially those who show signs of dyslexia. When these students are

identified, there should be an implementation of early interventions. These interventions support

the deficits in phonological awareness, word decoding, working memory, and comprehension.

The interventions also, if identified at an early age, will allow struggling readers work closer to

becoming proficient in reading comprehension. Scholars and researchers have explored various

strategies that have been used with struggling readers. The use of guided reading and explicit

instruction have proven effective in helping students with reading disabilities become proficient

in reading comprehension skills. E-books and computer-based programs have also been proven

to support struggling readers with deficiencies in all areas of reading. The computer-based

programs also help with students' self-perception on reading which then has demonstrated an

improvement in comprehension. Lastly, researchers have found that the pre, during, and after

strategy helps all readers learn how to engage with a text. Since students with dyslexia have

trouble with their working memory, thinking about the text before, during, and after will enhance

their ability to comprehend various texts. Without the strategies and interventions that have been

the focus of research, students with dyslexia will struggle with reading comprehension

proficiency.

Method

Context

Research for this study took place at a Catholic School in upstate NY. This school

receives students from various towns around the upstate area. According to the New York State

District Report card from 2014-2015, the school that all three students attend serve a population

of 231 students ranging from Pre-Kindergarten through sixth grade. One percent of the students

in this school are American Indian or Alaska Native, 1% are African American, 1% are Hispanic

or Latino, 1% are Asian or Native Hawaiian/ other Pacific Islander, 1% are multiracial, and 95%

are White. Fifty-five percent or 127 of the students are male, and 45% or 104 are female. The

population of children with disabilities is 23 which is about 10% of the school. There are no

students with Limited English. Lastly, 50% or about 116 students are labeled Economically

Disadvantaged (data.nysed.gov).

I conducted research in three classrooms during this study. The first student I worked

with is in third grade. This third grade classroom is one of two within this Catholic school.

There are a total of 21 students. 11 are male and 10 are female. All of the students are white

within the third grade classroom. The second student I worked with is in the sixth grade. There

is only one sixth grade in the school. There are a total of 20 students in the sixth grade. 15 of the

students are male and 5 are female. 2 students are Hispanic and the rest are white. The third

student I worked with is in the fourth grade. There are a total of two fourth grade classrooms in

this school. There are a total of 15 students. Ten of the students are female and 5 are males. All

15 students are white.

Participants

The participants that were in this study are in two different classrooms at the same

school. There will be two girls and one boy in this study ranging from eight to 10 years old. All

three students are white and have been students in this school since preschool or kindergarten.

Eric and Samantha are in third grade and in the same class, and Madison is in fourth grade at the

same school. All three children are in general education classes, and all require special

education services. Of the three students, all have been diagnosed with dyslexia and have IEPs.

Eric and Samantha receive 5 x 40 weekly resource room, while Madison receives 5 x 30 weekly

resource room.

Teacher #1— Mary Smith

Mary (pseudonym) is a white female who is the teacher of Samantha. Mary has been a teacher for 28 years in urban, suburban, and private school settings. She has experience as a classroom teacher working with students from 8-12 years of age in the amount of time she has been a classroom teacher. In addition to being a classroom teacher she has also served in the capacity of an AIS teacher, and as an administrator. She is certified as a General Education teacher N-6, Special Education Teacher, and Building Leader. She has her Bachelors in General Education N-6 and her Master's in Education. She enjoys teaching science and is always looking for new strategies and tools to implement into the classroom.

Teacher #2— Cindy Carpenter

Cindy (pseudonym) is a white female, who is 47 years old. She has been teaching for 26 years. She is certified as General Education Teacher N-6, Special Education Teacher K-12, Board Certified Behavior Analyst, and Licensed Behavior Analyst. She is currently the Consultant Teacher and services students from Kindergarten to sixth grade. Cindy lives with her daughter, son, and husband.

Teacher #3 — Jane Lewis

Jane (pseudonym) is a white female who is the teacher of Eric. She has been teaching for 42 years. She is certified as General Education Teacher K-6. She also has her Master's in Education. She has taught all grades from Kindergarten to sixth grade. She is currently the sixth grade teacher. She lives with her husband and has three kids.

Eric

Eric (pseudonym) is a twelve year old white male. He is currently in sixth grade and has two older brothers. Eric has been diagnosed with dyslexia which has resulted in an IEP in the winter

of 2012. He receives services with a consultant teacher for 30 minutes five times a week. He is

currently reading on grade level. He uses the program cowriter to write all of his assignments.

Samantha

Samantha (pseudonym) is an eight year old white female. She is currently in third grade and is an

only child. Samantha has been diagnosed with dyslexia which has resulted in an IEP in the fall

of 2015. She receives services in resource room with a consultant teacher 40 minutes five times

a week. Samantha's current reading level is late first, early second grade.

Madison

Madison (pseudonym) is a 10 year old white female. She is currently in fourth grade. Madison

has a twin sister and two younger sisters. She has been diagnosed with dyslexia and received an

IEP in fall of 2015. She meets with the consultant teacher 30 minutes a day five times a week.

Madison's reading level is late second, beginning of third grade. She enjoys dance and loves art.

Researcher Stance

I am currently a graduate student in the Literacy Master's program at St. John Fisher

College in Rochester, New York. I obtained a degree in Childhood and Special Education from

Niagara University as well. For this study, I was an active participant observer. According to

Mills (2014), an active participant observer is a teacher who is fully engaged in their teaching

practices, while consciously being aware and self-monitoring their approaches and adjusting

them according to the students they are serving. An active observer was the most suitable

observer for this study because I was able to work one-to-one with the students to show these

strategies. I did not have other teachers implementing the strategies because I wanted to focus

solely on how the strategies worked and if they were effective. If I were to have other teachers

implement the strategies there would be various teaching styles and I wouldn't be able to tell if it

was the strategy or the way the teacher showed the strategy.

Method

  For this study, I collected data that was qualitative and quantitative. The research

involved the implementation of three various strategies to three students that have been

diagnosed with dyslexia. I was the active observer for the three students. I interviewed the

students and teachers before and after implementing the strategies (Appendix A- Students and

Appendix B- Teachers). I used a formal interview for the students and an email interview for the

teachers. I observed these students individually three times each over the course of three weeks

(February 23rd 2015- March 8th 2015). Each time I met with the students was before school,

during a break, or after school for about 30 minutes at a time. Observations occurred in the

school that these participants attend. Each session was recorded, and I took notes to assure that

students' behavior and reactions were taken into account.

  The first aspect of my study was completed prior to meeting with students. I used an

email interview for the three teachers that work with the selected students (Appendix A). The

first teacher was the third grade teacher. The second teacher was the special education teacher

who works with the student(s) during their required resource or consultant room time. I asked

them a series of questions regarding reading comprehension and how it is taught in their

classroom, specifically to the students with dyslexia. These interview questions guided my

interview questions for the three students who have been selected for this study. After I

interviewed the teachers, I then interviewed the three students. The questions were based solely

on the students' perception of their ability to comprehend various texts.

For each session, I, the researcher actively observed the student before and after the implementation of each strategy. The first session for each student consisted of a short reading passage and set of comprehension questions geared towards each student's reading level. I used a Reading A-Z reading passages. This was used as the pre and post assessment. The students read the passages aloud, then quietly to themselves and then answer the questions. While the students performed the tasks, I took anecdotal notes to observe their behavior and attitudes. I then took the reading passage and comprehension questions and score it accordingly.

The third component of the study was the implementation of each of the four strategies. Each strategy was observed once for each student. The first was the before, during, and after strategy. Each student was asked to preview a given passage and connect with prior knowledge. They then self- regulated while reading, and summarize what they had learned at the end of the reading. The second strategy that was used during this study was the use of Irlen Colored Overlays. The overlays are colored filters that are placed over written text that will assist struggling readers, such as students with dyslexia, comprehend various texts. The last two strategies that I used in this study is the use of a graphic organizers. The specific graphic organizers I used were a story map and the five W's.

The fourth and final piece of my study was the student and teacher interviews. I asked the three students a set of questions that focus solely on the strategies that were used and how they affected their ability to comprehend the text. I used an email interview for the third grade teacher to see if she thought the strategies were effective and if she saw any changes, positive or negative, in her students' ability to comprehend. Each student participant was formally interviewed and asked approximately five to six questions. During each interview I wrote down the responses as well as recorded through audio to assure that I have received all responses.

Quality and Credibility of Research

Since the data collected in this study is essential to my action research, it is imperative that my study is trustworthy. Mills (2014) addresses four components of research that intend to promote trustworthiness: credibility, transferability, dependability, and confirmability. I referred to each of these components during my study to promote honesty and consistency.

The first component to promote trustworthiness is credibility. Mills (2014) addresses the credibility of a study, "Refers to the researchers ability to take into account the complexities that present themselves in a study and to deal with patterns that are not easily explained" (p. 116). It is important that researchers complete persistent observations in order to identify prevalent or atypical qualities. To address credibility in my research, I became an active. I observed students before and after the implementation of three reading comprehension strategies. These interviews allowed for persistent and/or atypical qualities to become apparent for my study.

The second characteristic in Guba's (1981) efforts to promote trustworthiness is transferability. Mills (2014) describes transferability as the "qualitative researchers' beliefs that everything they study is context bound and that the goal of their work is not to develop the "truth" statements that can be generalized to larger groups of people" (p. 116). Recognizing that my study is based on setting and the participants I work with, it is important to keep in mind that the data I collected through this study cannot be permitted to only these students, but can fit to any student(s) in any school.

Mills (2014) recommends that the dependability of a study is the third component of trustworthiness and, "Refers to the stability of the data" (p. 116). Through the use of experiencing, enquiring and examining, I used Mill's strategy of overlapping methods as a way to compensate for the weakness of one of my aspects of collecting data by the strength of

another. Through the use of interviews, I supported other aspects of my data collection, confirming that these are the strongest and most validated points of my research and collection.

The last and final characteristic Guba (1981) examines is the confirmability of study which refers to "the neutrality or objectivity of the data that has been collected" (p. 105). For my study to be trustworthy, it is imperative that I practice triangulation. Mills (2014) explains triangulation as "the use of multiple sources of data" (p.108). I will become an active/passive observer, I used interviews, and I examined pre and post comprehension assessments (using Reading A-Z) during the use of the three strategies. I thereby used three sources and thee different methods to cross- check my data.

Informed Consent and Protecting the Rights of the Participant

For all the students involved in my study, I provided a written permission slip for the parents to read and sign. The permission slip stated the purpose of my study, the duration, and ways to contact me. For all children under the age of 9, I asked for verbal assent to use them in my study. For the student older than 9, I explained my study and had them sign the written assent form to allow me to use them for my study. As for the teachers that are participating in my study, I had them fill out a consent form.

Data Collection

In order to collect research for this study I used four forms of data. The first form I used was interviews. I interviewed three students and three teachers before and after implementing the three reading strategies. These interviews determined what strategies the teachers and students used before implementing the three strategies for this study. The interview questions after the implementation of the strategies determined whether or not the strategies had a positive or negative effect on the students' ability to comprehend the text.

The second form I used is the active observer. I observed the students receiving these strategies to better enhance their ability to comprehend a passage. As an active observer I worked one-on-one with a student while implementing the three strategies. I was able to receive a direct response by becoming the active observer. I was the one who was providing the student with the directions and strategies.

The third form I used for this study is the use of audio recording and written notes during the observations. I was able to write down any behaviors or attitudes about the specific strategies being used. I also used written notes and audio recording of the interviews to assure that I am receiving all of the information both the students and teachers are providing. The interviews were used to support or decline the effectiveness of the strategies used in this study.

The last form of data that I used for my study is the use of the students work. I used the comprehension questions that have been provided for both before and after to assess if there was growth. The use of student work demonstrated the effectiveness of the strategies and helped the student with his/her reading comprehension. Students read an on level reading passage (using Reading A-Z) and answered various multiple choice responses. The students were able to either write their responses or verbally explain their answers.

Data Analysis

During the course of this study, several different forms of data were collected. In order to discuss the findings of my research, it was necessary to conduct an in-depth analysis of this data. The first set of data I analyzed was from an interview comprised of three teachers who work with students who have been diagnosed with dyslexia. Using a highlighter and a table with tally marks, I recorded all of the similarities I found throughout the email interviews. The highlighting was used for the short answer responses and the table with the tally marks was used

for the questions that only required a yes or no response. By analyzing the data in this way, I

was able to note the similarities and differences between the answers provided by the teachers. I

was then able to use that information to determine which behaviors were most often expressed in

classrooms with students with dyslexia. I also took a closer look at which reading strategies were

successful and which were not, and why those strategies did or did not work for those students. I

examined the students' scores on the pre-assessment and post-assessment for each strategy to

determine whether or not it had an influence on their ability to comprehend the story they were

reading. I then asked the students during their second interview whether or not they thought the

strategy helped them. If the student received a lower grade after using the strategy, I asked the

student what he/she found difficult when using that strategy.

The second set of data analyzed was the formal interviews that were completed by a

group of three students who have been diagnosed with dyslexia. The three students were

interviewed before the use of the strategies and interviewed after the strategies. Similar to how I

analyzed the teacher email interviews, I transcribed the interview and then used highlighting to

note similarities in the students' short responses and a table with tallies to note the similarities

between the questions that had yes or no responses. After analyzing this data, I was able to

determine what reading behaviors were displayed and what reading strategies the students had

used in the past. I was able to recognize common problems the students had with reading as well

as strategies they found were successful in the past.

The third set of data I collected and analyzed was the field notes during all three

observations. The field notes consisted of behaviors that were exposed during each of the three

strategies. After analyzing this data from the field notes, I discovered a collection of codes that

exemplified the themes from my research, but also the themes currently presented by the other qualitative data.

The final set of data I collected and analyzed was three sets of pre-assessments and post-assessments from the students. This set of data was analyzed by using a table to record the pre-assessment and post-assessment scores of each strategy for each student. Based on the documented information, I was able to determine which strategies successfully increased the student's scores and, therefore, were successful in supporting their reading comprehension. I also analyzed the types of questions that were asked and what the students missed while reading the passage.

Analyzing each piece of data is vital to the research process. Using the data from interviews, field notes, audio recordings, and pre-assessments and post-assessments, I was able to determine which strategies helped to support the reading comprehension skills of students who have been diagnosed with dyslexia. I was also able to discover what the most challenging part about reading for students' with dyslexia have. By using analyzing and coding my data, I was able to determine the three themes that will be discussed in the findings section of this paper.

Findings and Discussion

A range of educational abilities in today's schools continues to challenge teachers. Teachers are forced to create lessons that target various skills in a range of multiple ways. Students who have been diagnosed with dyslexia struggle with the fundamentals of the reading process. Since they struggle with reading and writing skills, it is important that teachers have the knowledge and resources to assist them so they can become proficient in both of these areas. Teachers play a pivotal role in the way their students learn. After examining the data to determine the effectiveness of teachers and reading strategies for students with dyslexia and their

reading comprehension, three themes emerged. The first theme is decoding and fluency and its effect on grade level reading comprehension. The next theme is the ability for students to track their reading in relation to reading fluency. The last theme looks at teacher driven comprehension strategies and their effectiveness on a student's ability to understand what he/she is reading.

Decoding and Fluency and its Effect on Grade Level Reading Comprehension

After analyzing the data, it was found that students with dyslexia struggle with understanding certain types of reading because it is difficult for them to decode words. In the students' formal interviews that were given before the strategies (Appendix A), each student specified that the hardest part of reading and understanding a story is that they cannot pronounce words. When asked about the hardest part about understanding what you are reading, Samantha (pseudonym) answered: "probably trying to figure out how to say the hard words" (Student Interview, 2016). Dyslexic students cannot understand what they are reading because they are too focused on what the words actually say. They spend all of their time trying to decode the many words on the page before they can even think about what the words mean. Layes, Lalonde, Mecheri, and Rebai (2015) support this by explaining that phonological skills have been found significant in reading comprehension. Reading comprehension deficits are a direct consequence from a student's inability to establish adequate phonological awareness. Some of the time, these students can use their knowledge on phonological awareness to sound out words; however for the most part sounding out words and using phonological awareness is a strategy that needs to be constantly reinforced. Madison (pseudonym) also states that "sounding out the words" is the hardest part about reading. She then goes on to explain that, "sometimes I can't think of the sound of a letter or a lot of letters so I have to look at it for a long time before I can

sound it out and then I forget all about what I am reading" (Student Interview, 2016). This

demonstrates the struggle that students with dyslexia have while trying to comprehend what they

are reading. According to Layes, Lalonde, Mecheri, and Rebai (2015) state that

> dyslexics take a long time in processing information, especially while reading because
>
> they must connect letter patterns with corresponding sounds. The working memory
>
> requires high stimuli and abilities to hold onto knowledge in short-term and long term
>
> memory. If a student cannot hold onto an unfamiliar word in short-term memory long
>
> enough to repeat it, segmenting the word poses an immediate challenge. (p.28)

This statement reinforces the struggles that Madison found while she was reading. She explained

that she has to look at a word for a long period of time because she has forgotten the sound that

the letters make. Since she spends so much time focusing on that word, she then forgets what she

is reading. This is a common problem that many dyslexic students face while reading. Eric

(pseudonym) explains a time when he was reading an informational text on the ozone layer, he

was asked why it is difficult to understand this passage and he said, "I wasn't excited to read

about it. It was really hard to understand and there were a lot of words I didn't know" (Student

Interview, 2016). Eric is another example of a dyslexic student who struggled with

understanding a text because he was challenged by the overwhelming amount of words as well

as the difficult in decoding multisyllabic words. A reading that is challenging is the student's

inability to decode the words and identify the meaning behind the words. Wanzek and Roberts

(2012) would support this claim that students with difficulties in basic reading skills such as

word recognition and fluency lack mastery in phonological awareness which could significantly

affect their ability to comprehend complex text in later years. In addition to the difficulty with

decoding, these students also lack the background knowledge of certain vocabulary words.

When provided with the teacher interviews (Appendix B), all three teachers explained that decoding words was one of the reasons why students with dyslexia find difficulty with reading comprehension. Mary Smith (pseudonym) found while working with all three students that "they become frustrated with a reading due to the difficulty to decode words along with not understanding the context. It is important for teachers to include in daily instruction review of phonemes and decoding strategies" (Teacher Interview, 2016). Mary, a teacher who has been working with dyslexic students for many years, has become aware of the struggles that these students face. She understands the importance of intervention and continual phonemic repetition. Wanzek and Roberts (2012) acknowledge this importance when they state that

> through the use of research, intervention on phonological activities also improves reading outcomes on reading comprehension. Since there is a strong link between phonology and semantics, students must have a strong foundation in the sounds of linguistic language before they can become proficient in their metacognition.

New vocabulary or words that are unknown to the student can inhibit their ability for understanding. While observing each student, I noticed how Madison had trouble with the word "erosion" in the story "The Mystery of the Sphinx." Since she was not able to pronounce the word, it then affected her ability to understand what the word meant. Erosion was used as one of the vocabulary comprehension questions on the Reading A-Z post-assessment for the five W's strategy. Since she did not know the pronunciation of this word or the meaning of it, she was then unable to correctly answer the question (Field Notes, 2016). Madison's inability to pronounce the word "erosion" affected her ability to understand what the word meant. Unfortunately, many comprehension questions focus around vocabulary, and since dyslexic students have trouble with decoding, it then results in trouble with comprehension. O'Brien, Van

Orden, and Pennington (2012) support this claim through their research that suggests, "when it comes to reading, evidence has shown that comprehension is affected because of the inability to analyze complex letter, word, and sentence structure" (p.383). Jane, Eric's teacher, described Eric's difficulty with reading. She explained in the interview that she has observed that this type of reading is problematic because "it is filled with words he does not know and cannot read" (Teacher Interview, 2016). Eric's general education teacher has identified the main reasons why Eric struggles understanding texts. Not only is are there too many words on the page, but Eric cannot figure out what the bigger words mean. This situation is another example of why the students with dyslexia are challenged with reading fluency which then, as a result, affects their reading comprehension.

In addition to the challenge of decoding words, it was found through this data analysis that students with dyslexia have a hard time focusing on words while they are reading. Through both student and teacher interviews, it was mentioned that there are either too many words, they are too small, or they jump around on the page. Eric mentioned in his interview that, "…the words are close together in a lot of stories I read" (Student Interview, 2016). One main issue that is common for dyslexic students is the idea that words are moving around on the page and are either backwards or shifted. For Eric, it is hard to read stories because the words are so close together. Fajardo et al. explains that "easy to read, or simplified, texts is one of the strategies used by educators to improve the reading comprehension performance of students with reading disabilities" (p.212). Easy to read texts can help dyslexic students because it will allow the student to read the text with less focus on chasing words and more focus on comprehension. For many students, these problems do not exist, however for students with dyslexia they have to learn ways to compensate for these challenges. Fajardo et al. contributes to this by stating that

easy to read, or simplified, texts is one of the strategies used by educators to improve the

reading comprehension performance of students with reading disabilities. The more

complex a sentence is, or if there are too many words grouped together, the harder it is

for students with dyslexia to retain the information. (p.212)

Mary Smith also found that the dyslexic children she has worked with have told her that they

have trouble focusing on what they are reading because "the print moves around on the page and

letters reverse" (Teacher Interview, 2016). Mary, along with other teachers find that many of the

students they work with struggle with focusing on words because of the constant movement and

reverses of the letters. If print is constantly moving on a page, strategies need to be implemented

for the students, so they can worry less about the words moving and more on what they are

reading. According to Fajardo et al. they state that "easy to read, or simplified, texts is one of the

strategies used by educators to improve the reading comprehension performance of students with

reading disabilities" (p.212). Teachers can use these types of texts to help dyslexic students focus

on the movements and reversals of letters. Samantha also contributes to this issue when she

states in her interview that, "I have trouble focusing on one word because all of the words are

jumping around on the page" (Student Interview, 2016). Dyslexic students find it difficult to

focus their attention on the meaning of a text because they are worried about figuring out what

the words say. Movement of words has appeared to be a common issue between the three

students. This issue has surfaced as an indicator for students who have dyslexia. After observing

Samantha during her pre-assessment she demonstrated that it was hard for her to focus on each

word. She was constantly repeating words and sentences because she was getting lost. After

reading twice, she was asked why she had trouble reading the story out loud and she explained

that" the words are jumping around on the page so I have to point to each word so I don't get

lost" (Field Notes, 2016). Samantha has now proven that this is a major issue for her as she is

reading. Her, along with other dyslexic students, demonstrate the difficulty with reading due to

the inability to focus on the words and their meanings. According to the research that was

provided earlier in this paper, an early indication to dyslexia can be the challenge a student has

with the movement of letters and words on a page. As a result of the constant repeating of words

and sentences, Samantha only received a 50% on her pre-assessment. This score explains that

her focus was on tracking her words rather than understanding what the reading was about. The

inability to focus on comprehension because the students are concerned about decoding

strategies is a common theme that has been developed through this study.

The Ability for Students to Track Their Reading in Relation to Reading Fluency

A second theme that has emerged from this study is the ability for students to track their

own reading in relation to reading fluency. In this study, three dyslexic students were observed

using three different reading comprehension strategies. Each student was selected from three

different grade levels. Eric is a sixth grade student; Madison is a fourth grade student; and

Samantha is a third grade student. Each student expressed their struggle with focusing on the

words in a story in their interview before the implementation of the three strategies. It was found

through careful analysis that Eric (the sixth grader) has developed self-tracking skills that has

helped him compensate for the difficulty in fluency and his comprehension skills. In the first

interview, Eric explains that "he use to use an index card to help track his reading" (Student

Interview, 2016). Eric has been instructed to use this tool to assist in his reading. Since he has

been using this tool for years, it is a natural support for him while he is reading. Wanzek and

Roberts (2012) support this claim when they explain "explicit instruction in comprehension with

many opportunities to practice reading and understanding text may be the most important

instructional intervention for improving student learning" (p.91). This increased intervention, like the use of an index card, in reading comprehension supports students', like Eric, in their ability to read and understand complex content area text in the upper elementary grades. Being able to use this index card on his own has been something he has learned along the way. Whereas, Madison and Samantha have not had as much experience as Eric and do not use the tracking strategy on their own. In Samantha's interview she states that, "I don't use anything to track my reading except when the teacher asks me to use an index card or overlay" (Student Interview, 2016). This statement proves that Samantha is not fully confident in using her own tracking strategy because she has not spent much time using one either within her classroom or on her own. Dyslexic students learn to compensate for their challenges by using various strategies. When asked if Samantha uses a type of tracking strategy, she explains that "I only use them when a teacher reminds me. Sometimes I forget that I have it" (Student Interview, 2016). Eric has proven that he has learned to compensate for his decoding and encoding deficiency as compared to Samantha and Madison who still need more practice and exposure to strategies that will help them with their reading. After discovering that each of the three students have various experience with a tracking strategy, I decided to implement the Irlen Overlay and test to see if it makes a difference in each student's ability to focus on their reading and then as a result increase their reading comprehension.

Table 1

Student Interview- Irlen Overlay Strategy

Students	Irlen Overlay
Eric	☺
Madison	✓ ☺
Samantha	✓ ☺

✓ Used Strategy before   ☺ Strategy was successful

Table 1 demonstrates which students have used the Irlen Overlay in the past. From the three students, Madison and Samantha are the only two students who are familiar with the overlay. Both Madison and Samantha are familiar with the overlay because their teachers are familiar with them. The overlay has been introduced to these two students because their teacher understands the purpose and use of the overlay. However Eric has never heard of or used the overlay before. The main reason he is unfamiliar with this tool is because his teacher has never used it within her classroom. She is unfamiliar with its purpose and how to use it. As shown in table 2, the three teachers that were used in this study state whether they have or have not used the overlay in the past. The unfamiliarity that teachers have with this strategy illuminates the importance for professional development for in-service teachers. As stated, Spear-Swerling and Zibulsky (2013) explain that professional development is an important component of a teacher's ability to teach specific content knowledge and areas such as reading comprehension. Professional development should include focus on research- based strategies. All teachers should continue to stay up to date on new and effective strategies for all learners.

Table 2

Teacher Interview- Irlen Overlay Strategy

Teachers	Irlen Overlay
Mary	✓ ☺
Cindy	✓ ☺
Jane	

✓ Used Strategy before   ☺ Has seen success after implementing Irlen Overlay

Table 2 reveals that two of the three teachers are familiar with the Irlen Overlay and have used it in the past with their students. Mary and Cindy have found that the Irlen Overlay has been successful with some of their dyslexic students. The overlay helps the students track the words as they are reading. These teachers have been introduced to a strategy and have implemented it with their students. Cindy described in her interview that

> an overlay has not been used in class, however I am familiar with it and Samantha is as well. We mainly use straight edged paper or index card to help isolate text that is in the primary area of focus while blocking intimidating passages and extraneous text, which overwhelm the readers. (Teacher Interview, 2016)

This quote explains why Samantha has not used an overlay in her general education classroom. Jane has never used the overlay with her students however is willing to use it if found effective for dyslexic students. Jane along with the other teachers have expressed their interest in this strategy and are willing to use it for their dyslexic students. Since it has shown improvement in

the students' comprehension abilities, this strategy can be implemented. It will also depend on what type works best for each student and if the student is willing to use it. Table 3 demonstrates how each of the students performed on both the pre-assessment as well as the post-assessment using the Irlen Overlay.

Table 3

Irlen Overlay Strategy – pre assessment and post-assessment score

Students	Before-Irlen Overlay	Irlen Overlay
Eric	100%	80%
Madison	50%	100%
Samantha	80%	100%

Table 3 represents the scores that the students received before the implementation of the Irlen Overlay and after the implementation of the Irlen Overlay. All three students' post-assessments demonstrate an improvement in their scores after using the overlay. Although two of the three students struggled with certain aspects of the overlay it still helped them understand what they were reading. The overlay provided support and demonstrated a growth in each student's comprehension score. Eric received a 100% on the pre-assessment and an 80% on the assessment using the overlay which shows that he was focused more on where the sentence ended and a new sentence began rather than what he was actually reading. He did better on the assessment where he did not use any of the strategies that were being studied. The score from the assessment without any strategies demonstrates that Eric has learned his own self- skills to help him

compensate for his dyslexia. Madison received a 50% on the pre-assessment and a 100% on the

assessment using the overlay which shows that the overlay made a tremendous impact on her

ability to focus on the words and understand what she was reading. Madison uses the overlay to

track her reading because it is very difficult for her to follow the words. Samantha received an

80% on the pre-assessment and a 100% on the assessment using the overlay which shows that

she, in addition to the other two students found the overlay to be useful. In Madison's interview

she explains that "I need the clear overlay because the colored overlays make me dizzy" (Student

Interview, 2016). Madison can identify strategies that do and do not work for her. She

understands that is it difficult for her to track her reading, however she also knows that certain

overlays do not work for her. Miller and Glutting (2012) say that

> students' acquisition is based on the "Strategy Development Instruction (SRSD)," which
>
> means think before reading, think while reading, and think after reading. SRSD is used to
>
> help students think about their learning during a reading text. (p.1134)

This statement is proven true when Madison used the colored overlay during this part of the

study. She started to use it and then made a decision that the colored overlay does not help her.

This is an example of her self- monitoring and thinking about her reading during a text.

When interviewing the teachers it was found that only two of the teachers were familiar

with the Irlen Overlay. Both Mary and Cindy have used the overlay in the past. I have also used

the overlay with Samantha in my classroom. We are familiar with how to use it and why it is

important for struggling readers. When asked how the teachers knew about the overlay, they

explained that they either heard from another teacher or through a professional development

opportunity. These explanations shows the importance that in-service teachers receive training

for strategies that will assist struggling readers. Mary has used the overlay with many of her students and has found that it only helps some of her dyslexic students. As seen with Madison and Eric, although they both showed improvement in their scores, they still had difficulty with certain aspects of the overlay. Samantha cannot use the colored overlay and Eric needs an overlay that shows more than one sentence at a time. Mary stated in her interview "I find that if the overlay really works for a child you see immediate increase in decoding and fluency" (Teacher Interview, 2016). A student uses the overlay to cover up the longer texts so they are not overwhelmed or lost while reading. Madison is a prime example of the overlay being a success. Not only did her comprehension increase, but there was a dramatic increase in her decoding and fluency. According to Fajardo et al. (2012) once students learn various strategies and use easy-to-read texts they gain confidence in themselves as readers. This quote supports Mary's claim that for students who use the overlay they are able to track their reading and focus more on what they are reading rather than where they are reading. Mary also explains that although the overlay works for some dyslexic students, it does not work for all dyslexic students. She states "for some students it does not help, or makes reading worse. You can observe a student by watching if they are unable to keep the overlay in place, turning their face and squinting, bringing text to face etc… " (Teacher Interview, 2016). These observations will determine if the strategy is beneficial. Not all reading strategies work for every students, so it is important that teachers observe and make notes of students' behavior while implementing strategies. In this case, the overlay helped each student with understanding the text, however each student preferred to use the overlay in different ways. While observing all three students, I noticed with Eric he had the hardest time using the overlay. He mentioned in his post interview,

I did not find it easy at all, mainly because the overlay kinda highlighted the sentence I

was reading but covered up the sentence after it. So if the sentence went to the next line

you don't know you might think it's the end but it really isn't. I also do not like the color

on the overlay, it's hard to see the words. (Student Interview, 2016)

 Eric had trouble keeping the overlay in place and was constantly worried about where the

sentence ended. In addition to Eric, Samantha also found the overlay was difficult to use. She

could only use a clear overlay. She started with a colored overlay (colored filter) and then

explained that the colored overlay "makes her dizzy" (Student Interview, 2016). Strategies can

help many students who struggle with reading, however they can also make it more difficult for

them. In this case, Samantha had trouble with colored overlays so as a teacher it is important to

recognize these types of behaviors so he/she can address them immediately. So after the first

attempt with the colored overlay, we tried the clear overlay and she said "this is a lot better and it

does not make me dizzy" (Student Interview, 2016). Here is a perfect example of the teacher

addressing the problem immediately and thinking of an alternative for this student. As a teacher

it is imperative to be equipped with various strategies so that if one does not work, there are

many other choices. On the other hand, Madison explained how the overlay helped her with her

reading when she used it. She stated that the overlay "helped me understand without getting

confused" (Student Interview, 2016). Madison did not have any trouble with this tool. Her

experience with the overlay improved her comprehension and her fluency. Since this helped

Madison with both aspects of reading, the overlay will be encouraged more within Madison's

classroom setting as well as home. As I observed Madison using the overlay, she was

comfortable with it and used it to guide her through her reading. She repeated a few words, but

for the most part the overlay kept her on track during her independent reading (Field Notes

2016). She will be provided with this tool and the more she uses the overlay, the more it will

become natural to her. She will then become confident in her reading and her confidence will

then result in increased reading skills.

Teacher Driven Reading Comprehension Strategies

       Dyslexic students are taught strategies that can help compensate for their deficiencies in

the reading process. As the students get older they learn these strategies and can implement them

on their own. However, some strategies need to be teacher driven in order for success to be

demonstrated. According to Kopiewnicki (2006)

       students need to be provided with strategies to help with understanding various texts. The

       evidence from Kopiewnicki shows that teachers continue to teach lessons where the main

       skill is reading comprehension, but have failed to teach the strategies to become skillful

       in reading comprehension. (p.356)

So with that said, three strategies were analyzed in this section of the study and were revealed as

teacher driven strategies. These strategies either showed that they helped or hindered each

dyslexic student's success in reading comprehension. It is important to recognize that each

student is different; however it is also important for teachers to be aware of various strategies and

whether or not they are effective.

Table 4

Student Interview- BDA strategy, Five W Graphic Organizer, Story Map

Students	Before, During, and After Strategy	The Five W's	Story Map
Eric	✓ ☺	✓ ☺	✓ ☺
Madison	✓	✓	
Samantha	✓ ☺	✓ ☺	☺

✓ Used Strategy   ☺ Strategy was successful

Table 4 demonstrates which students have used the Before, During and After (BDA) strategy, the five W's, and Story Map Graphic Organizers in the past. All three were familiar and have used the before, during, and after strategy once before. They have also all used the Five W's. Eric was the only student who has used a story map in the past to help organize his thoughts while reading. After each strategy was applied for this study, Eric found that all three strategies helped him understand his reading. He explained in his post interview that "you know I've used the before, during, and after questioning a few times during my reading. It really helped me break apart my reading and really understand it" (Student Interview, 2016). As a sixth grader, Eric has been exposed to all three strategies. Since he is familiar with each, he was able to successfully read each passage and answer the comprehension questions. In the pre-assessment for the BDA strategy, Eric was already using his self-monitoring skills. He summarized each paragraph in his own words to get a better understanding of what he was reading. He has learned along the way how to take strategies he has learned and implement them on his own. Wanzek and Roberts (2012) support this claim through their research and concluded that "practices

including previewing a text and connecting with student knowledge, self- regulating while

reading, and summarizing what is learned at the end of a reading, improved comprehension and

vocabulary skills" (p.91). After Madison used all three strategies it was discovered that none of

the strategies helped improve her comprehension for the three stories. It was difficult for her

because she did not fully understand how to use the graphic organizers. Although, Madison has

worked with the five W's, she was not familiar with the type of graphic organizer that was used

for this study. She has worked on the five W's using skill cards, but has not used a graphic

organizer. Along with the five W's, Madison also has not been exposed to the story map that was

used in this study. Since she had not seen it before or used it in the past, it was difficult for her to

use this as she was reading. Mary supports this by explaining that

> graphic organizers can be helpful to some students, however I often find that students have
>
> no idea how to effectively use an organizer. If a student doesn't understand why you need to
>
> use a graphic organizer; there will be little effectiveness. (Teacher Interview 2016)

Students must be taught these strategies and the importance of them in order for them to be

successful. If students are not familiar or comfortable using graphic organizers, then it is

pointless to use them. The students need to fully understand how to use them for them to be

effective. Eric found these strategies successful because he has used the Five W's and Story

Maps in the past and has been taught the importance of using them. Although they are teacher

driven strategies, Eric has more experience with them compared to the other two students and he

was able to use it on his own during the pre-assessment, before the teacher asked him to do so.

Table 5

Teacher Interview- BDA strategy, Five W Graphic Organizer, Story Map

Teachers	Before, During, and After Strategy	The Five W's	Story Map
Mary	✓ ☺	✓ ☺	✓ ☺
Cindy	✓	✓	
Jane	✓ ☺	✓ ☺	✓ ☺

✓ Used Strategy before   ☺ Has found strategy was helpful

Table 5 represents the three teachers that were used in this study. During the teacher interview, each teacher was asked if they use the three strategies within their classroom. Mary explains that she uses before, during, and after almost all the time when she is working with any student, specifically students with dyslexia. She also has used the five W's, not as a graphic organizer but in other forms. She says "presenting the information in many ways and using more than one strategy can often improve comprehension" (Teacher Interview, 2016). With two of the three students used in this study, this was proven true. Eric and Samantha were able to improve their comprehension using more than one strategy. In addition to Mary, Cindy also explains how graphic organizers have been used in her classroom. She has used the before, during, and after as well as the five W's. She does not use the story map, but states "she is willing to use the story map in the future" (Teacher Interview, 2016). Although Cindy does not use the story map within her classroom, Samantha made it clear that she has used it in other grades to help organize her thoughts as she is reading. As shown by the student interview table above, Samantha has shown

success in her comprehension using the story map graphic organizer. This strategy is effective

because it worked for Samantha and can be transferred to her general education classroom during

any reading time throughout the day.

Table 6

Pre and Post assessment using BDA strategy, Five W Graphic Organizer, Story Map

Students	Pre – Assesment	Before, During, and After Strategy	The Five W's	Story Map
Eric	100%	100%	100%	100%
Madison	80%	80%	60%	80%
Samantha	70%	100%	100%	80%

Table 6 includes the scores that each student received on the pre and post assessment for

the BDA, Five W's, and Story Map strategies. Eric was able to successfully answer the

comprehension questions for each strategy. Eric was able to successfully answer all of the

comprehension questions using all of the strategies in this study because he was familiar with

them and has used them in the past. Samantha showed improvements in the story map strategy.

She explained during her post assessment "I enjoy using the story map, it helped me find and

organize the characters, setting, and problem of the story" (Student Interview, 2016). Samantha

was successful in the story map because she was comfortable with it and she knew how to use it.

As stated before, the more familiar a student is with a strategy the more effective it is. The scores

showed that Madison struggled with the five W's graphic organizer. During the observation of

this strategy, I had to remind Madison what type of things she was looking for in each category.

She could not remember what type of information would answer the "why" section of the

graphic organizer (Field Notes, 2016). Since Madison had trouble remembering what type of

information each question was looking for, she then struggled overall answering the

comprehension questions. She only received a 60% because she had trouble with the "why"

section on the graphic organizer. This observation and score shows that if a student has trouble

with understanding the graphic organizer or strategy, he/she will then as a result struggle with the

comprehension. Samantha showed improvement with each strategy. She showed more success

with the BDA and Five W's graphic organizer than the Story Map.

Based on the data, the four strategies that were implemented were a success for some or

all of the students used in this study. As evident in Tables 1, 2, 4, and 5 most students and

teachers use a variety of strategies to support reading comprehension. However, not all of the

strategies that are successful make as big of an impact as others. It can be argued that where one

strategy can be successful for most kids who struggle with reading comprehension that does not

mean it will be successful for all dyslexic students. An example of this difference is the use of

the overlay. The overlay only positively impacted Samantha and Madison's comprehension, it

did not help Eric. Eric not only felt uncomfortable with the overlay, but he also received a lower

score on his post –assessment for this strategy.

Implications

After analyzing the data and discussing the findings of this research, several implications

can be offered to teachers of dyslexic students. These implications focus on a variety of

strategies that either support or impede the reading comprehension of dyslexic students. Since

students who have been diagnosed with dyslexia often struggle with various aspects of the

reading and writing process, especially reading comprehension, it is important for teachers to be well equipped with knowledge of the types of strategies they teach their students in order to increase the students' proficiency in reading comprehension. The evidence from the Kopiewnicki (2006) study shows that teachers continue to teach lessons where the main skill is reading comprehension, but have failed to teach the strategies to become skillful in reading comprehension. It is important that both in-service and pre-service teachers are aware and knowledgeable of the various strategies that can be offered to all students, specifically students with dyslexia. Carreker, Joshi, and Boulware- Gooden (2010) go on to state "what teachers know and can do is one of the most important influences on what students learn" (p.148).

The first implication of my research that should be shared with the teachers are the strategies that worked for all three dyslexic students. In my research, it was discovered by the pre-assessment and post-assessment that all three students increased their scores or it remained the same when the story map was implemented. Although Samantha's score did not increase drastically, it did show that it made a positive impact on her comprehension of the story. This strategy is teacher driven, so the more practice with a story map, the more comfortable the student will be. The scores also increased or stayed the same when the Before, During, and After (BDA) strategy was used. After close examination of the teacher and student interviews, these two strategies help guide struggling readers, specifically dyslexic students towards proficiency in reading comprehension. These strategies have been found effective and should be incorporated in the instruction of all students, especially dyslexic students, during both structural and independent reading time.

The second implication from the findings of my research is one additional strategy that was discovered in the course of the study that is not typically found in most classrooms, but is

designed to meet the needs of students who are dyslexic. This strategy was developed to guide dyslexic students through a story without the struggle of moving letters and words. The Irlen Overlay was found to be successful with two of the students. These two students have been introduced to the overlay in the past and have found that it helps guide them through a story. As explained in their interviews, the students state that the overlay helps them focus on where they are reading. As one student stated prior to using the overlay, the words jump around on the page. After using the overlay it helps control the jumping words and she can focus on what she is reading. There are various kinds of overlays; small ones, colored ones, and different shapes. One student prefers a clear over a colored overlay because the "colored one makes her dizzy" (Student Interview, 2016). Although the overlay helped two of the three participants, it does not work for every dyslexic student. The last participant found it was more difficult to understand his reading because he did not know where the sentence ended. This shows that not all strategies help every dyslexic student. It is imperative that the teacher tries the strategy and observes the student's behavior using the strategy.

The final implication discovered during the course of my research was the strong emphasis on teacher preparation. It was apparent that the students who have not been shown some of the strategies in this study had a difficult time using the specific strategy to comprehend the text that was given. It also was shown that the students whose teachers were familiar with the strategies had a better understanding of how to use the strategy and they showed growth because of they knew what to do. The teachers that were familiar with one or more of these strategies explained how they were introduced either by another teacher or professional development. Professional development is a vital piece in helping students who struggle in reading.

Teachers are constantly making adjustments and in this case, I the observer, made an adjustment by using a clear overlay instead of a colored overlay to see if it made a positive impact. The results from the data collected during this study indicate that both common and uncommon reading comprehension strategies can be used to support the reading comprehension skills of students with dyslexia. It was shown that one strategy can help one student comprehend a text while hindering another student's ability to comprehend a text. Teachers should be familiar with various strategies and how to best implement them in the classroom. Recognizing the value of one strategy over another is also important. In this study, four strategies were tested with three different students, and all three students found that one or two strategies worked better than the others.

Conclusion

My research was focused around the question "Given that early identification and intervention help students with dyslexia understand reading, how can teachers guide students who have been diagnosed with dyslexia move towards proficiency in reading comprehension?" I used various tools in this study to determine if the four types reading strategies that help students with dyslexia. The tools I used to collect data included teacher and student interviews, pre and post assessments, and field notes/audio recordings. This research supported the findings that some classroom reading comprehension strategies were successful when used by dyslexic students. The research also revealed some strategies that are not typically used with struggling readers but were designed to meet the needs of students with dyslexia. Lastly, the data showed that some strategies do not increase the reading comprehension skills in dyslexic students, but make it more difficult for them. The implications for teachers includes implementing reading comprehension strategies with students who are dyslexic, as well as some strategies that need to

be specifically designed to meet those students' needs. An additional implication for teachers is

to pay close attention to the behavior and responses that students provide using the various

strategies. The scores may show that the strategy helped, however the strategy could still

frustrate the child. The strategy also may be effective only because the teacher has guided the

student rather than the student using it by his or her own self.

There were two main limitations for this study. The first limitation was my lack of

available participants. Since I was able to work closely with just three students in my school who

are officially diagnosed with dyslexia my findings were limited. A larger group would have

provided increased opportunities to discover additional similarities or discrepancies among the

strategies used. Considering a future study of this kind, I would expand my field of participants

to include students from other schools. The second limitation of this study was the time frame to

collect data. Collecting an adequate amount of data was problematic since two of the three

students were sick during some of the data collection time

After conducting my research, I am still left with a few questions concerning effective

strategies in reading comprehension for dyslexic students. It was stated in my literature review

that the use of E-books help guide dyslexic students towards proficiency in comprehension. I

would be interested to see whether or not the E-book is successful or not. I would also like to

expand the research to see what the most effective technological devices are for students with

dyslexia. Since technology is used in most of students' daily lives, it would be interesting to see

how much of an impact it makes on dyslexic students' reading abilities. Another aspect of this

research I would like to explore is when a teacher identifies a student with dyslexia and

implements intervention, is there a significant increase in that student's ability to comprehend

various texts. The last question I have has to do with professional development. What are some

of the current professional development workshops specifically for teachers of dyslexic students? As stated in my literature review, professional development is crucial to assisting dyslexic students with reading comprehension. As a teacher of one of these students, I would like to attend one of these professional development sessions to learn more strategies to help struggling readers.

If I were to complete this study again there would be a few parts I would like to do differently. The first part would be to adjust the data collection time frame. An expanded time frame would allow for more diagnostic and intervention strategies to support reading comprehension. In addition to spending more time on collecting data, I would also pay particular attention to examining and trying some other strategies that were discovered during the literature review. In addition to adding more strategies to my research I would also like to expand outwards to other schools that have dyslexic students. I could use schools that do not have as many resources and compare their difficulties with students from my school.

Dyslexia continues to affect young students in the early stages of reading as well as grown adults. It impacts the development of reading, but also impacts self-esteem, school, and professional performance. Teachers can be crucial in bridging the gap for dyslexic students with knowledge of strategies they can use in the classroom to support reading, especially reading comprehension.

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Appendix A

Name: _____   Student Interview

Date: _____

Interview #1

1. Do you enjoy reading? Why or why not?

2. What do you find is the hardest part of reading?

3. When do you find it hard to understand what you are reading?

4. What do you do when you find it is hard to understand what you are reading?

5. Do you ask a teacher to help you when you don't understand something?

6. Does your teacher show you different ways for you to practice what you are learning?

7. Have you ever used the before, during, and after strategy? The use of Irlen Overlays? Or the use of a graphic organizer to help your struggling readers? If so, do they help you with understanding a reading?

Appendix B

Name: _____   Teacher Interview

Date: _____

Interview #1

1. Do the students in your class that have been diagnosed with dyslexia enjoy reading? Do they have a difficulty with comprehending texts? If so, what type of texts do they have the most difficulty with?

2. When working with students who have been diagnosed with dyslexia, what strategies do you use to help them with reading comprehension?

3. When a strategy is not working, do you use other strategies to help these students?

4. What strategies do you find the most effective?

5. What strategies do you find the least effective?

6. Have you ever used the before, during, and after strategy? The use of Irlen Overlays? Or the use of a graphic organizer to help your struggling readers? If so, have they been effective?

Appendix C

Name: _____   Student Interview

Date: _____

Interview #2

1. When you read the first passage without any of the three strategies was it difficult or easy to answer the comprehension questions?

2. After using the before, during and after strategy was it easy or difficult to answer the comprehension questions? If it was easy, why do you think? If it was difficult, why do you think?

3. Do you think the before, during, and after strategy helped you understand the reading? Would you use this in the future when you are reading?

4. After using the graphic organizer (story map or five W's) was it easy or difficult to answer the comprehension questions? If it was easy, why do you think? If it was difficult, why do you think?

5. Do you think the graphic organizer helped you understand the reading? Would you use one of these graphic organizers in the future when you are reading?

6. After using the overlay was it easy or difficult to answer the comprehension questions? If it was easy, why do you think? If it was difficult, why do you think?

7. Do you think the overlay helped you understand the reading? Would you use the overlay in the future when you are reading?