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**Research Paper**

# Adapted text benefits for teachers and students: A retroactive case study

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**ABSTRACT**
This case study retrospectively reflects on a self-contained teacher's decision to pair publisher-created adapted text with audio support as part of a multicomponent reading intervention. She evolved from creating her own adapted text to implementing publisher-created adapted text throughout a school year. The study analyzed students' reading comprehension test scores throughout the year to examine the influence of publisher-created adapted text embedded within a multi-component reading intervention. The Related-Samples Wilcoxon Signed Rank Test revealed significance (p=.043) between students' fall and spring Reading Inventory scores, with a moderate effect size (r=.562). The teacher made the instructional decision to implement publisher-created adapted text which eliminated time consuming self-adaptation of materials (Browder et al., 2007) and her students continued to make progress with this shift of materials with some demonstrating significant progress by the end of the school year.

## INTRODUCTION

Teaching a self-contained English class to a diverse population of students with disabilities is a challenging task. Teachers need to ensure access to the grade-level content, in addition to accomplish individual learning goals (Apitz et al., 2017). Reading comprehension research emphasizes the need for modeling and feedback during the reading process, however multiple strategies are necessary with accessible text to result in long term comprehension effects (Gersten et al., 2001). Accessible text is an example of accessible educational material (AEM) which is "usable for learning across the widest range of individual variability, regardless of format or features. Whether a material or technology is designed from the start to be accessible for all learners or is made accessible for learners with disabilities, it is considered AEM" (AEM Basics, n.d., para. 1). Teachers need to match their students with appropriately accessible materials, which can be particularly challenging when students are reading below grade level and many texts are written for on or above grade level (Gunning, 2003). Therefore, a teacher's role in implementing adapted instructional materials is a vital step in fostering reading comprehension (Gunning, 2003) and aligning to grade level standards (Browder et al., 2006).

The Don Johnston Start-to-Finish ® Series adapts classic literature to be more accessible to students with disabilities (Don Johnston, 2019). As cited in Gordon et al., 2001 "Research indicates that when low frequency words or difficult vocabulary words are found in sentences which contain important concepts, comprehension might be lowered (Freebody & Anderson, 1983)" (p. 158). Start to Finish ® utilizes adapted text, keeping the essential content of the story while increasing the readability and accessibility for students with disabilities. This study contributes to the existing research on the impact of adapted text on reading comprehension for students with disabilities and teacher preparation. It also attempts to bridge the gap between practice and research through the retrospective design by measuring the impact of authentic teaching practice and decision making. This study works to "generate valid new understandings of realities of classroom teaching and learning" (McIntyre, 2005, p. 370) with the goal of supporting classroom teachers and other professionals in the field.

### Target Audience and Relevance

The audience for this study is primarily classroom teachers and administrators. For classroom teachers, this study provides data to demonstrate the impact of the utilization of publisher-created adapted text paired with instructional strategies on reading comprehension for students with significant reading challenges. Teachers can also consider the implementation of publisher-created adapted text for instructional purposes to decrease the time spent on custom adaptation. For administrators, this study will provide insights on making data-based decisions for accessible curricular materials for special education classrooms.

### Reading Comprehension for Students with Disabilities

The National Reading Panel has identified reading comprehension as a critical component to the development of reading skills and accessing education (NICHD & National Reading Panel, 2000). Many studies have been conducted on effective reading comprehension instruction for students with disabilities (Afacan et al., 2018; Ahlgrim-Delzell et al., 2006; Lundberg & Reichenberg, 2013; Swanson & Hoskyn, 2001). For example, researchers found that direct instruction and strategy instruction was effective for

students with learning disabilities (Swanson & Hoskyn, 2001). Additionally, active discussions around text with peer interactions was beneficial for students with intellectual disabilities (Lundberg & Reichenberg, 2013). Although there is significant research on teaching sight words and vocabulary for students with significant disabilities, additional research on other aspects of reading (i.e. reading comprehension) need to be conducted (Ahlgrim-Delzell et al., 2006; Carnahan & Williamson, 2010; Dell et al., 2016). Question generation, peer mediated activities, visuals, and systematic prompting are also effective strategies to improve comprehension for students with autism spectrum disorders (Whalon et al., 2009). In their literature review of multi-component reading interventions, Afacan, Wilkerson, and Ruppar (2018) posit that integrating multiple evidence-based practices can successfully support students with intellectual disabilities' reading progress. However, identifying appropriate instructional strategies for students with disabilities in a self-contained classroom can be an evolving process. Two specific strategies were identified and utilized in this study to facilitate students' reading progress.

### *Shared Reading*

Shared story reading is an instructional practice that involves "reading a story aloud to a student and providing support for the student to interact with the reader about the story" (Hudson & Test, 2011, p. 34). Shared story reading is an effective instructional strategy for students with significant reading difficulties (Mims et al., 2009, 2012; Skotko et al., 2004). Skotko et al. (2004) found increased interactions between mothers and their daughters diagnosed with Rett Syndrome when incorporating shared story reading with assistive technology and communication strategies. Mims et al. (2009) found that when objects were paired with shared story reading, two students with intellectual disabilities and visual impairments demonstrated an increase in comprehension. Finally, Mims et al. (2012) integrated shared reading with adapted non-fiction text and a system of least intrusive prompting. They found students with intellectual disabilities and autism spectrum disorder demonstrated acquisition of comprehension skills (Mims et al., 2012). In this study, the special education teacher augmented shared story reading with explicit instruction during reading.

### *Explicit Instruction*

Explicit instruction is identified as a high leverage practice in special education (McLeskey et al., 2017). Although there are varying definitions of explicit instruction (Hughes et al., 2017), the five essential components identified by Hughes et al. (2017) are:

1. segment complex skills
2. draw student attention to important features of the content through modeling/think-alouds
3. promote successful engagement by using systematically faded supports/prompts
4. provide opportunities for students to respond and receive feedback
5. create purposeful practice opportunities (Hughes et al., 2017, p. 141)

Research supports the use of explicit instruction when teaching students with learning and reading disabilities (Gersten et al., 2001; Solis et al., 2012; Swanson & Hoskyn, 2001). Although research demonstrates the benefits of explicit comprehension instruction, there is a gap between research and practice (McKenna et al., 2015). Explicit comprehension instruction can be delivered for struggling readers through listening and reading comprehension (Erickson et al., 2009). Providing explicit instruction on vocabulary can also increase students' understanding of more complex concepts (Beach et al., 2015), especially for students with language and reading challenges (Spies & Dema, 2014). Choosing the content to accompany explicit instruction is also essential to successful reading instruction.

### Adapted Text

Text adaptations have significant impact on access to content for students with disabilities (Carnahan & Williamson, 2010; Dell et al., 2016; Edyburn, 2003; Galvis, 2012; Hudson et al., 2013; Lovitt & Horton, 1994). Adapting text can include: bypassing reading, decreasing reading, supporting reading, organizing reading, and guiding reading (Dyck & Pemberton, 2002; Edyburn, 2003). Using a systems approach to text modification, considering the environment, student characteristics, original source, student reading challenges, and teacher responsibilities are all essential to successful text adaptation (Edyburn, 2003). Creating adapted text by rewording the content with simpler terminology can be the most time consuming text adaptation for teachers (Dyck & Pemberton, 2002) and technology can provide vital assistance within this process (Edyburn, 2003, 2017). Many different tools are available for teachers supporting adaptation, including – but not limited to -- Rewordify (www.rewordify.com), Newsela (http://newsela.com), Tween Tribune (www.tweentribune.com), and Start to Finish ® (http://start-to-finish.com). Rewordify allows a teacher to copy and paste text into the website to adjust the readability, whereas Newsela, Tween Tribune, and Start to Finish ® provide publisher-created adapted material.

A variety of readability and leveling systems exist to evaluate the readability of text (Gunning, 2003; McTigue & Slough, 2010). When working with students with significant reading challenges, teachers need to evaluate the essential concepts within the text that should remain and will often adapt text to meet their students' needs. Achieving a balance of readability and content can be a challenging feat (Hudson et al., 2013). Steps to adapt text have been identified to ensure that students with significant disabilities engage with similar content and skills as their typical peers, which include first outlining the content within the section of text and then rewriting at a lower grade level (Browder et al., 2007; Hudson et al., 2014). Adapting text can be "a time-consuming process that also requires a level of writing skill to capture the main idea of the text and gauge the level of comprehension" (Browder et al., 2007, p. 216). Teachers may focus the majority of lesson planning and preparation on adapting content, instead of instructional

preparation. Given the individual nature of text adaption, what impact does implementing publisher-created adapted text have on classroom instruction and student learning?

**Technology to Support Literacy**

Teachers can utilize technology to provide their students access to text (Edyburn, 2017), however it is important for each teacher to evaluate the technology before implementation and ensure it matches their students' needs (Moran et al., 2008). Integrating technology can increase student engagement with the reading process and increase opportunities for learning (P. Coyne et al., 2012; Lindeblad et al., 2017) when paired with effective instructional practices. Coyne et al. (2012) paired researcher created electronic books designed with the principles of universal design for learning (UDL) and two other reading programs with effective instructional practices. The study found that students with significant reading challenges demonstrated gains in listening and reading comprehension (P. Coyne et al., 2012). Lindeblad et al. (2017) followed 35 middle schoolers after a year of using a variety of assistive technology to support reading skills in addition to direct instruction. After one year, the students' reading test scores demonstrated a rate of growth commensurate with typical peers rather than a widening gap (Lindeblad et al., 2017). Reading technology can also increase student motivation and engagement with reading (Lindeblad et al., 2017) while also supporting teacher preparation.

The Start to Finish ® series published by Don Johnston is a series of adapted texts for classic titles to increase access to grade level content and vocabulary for students with disabilities (Don Johnston, 2019). This accessible library was developed from high interest content at two different readability levels and three different formats (paperback, audio, or computer). This modification and multi-modal access provides increased reading opportunities for reluctant readers (Green, 2018). The audio versions of the books have been professionally recorded with expression and intonation to model appropriate fluency (Dell et al., 2016). The Start to Finish ® Library includes many titles commonly read in middle and high school – such as Romeo & Juliet or Macbeth – allowing students with significant reading challenges to engage with the same content and activities as their peers (Dell et al., 2016).

**Research Question**

What is the influence, if any, on the utilization of publisher-created audio supported adapted text as part of a multicomponent reading intervention in a self-contained English classroom on students reading comprehension as measured by the Reading Inventory?

**METHODOLOGY**

**Origins of the study**

Before reviewing the methodology of the study, the origins of the analysis will be explained. The special education teacher of the class shared her observations of student learning and test scores with the researcher with excitement and pride. She explained that her instructional strategies and implementation of publisher-created audio supported adapted material not only positively impacted her students anecdotally, but was also reflected in their district test scores. The special education teacher was eager to share her practices and what she learned with the field. The researcher and the special education teacher collaborated to frame the work, seek approval from school administrator, request IRB approval, analyze test scores that were previously administered per school and district policy, and discussed impacts. The methodology and instructional practices outlined in the next section naturally occurred in the classroom and were reported by the researcher. Although a unique methodology, this research design provides a valuable look into authentic classroom practices, instructional decisions, and student learning with the goal of contributing to bridge the gap from research to practice (Vanderlinde & van Braak, 2010).

**Setting**

This retrospective analysis occurred with data and teacher observations from a self-contained, high school level English class in a suburban school district in the northeastern United States. The class consisted of thirteen students, profiled in Table 1, and one Special Education teacher. The main objective of the class was to target students' goals and objectives as related to reading and writing while providing access to grade level content. The teacher was expected to align her instruction to the regular education curriculum and to modify inaccessible content. Based on these expectations, the teacher utilized adapted literature, comprehension activities, shared story reading (Hudson & Test, 2011), and explicit instruction (Hughes et al., 2017).

**Participants**

The classroom special education teacher was in her first year of teaching. She was also enrolled in a Master's of Science program with a concentration in Assistive Technology (AT). She taught the self-contained English class and co-taught two English classes. She was also the case manager for sixteen students. She explained that outside of school she spent about ten hours weekly writing lesson plans, adapting activities, creating activities, completing paperwork, and collaborating with other professionals.

***Class***

The class consisted of thirteen students who had been placed in the self-contained classroom for English instruction. Age ranges of the students were 16-20 years old (SD=1, M=17). Of the thirteen students, nine were female and four were male. Four were receiving

special education services under the eligibility category of intellectual disability, four under learning disability, three under autism spectrum disorder, and two under speech and language impairments.

The district utilized Reading Inventory (RI) by Houghton Mifflin Harcourt (HMH) as a benchmark assessment administered three times throughout the year. To augment the special education teacher's observations, the previously gathered benchmark assessments were requested. Permission from the school principal and district superintendent was obtained to receive student Reading Inventory (RI) by HMH test scores previously collected. Gender, age, and disability categories were also requested. The data was anonymously sent to the researcher for analysis. Table 1 provides the demographics for each of the students.

**Table 1.** Student Demographics

| Disability Category | Age | Gender |
|---|---|---|
| Intellectual Disability | 17 | Female |
| Intellectual Disability | 17 | Female |
| Intellectual Disability | 17 | Female |
| Intellectual Disability | 16 | Female |
| Learning Disability | 17 | Female |
| Learning Disability | 20 | Male |
| Learning Disability | 17 | Female |
| Learning Disability | 17 | Female |
| Autism Spectrum Disorder | 17 | Male |
| Autism Spectrum Disorder | 17 | Male |
| Autism Spectrum Disorder | 16 | Female |
| Speech and Language Impairment | 17 | Male |
| Speech and Language Impairment | 17 | Female |

**Measures**

The teacher provided observations about her classroom dynamics, her instructional practices, and student participation. The retrospective nature of the research design focused on discussing the classroom practices and dynamics after they occurred.

The Reading Inventory (RI) by HMH, known as the Scholastic Reading Inventory (SRI) before 2016, is an adapted computer based reading assessment that provides Lexile ® measures for student reading ability for grades 1st through 12th (Accuracy matters : Reducing measurement error by targeted SRI testing, 2016; SRI Educator ' s Guide, 2011; Lennon & Burdick, 2014). Specifically,

> "The purpose of Reading Inventory is to describe what level of text complexity a student can read and comprehend with 75-percent accuracy, regardless of the student's initial ability level. Reading Inventory contains about 6,000 items that can detect and measure a student's reading comprehension between 100 and 1500 Lexiles. The resulting Lexile score is accurate across all ranges of abilities, not just the range of abilities common to students at a particular grade level. The score is designed to be used instructionally, to guide students to text that they can read and comprehend with an accuracy rate of 75 percent or greater." (Accuracy matters : Reducing measurement error by targeted SRI testing, 2016, p. 4)

Questions in the RI consist of a short passage with topics that are classroom and community based with a fill in the blank question to accompany the passage (Scholastic Reading Inventory technical guide, 2008). Students are able to skip questions which increase in complexity (Reading Inventory Overview, 2019). The standard error of measurement (SEM) for the RI is significantly decreased when the students' prior reading ability and grade level are utilized (Accuracy matters : Reducing measurement error by targeted SRI testing, 2016). This assessment is consistently utilized in this classroom and school, therefore each participant's reading ability and grade level were utilized during the test administrations to achieve the most valid scores.

To determine construct validity of the RI, six validation studies were conducted with a 512,224 student sample, in addition to correlations with the Stanford Achievement Test (version 8) and the North Carolina End-of-Grade Test of Reading Comprehension (Scholastic reading inventory research summary, n.d.; SRI Educator ' s Guide, 2011); however specifics on students with disabilities were not included. The Lexile measures were also validated against fifteen other standardized tests for measuring reading (Scholastic Reading Inventory technical guide, 2008). Although the validation studies don't explicitly identify students with disabilities, HMH links a paper titled "Research on Assessments" on their main website with the purpose of identifying average yearly growth. This paper outlines research conducted in a large urban district, with representative proportions of students with disabilities compared to the US average (HMH, n.d., p. 6).

**Procedure**

The procedure had two phases:

- Phase one: teacher created adapted text
- Phase two: publisher created text.

Adapted text was utilized throughout the academic year integrated into multicomponent reading intervention for students with significant reading challenges, however the source of the adapted text shifted in the two phases.

The teacher chose text to guide her self-contained English class based on grade level titles, assignments, and student interest. She began the school year compiling materials from a variety of resources. During phase 1, the teacher created adapted texts with Rewordify, Newsela, and ReadWorks. She used Rewordify to simplify Alice's Adventures in Wonderland, which is a text released from copyright and available for free online. The teacher needed to copy and paste all the text into Rewordify and adjust the simplified language as needed. Specifically, the teacher needed to choose the simplified definition applicable to the sentence. This process was cumbersome because the vocabulary was difficult to adjust due to some of the nonsense words used by the author, requiring each definition to be double checked and modified. The teacher also explained that in order to print copies for her students she needed to copy and paste the text back into a document and adjust the formatting.

Occasionally the teacher also located some smaller pieces from Newsela or ReadWorks. She picked articles that were highly motivating to her students and that correlated to their Lexile levels provided by the RI. These short texts were not specifically aligned to the grade level content, but they were linked to modified assignments from the regular education curriculum.

Using these compiled resources, students engaged with the text, participated in class, and completed corresponding activities. The teacher also read the pieces out loud in class during shared story reading (Hudson & Test, 2011). She tried having students listen to pieces themselves using text-to-speech, but they did not like the robotic voice. Although the teacher tried multiple times, the students expressed they preferred reading together. The teacher felt that her instruction was piecemeal and not succinct with her self-created and compiled resources. She wanted to facilitate more cohesive units of study accessible to her students.

In winter through the entirety of the school year, Start to Finish ® titles were used which allowed the teacher to focus significantly in her instructional practices, data collection, and student IEP goals and objectives. The teacher explained she transitioned to Start to Finish ® titles to expose her students in her self-contained English to classic literature titles along with their typical peers. The teacher provided a copy of the printed text for each student in addition to online access to the books. Individual access allowed each student to listen to the chapter at his or her own pace, complete the end of chapter quizzes, and apply the comprehension strategy introduced in class. The teacher continued to utilize the Start to Finish ® novels for the remainder of the year.

When using the Start to Finish ® titles, the teacher reported reducing her material preparation time. Rather than first needing to locate or adapt her own material, she was able to focus her lesson planning on her explicit instruction, comprehension modeling, and data collection. The teacher also shared that her students were more engaged with the content. She cited specific examples such as referencing their excitement to find out what happened next in the story. She explained that her students were proud to be talking about the characters and events in Romeo and Juliet alongside their peers in other English classes. Overall, the teacher expressed an improvement in her professional preparation and student engagement in lessons after her implementation of the publisher-created adapted text with audio support.

**Monthly Breakdown**

- Data Collection - September, December, and May: Conduct RI assessment per district protocol
    - For the test administration, each student was provided a Chromebook and headphones in a separate testing setting. The students were untimed while completing the adapted test. The RI reads the directions out loud to the students, but they need to read the passages and questions themselves. Before they begin students choose three topics of interest (like sports, comedy, etc.). They read passages related to those topics and answered the corresponding multiple-choice questions.
- Phase one: September-November: Implement teacher created and compiled curricular materials
    - The teacher created her own material by adapting released text to have simpler language (Rewordify) or sourced short articles by Lexile level (Newsela and ReadWorks). She read the text out loud to the class for shared story reading (Hudson & Test, 2011) and model comprehension strategies (Hughes et al., 2017) while the students followed along on their printed copies. The teacher felt that compiling resources resulted in disjointed instruction and inconsistent content to anchor the instructional strategies.
- Phase two - December-June: Implement Start to Finish ® adapted text with audio support
    - Initially, Start to Finish ® novels were provided for each student. The teacher played the audio in class while each student followed along. The teacher paused the audio to model think alouds (Hughes et al., 2017) throughout the chapters. The teacher utilized the reading comprehension quizzes at the end of each chapter to check student understanding.
- Summer: Reading scores were requested and analyzed

From December to the end of the school year, the teacher incorporated the publisher-created adapted text daily in her classroom instruction. The audio version of the adapted novel was played out loud in the classroom while the students had individual printed books to follow along, for shared story reading (Hudson & Test, 2011). The teacher shared that her students preferred to have the high quality audio played because it helped set the tone for the story. For example, when the students listened to The Telltale Heart and Other Short Stories by Edgar Allen Poe the actor's voice made the story creepier. Each student had their own copy to follow along and the teacher also projected the text on the overhead projector. To further modify the content, the teacher taught the novel specific vocabulary explicitly within the context of the story (M. D. Coyne et al., 2004) during the shared reading. The teacher also utilized think alouds (Hudson et al., 2013) to model comprehension strategies and explicit instruction (Hughes et al., 2017) of academic vocabulary (Beach et al., 2015; Spies & Dema, 2014). After reading each chapter together, the students would take the provided reading comprehension quizzes independently and complete teacher created activities.

### Analysis

This post-administration data analysis was conducted to determine the influence, if any, of the integration of publisher-created adapted text with audio support paired with instructional practices on students' reading comprehension, as measured by the RI. Given the small data set (n=13) and data abnormality (kurtosis scores < 3), the Related-Samples Wilcoxon Signed Rank Test was utilized. This nonparametric analysis compares pre and post data within the same case (Tanner, 2012). The thirteen student sample, although small, is representative of most self-contained classroom sizes. This test was utilized to compare the fall and winter scores, winter and spring scores, and fall and spring scores. These scores were compared because the publisher-created adapted books were integrated into the self-contained English class in between these data points.

Effect size (r) was also calculated for fall to winter, winter to spring, and fall to spring to illustrate the size of the difference. Rosenthal's formula for effect size was utilized given the abnormal data and small sample (Rosenthal, 1994). In this study the effect size indicates the likelihood that if a test score is randomly taken from the second test administration it will be higher than a random taken from the first. The r value demonstrates the size of the effect the instructional strategies paired with publisher-created adapted text with audio support had on students' reading comprehension scores as measured by the RI.

#### *Data by Case*

Table 2 shows each student's scores across the three measured intervals within one school year.

**Table 2.** Case Testing Data

| Case # | Gender | Disability Category | Fall | Winter | Spring |
|---|---|---|---|---|---|
| 1 | F | ID | 635 | 684 | 610 |
| 2 | F | LD | 678 | 593 | 609 |
| 3 | M | LD | 764 | 698 | 773 |
| 4 | M | Speech/Language Impairment | 640 | 556 | 624 |
| 5 | F | ID | 328 | 327 | 384 |
| 6 | F | Speech/Language Impairment | 570 | 594 | 723 |
| 7 | F | ID | 552 | 545 | 827 |
| 8 | M | ASD | 374 | 414 | 399 |
| 9 | F | ID | 407 | 464 | 531 |
| 10 | M | ASD | 787 | 830 | 944 |
| 11 | F | LD | 797 | 924 | 839 |
| 12 | F | ASD | 982 | 1002 | 974 |
| 13 | F | LD | 579 | 544 | 772 |

## FINDINGS AND DISCUSSION

### Descriptive Statistics

Table 3 displays the descriptive statistics for the fall, winter, and spring scores across all cases. The skewness and kurtosis statistics reveal moderately negatively skewed and platykurtic data set. As previously mentioned, given the small sample size and abnormal data, nonparametric analysis was conducted.

**Table 3.** Descriptive Statistics for Fall, Winter, and Spring

| | N | Min | Max | Mean | Median | Std. Deviation | Skewness | | Kurtosis |
|---|---|---|---|---|---|---|---|---|---|
| | Stat | Stat | Stat | Stat | | Stat | Stat | Std. Error | Stat |
| Fall | 13 | 328 | 982 | 622.54 | 635 | 185.934 | .118 | .616 | -.201 |
| Winter | 13 | 327 | 1002 | 628.85 | 593 | 196.028 | .559 | .616 | -.197 |
| Spring | 13 | 384 | 974 | 693.00 | 723 | 187.448 | -.241 | .616 | -.749 |
| Valid N (listwise) | 13 | | | | | | | | |

**Fall to Winter Scores – Phase 1 – Teacher Created**

The fall and winter score comparison was utilized to provide a baseline of student scores in their self-contained classroom with their teacher. During the fall, the teacher created her own adapted text for the first unit of study, which is phase 1 of the study. The winter benchmark was gathered as the students were beginning their first unit using the Start to Finish ® adapted text, therefore the impact of instruction paired with the publisher-created adapted text was not captured. As Table 4 demonstrates, the differences between the fall ($\bar{x}$=635) and winter scores ($\bar{x}$=593) are not significant, p=.753. Seven of the thirteen students increased their scores from the fall data points (Cases 1, 6, 8, 9, 10, 11, & 12). Almost half of the students decreased their RI scores, possibly indicating mismatched instructional practices. As explained in the procedure, the teacher felt instruction was not as effective with teacher created materials, which is why she made the change to publisher-created adapted text. Six students' RI scores dropped at the winter benchmark, supporting her instructional change. This initial test score comparison serves as a baseline for the subsequent data analysis. A p value greater than .050 indicates that the two samples are from the population, without a significant difference between the two test score results. The effect size calculation using Rosenthal's formula (Rosenthal, 1994) for fall and winter (r=.087) was very low.

**Table 4.** Related-Samples Wilcoxon Signed Rank Test Summary for Fall and Winter RI Scores

| **Total N** | **13** |
|---|---|
| Test Statistic | 50.000 |
| Standard Error | 14.309 |
| Standardized Test Statistic | .314 |
| Asymptotic Sig.(2-sided test) | .753 |

**Winter to Spring – Phase Two – Publisher-Created**

The winter to spring test scores were also compared to assess the influence, if any, of the Start to Finish ® adapted text paired with the teacher's instructional strategies, since it was implemented mid-year. The winter ($\bar{x}$=593) and spring ($\bar{x}$=723) scores are not significant as shown in Table 5. This decrease in p value indicates that the students' rate of growth increased from their winter to spring scores, but it was not significant. Nine of thirteen students increased their scores from the winter to spring administration (Cases 2, 3, 4, 5, 6, 7, 9, 10, and 13). Although they maintained the same teacher with the same test administration, their test scores elevated at a faster rate as compared to the fall and winter gap, demonstrated by the moderate effect size (r=.494).

**Table 5.** Related-Samples Wilcoxon Signed Rank Test Summary for Winter & Spring RI Scores

| **Total N** | **13** |
|---|---|
| Test Statistic | 71.000 |
| Standard Error | 14.309 |
| Standardized Test Statistic | 1.782 |
| Asymptotic Sig.(2-sided test) | .075 |

**Fall to Spring – Pre and Post**

Finally, student test scores were compared between the fall and spring results. This comparison simulates a pre and a post-test model. The Wilcoxon Signed Rank Test, displayed in Table 6, demonstrated significance (p=.043) between fall ($\bar{x}$=635) and spring ($\bar{x}$=723) scores. This p value rejects the null hypothesis that both samples are from the same population. In this analysis, a rejection of the null hypothesis indicates that the independent variable, the utilization of publisher-created adapted text with audio support to complement instructional strategies and routines, may have had a positive influence on the dependent variable, student RI scores measuring reading comprehension. A p<.050 indicates the results achieved were not by chance or random. The effect size (r=.562) also reflected a moderate effect.

**Table 6.** Related-Samples Wilcoxon Signed Rank Test Summary for Fall and Spring RI Scores

| **Total N** | **13** |
|---|---|
| Test Statistic | 74.500 |
| Standard Error | 14.305 |
| Standardized Test Statistic | 2.027 |
| Asymptotic Sig.(2-sided test) | .043 |

Table 7 displays the change in test scores from fall to spring for all thirteen cases. Nine of thirteen students increased their RI scores from the fall to spring with a range of 9 to 275. Of the four that decreased their scores, Cases 1, 2, 4, and 12, the range of their decrease was 8 to 69. As the ranges indicate, the rate of change for score increases was wider, with five students increasing their scores by more than 100 points.

**Table 7.** Case Score Change from Fall to Spring

| **Case #** | **Gender** | **Disability Category** | **Fall** | **Spring** | **Change** |
|---|---|---|---|---|---|
| 1 | F | ID | 635 | 610 | -25 |
| 2 | F | LD | 678 | 609 | -69 |
| 3 | M | LD | 764 | 773 | +9 |
| 4 | M | Speech/Language Impairment | 640 | 624 | -16 |
| 5 | F | ID | 328 | 384 | +56 |
| 6 | F | Speech/Language Impairment | 570 | 723 | +153 |
| 7 | F | ID | 552 | 827 | +275 |
| 8 | M | ASD | 374 | 399 | +25 |
| 9 | F | ID | 407 | 531 | +124 |
| 10 | M | ASD | 787 | 944 | +157 |
| 11 | F | LD | 797 | 839 | +42 |
| 12 | F | ASD | 982 | 974 | -8 |
| 13 | F | LD | 579 | 772 | +193 |

### Limitations

A variety of limitations within the study should be strongly considered when reviewing the findings. First, the sample size (n=13) is very small, although representative of class sizes for self-contained classes. A small sample size impacts the generalization of the findings to larger populations and statistical findings. The retroactive methodology and analysis of test scores, although purposeful, includes a multitude of factors which may also influence student progress. The researcher did not control the teacher's implementation of both phases of adapted texts and instructional strategies. This design was intentional to reflect on the influence, if any, on student learning in a natural classroom implementation. Also, only one year of test scores were analyzed. As this was the teacher's first year teaching and her first year with these thirteen students, a variable for consideration could be her teaching practices and students' responses to them. To address this limitation, the comparison of fall to winter, winter to spring, and fall to spring were all analyzed. However, this uncontrolled variable is still a significant limitation of the results. The researcher chose the transition to publisher-created adapted text with audio support as a focus but a variety of factors could also have impacted student learning and performance on the RI.

## DISCUSSION

The findings indicate that the utilization of publisher-created audio supported adapted as part of a multicomponent reading intervention has a positive influence on reading comprehension in a self-contained English classroom. The teacher also reported an increase in student engagement and motivation with the new material. To supplement the anecdotal evidence, the majority of students' RI scores increased from fall to spring, some significantly.

The current study adds to the literature on the benefits of adapted text for students with significant reading challenges (Browder et al., 2007; Hudson et al., 2014; Mims et al., 2012). The special education teacher reported a decrease in time spent on material creation and an increase in time spent on instructional strategies. Two outcomes can be drawn from this research: a contribution to the field of research on adapted text and the importance of data-based curricular and tool decisions. Two additional benefits are the applied evaluation of the research design and a direction for future research on impacts of adapted text on student learning.

### Research on Adapted Text

As the literature demonstrates, there is a lack of research on supporting reading for students with significant disabilities beyond sight word instruction (Ahlgrim-Delzell et al., 2006; Carnahan & Williamson, 2010; Dell et al., 2016). Although many studies

provide insight on instructional practices to teach students with significant reading challenges (Ahlgrim-Delzell et al., 2006; Erickson et al., 2009; Hudson & Test, 2011; Mims et al., 2009, 2012), the text and materials utilized in the classroom can be overlooked. Hudson et al. (2016) posits the importance of adapted text on students with significant disabilities' access to grade level content and reading comprehension. However, the time to adapt this content for each students' needs may be overbearing even though the student learning benefits are plentiful (Browder et al., 2007; Dyck & Pemberton, 2002). This study adds to the literature that implementing publisher-created adapted text for self-contained classrooms as instructional materials decreases the teacher's preparation time for class materials and may increase student reading comprehension when paired with research based instructional strategies. In addition to statistical significance when comparing fall to spring, five students demonstrated more than a one hundred point increase.

This case study positions itself as authentic evidence of adapted text to accompany instruction in a teacher's daily practice. In their synthesis of observational research, McKenna et al. (2015) provides evidence towards the gap between research and practice in the teaching field in application of evidence based practices for students with learning disabilities. This case study demonstrates a teachers' self-selection of research based instructional strategies – explicit instruction (Hughes et al., 2017) and shared story reading (Hudson & Test, 2011) – paired with adapted text (Hudson et al., 2013, 2014; Mims et al., 2012) positively impacted student learning.

The teacher also anecdotally reported more time for instructional planning, improvement in student engagement in the classroom, and reading comprehension during activities. As Andrew and Brown (2015) found, there may be a discrepancy between special education teachers' expectations of workload and the amount of work required to maintain their courses. This study demonstrated that implementing publisher-created instructional materials appropriately within a multicomponent reading intervention can result in more targeted and effective preparation; therefore, resulting in more effective time management and teaching practices.

### *Curricular*

The findings of this research also provide guidance to schools on the importance of adapted text for novel study. As supported by research, explicit vocabulary and reading instruction within a story context is beneficial for students with disabilities (M. D. Coyne et al., 2004; Douglas et al., 2009; Hudson & Test, 2011). Just as Mims et al. (2012) and Hudson et al. (2013) demonstrated the importance of adapted non-fiction text, these findings support the work of Browder, Trela, and Jimenez (2007) in providing evidence supporting the utilization of adapted fiction text to complement instruction. The teacher in the current study learned about the various benefits and resources to create and acquire adapted text through her "Assistive Technology for Reading and Writing" course in her graduate program. Her instructional decisions based on her student participation and classwork contributed to their continued reading comprehension progress. Research, like the current study, can be utilized to make data-based decisions on instructional strategies and curriculum and materials, which can be one major benefit of action research (Johnson, 2012). Retrospective case studies like this one can be utilized to validate teaching decisions, strategies, or materials.

### Applied Evaluation

Although the benefits of the implementation were anecdotally experienced by the students and teacher, formal evaluation was utilized to determine the influence of the teacher's decision. As Johnson (2012) posits "it is common to hear people make conclusive statements about the state of education or the effectiveness/ineffectiveness of a program, strategy, or approach without any supporting data" (p. 122). This retroactive case study analysis was utilized to capture the authentic teaching within a self-contained classroom through the teacher's perspective and assessment data. Teachers can utilize a similar research design to investigate their own classroom practices by partnering with researchers to begin bridging the gap between research and practice (Andrews & Brown, 2015; Vanderlinde & van Braak, 2010). Unfortunately, many teachers indicate that research conducted is unclear and inapplicable to their practice (Hemsley-Brown & Sharp, 2003; Vanderlinde & van Braak, 2010). This collaboration is an important step to creating research accessible to practitioners and to validating teachers' in-class action research process.

### *Case Study Analysis*

Although a small sample, this case study provides insights on this classroom phenomenon (Yin, 2009) and will allow readers to make connections within similar classroom profiles. Case study research, specifically for students with significant disabilities, can provide beneficial evidence for effective teaching strategies (Ahlgrim-Delzell et al., 2006), beyond simply word of mouth or discussion (Johnson, 2012). Finally, this case study adds to the evidence that effective teaching strategies paired with adapted text improves students' with significant reading difficulties reading progress (Browder et al., 2007; Hudson et al., 2014; Hudson & Test, 2011; Mims et al., 2012).

## FUTURE RESEARCH

This preliminary study investigated authentic instructional decision making and possible influence on reading comprehension. The results indicate a positive influence on student comprehension, but more research is needed. Further investigation on teachers' decision making of creating and choosing adapted text would be valuable to provide a more concrete implementation process for teachers. To build on these findings, designing a quasi-experimental study to examine teacher created adapted materials and publisher-created adapted text paired with instructional strategies would provide further information on the impact of individualization and customization. With a controlled experience, teacher time on creating instructional materials, quality of

instruction, and data collection can be added as variables towards evaluating the impact of adapted text. In this case, the students also preferred the audio supported text over text-to-speech. Conducting deeper investigation on the pairing of adapted text with audio support would also add to the field of technology for reading and impact on student learning.

## COMPLIANCE WITH ETHICAL STANDARDS

The researcher has no conflicts of interest to disclose. The researcher gained district and IRB approval to analyze the existing test scores.

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