JAASEP

JOURNAL OF THE AMERICAN ACADEMY *of* SPECIAL EDUCATION PROFESSIONALS

WINTER 2021

ISSN 2325-7466 (Online)

JOURNAL of the
AMERICAN ACADEMY
of
SPECIAL EDUCATION PROFESSIONALS
(JAASEP)
Winter, 2021

Volume 16, Issue 1

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Fluency Matters: An Outline to Students Becoming Fluent Readers Using Research Based Practices in Under an Hour: A Quasi-Experimental Research Study

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Abstract

All too often fluency is a neglected component to reading instruction and the curriculum, even though there is research supporting the fact that fluency builds comprehension and is a strong predictor of future academic achievements in the classroom. This study was designed to test the validity of using research based fluency strategies in the classroom through small-group targeted instruction and the benefits it carried in developing fluency. This model follows the fluency development lesson (FDL) implemented one day a week, for 55 minutes of instruction in a small group fourth grade setting (Rasinski, Linek, & Sturtevant, 1994). The goal was to prove that implementing targeted fluency instruction into the regular reading curriculum had substantial benefits on students' word recognition automaticity and accuracy. In addition, the increase in these two fluency areas, will result in an increase in the students' comprehension levels that can be transferred across grade level texts.

Key Words: Fluency, word recognition automaticity, word recognition accuracy, targeted instruction, FDL

Fluency Matters: An Outline to Students Becoming Fluent Readers Using Research Based Practices in Under an Hour: A Quasi-Experimental Research Study

Over the last two decades, there has been a shift in focus when it comes to reading achievement and instructional content. According to the National Panel Report (2000), the average reading score for the nation's fourth-graders in 2011 has remained unchanged from 2009 with a consistent reading score of 221. What this means is students are performing at the basic level and just below the proficient reading level. The National Panel defines proficient readers as, "students who are able to integrate and interpret texts and apply their understanding of the text to draw conclusions and make evaluations" (2000). The revelation that our nation's fourth graders have not reached a proficient level of reading since 2009 is a staggering statistic that calls to question, how do we get students to reach the proficient level of reading and eventually to the advanced reading level? Until the end of third grade students are learning to read; however, starting in fourth grade, students are reading to learn, using their skills to gain information; if students can't read a text and use their understanding to draw conclusions and make evaluations, this will severely hinder their future academic success as they move up into higher grade levels. According to a special report written by the Annie E. Casey Foundation, "academic success in high school can be predicted by the students' third grade reading scores" (Fiester, 2010). The awareness that reading scores remain unchanged over the course of years maintaining basic level readers, should be enough to question why, and how we fix this. The fact that reading scores also predict academic achievement is another reason to be looking at this issue more in-depth. The National Panel reports that reading fluency is the way to break this plateau of reading scores and

improve students' reading to a proficient and advanced level. The National Reading Panel outlined fluency as a critical component of skilled reading however is often neglected in the classroom (2000, 3-1).

What is Fluency and Why is it Important?

To be a fluent reader means to read a text with speed, accuracy, and prosody; being a fluent reader indicates a strong ability to decode a text aiding student comprehension. Students can understand the text and develop deeper experiences while reading. In contrast, dysfluent readers, are identified by their excessively slow, laborious reading, which, in turn, impairs comprehension (Schwanenflugel, Meisinger, Wisenbaker, Kuhn, Strauss, & Morris, 2006). According to the National Reading Panel, "children who do not develop reading fluency, no matter how bright they are, will continue to read slowly and with great effort" (2000, 3-3). When students associate reading to a daunting task, they become less motivated to read both inside and outside of the classroom, for this reason creating fluent readers in the classroom is essential to increasing their motivation to read and developing positive reading experiences. Students are not reading enough both inside and outside of the classroom, therefore they aren't practicing the skills to become proficient and fluent readers. According to the National Reading Panel, "In 2011, fourth-graders who reported reading for fun almost every day scored higher on average than those who did so less frequently, and students who reported never or hardly ever reading for fun scored lowest" (2000). Students need to practice reading on a daily basis, but when reading is a frustrating task, it makes it impossible to get kids to read; for this reason, fluency instruction must be implemented in order to develop stronger and more motivated readers. Another important factor to developing fluent readers is to help their comprehension. When students read at an excruciatingly slow rate or even read too fast ignoring the punctuation and phrasing, their comprehension will be affected in a negative way.

Three Dimensions of Fluency.

According to Timothy Rasinski there are three dimensions to fluency that build a bridge to comprehension: accuracy in word decoding, automatic processing, and prosodic reading (2004). Accuracy in word decoding means the student is able to read and sound out the words in a text with minimal errors whereas automatic processing refers to the speed and rate the student is able to read at expending as little mental effort as possible; the importance of this is to save their cognitive resources to make meaning of the text (Rasinski, 2004). When students expend all their energy into decoding the text, they become fatigued and unable to develop meaning or comprehension from what they just read. The final dimension is reading with prosody, or expression, phrasing the text appropriately and following along with the guidance of the punctuation. Current research suggests that prosody is becoming a more important factor to fluency than rate or speed of which one can read the text; prosodic reading has been considered an essential component of reading fluency (Allington, 1983; National Reading Panel, 2000). If a student is reading with no expression, no sense of phrasing and ignoring the punctuation, it is unlikely they will fully understand what they read (Rasinski, 2004). Word recognition accuracy, automatic and prosody are the three main components to fluency that will aid the student in their reading comprehension and overall reading achievement.

So, if fluency is important for reading comprehension, student motivation and becoming a proficient reader altogether, how come fluency instruction is neglected in the classroom? A

simple answer would be there isn't enough time in the day. But it is possible if teachers are willing to put in the extra planning time to integrate fluency into their everyday lessons.

Previous Reviews

Extensive research was conducted relative to the reading statistics and achievements of primary grade level students in both New York State and the Nation using the National Center for Education Statistics and the National Reading Panel. According to the National Center for Education Statistics, far too many American children complete the third grade without basic literacy skills; the significance behind this is this jeopardizes their future educational success as well as their ability to succeed in the workforce. Until the third grade students are learning the basic skills of reading such as decoding and phonics instruction, but upon completion of third grade, instruction turns to reading to learn; they are learning to read from texts and be able to pull information to make conclusions, gain insights and think critically. According to the National Assessment of Educational Progress, 67 percent of fourth graders read below the proficient level, being a proficient reader means students are able to integrate and interpret texts and apply their understanding of the text to draw conclusions and make evaluations (National Center for Education Statistics). Only 33 percent of students reading at or above the proficient level is a very daunting statistic; how is it so many students are still reading at a basic level of reading by the time they reach the age of 9 or 10? What is perhaps even more unnerving is the statistic that reading scores have remained unchanged since 2007 and have only improved by three points over the last decade (National Center for Education Statistics). If reading scores have remained unchanged in the last ten years, maybe it is our methods of reading instruction that need to change.

Students are not reading enough nor are they practicing the skills to become proficient readers. It is not enough to be reading in the classroom, but also when they are home; but if reading is such a daunting task for students it is likely they aren't reading enough at home either. When students enter the upper elementary grade levels, it turns from learning to read to reading to learn, but if students can't read informational texts and be able to form inferences and analysis from it, how are they learning? According to Allington (1977), "reading is not responding to flashcards, nor is it filling in blanks, marking vowel values, or responding to graphemes presented in isolation" (pg. 2). Fluency frequently takes a back seat to skills instruction but as Allington asserts, when students practice sight words or marking vowel sounds, they aren't reading, they are learning the skills and traits to become better and stronger readers. But according to the National Center for education statistics, decoding is not the issue, fluency and comprehension is. Therefore, while students are practicing their decoding and reading skills, the fact is they are doing very little reading. When students can decode but at an agonizingly slow rate, their reading achievement suffers, this is why fluency instruction needs to be implemented into the curriculum; when the students' rate improves, and their word recognition becomes automatic, they can save their cognitive energy for comprehension and critical thinking. This idea stems from LaBerge and Samuels' (1974) theory of automaticity in reading; according to this theory readers who have not a reached a level of automaticity in word recognition will have to apply a significant amount of mental energy to decode the word encountered while reading. The attention or energy students are expending on decoding takes away from the more important task which is to comprehend a text; thus, comprehension suffers at the hand of a lack of fluency. Allington stresses that in order to develop fluency, students need to be given the opportunity to read. The main issue that seems

to arise frequently however is, educators feel that there is not enough time in the day to implement fluency instruction along with all the other content that needs to be taught. Timothy Rasinski has created a procedure in which he was able to implement fluency instruction into the everyday curriculum; this will be the foundation for the following research project.

Rasinski (1989) argued that fluency is a neglected but needed goal of reading instruction and development. Rasinski argued that at least one of his six principles of fluency development could be implemented into a reading curriculum. The six principles used to guide the development of fluency instruction are as follows: modeling fluent reading, direct instruction and feedback, assisted reading (choral reading), repeated readings of one text, cueing phrase boundaries (prosody), and providing accessible and easy materials (Rasinski, 1989). These principles were the foundation to Rasinski, Linek, and Sturtevant's study of and implementation of the fluency development lesson (FDL) conducted in 1994. This model has been developed and modified spanning decades by other researchers trying to aid this fluency dilemma. Rasinski, Linek, Sturtevant, and Padak (1994) developed this FDL model as a way to support the inclusion of a fluency component in the general reading curriculum; rather than waiting until students fall behind the grade level curriculum and targeting instruction outside of the classroom, fluency development should be taught throughout the day to the whole class inside the general education classroom. Rasinski et al. developed the FDL model with the following steps and procedures: the teacher introduces a text and invites predictions from the class, the teacher then models fluent reading by orally reading to whole class as they silently follow along. Next the teacher leads a class discussion of the text as well as asking questions about the teacher read the text orally paying particular attention to rate, phrasing, and expression. The teacher then leads the whole class in several choral readings of the text making sure everyone is reading in one voice. Lastly, the teacher divides the class into pairs and they read text three-four times each to each other and once everyone has done so, reconvene as a whole class and invites individuals or pairs to read aloud (1994). This lesson was made to last 10 to 15 minutes that could be integrated into the regular curriculum.

Rasinski et al. (1994) developed a lesson procedure that has incorporated many research practices in developing fluency such as: repeated readings, choral reading or assisted reading, and error correction. All three of these instructional strategies has been tested in many studies by other researchers with significant results of improved fluency. Modeling fluent reading, whole class choral reading, and repeated reading for practice are the building blocks to oral reading fluency and build the foundation for higher levels of reading achievement; when integrated into a single program, the prospective impact on both fluency and overall reading proficiency is even greater (Rasinski, Paige, Rains, & Stewart 2017).

Whole Class Choral Reading (WCCR) was tested by Paige (2011) as a system to get students reading more and in turn, develop better fluency. The process of WCCR is intended to create whole class engagement in reading a text; when implementing this procedure into the lesson, the teacher first starts with a text and reviews the words with the class that are anticipated to be difficult, the teacher then briefly discusses the passage to activate prior knowledge as an aide to comprehension. Finally, the teacher will read the passage out loud as a model for the students as they follow along silently, this is one of the most important aspects to this procedure because students are given a model of what fluent reading sounds like, they are listening to how their

teacher is phrasing the sentences and using expression where it is needed, and lastly they are following the rate at which the teacher is reading, all key to developing fluency. Once the teacher has finished reading aloud the text, the class then reads that same passage in unison, staying in one voice. The teacher monitors and provides corrective feedback, or error correction, when necessary (Paige, 2011). The most critical aspect to this strategy was students were actually reading, and they were given the chance to see and hear what a fluent reader sounds like and then try to model that same sound. Two key components to this was the use of error correction and repeated reading strategy.

Error correction is an incredibly important aspect when developing fluency; when students are involved in multiple reading of the same text (repeated readings) you as their teacher want to make sure they are practicing and using the correct pronunciations of words; this is also why a review of the words before reading the text is a good strategy. Error correction coincides with the whole class choral reading model as well as the use of repeated reading strategy. It is a procedure which involves (a) consequent modeling on the part of the instructor and (b) prompting the student to repeatedly practice the phrase from the text which includes the error word (Begeny et al., 2006). What this entails, is when the students are reading in unison a text, and there is a phrase that either a few or all of them get stuck on, it is key that the teacher stops the students there and repeatedly practice saying the phrase until students can say and or understand it. In a separate study done by Therrien (2004), the author noted that the use of corrective feedback on word errors was essential because all students involved in the intervention were given corrective feedback and obtained a large mean fluency effect size (1.37). Before students can repeatedly read a text, it is necessary to make sure students are saying all the words and phrases correctly so that is they do not learn to read the words incorrectly and continue practicing reading the text with the incorrect sayings.

The last strategy used in all of the research cited to develop fluency, was the repeated reading strategy. Repeated reading is an effective strategy for improving reading fluency and comprehension on a passage that is read repeatedly (Therrien, 2004). Students can do this individually or with partners, but the teacher predetermines the amount of times the students need to repeatedly read a passage. A preferred method that carried significant results would be to have students pair up and repeatedly read the passage one at a time to each other, and the other partner can provide any corrective feedback or compliments. Rasinski et al. found that paired reading resulted in a more meaningful reading experience in addition to improvements in their fluency (1994). Therrien suggests the passage should be read three to four times based on the outcome of the effect size on fluency compared to reading it only two times (2004).

As it has been discussed previously, fluency does not mean just the ability to read a text fast, if the student can read the text fast but with little expression or word recognition, it hinders their comprehension. The goal of developing fluency is ultimately to improve reading comprehension. However, when it comes to measuring the effects of fluency interventions, many researchers have used the rate at which a student reads with a predetermined set time as their method of assessing fluency. The use of a performance criterion for example, reading until a fixed number of correct words per minute is reached or reading a passage within a predetermined time period is recommended because “interventions that used such a criterion obtained a mean fluency effect size increase (1.70) that was more than four times larger than that obtained by interventions that

used a fixed number of readings (.38)" (Therrien, 2004). What this means is, researchers will gain a clearer understanding of their results when using a performance criterion that allow you to compare and analyze results.

The outcome of improved fluency results in improved comprehension; once more the key components to being a fluent reader is to read with speed, accuracy, and prosody. When students can master these three areas of fluency, they are able to comprehend texts more easily, which is the goal of knowing how to read; we read to learn new information. Readers need to be able to decode words correctly and effortlessly (automaticity) with the appropriate expression to make sense of what they read (Rasinski, 2006). Developing readers all too often make many decoding errors, read words incorrectly, and/or read with little to no expression, exhausting their cognitive resources which then impedes their ability to comprehend the text (Rasinski, 2006; Uysal & Bilge, 2018). When word recognition becomes automatic, students will spend less effort in decoding words and save their cognitive resources for constructing meaning from the text (Kuhn, Schwanenflugel, Morris, Morrow, Woo, Meisinger, & Stahl, 2006). Creating a fluency intervention that helps students with their reading speed, accuracy and prosody will significantly enhance their ability to read a text, understand the text and overall their enjoyment of reading. All these articles are what influenced the methodology of this research based intervention

Purpose

Reading fluency has long been considered a critical factor in general reading development and achievement (Rasinski, Linek, Sturtevant, & Padak, 1994; Kuhn, Schwanenflugel, Morris, Morrow, Woo, Meisinger, & Stahl, 2006; Rasinski, Paige, Rains, & Stewart 2017). Fluency is a strong predictor of students' success in higher grade levels and even with this knowledge, it is still a neglected goal in the elementary classroom. According to the National Standards, a student who is not at least a moderately skilled reader by the end of 3rd grade is unlikely to graduate from high school; another staggering statistic is 75% of students who are poor readers in third grade will remain poor readers in high school. This begs the question: if fluency is so important for students to develop in order to become successful students in the future, why is it not a part of curriculum until students are in intervention supports? Until students are failing severely, they are not receiving any fluency support or reading strategies that will help them to improve significantly. According to Allington (1983), oral fluency rarely appears as an instructional objective in reading skills, teacher's manuals, daily lesson plans, and individualized education; rather teachers put more emphasis on phonics and decoding instruction but is proven that words read in isolation is in fact not reading, so when teachers are delivering "reading instruction" by decoding words, students are not actually reading.

Synopsis

This study was created in order to target students reading below grade level and improve their reading fluency with the hopes of getting them to on grade level reading and also improved comprehension. Students were put in a small-group setting and receive an extra fifty-five minutes of explicit reading instruction with a focus on fluency development, one day a week, to improve the oral reading fluency of struggling fourth grade readers.

Methodology

Participants

Participants were 8 fourth-grade students who attended an elementary school within a suburban public school district. Of the eight students, 6 of them were Hispanic as well as English Language Learners and the other 2 students were Caucasian with English as their primary language. All eight students were selected based on their Universal Screening data using their words per minute scores (WPM); students selected were individuals just below the average 25th percentile (target 105 wpm) and were not receiving tiered support or special education services. Individuals' WPM ranged from 73 to 80 with an average words per minute score of 77.

Hypothesis

By the end of the study, the hope was to increase students' words per minute scores by using research based fluency practice, integrated into their general education curriculum. Without disrupting the flow of each students' academic schedule, this intervention was made to be easily applied in the classroom without disturbing the flow of learning; however, since participants were from different classrooms, this intervention took place during their lunch and recess. By providing targeted fluency interventions into the students' academic schedules on a weekly basis, students would increase their fluency and ultimately their words per minute.

Procedure

Students involved in the study came from two different classrooms so each time the intervention was implemented, student groupings and set-ups varied; the intervention consisted of working in small groups, partnerships and independently. This procedure was developed using Rasinski, Linek, and Sturtevant (1994) FDL model. Rasinski et al. (1994) created a fluency model with the goal of it being integrated into the general education curriculum without interfering with state standards and curricular goals. This was the model the researcher wanted to establish when performing this study; the main reason fluency is neglected in the classroom is because teachers feel there is not enough time in the day to practice it, Rasinski et al. developed this method where it could be integrated into different content areas without taking time away from it. Since participants came from different classrooms, the researcher chose to implement the intervention during the fourth grade scheduled lunch and recess time however this could easily be implemented into the whole class general education classroom. The researcher created a fluency intervention that could be integrated into different content areas and the intervention is implemented in smaller bursts. Rasinski et al. (1994) developed a ten to fifteen minute fluency development lesson (FDL) that has been modified and used by researchers over the course of decades and is what this researcher has done for this current study. Each intervention required only ten to fifteen minutes of fluency intervention, three days a week, so taking this the researcher combined the required times and adapted it into one longer lesson for one period a week. When following the FDL model, for this intervention, the author focused on three areas of fluency development when working with students: accuracy in word decoding, automatic processing, and prosodic reading. The following paragraphs discuss which research based practices were used throughout the intervention.

Materials. Each week a new text was introduced to the students for them to practice and develop mastery over. Texts varied week to week; genres consisted of: fiction, non-fiction, phrases and poems, and sight words. The use of phrases and poetry for this intervention was

gathered from research conducted by Rasinski (2006), where he states that rhythmical or interactive texts such as poetry, work well for oral reading with expression and meaning not just speed. Reading poetry, students gain skills in accuracy, automaticity, and prosody all effecting their comprehension of the text. It was also important to focus on the level of text the researcher provided to each student; it was critical to not give students a text that was too challenging for them to read, it was important to give them a text that they would be able to develop mastery over. According to Allington (1977), poor readers are never given material they can read fluently so they rarely have the opportunity to develop qualities associated with good reading. For this reason, it was crucial that the researcher gave students materials that matched their reading levels. Aside from reading materials, recording materials were essential to this intervention; the researcher used Chromebooks along with "Read and Write" in order to record the students and track their progress of reading the texts.

Teacher modeling. The investigator introduced the text by first discussing what it was about to activate schema and prior knowledge; this also helped to aid reading comprehension. The teacher then modeled fluent reading by reading aloud the text while students listened and followed along, paying special attention to rate, expression, and phrasing. The purpose of first modeling a new text before the students go off and read on their own is so that they can hear how a fluent reader sounds when reading a text. Poor readers predominantly hear other poor readers in their leveled reading groups and rarely have a fluent reading model to emulate (Allington, 1983). Having the researcher model reading the text, allowed the students to copy those same practices and behaviors associated with fluent reading. Rasinski, Paige, Rains, and Stewart agree that modeling fluent, expressive reading demonstrates overtly to students what fluent reading sounds like and how it can improve comprehension (2017). Once students heard how the teacher sounded while reading, they then took those skills and applied it when reading on their own or in their groups.

Whole class choral reading (WCCR). Once the researcher finished modeling the text, the whole group participated in whole-class, or in this case whole-group, choral reading. The group read aloud the passage in unison as the teacher listened to make sure students read together, staying as one voice. The teacher listened for errors made while reading (both words and phrases) so that at the end, a discussion could be held to correct students' decoding errors. WCCR is a research based method in order to increase fluency and student success, researcher David Paige conducted a study in which he tested the validity of using WCCR in a whole class lesson within 20 minutes. Paige asserted that what is perhaps most critical to reading improvement is the length of time actually spent reading by students (2011). Both Paige (2011) and Allington (1977) agree, that to develop the ability to read fluently, it requires the opportunity to read; students are not reading enough and often reading is put on the back burner to skills instruction. WCCR allowed all students to be part of the process of reading as the teacher moved around the room to make sure all students were reading and participating. What is most significant from Paige's research is once this WCCR model was implemented into the classroom, students were reading for a full sixteen minutes per session, sixteen minutes of reading was all it took for students to make moderate gains for decoding knowledge and oral fluency (Paige, 2011). The WCCR procedure was implemented into the researcher's methodology to get everyone in the small group involved in reading while simultaneously making sure everyone was reading for the full twenty minutes. The researcher wanted to make sure all students were

spending these short sessions fully engaged and reading, WCCR allows this to occur. WCCR was used in the whole-group sessions, as well as when students read in partnerships on their own.

Error correction. Error correction, or corrective feedback, is essential to fluency development, specifically when using a repeated reading strategy. Error correction is a research based procedure used to correct students reading mistakes so that it is not repeated or learned as the correct pronunciation. If a student continuously practices misreading a word, it is very difficult for them to unlearn it; for this reason, during the intervention, the researcher payed close attention to any mistakes made during the whole-group choral read, whether it was a specific word or a phrase. When the students made an error while reading, the researcher would stop the students' right at that point and practice reading the word or phrase multiple times before continuing on. This error correction procedure involved the teacher to model the appropriate pronunciation and then prompting the students to repeatedly practice the sentence that included the error word or phrase (Begeny, Daly, & Valleley, 2006).

Repeated reading. Repeated reading involves a student rereading a specific passage out loud multiple times to a teacher or peer (Lo, Cooke, Starling 2011). Each week a new text was introduced to students; this allowed the students to practice reading the same text over and over again to develop mastery. Therrien conducted a study in which he proved repeated reading improved the reading fluency and comprehension of both nondisabled students and students with learning disabilities (2004). When students have the chance to practice and become better readers, they develop mastery and confidence in their reading abilities and are more able to track their progress over the course of the week. After the whole-group choral read, students were put into partnerships and practiced reading the text to each other 3-4 times each; one student read while the other listened and then switched roles, next students choral read together, and lastly echo read, meaning one student read the sentence and then their partner echoed that same sentence; again, they switched roles after. Having the students read the passage three to four times during the session was chosen based on specific evidence from Therrien's study that the amount of times reading the same passage (3-4) was statistically significant when it came to fluency development. According to Therrien's study, "the passage should be read three to four times because when the passage was read three times (ES = .85) or four times (ES = .95), mean fluency effect size increases were more than 30% larger than when the passage was read twice (ES = .57)" (2004). An increase of thirty percent from reading the passage three times instead of two times, showed the power that repeated reading has on a student's fluency development. Therrien's article proved that repeated reading combined with other fluency strategies, had a significant impact on the child's reading growth and development. One fluency strategy that is essential to the repeated reading is the use of error correction, or corrective feedback. If the student is repeatedly reading a passage, it is important that the students is using the correct pronunciation and phrasing. For this reason, error correction was used after the whole-group choral read so that students did not repeatedly read a word or words incorrectly.

Data Collection and Analysis

The researcher used the AIMSweb Universal Screening Reading-Curriculum Based Measurement (RCBM) to administer a pre-test and determine each students' basal score. A curriculum based measurement was used because it produces quantitative data as well as

generate qualitative information; the qualitative data provided information to the researcher on how to group student partnerships (Hunley, Davies, & Miller, 2013). One of the most common methods for determining oral reading fluency rate is to have students read a passage aloud for one minute and then calculate the number of words read correctly within that minute (Hunley, Davies, & Miller, 2013). Students were given one-minute to read a grade level passage as the researcher scored their word recognition accuracy and word recognition automaticity. These scores were then compared to the national norms; for students at the fourth grade level they should be starting at 105 words per minute, these students fell just below those norms. At the end of the seven week intervention, the researcher used the AIMSweb Universal Screening Reading-Curriculum Based Measurement (RCBM) once more to administer a post-test in order to compare and analyze student progress. Using both these scores, the researcher generated a t-test to compare the means of the pre- and post-test and determine the statistical significance of the intervention program. As you will see in the following section, the results show a major significant value in relation to this intervention program.

Results

As shown in figure 1.1 below almost every student made significant gains in their oral reading WPM scores. All but one student made a gain of at least 21 WPM in their post-test results. When administering the post-test assessment, it was important to inform students that this was just to track their process and to not be nervous. Reducing the stress was very important in order to gain accurate results. The main goal of this intervention was to analyze if students spent more time reading and practicing fluency strategies, would that increase their reading scores; when observing different classrooms of all grade levels, it is clear that fluency development is not part of the reading curriculum. There have been many instances where the researcher has observed classes where students went the whole day without reading for at least fifteen minutes. There have been other instances where the researcher has seen teachers send students off to independently read for thirty minutes, even though you can tell the student is not actually reading; instead of independent reading practice, why not dedicate that time to fluency support? The results show that direct instruction of fluency, has significantly improved students' reading scores. A T-test was administered to assess the statistical significance of this intervention; the results delivered a p-value of .000125 making this intervention statistically significant indicating the validity of the intervention program.

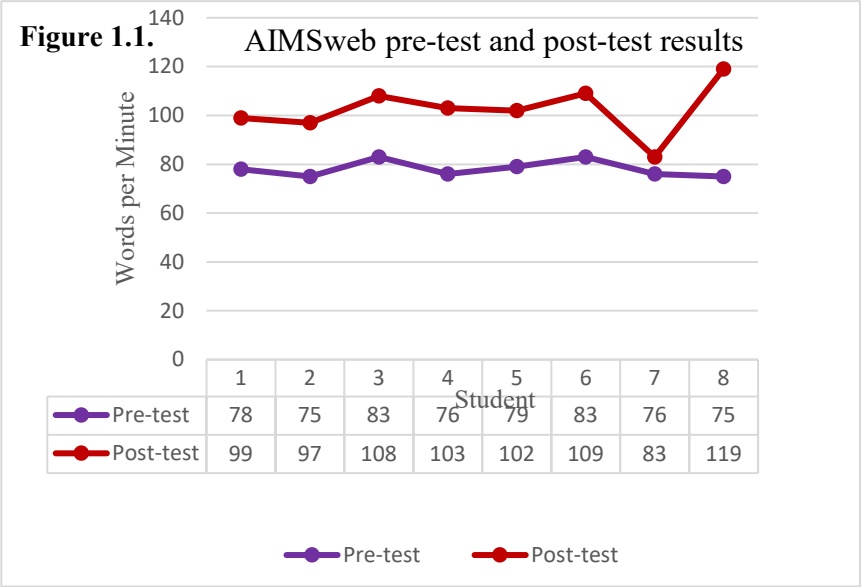

Figure 1. Improvement in students' Words per Minute scores after receiving fluency intervention.

Discussion

As outlined throughout the whole study, fluency development is crucial for students to acquire in order to become successful students in the future; it has also been outlined above that students are not reading enough in the classroom which impedes their fluency development as well. What is most significant about these findings is I was able to support my hypothesis and reject the null. Using the data above, I administered a T-test so asses the p-value of my results; the results delivered a p-value of .000125 meaning this intervention did work and my results are statistically significant. The biggest enigma regarding this study was student 7. This student improved the least in relation to the other students with only improving 7 words per minute. It is hard to determine the lack of improvement for this student, since the intervention was successful for the other seven students; this leads me to think about this student possibly needing tiered support services, something that will provide that student with a longer, more focused intervention to support their needs. In contrast, student 8 improved significantly in just seven short weeks of intervention services, with a gain of 44 words per minute. This spike in reading scores leads me to believe that this student really benefitted from a direct instruction approach and these research based reading strategies; sometimes all students need is more time to develop the skills associated with good reading.

Limitations and Future Research

There were a few limitations in relative to this study, the main one being a small sample size. This study was conducted with only eight students and they were also from different classrooms making it difficult to have this study take place in the classroom; perhaps further research can be done by using these strategies integrated into the curriculum in a whole-class setting. Another limitation was the time constraint, this intervention only lasted about seven weeks, and perhaps students like student 7 would have benefited from a longer intervention service. Lastly this intervention took place around testing season, so that added pressure to perform in their academics could in fact have impacted the results of this test or their motivation. This study did not measure comprehension, so for future purposes this study could be done to measure if the increase in their reading rate, improved their overall comprehension of the text. Another possible outlet to move from this study is to adapt it to a whole-class model, all students will benefit from extra reading practice, these strategies are not just for struggling readers; it would be really interesting to see if this model could be used and integrated into the whole-class curriculum.

Conclusion

Fluency development is an important skill that needs to be acquired at an early age in order to create the greatest possibility of success in the future. A common argument for the lack of fluency support, and even reading, in the classroom is that there is not enough time; however, throughout this study, the researcher has shown how to integrate fluency into the general education curriculum using different strategies and instructional methods. This short amount of intervention proved to show significant reading results with seven out of the eight students, improving their words per minute scores by at least twenty words. Although one student did not improve as much as the others, this information is not wasted, instead it has shown the researcher that this student may benefit from a more intense intervention service. If the data shows that fluency development is a key determining factor in future academic success, and there are

multiple strategies to integrate fluency into the general education reading curriculum, why are educators not putting forth the effort to integrate? Students need more support, more practice, and lastly more time spent reading.

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About the Author

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Quality of Life for Individuals with Disabilities During the COVID-19 Pandemic

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Abstract

Individuals with disabilities go through many transitional periods throughout their lifetime, and each series of transitional decision(s) has a direct impact on one's quality of life. Educators and families want to see young adults experience a quality of life with opportunities to have independence, a job where they receive a paycheck, and a life where they can enhance their overall personal outcomes (Center for American Progress, 2019; Emerson et al.,1996). For some, quality of life may entail pursuing dreams, accomplishing goals, and living life to the fullest (American Association on Intellectual and Developmental Disabilities, 2015). Other individuals may be content with where they are at the present moment. Quality of life (QoL) for people with disabilities varies with each individual. It is different for each diverse family who has a young adult with a disability, especially when varying factors are beyond their control (World Health Organization, 2020). This manuscript will explore what quality of life is and what it means for individuals with disabilities during the COVID-19 Pandemic.

Keywords: Quality of life, COVID-19, Self-Determination, Choice-Making

Quality of Life for Individuals with Disabilities During the COVID-19 Pandemic Quality of Life for Individuals with Disabilities

Individuals with disabilities go through many changes throughout their lifetime. They transition from elementary to middle school, from middle school to high school, eventually most individuals with disabilities transition from high school to a post-secondary educational program. These young adults with disabilities often work in a competitive employment setting, work with a job coach, or in a sheltered workshop (American Association on Intellectual and Developmental Disabilities, 2015). These major life transitions can lead to successful and satisfying outcomes, but they can also lead to failures and disappointments for young adults with a disability (Glidden & Jobe, 2007). Within these transitions, there are conflicts and dilemmas that everyone will face during their lifespan. However, educators, diverse families, and friends of the individual with a disability often wonder what quality of life the individual will experience. People involved in the individual's life want him or her to be set up for successful outcomes, but that person's quality of life is not always what we intended for it to be.

For many individuals with disabilities, quality of life can be hindered by caregivers or parents making decisions for them (Emerson et al., 1996). Often, individuals with disabilities possess a quality of life that they are pleased with, which is due to the meaningful supports in place (Del Bianco & Accorsi, 2019). Due to the COVID-19 Pandemic, one's overall quality of life has taken on a whole new meaning (TIME, 2020). Families are faced with unique challenges due to

the COVID-19 Pandemic when it comes daily routines, social supports, and overall support for their young adult with a disability (Redquest et al., 2020)

COVID-19 and Individuals with a Disability

COVID-19 can be spread human to human via droplets (i.e., spit, eyes, hands). People with disabilities are at a higher risk for contracting COVID-19 due to multiple factors (i.e., physical contact with caregivers, respiratory infections) (Trummers et al., 2020). Often individuals with disabilities are at an increased risk due to limited mobility (i.e., direct contact with service providers), preventative measures (i.e., social distancing, handwashing), and unable to communicate symptoms of the illness (Center for Disease Control, 2020). Additionally, individuals with intellectual or developmental disabilities are at a higher risk of mortality if they live in a group home and have a caregiver (Mozes, 2020). Individuals with disabilities often depend on caregivers and family members to care for them (NIH, 2020). No one would have imagined what one's quality of life would look like when the COVID-19 Pandemic wreaked havoc on the economy. The opportunity to work was no longer even an option for many with or without a disability.

Definition of Quality of Life

The World Health Organization (2020) defines "*Quality of Life*" as one's perception of his or her position in life. Quality of life relates to one's culture, values, goals, expectations, and standards. *Quality of life* is broad and associated with one's health, psychological well-being, belief system, social relationships, and how they relate to one's environment. Merriam Webster Dictionary (2020) defines 'quality' as a degree of an essential character, feature, role, rank, characteristic, accomplishment, and degree of excellence. 'Life' is defined as the period of birth to death, manner of one's living, one's being, and period of existence (World Health Organization, 2020). This manuscript will address the following: (a) defining one's of quality of life, (b) self-determination as a component of quality of life during the COVID-19 Pandemic, (d) personal and meaningful relationships during this challenging time, (e) choice as a necessary component of life, and (g) conclusions and implications.

Defining One's of Quality of Life

For some, quality of life may involve pursuing dreams, accomplishing goals, and living life to the fullest (The ARC, 2019). Other individuals may be content with where they are at in the present moment. When it comes to individuals with disabilities, we want to see our young adults live a life in which they may be able to experience independence, have a job where they receive a paycheck, and live a life where they can enhance their outcomes (Center for American Progress, 2019; Emerson et al., 1996). However, the term moves away from the traditional dictionary definitions and focuses on personal outcomes for the individual.

Emerson et al. (1996) expressed that quality of life is one in which one receive full supports in community life, and are supported in developing independence and skills. They are given choices to have control of their life, and are treated with high respect in an environment that is safe and secure for them. Additionally, the nature and quality of supports that one receives appear to play a vital role in determining one's quality of life (Beadle-Brown et al., 2016). When considering one's quality of life, caregivers of individuals with disabilities need to be aware of the individual with disabilities goals and aspirations for the future (Hensel et. al, 2002).

Self-Determination as a Component of Quality of Life

An important component to enhance the quality of life is improving the individual's life (Wehmeyer & Bolding, 2001). Self-determination has two significant meanings. Self-determination refers to one having control over his or her life and destiny. Wehymeyer and Bolding (2001) noted that individuals with disabilities need to be provided opportunities to be "*causal agents*" in their own lives by making decisions and choices without any external influences (Wehmeyer, 2014). Self-determination is defined as one who makes choices or decisions regarding his or her quality of life and who acts independently (Wehymeyer & Schalock, 2001). There are four characteristics to self-determination: (1) the individual with a disability acts autonomously, (2) behavior is self-regulated, (3) the individual with a disability is empowered to initiate and respond on their own and, (4) the individual with a disability acts in a self-realizing manner. Individuals with disabilities must act with these intentions that will help shape their future, tremendously improving their overall quality of life (Wehmeyer, 2014). Some individuals with disabilities possess the qualities of self-determination and self-advocacy, but experience loneliness when it comes to forming meaningful personal relationships with friends. During this time of social isolation, it is important for individuals with disabilities to be provided with opportunities to choose and select what they want to wear during the day, what they want to watch on television, and be purposeful and have an active role in the process. This will allow individuals with a disability to still advocate for themselves and allow for them to still practice self-advocacy during a crisis. Daily life during this COVID 19 Pandemic and staying at home does not mean individuals with disabilities do not have the right to be autonomous and remove one's right to display self-determination in everyday life (Wehmeyer, 2014).

Personal Relationships

Personal relationships are significant for individuals with disabilities, and they are a necessary component to improving their overall quality of life (Kim, 2019). McVilly et al. (2006) defined loneliness as an unpleasant feeling or emotion that may arise from decreased social interactions. Due to the COVID-19 Pandemic many individuals with disabilities are experiencing personal feelings of loneliness, feelings of inadequacy, and social isolation (McVilly et al., 2006). Many individuals expect to get some emotional component from friendships, but sometimes they do not get what they want or need in return. Often individuals with disabilities experience peer rejection, isolation which can impair one's overall quality of life. Additionally, this greatly affects one's overall quality of life as they transition into adulthood (Papoutsaki et al., 2013).

There are two distinct dimensions of loneliness. First, a social dimension where these interpersonal interactions result in a personal belonging within a social realm, however this is greatly limited due to the current pandemic (i.e., friends, social relationships) (Papoutsaki et al., 2013). Second, is the emotional dimension, where the individual finds that the relationship formed is meaningful and rewarding on a higher level of intimacy (i.e., feel supported, accepted, included) which can be quite difficult in determining during social isolation (McVilly et al., 2006).

Individuals with disabilities often face challenges when forming relationships. One of the most important factors is finding a stable and rewarding relationship (McVilly et al., 2006). Individuals with disabilities need opportunities to form social networks, emotional support, help with decision- making, and assistance in order to develop and sustain meaningful relationships.

Just because one is staying at home does not mean that there cannot be innovative ways to engage in meaningful relationships.

Individuals with an intellectual disability experience more loneliness than their typical peers without disabilities. Stancliffe et al. (2007) found that there is a greater risk of loneliness for adults with disabilities because they have fewer opportunities to engage in social interactions. It is important for individuals with disabilities to feel accepted within their neighborhood and community, but sadly they do not really feel a part of their communities (Stacliffe et al., 2007). The majority of individuals with disabilities experience fewer friends and greater social isolation due to their smaller social networks. Adults living with disabilities tend to be very lonely within their home setting, and are afraid to go outside or out of their comfort zone to form these meaningful relationships (i.e., friends) (Stacliffe et al., 2007).

Due to the COVID-19 Pandemic is important for young adults with disabilities to be provided with opportunities to engage with their friends in social activities rather it be through various social platforms such as ZOOM, Facetime, and Skype. Planning online game nights (i.e., bingo, trivia) allowing for minimal social interaction, but also adhering to the guidelines recommended by the Center for Disease Control and Prevention (CDC, 2020). Planning virtual online events allows individuals with disabilities to display self-advocacy. All humans thrive for interaction and this an essential component for individuals with disabilities during the COVID-19 Pandemic to have access to friends.

Choice as a Necessary Component of Quality of Life

Some scholars argue whether a choice is a necessary component of the quality of life. Neely-Barnes et al. (2008) researched choice and quality of life to see if choice affected larger residential settings, if the choice positively correlated with quality of life measures and if individuals with disabilities living in smaller settings experienced a better quality of life. The National Core Indicator (NCI) survey was used to assess the overall quality of life of participants in the study who were provided choices (Neely-Barnes et al. 2008). The NCI surveyed the individual with a disability, their family members, and service providers. The survey questions included: (a) demographics, (b) residence, (c) diagnosis, (d) health,(e) services,(f) self-determination, and (g) behavior supports.

It included questions about home and work setting activities, friends, rights, and family members (Neely-Barnes et al., 2008). A random sample was selected, and 224 respondents were chosen for the study. Choice-making opportunities were readily available in smaller living arrangements. Individuals who had other people represent them on the survey exhibited less influence over their choices. The level of disability was also affected by the choices of living arrangements. Individuals with disabilities who could answer for themselves experienced greater respect for rights and social inclusion. Individuals with disabilities who lived in smaller settings also received greater support from their families. Individuals with disabilities who lived within their community tended to make more choices, having an overall greater quality of life (Neely-Barnes et al., 2008). Their rights were acknowledged more frequently than those who could not answer for themselves.

Individuals with severe disabilities often live in larger settings where their quality of life was not experienced to the fullest (AAIDD, 2015). Their barriers included fewer choice-making opportunities and participation in activities. They often were unable to form significant relationships, and their choices were not respected (Neely-Barnes et al., 2008). Implications of this study raised questions as to whether if individuals with disabilities who are non-verbal have adequate opportunities to make choices in their daily lives.

Individuals with disabilities need to be provided with opportunities to be successful in everyday life (AAIDD, 2015; Neely-Barnes et al., 2008). However, quality of life is different for all individuals with disabilities. Choices are not always made independently by persons with disabilities. Choices are sometimes made for individuals with disabilities due to their degree of disability. It is vital during this COVID-19 Pandemic that individuals with disabilities are given the opportunity to make choices and self-advocate. Choices can include and not limited to the following: (1) what he/she wants to eat, (2) what he/she wants to watch on television, (3) who he/she wants to talk on the phone with, (3) what he/she chooses for exercise, and (4) when he/she wants to take a shower (AAIDD, 2015).

Conclusions and Implications

Throughout our lives, we make choices. These choices affect what we are going to wear, eat, shop, and affect our daily activities. However, some choices significantly impact our daily lives (i.e., employment, living arrangements, and medical decisions) (DeVito, 2016). Choice making is a core element of self-determination, and it is critical for all individuals with disabilities (Agran et al., 2010). Parents, guardians, and caregivers can provide informed choice-making opportunities. Making informed choices allows for the young adult with a disability to experience a degree of control in their lives. Making informed choices will enable individuals with a disability to make a choice but also be aware of the potential advantages and disadvantages of those choices (i.e., cause and effect) (Mitchell, 2015).

Families play a vital role in promoting self-determination in their young adult (Wehmeyer, 2014). Wehmeyer (2014) states that families have a hard time “letting go,” and it can be quite overwhelming (i.e., COVID-19 Pandemic), but families need to help their child at a young age to explore autonomy and allow their son or daughter to achieve unlimited possibilities. Thus, allowing all individuals with disabilities to be self-determined across their life span (i.e., implementing before middle and high school). It is important during these unique challenges that individuals with disabilities voices and perspectives are heard (John Hopkins University, 2020). Empowering parents to let their young adult make choices and decisions regarding their living arrangements, friends, and lifestyles will provide individuals with disabilities with unlimited options and success for their future.

Quality of life for individuals with disabilities varies with each individual and is different for each parent who has a child with a disability. Schalock et al. (2007) suggested that services, improvement strategies, and supports need to be put into place to enhance individuals with disabilities' personal outcomes. Due to COVID-19 restrictions varying from state to state, this may look different for each individual. However, it requires families, caregivers, and community members to think differently about how they can best serve individuals with disabilities.

Educators, family members, and caregivers must provide opportunities for self-determination, self-advocacy, role-playing, and turn-taking across settings (AAIDD, 2015).

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The Influence of Teaching Assignment on Burnout in Special Education Teachers

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Abstract

Empirical research has identified many factors that contribute to feelings of burnout among special education teachers. Few studies, however, have examined the influence of varying responsibilities on burnout among special education teachers. The *Maslach Burnout Inventory Educator Survey* was distributed to a sample of special education teachers nationwide (n = 250). Using MANOVA, this study examined the influence of teaching assignment on the dimensions of burnout in special education teachers. The results indicated a statistically significant difference in levels of emotional exhaustion among self-contained special education teachers. Potential sources for the increased levels of emotional exhaustion are discussed and recommendations for ways to reduce high levels of burnout are presented.

Keywords: burnout, special education, self-contained teachers, resource teachers, inclusion teachers

The Influence of Teaching Assignment on Burnout in Special Education Teachers

Changes in laws pertaining to special education over the last three decades have led to an increased workload for teachers. The 1990 and 2004 reauthorizations of the Individuals with Disabilities Education Act (IDEA) brought about changes in the educational placement and services provided to students with disabilities. According to the most current provision of IDEA, school systems must provide students with disabilities a free and appropriate public education (IDEA, 2004). Under IDEA, students with disabilities are now served in their least restrictive environment. Consequently, the role of special education teachers expanded beyond self-contained classrooms and into inclusive general education settings.

In 2001, No Child Left Behind (NCLB) introduced accountability systems for measuring student achievement. The purpose of the bill was to ensure all students, including those with disabilities, would meet state-selected proficiency standards by the 2013-2014 school year (Hayes, 2002). Under NCLB, students with developmental and intellectual disabilities were expected to achieve the same outcomes as their peers on state testing. Teachers and school systems were pressured to demonstrate growth or face a series of sanctions under NCLB. These influential pieces of

legislation continue to place increasingly strenuous demands on teachers of students with disabilities, resulting in special education teachers leaving their jobs for different positions in education or exiting the field entirely.

The need for quality and qualified teachers is greater than ever, yet, 98% of school districts report a shortage of special education teachers (Bergert & Burnette, 2001; Boyer & Gillespie, 2000; Thorton, Peltier, & Medina, 2007). The excessive number of special education openings raises concern about the factors forcing teachers out of the field and the aspects preventing them from seeking special education certification. Literature related to the shortage of special education teachers has identified burnout as a major problem within the field. Burnout severely impacts teachers' performance in the classroom, their personal well-being, and their desire to remain in the profession (Brunsting et al., 2014; Emery & Vandenberg, 2010; Shen et al., 2015).

Maslach, Jackson, and Leiter (1996) define burnout as: "A psychological syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment than can occur among individuals who work with other people in some capacity" (p. 192). Previous research finds teachers as most likely to leave the field within the first five years (Billingsley, 2004; Boyer & Gillespie, 2000; Brownell, Hirsch, & Seo, 2004). Numerous factors have been cited as contributing to burnout in special education teachers, including: lack of administrative support, limited resources, large caseload size, and disability population (Wisniewski & Gargiulo, 1997).

Administrators are cited throughout literature as one of the strongest elements influencing burnout in special education teachers (Billingsley & Cross, 1992; Conley & You, 2017; Davis & Palladino, 2011). Administrative support encompasses a number of elements such as: (a) support from building and central office personnel, (b) availability of resources (Billingsley & Cross, 1992), (c) selection of professional development opportunities, and (d) facilitation of collaborative and supportive work environments (Davis & Palladino, 2011.) The notion of administrative support as contributing to burnout was supported by Cancio, Albrecht, and Johns (2013). Their study found that teachers who received administrative support have higher job commitment and satisfaction. The authors' findings were similar to Conley and You (2017), who examined 2,060 secondary special education teachers on their intentions for leaving the field. The results of their study revealed that unsupportive administration contributes to low motivation and job commitment.

In addition to administrative support, paperwork and the taxing workload required of special education teachers strongly affects their desire to stay in the field (Boyer & Gillespie, 2000; Emery & Vandenberg, 2010; Hale, 2015; Kaff, 2004). A study of 215 Alabama special education teachers examined the factors that influence burnout and found a significant relationship between the number of hours spent on paperwork and levels of burnout. Another study by Kaff (2004) sampled special education teachers on their reasons for leaving the field. More than half the participants stated caseload manageability as contributing to their decision to leave.

Subsequent inquiries have discussed classroom factors that contribute to burnout in special education teachers. Banks and Necco (1990) studied the influence of teaching assignment on burnout. The authors sought to determine whether there was a statistically significant difference in levels of burnout between teachers according to their teaching assignment and concluded self-

contained and teachers of students with multiple disabilities reported the lowest levels of work-related stress when compared to inclusion teachers. In a review of literature related to occupational stress, Wisniewski and Gargiulo (1997) reported that classroom make up and setting can affect stress in special education teachers. They stated that teachers of students with intellectual and developmental disabilities experience lower levels of stress, whereas teachers of students with emotional and behavior disorders experience the highest levels of occupational stress.

Researchers have proposed numerous interventions for reducing burnout and retaining quality special education teachers. Kerr and Brown (2016) suggested pre-service preparation programs include strategies for dealing with the emotional stressors associated with teaching. Stress management techniques taught through professional development or workshops are recommended for special education teachers a way for coping with work-related stress (Ansley, Houchins, & Varjas, 2016; Wisniewski & Gargiulo, 1997;). Additionally, increased support from administration or through mentorship programs (Boyer & Gillespie, 2000; Mastropieri, 2000; Nichols, Bicard, Bicard, & Casey, 2008) would be beneficial for teachers, particularly those in their early years of teaching (Bettini, Cheynew, Wang, & Leko, 2015).

Purpose

Despite the abundance of empirical research pertaining to the origins of burnout, minimal research exists investigating the roles of special education teachers and whether or not their varying responsibilities influence feelings of burnout. Given the fact that roles and responsibilities of special education teachers differ so greatly according to their teaching assignments, it is reasonable to assume that teachers could experience more or less of the three dimensions of burnout (i.e., emotional exhaustion, depersonalization, and lack of personal accomplishment), depending on placement. Therefore, the purpose of this study is to examine the differences in levels of emotional exhaustion, depersonalization, and/or lack of personal accomplishment according to teaching assignment. Examining the influence of teaching assignment on burnout will allow researchers, pre-service educator programs, and system administrators to develop individualized support for managing the responsibilities of special education teachers according to their placement. Furthermore, professional development opportunities can be tailored to better meet the needs of special education teachers.

Using MANOVA, this study aimed to answer the following question: is there a statistically significant mean difference in levels of emotional exhaustion, depersonalization, and lack of personal accomplishment between special education teachers in self-contained settings, resource settings, and inclusion settings. Due to the increased responsibilities of teachers working with students with severe disabilities, we hypothesized teachers in self-contained and resource teaching assignments would experience higher levels of emotional exhaustion (EE) and reduced personal accomplishment (PA) compared to inclusion teachers (H_1: $\mu_{EE,\text{ self-contained and resource}} > \mu_{EE,\text{ inclusion teachers}}$; $\mu_{PA,\text{ self-contained and resource}} > \mu_{PA,\text{ inclusion teachers}}$). Furthermore, we hypothesized that teachers in inclusion classrooms will experience higher levels of depersonalization (DP) than self-contained and/or resource teachers, since their role requires them to serve multiple students in various settings (H_2: $\mu_{DP,\text{ inclusion}} > \mu_{DP,\text{ self-contained and resource}}$). The null hypothesis for this study was that there was no significant mean difference between levels of EE, DP, and/or PA between

self-contained, resource, and inclusion teachers ($H_{0:}$ $\mu_{EE,\ self\text{-}contained\ and\ resource} \leq \mu_{EE,\ inclusion\ teachers}$; $\mu_{DP,\ inclusion} \leq \mu_{DP,\ self\text{-}contained\ and\ resource}$).

Method

Participants

The data collected were part of a larger nationwide study on special education teacher burnout. The original dataset included 363 participants from 34 states (Robinson, Bridges, & Rollins, 2017). For the purpose of this analysis, participants were those teaching only in self-contained classrooms, inclusion settings, or resource rooms. Participants for this study included 250 public school special education teachers from 29 states. Teachers from private and charter schools were not invited to participate in the survey due to lower representation of students with disabilities within these settings. The sample comprised more females (82%) than males (17.2%) and represented a broad range of ethnicities, ages, levels of education, and years of teaching experience. Early childhood, elementary, middle, and high school special education teachers who work with students of varying disability categories were included in the sample. Participant demographic information is provided in Table 1.

Table 1
Subject Demographics

	Frequency	Percent
Gender		
Male	43	17.2
Female	205	82.0
Total	248	99.2
Age in Years		
20 to 29	54	21.6
30 to 39	70	28.0
40 to 59	51	20.4
50+	71	28.4
Total	246	98.4
Ethnicity		
White	224	89.6
Black	10	4.0
Indian	1	0.4
Asian	2	0.8
Native	0	0.0
Other	13	5.2
Total	250	100
Teaching Assignment		
Self-contained	103	41.2
Inclusion	74	29.6

Resource	73	29.2
Total	250	100
Years of Teaching		
0 to 5	81	32.4
6 to 10	52	20.8
11 to 15	43	17.2
16+	73	29.2
Total	249	99.6
Grades		
Pre-K and/or Elementary K-5	97	38.8
Middle 6-8	62	24.8
Secondary 9-12+	85	34.0
Total	244	97.6

Note: Participants who did not respond to demographic questions were not included in the total frequencies or percentages.

Procedure

Power analysis for a MANOVA with three groups and three dependent variables was conducted in G*Power to determine a sufficient sample size using an alpha of 0.05, a power of 0.80, and a medium effect size ($f = 0.30$). Based on these assumptions, G*Power provided a desired sample size of 66, or, $n = 22$ for each group (Faul, Erdfelder, Lang, & Buchner, 2007). Permission from the university review board was granted for conducting the study. Data were collected during the 2016-2017 school year using snowball sampling techniques (Patton, 2002). Special education teachers were invited to participate in the anonymous survey through Qualtrics (2017). Initial invitations to participate in the study were emailed to special education teachers with two reminder emails sent weekly after the initial invitation. An anonymous link was included in the email and subjects consented to participate in the study at the beginning of the survey. Completed survey data were made available to the research team through Qualtrics.

Prior to conducting the MANOVA in SPSS, the raw scores from the 7-point Likert scale were transformed to a 0-100 scale using logit transformations (Bond & Fox, 2007; Schumacker, 2006). The research team used The Winsteps Rasch measurement program (Linacre, 2017) to generate person logits. The logits were then used to calculate a mean and standard deviation. The new means and standard deviations were plugged into a formula (mean +/- logit*standard deviation) in order to transform the raw data (Allen & Schumacker, 1998).

Instrumentation

The *Maslach Burnout Inventory Educator Survey* (MBI) is widely used in educational research related to teacher burnout (Maslach, Jackson, & Leiter, 1996). The self-administered survey

consists of twenty-two questions and measures burnout on three subscales: emotional exhaustion, depersonalization, and reduced personal accomplishment. The MBI does not give an overall score of burnout, rather, questions included in the survey align with each subscale to produce three separate scores. The emotional exhaustion subscale evaluates the depletion of emotional resources. The depersonalization subscale measures emotional and psychological detachment towards students and colleagues, and the personal accomplish subscale assesses teachers' feelings of personal success (Nichols & Sosnowsky, 2002). The seven-point scale ranges from 0, "never," to 6, "every day," to produce a score for each subscale. Scores can be coded as low, average, or high. High scores on the EE and DP subscales correspond with high levels of EE and DP, whereas lower scores correspond with high feelings in PA.

Variables

Teaching assignment

Self-contained teachers. The structure of self-contained classrooms varies between schools, but there are commonalities that exist among most self-contained classes. For instance, students receiving instruction in self-contained classrooms receive highly individualized adaptive, behavioral, and academic instruction. Special education teachers in self-contained classrooms often receive the assistance of paraprofessionals. Self-contained classrooms can be made up of students within a specific disability category, such as autism or emotional disturbance. Students with multiple diagnoses or those in need of intensive support often receive instruction in self-contained classrooms.

Although most students in self-contained classes spend the majority of their day there, some students attend general education classes. For students receiving instruction in both the general education and self-contained special education classroom, the teacher must split his or her time between the two settings to ensure students are receiving proper accommodations and modifications (Pierangelo, 2004). The special education teacher is responsible for developing Individualized Education Plans (IEPs) and monitoring progress toward to attainment of IEP goals. The amount of paperwork completed by the special education teacher is likely to exceed that of teachers in other positions because of the need to monitor academic, adaptive, and behavioral skills (Vannest, Hagan-Burke, Parker, & Soares, 2011).

Resource teachers. Resource classrooms are for students with mild to moderate disabilities (Vannest et al., 2011). Students receiving instruction in resource rooms require intensive support in one or more subject areas and are provided instruction with other students with varying disabilities at the same time. The special education teacher's role in a resource classroom is to collaborate with general education teachers to promote generalization of skills between the resource and general education classrooms (Pierangelo, 2004). Similar to self-contained teachers, resource teachers are responsible for developing IEPs and monitoring the progress of student IEPs. Resource teachers work to implement appropriate accommodations in all school settings and collaborate more with general education teachers than self-contained teachers.

Inclusion teachers. Inclusion teachers spend the majority of their day working with students receiving special education support within general education classrooms. They teach alongside general education teachers and work collaboratively to develop curriculum and

accommodate instruction to meet the needs of all students. According to Vannest et al. (2011), inclusion teachers may be expected to spend time providing direct instruction or circulating the classroom to assist individual students during lessons. Inclusion teachers are responsible for developing and monitoring IEPs, completing paperwork, and providing accommodations for students with disabilities in the general education classroom. Inclusion teachers have the highest interaction with general education colleagues.

Dimensions of burnout. The dimensions of burnout include emotional exhaustion, depersonalization, and a reduced sense of personal accomplishment. Emotional exhaustion occurs when the individual has depleted all emotional resources. Depersonalization is the development of negative attitudes and feelings towards students, and reduced personal accomplishment is a negative evaluation of one's work (Maslach & Jackson, 1980). Special education teachers may experience one or more of aforementioned elements of burnout as the result of prolonged stress.

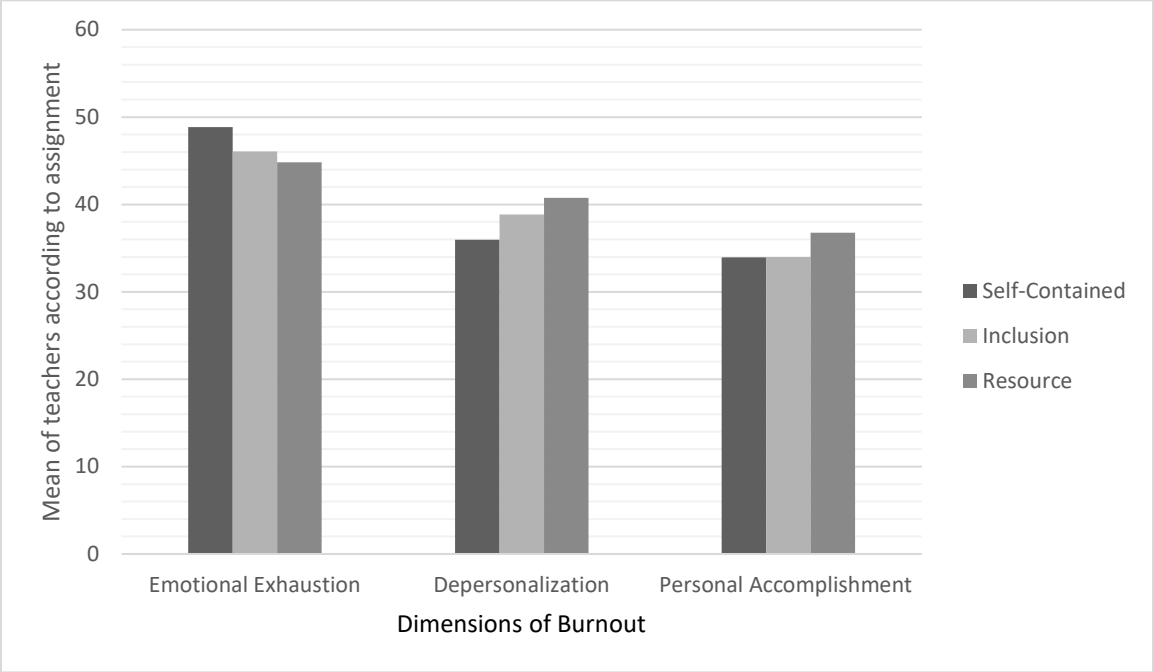
Results

A multivariate analysis of variance (MANOVA) was used to assess the differences in levels of the three dimensions of burnout (emotional exhaustion, depersonalization, reduced personal accomplishment) between self-contained, inclusion, and resource special education teachers. Prior to the analysis, several assumptions of MANOVA were conducted. The Shapiro-Wilk test indicated only one of the dependent variables, emotional exhaustion, was normally distributed ($p > 0.05$), whereas depersonalization and reduced personal accomplishment were not ($p < 0.05$). We did not find this violation to be problematic as MANOVA procedures are robust to violations of normality and deviations from multivariate normality have minimal effects on type I error (Pituch & Stevens, 2016). Pearson correlation was assessed to determine absence of multicollinearity. No multicollinearity was detected between EE and DP ($r = .420$, $p > .001$), EE and PA ($r = -.345$, $p > .001$), or DP and PA ($r = -.324$, $p > .001$).

Linear regression was used to check for outliers. The maximum critical value for Mahalanobis distance where $df = 3$ is 16.27. We received a maximum value of 16.05, therefore, no outliers were detected. Box's M test ($p = 0.416$) indicated homogeneity of variance-covariance matrices.

A comparison of group means reveal that self-contained teachers experienced higher levels of emotional exhaustion than resource and inclusion teachers ($M = 48.85$, $SD = 10.15$; $M = 46.08$, $SD = 9.91$; and $M = 44.82$, $SD = 9.63$, respectively). On the depersonalization subscale, resource teachers scored higher than inclusion and self-contained teachers ($M = 40.77$, $SD = 22.59$; $M = 38.85$, $SD = 22.48$ and $M = 35.95$, $SD = 22.20$, respectively). For the personal accomplishment subscale, lower means correspond with high feelings of reduced personal accomplishment. The data indicated that inclusion teachers felt the highest levels of diminished personal accomplishment ($M = 34.00$, $SD = 17.59$), followed by self-contained and resource teachers ($M = 33.96$, $SD = 17.88$ and $M = 36.77$, $SD = 19.71$, respectively). Figure 1 displays the comparison of group means.

Figure 1
Comparison of mean burnout among teachers by teaching assignment



The multivariate test revealed a statistically significant difference in teaching assignments on the dependent variables, (Pillai's Trace = 0.65, $F(6,492) = 2.76$, $p = .012$; partial $\eta^2 = .033$). The multivariate effect size was small at .033, indicating approximately 3.3% of the variance in the dependent variable is explained by teaching assignment. The multivariate test results are shown in Table 2. Using a Bonferroni adjusted α level (.05 / 3 = 0.02), follow-up univariate ANOVAs indicated a statistically significant difference in levels of EE ($F(2,247) = 3.86$, $p = .022$; partial $\eta^2 = .03$) but no statistically significant difference in levels of DP ($F(2,247) = 0.92$, $p = .399$; partial $\eta^2 = .007$) or PA ($F(2,247) = 0.60$, $p = .551$; partial $\eta^2 = .005$). The univariate results are summarized in Table 3. All partial eta-squared values indicated small effect sizes. Tukey post-hoc tests showed that self-contained teachers had statistically significantly higher levels of emotional exhaustion than inclusion teachers (p = .022).

Table 2
One-way MANOVA of Dimensions of Burnout by Teaching Assignment

Effect		Value	F	Hypothesis *df*	Error *df*	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.973	2925.95	3.00	245.00	.000	.973
	Wilks' Lambda	.027	2925.95	3.00	245.00	.000	.973
	Hotelling's Trace	35.83	2925.95	3.00	245.00	.000	.973

	Roy's Largest Root	35.83	2925.95	3.00	245.00	.000	.973
Teaching Assignment	Pillai's Trace	.065	2.76	6.00	492.00	.012	.033
	Wilks' Lambda	.935	2.78	6.00	490.00	.012	.033
	Hotelling's Trace	.069	2.80	6.00	488.00	.011	.033
	Roy's Largest Root	.060	3.00	3.00	246.00	.003	.056

Note: Significant at the $p < 0.05$ level

Table 3
One-way ANOVA's with Dimensions of Burnout as Dependent Variables and Teaching Assignment as Independent Variable

	Levene's		ANOVA's			Self-Contained		Resource		Inclusion	
	$F_{(2,247)}$	*p*	$F_{(2,247)}$	*p*	η^2	*M*	*SD*	*M*	*SD*	*M*	*SD*
Depersonalization	.804	.449	.922	.399	.007	35.95	25.20	40.77	22.59	38.85	22.48
Emotional Exhaustion	.268	.765	3.86	.022	.030	48.85	10.15	40.08	9.91	44.81	9.63
Personal Accomplishment	.159	.853	.597	.551	.005	33.96	17.88	37.77	19.71	34.00	17.59

Note. $N = 250$; η^2 = Partial eta squared.

Discussion

The purpose of this study was to investigate the differences in levels of emotional exhaustion, depersonalization, and lack of personal accomplishment in special education teachers in different teaching assignments. This study focused on the form of burnout experienced by teachers according to their teaching assignments, which has yet to be thoroughly investigated. It is critical to understand how teachers in varying placements experience burnout to identify role-specific sources of stress, reduce factors that contribute to burnout, and retain quality teachers. Our multivariate results reveal a statistically significant mean difference in levels of emotional exhaustion between the three groups of special education teachers. Comparisons of the group mean differences support our hypothesis that teachers in self-contained classrooms experience the highest levels of EE, followed by inclusion and resources teachers, respectively.

Additionally, the data support our hypothesis that self-contained teachers would feel higher levels of reduced personal accomplishment. Contrary to our hypothesis regarding inclusion teachers feeling higher levels of depersonalization, our results indicated that resource teachers feel the highest levels of depersonalization, followed by inclusion and self-contained teachers, respectively. It is important to note that our findings differ from Banks and Necco's (1990)

earlier findings that teachers working in self-contained classrooms report the lowest levels of work related stress; our results indicate that is no longer the case. The changes in legal mandates in special education since the previous study have vastly increased the workload of self-contained teachers. Our findings now show that self-contained teachers are experiencing increased feelings of burnout, and in particular, these educators are emotionally exhausted.

Emotional Exhaustion. Maslach (1993) stated that emotional exhaustion is the result of investing too much of oneself in one's work. The consequences of emotional exhaustion are severe. Teachers who are emotionally exhausted may feel reduced energy, diminished motivation, and dread going to work (Emery & Vandenberg, 2010). Self-contained teachers are those working with smaller groups of students, but students whose needs extend well beyond academics. When examining the roles and responsibilities of special education teachers in self-contained settings, it is evident that these teachers expend a great deal of emotional resources on a daily basis. Many self-contained classrooms are comprised of students with severe intellectual disabilities, emotional and behavior disabilities, and/or students in need of intensive adaptive supports. The outcome of teachers in self-contained classrooms experiencing higher levels of EE aligns with existing research on burnout. Studies by Singh and Billingsley (1996) and Wisniewski and Gargiulo (1997) both concluded that teachers of students with emotional and behavior disorders and intellectual disabilities are more likely to experience burnout and attrition, but neither study specified the type of burnout experienced by the teachers in the study

Job demands. Explanations for the significance of higher levels of EE for self-contained teachers compared to inclusion teachers are clear when examining the job demands of self-contained teachers. It is not surprising that teachers in this placement would feel high levels of EE and lack of personal accomplishment when considering their responsibilities. The development and implementation of IEPs and behavior intervention plans (BIP) are the focal point of teaching special education. These legal documents are central to ensuring students with disabilities are provided an appropriate and highly individualized education. It is the responsibility of the special education teacher to develop a plan that reflects each student's individual strengths, needs, and interests. The amount of paperwork involved in developing these documents, paired with the paperwork related to data collection for monitoring the progress of multiple students across multiple measures is daunting, to say the least. Paperwork is cited throughout literature as a contributing factor to burnout and attrition in special education teachers (Boyer & Gillespie, 2000; Fore III, Martin, & Bender, 2002; Hale, 2015). Self-contained teachers are likely to feel as though they are unable to assist in meeting their students' needs, because of the amount of time required to complete paperwork.

In addition to paperwork, self-contained teachers are responsible for managing paraprofessionals. Paraprofessionals are often included as a supplementary aide or service in IEPs for students with significant disabilities and/or severe behaviors; therefore, paraprofessionals are most commonly assigned to self-contained special education classrooms. Although paraprofessionals are intended to alleviate the excessive workload of special education teachers, finding a balance between teaching and overseeing other service providers can be a source of added stress and may explain why self-contained teachers are more likely to feel emotionally exhausted and less accomplished. A study by Irvin, Hume, Boyd, McBee, & Odom (2013) reported a significant relationship between the adult-to-student ratio and burnout among teachers working with children with

autism spectrum disorder. The additional responsibilities of data collection, paperwork, and overseeing paraprofessionals may seem overwhelming to teachers in self-contained environments, causing them to feel a reduced sense of personal accomplishment.

Depersonalization. Depersonalization is detaching oneself from others. In the context of special education, teachers may exhibit depersonalization by distancing themselves and developing unsympathetic feelings toward colleagues and students. Our findings reveal that resource teachers experience the highest levels of depersonalization, although, this finding was not significant. High levels of depersonalization among resource teachers are corroborated by a single study. Banks and Necco (1990) found that teachers working in resource classrooms experience high levels of burnout, but these findings are outdated. Changes in special education laws have reshaped the roles of special education teachers working in resource and inclusion settings. Therefore, it is relevant to discuss the elements that contribute to higher levels of depersonalization for teachers currently in these placements.

Resource teachers serve a small population of students who can participate in the general education classroom for the majority of their school day but require additional support from a special education teacher that is provided in an alternate setting, whereas inclusion teachers provide special education services to students within the general education classroom. Characteristics shared between the two placements include required collaboration with general education teachers (Pierangelo, 2004), developing and implementing IEPs and BIPs (when necessary), and serving a diverse population of students with varying disabilities. Teachers working in these placements often have larger caseloads, which is identified in literature as influencing burnout (Wasburn-Moses, 2005). Larger caseloads lead to increased amount of paperwork for resource and inclusion teachers, preventing them from developing relationships and providing students with adequate supports.

Collaboration and role dissonance. Collaboration and role dissonance may explain the higher levels of depersonalization among resource and inclusion teachers. Collaboration is a widely used practice in the field of education. Special education teachers collaborate with numerous parties within and outside the school, depending on the services outlined in their students' IEPs. Collaborative relationships are intended to produce positive outcomes and provide students support across multiple personnel and settings. Collaboration, however, can create additional stress for special education teachers when they feel unsupported by general education colleagues and administrators. A study by Nichols and Sosnowsky (2002) found that teachers who felt dissatisfied with their support network felt increasingly isolated. Lack of support can lead special education teachers working in resource and inclusion settings to withdraw from co-workers and students, resulting in increased depersonalization.

Bettini, Cheynew, Wang, and Leko (2015) stated that administrators play a key role in establishing collaborative relationships among general and special education teachers. Furthermore, the authors note the importance of special education teachers feeling as though their role is valued while working with general education teachers. It is critical for special educators to view themselves as more than assistants to general education teachers. It is the special educators' responsibility to ensure accommodations and supports outlined in IEPs are implemented. When special education teachers feel like assistants or not perceived as the general

educator's equal, they do not feel as though they are contributing to the success of the students. These feelings can have a severe impact on the special education teacher's self-perception, thus, resulting in detachment from the students. Administrators should clearly define the roles and responsibilities of both parties and develop a collaborative culture within schools to reduce isolating special education staff.

Role dissonance is another aspect identified in literature as contributing to burnout in special education teachers. Role dissonance is more prominent for resource and inclusion teachers, because they are often required to teach multiple subjects and students with a broad range of abilities. The extent of their responsibilities may be unclear if the administrator does not specify roles and prioritize collaboration between general education and special education teachers. Gersten, Keating, Yovanoff, and Harniss (2001) stated that stress related to job design causes teachers to feel helpless, isolated, and burned out. The authors found that special education teachers who engage in frequent conversations with colleagues and administrators experience less role dissonance and stress. Strong collaborative relationships can alleviate feelings of isolation and reduce depersonalization in resource and inclusion teachers.

Conclusion

This study aimed to determine whether special education teachers in self-contained, resource, and inclusion classrooms experience burnout differently. Literature has identified many factors that cause burnout and attrition in special education teachers. Examining whether these factors are more influential to one category of teachers than others would allow researchers and administrators to determine effective interventions specific to the needs of teachers according to their assignments. The responsibilities of special education teachers have shifted greatly with changes in legal mandates. It would be beneficial to researchers and administrators to examine how the effects of burnout have evolved as education laws for students with disabilities have progressed.

Recommendations outlined in research have named professional development, mentoring programs, induction teacher programs, and stress management strategies as methods to reduce stress for special education teachers. Due to the fact that the roles and responsibilities vary so greatly among the three teaching placements, specific strategies should be explored to reduce the type of burnout the teacher is likely to experience according to teaching assignment. We believe these interventions should be explored further, but also that teachers need strategies for reducing the specific type of burnout they are experiencing. The shortage of special education teachers has yet to be resolved. It is critical that researchers and administrators find ways to support special education teachers to reduce burnout, prevent attrition, and improve outcomes for students with disabilities.

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Retaining Special Education Graduate Students in Times of Transition

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Abstract

This paper examines special education graduate program retention data in connection with issues identified as affecting retention in higher education. We reviewed archival data for a three-year period to evaluate retention during a time of continual institutional and programmatic change. Descriptive data for four specific graduate strands in the participating program were examined through the consideration of student involvement, student interactions with faculty, and the disruption of established traditions. Through this examination, we found that retention rates remained stable over the three-year period, which may have been the result of several factors shown in retention literature to decrease student attrition.

Keywords: retention, attrition, graduate students, programmatic change, special education, higher education, student completion, student persistence

Retaining Special Education Graduate Students in Times of Transition

In alignment with a longstanding line of research on retention, institutions of higher education continue to focus on the retention and eventual graduation of students (Tinto, 2006). Many research teams have attempted and have been unsuccessful in capturing the specific reasons why students stay or leave institutions, but some researchers have uncovered characteristics of institutions of higher education that contribute to student retention (Davidson & Wilson, 2013; Golde, 2000; Tinto, 2006; Thomas, 2002; Vaquera, 2007). Of the several factors that may affect student retention, we consider three factors that may be visible using special education graduate program data. These institutional factors include: a) student contact and involvement, b) student and faculty interaction, and c) long-standing, established institutional traditions (Tinto, 2006; Thomas, 2002; Vaquera, 2007).

Students who are retained in higher education tend to have increased contact with other students and increased social involvement within their institution (Tinto, 2006). This social engagement includes a sense of belonging for a student and can be understood in terms of the opportunity for interaction with peers, time spent in the classroom, and inclusion in clubs or organizations (Gardner 2008; Gardner & Barnes, 2007; Hurtado & Carter, 1997; Vaquera, 2007). Social engagement has been critically affected by both establishing and strengthening new relationships in the higher education setting and by maintaining previously established relationships with families and communities of origin (Thompson, Johnson-Jennings, & Nitzarim, 2013; Tinto, 2006). If an institution does not make the effort to create and maintain engagement as expressed by the feeling of community among students, students may be less likely to continue their education. Retention may be further impacted if institutional changes occur that cause a

disruption in established programs that were designed to build a sense of community among students.

A second institutional characteristic that fosters student retention has been the positive interaction between students and faculty. Students hope to develop deep relationships with faculty members (Carpi, Ronan, Falconer, Boyd, & Lents, 2013; Cox, McIntosh, Terenzini, Reason, & Lutovsky Quaye, 2010; Thomas, 2002). Specifically, retention has been facilitated by student-faculty relationships that are encouraging, supportive, and directed to helping students meet their own personal goals (Golde, 2000; Merrill, 2015). Positive student-faculty interaction during times of transition may be especially important in helping a student decide to stay in or leave a program (Tinto, 2006), while disruption of previously established student-faculty relationships may also affect a student's decision to stay or leave. In an effort to prevent student attrition, faculty should attempt to make contact with students, know students' names, and show signs of friendship (Thomas, 2002). Further addressing positive interactions, Vaquera (2007) summarized student attrition as a longitudinal process that is directly related to student interactions with the educational environment. Because relationships with faculty have been an important part of the educational environment, the quality of student-faculty relationships is essential to retention (as demonstrated by student perceptions of faculty competence in supporting students to achieve personal goals).

Finally, student retention has been affected by a student's level of confidence in an institution as informed by the institution's long-standing, established traditions (Berger & Braxton, 1998; Braxton, 2008). Students hope that a degree from an institution will eventually lead to the desired type and level of employment they wish to obtain. Students want to know that the institution is well respected among potential employers or other graduate programs and that a degree from that institution will help to elevate their current standing. Unfortunately, a student's confidence in the ability of an institution to assist in meeting individual goals may be affected by continual changes. As changes occur new traditions are established that may affect student confidence in an institution's ability to help students achieve personal goals.

Institutional change can have an impact on all of the three identified characteristics that could lead to student retention. The removal, maintenance, or addition of programs designed to facilitate community among students, maintain faculty interactions with students, and instill institutional confidence in students, are all areas that would benefit from further investigation. The purpose of this specific study was to examine special education program archival student retention data to evaluate the overall graduate student retention over a three-year period of continual change affecting student contact and involvement, student to faculty interactions, and long-standing, established institutional traditions.

Method

To determine retention levels, Institutional Review Board (IRB) approval was obtained to review archival program retention data for all New Mexico State University special education graduate program students from Fall 2014 to Summer 2017. Archival data sources included the university enrollment data system, the departmental database, and the former program director's regularly-kept program records. We used the archival data to complete a comprehensive spreadsheet titled

Special Education Graduate Program Admissions, Exits, and Retention from Fall 2014 to Summer 2017. This spreadsheet was used to create five summary tables: new student admissions tracked to exit, completion, or continuation (Table 1), enrollment by program strand (Table 2), retention by semester (Table 3), exit reasons (Table 4), and exits by program strand (Table 5).

Setting

The program was located in a southwestern borderlands U.S. research-intensive university that was also designated as a land-grant institution and Hispanic Serving Institution (HSI). The university's research-intensive status required that graduate students engage with faculty in research activities to a higher degree than for other locally available institutions, while the role as a land-grant institution requires that faculty also focus on practical career preparation goals for students. University-wide demographic information from the Office of Institutional Analysis (New Mexico State University, 2016) shows that approximately 52% of the student population were identified as Hispanic. Further, many graduate students in the special education program (at least 50%, based on enrollment in the alternative licensure strand) taught full-time within public school classrooms in the community and pursued graduate coursework part-time. Over time the program has maintained 80% or greater graduate student enrollment with lower undergraduate enrollment, leading to a focus on graduate student retention.

Participating Program Description

The graduate program in special education includes PhD, EdD, and MA degree plans. The MA program has five possible pathways or "strands," three of which are represented in this study: traditional licensure, alternative licensure, and scholarly/non-licensure. The remaining two pathways or strands (i.e., visual impairment preparation and the autism spectrum certificate) are offered separately from these degree plans/strands and therefore are not included in this study. The traditional licensure strand includes practicum and student teaching field experience components. The alternative licensure strand includes field experience structured as concurrent employment as a special education teacher while taking courses. The scholarly/non-licensure strand includes coursework without required field experience for students not seeking licensure either because they already have a license in special education, or they are seeking a career that will not require licensure. We considered retention for these three strands of the MA program and for the doctoral program.

Research Design, Data Collection, and Analysis

After receiving IRB approval to use the archival dataset, the data were transferred into a Microsoft Excel spreadsheet for easy mode and percentage calculations. We used the term "strands" to encompass Alternative MA, Traditional MA, Scholarly MA, and Doctoral pathways. Descriptive statistics were used to examine student retention and exit data over a three-year period (i.e., Fall 2014 to Summer 2017). Data presented over the three-year period included totals, modes, and percentages for students.

Results

Table 1 contains data for newly admitted graduate students across multiple semesters and considers whether these newly admitted students graduated, continued their studies, or exited the program. Students who exited were non-continuing students who did not complete a program

strand (i.e., Alternative MA, Traditional MA, Scholarly MA, or Doctoral) as indicated by graduation. The retention of newly admitted special education graduate students ranged from 60% to 100% over the three-year period (Fall 2014 to Summer 2017). The lowest retention percentage (60%) was in Spring 2015. As reflected in Table 1, there were multiple semesters in which 100% of newly admitted students either graduated or were retained through Summer 2017, with the majority of new student 100% retention happening in summer semesters (Summer 2015, 2016, and 2017) and one instance in a spring semester (Spring 2017). The majority of students entered the program in the Fall semesters (Fall 2014, 2015, and 2016). When considering all newly admitted students, there was an overall retention rate of 83% for the 65 students admitted over the three-year period.

Table 1
Retention of Newly Admitted Special Education Graduate Students Fall 2014-Summer 2017

Admittance Semester	Admitted	Exited	Graduated	Continuing Summer 2017	Percent Retained
Fa 14	13	3	6	4	77
Sp 15	5	2	1	2	60
Su 15	4	0	3	1	100
Fa 15	12	1	1	10	92
Sp 16	8	2	1	5	75
Su 16	4	0	0	4	100
Fa 16	14	3	0	11	79
Sp 17	3	0	0	3	100
Su 17	2	0	0	2	100
Totals	65	11	12	42	83

Note. Fa = Fall. Sp = Spring. Su = Summer. 14,15,16, and 17 refer to 2014, 2015, 2016, and 2017. Admitted = admitted and registered for courses. Exited = withdrew or became inactive. Percent Retained = (Graduated + Continuing) / Admitted. All data refers only to students admitted for the semester indicated.

Table 2 includes the total enrollment across the three MA strands and the doctoral program. Approximately 50% of the total 98 students were enrolled in the alternative licensure strand. Over four semesters, program enrollment numbers ranged from 58 to 63 students, with the lowest student enrollment in the Spring 2017 semester. Using the total enrollment across strands from Table 2, data in Table 3 includes retention numbers for students across all graduate program strands in special education over a two-year period. Retention for each semester was high (86 – 98%), but was much lower (77%) when considering retention for individual students rather than students as cohort members in multiple semesters. When comparing the overall retention of all students in the program (77%) to the retention rates of newly admitted students, a slightly higher percentage of retention (83%) was present (compare Table 1 and Table 3). The most frequent reason for exiting (n=7) was that students in the alternative licensure strand

finished the seven courses and supervision requirements to obtain a teaching license and chose not to continue with their MA degrees (Table 4). The second most frequent reason for exiting (n=6) was "unknown," which was a category that included students who stopped taking coursework and became inactive without discussion with their advisors.

Table 2
Special Education Graduate Program Total Enrollment in Four Strands

	MA			PhD / EdD	
Semester	Alternative	Traditional	Scholarly	Doctoral	Total
Fa 15	32	6	16	9	63
Sp 16	32	7	16	8	63
Fa 16	31	8	16	8	63
Sp 17	30	8	13	7	58
Distinct	50	13	24	11	98

Note. Fa = Fall. Sp = Spring. 15,16, and 17 refer to 2015, 2016, and 2017. Alternative = earning an MA while pursuing alternative teaching licensure. Traditional = earning an MA while pursuing traditional teaching licensure. Scholarly = earning an MA while not pursuing teaching licensure. Distinct = total non-repeated individuals pursuing the strand indicated across all semesters.

Table 3
Special Education Graduate Program Retention Fall 2015 – Spring 2017

Semester	Enrolled	Exited	Graduated	Continuing	Percent Retained
Fa 15	63	1	8	54	98
Sp 16	63	7	5	51	89
Fa 16	63	7	3	53	89
Sp 17	58	8	11	39	86
Distinct	98	23	27	48	77

Note. Fa = Fall. Sp = Spring. 15,16, and 17 refer to 2015, 2016, and 2017. Enrolled = current active student. Exited = withdrew or became inactive. Percent Retained = (Graduated + Continuing) / Enrolled. Distinct = total non-repeated individuals enrolled across semesters. Summer semester numbers are included with the preceding spring semester.

Table 4
Exit Reasons Fall 2015 – Spring 2017 (n=23)

Semester	Moved	Negative SS	Changed Dept	Completed Alt Prog	Changed Alt Prog	Unknown
Fa 15	1	-	-	-	-	-
Sp 16	1	1	-	1	-	-
Su 16	-	-	-	2	-	2
Fa 16	-	1	-	2	1	3
Sp 17	1	1	2	2	1	1
Totals	3	3	2	7	2	6

Note. Fa = Fall. Sp = Spring. 15,16, and 17 refer to 2015, 2016, and 2017. Negative SS = Self-Selected to leave after faculty advice regarding low grades or dispositional concerns. Changed Dept = Changed Department. Completed Alt Prog = completed those parts of the program required to earn alternative licensure and thus continue teaching but did not complete a degree. Changed Alt Prog = enrolled in another state approved alternative process or preparation program. No exit data was available for Fall 2014-Summer 2015 or Summer 2017.

The data in Table 5 included the number of students who exited based on the program strand. Percentages of students exiting were fairly consistent across strands, ranging from 0 – 25% and with a strong mode of 13% (6 of 11, 54% of non-zero data).

Table 5
Exits by Program Strand Fall 2015 – Spring 2017 (n=23)

	MA						PhD / EdD	
Semester	Alternative		Traditional		Scholarly		Doctoral	
	N	%	N	%	N	%	N	%
Fa 15	1	3	-	-	-	-	-	-
Sp 16	4	13	-	-	2	13	1	13
Fa 16	3	10	2	25	1	6	1	13
Sp 17	4	13	1	13	3	23	-	-

Note. Fa = Fall. Sp = Spring. Su = Summer. 15,16, and 17 refer to 2015, 2016, and 2017. N = number of students exited, % = exit percent of students enrolled in that strand for that semester. No exit data was available for Fall 2014-Summer 2015 or Summer 2017. Summer data is included with the preceding spring semester to enable comparison with strand totals in Table 2.

Discussion

Program Changes

The graduate program in special education underwent significant changes from Fall 2014 to Summer 2017. These changes affected graduation timelines and were relevant in student retention. The changes set the context for reviewing retention data collected from Fall 2014 to Summer 2017. Many of the changes occurred concurrently, but will be discussed separately for clarity. The discussion of these changes does not include the reasons for the changes, evaluation of the changes, or comments on the change process beyond consideration of graduate student retention.

Changes experienced in the time of the archival dataset included changes of faculty and staff in the program and department, changes to program strands, and changes in department and college leadership. Changes will be discussed in relation to their effect on student contact or involvement, their effect on student-faculty interaction, and their impact on existing, established traditions (Tinto, 2006; Thomas, 2002; Vaquera, 2007).

Retention and Student Contact and Involvement

As reflected in Table 1, newly admitted students in the Spring 2015 semester experienced a greater degree of exiting and lower retention than newly admitted students in any other semester. This result may have been connected to the changes that were occurring immediately prior to and during the admission semester. During the academic year in which these students were admitted (2014 - 2015), the college and department had undergone multiple changes in leadership. The dean of the college had announced retirement in Fall 2014 and a search for a new dean was underway. Additionally, in the immediately prior academic year, the department had four special education faculty member resignations. Two new faculty members were hired over the summer of 2014 to assist in filling the prior resignations. Finally, the department experienced three different department heads during the three year data period with varied levels of experience in special education, from very little knowledge of special education to expertise in the field. Two of those department leaders served as interim department heads, which is by definition a transitional role. Students newly admitted in Spring 2015 would have experienced these changes in their immediate academic community as they engaged in their programs. The decline in retention for students newly admitted in Spring 2015 could be related to a student sense of loss of the former community of leaders and faculty members. Tinto (2006) suggested that focusing on student contact and involvement in the academic community has been critical to student retention; unfortunately, students may have felt that the pre-established community with the previous dean, department head(s), and faculty members could no longer exist and, therefore, chose to exit the program.

In the newly established academic community in Spring 2015, student contact and involvement in the program declined, which is consistent with the Tinto (2006) explanation of declining retention. This occurred partially because of fewer opportunities for student engagement as time was needed for newer faculty to become acclimated as proactive agents in building the community experience. Part of this included the diminished number of faculty available and lack of experience of new faculty in community building activities that would have increased student

contact, such as sponsoring the multiple organizations, clubs, and fundraisers that were previously offered to students in the program.

Additionally, due to having fewer faculty members, many of the initial courses for the program were assigned to adjuncts, doctoral students, and newly appointed faculty rather than to more experienced faculty. Coursework that is introductory for entering students has been a critical juncture in which students choose to stay or leave a university (Tinto, 2006), but many times the department's least experienced faculty were assigned to teach these courses due to a lack of experienced faculty.

Further, beginning in Fall 2015, the new dean's office established a new vision for the college. This shift away from the vision of the previous dean may have further disrupted students' feeling of community. In the Spring of 2016, as this shift progressed and in response to a university-wide push for reorganization of colleges, the dean's office began to discuss the relocation of the special education program from a departmentalized system into a new school structure. Students were faced with the cumulative results of changes that included losing and acquiring faculty members, losing and acquiring departmental and college leaders, aligning with a new college mission, and managing uncertainty related to restructuring the program. This led to persistent, ongoing change from a known academic community to an unknown, inconsistently defined, and developing community. Fortunately, as the new community became more established within the department and college, retention rates continued an upward, stable trend, finally reflecting 100% retention of students newly admitted in Spring 2017. The increased retention rates were indicative of some success in student retention despite the intensity of programmatic changes that affected student contact and involvement.

Retention and Student and Faculty Interactions

The quality of student and faculty relationships tends to be an indicator of strong academic integration for students (Golde, 2000, 2005). As Thomas (2002) explained, a relationship of caring and investment between students and faculty can be established by faculty who express sentiments of encouragement and engage in assisting students to reach their personal goals. Quality student-faculty interaction has been developed by building strong academic, advising, and mentoring relationships. As noted in Tables 2 and 3, the number of students enrolled in each of the graduate strands remained consistent from Fall 2015 to Spring 2017 (i.e., 58 - 63 students, respectively), but the total number and experience level of the faculty did not remain consistent during that time. Starting in the Fall 2013 semester, the department experienced the loss of four special education faculty. The exit of a large number of faculty, each with a significant amount of experience, meant that many functional, yet unwritten procedures and policies left with those faculty members, including expectations and methods for developing quality student-faculty interactions. Also, an additional faculty member resigned in 2016. Due to university budget constraints, only three of the five vacated positions were filled. Advising for all graduate level students was reallocated across the existing faculty and new faculty, which temporarily made building and maintaining strong student-faculty relationships a largely impossible goal. Adding to this challenge in building consistent and strong relationships with students, staff changes since Fall 2014 included reassignment of two long-term administrative assistants and hiring and resignation of three new administrative assistants.

Several effects of faculty and staff changes were relevant in considering graduate student retention. One effect of these changes was that new faculty were in positions where they must provide mentorship to students before having acquired detailed systemic knowledge of programs and degree options. The newer faculty's lack of knowledge in reference to degree planning may have led to a longer time to degree which is correlated with a higher attrition rate for students (Bowen & Rudenstine, 1992). Student advisees who were assigned to new faculty, formerly advised by faculty who had left, may or may not have had a clearly defined program of study for their chosen strand as this was not a required action for previous advisors. Additionally, course listings for strand options were not clearly defined at that time and were not consistently offered. Therefore, the lack of knowledge of newer faculty as well as no clearly defined degree plan for some inherited student advisees may have led to a longer time to degree. Contrastingly, it is not likely that newly admitted students exited the program for these reasons. As new faculty began organizing course offerings, requiring the presence of a degree plan on file for all graduate students, and defining degree plans explicitly, newly admitted students would often graduate at a quicker rate (Table 1).

Additional challenges in retention connected to student-faculty interaction occurred. For example, due to the abundance of newer faculty, a team-oriented approach had yet to be established due to new relationships forming among faculty and this may have affected student retention (Vaquera, 2007). Further, the mentorship relationship between faculty members and graduate students was disrupted (for some students multiple times) because students had a number of different advisors throughout this time period. Doctoral students were affected because they had to change the members of their committees a number of times. Moreover, faculty and staff changes may have affected retention in relation to the ability of new faculty and staff to respond knowledgeably to student procedural questions.

Multiple strategies were used to aid in retention during this time of change. First, newer faculty focused on communication with new advisees in an attempt to build strong relationships between new students and faculty. For example, newer faculty increased communication efforts and allowed for multiple methods for advisement meetings (i.e., in person, via phone, via video conference) in an effort to improve student and faculty interactions. In alignment with Tinto (2006), new faculty members focused on making contact with students, especially outside of the classroom, in an effort to improve retention.

Second, in consideration of the role of both mentor and advisor, three local emeritus faculty were contacted to teach additional classes to reduce the teaching load of new faculty so that more time could be spent on mentoring and advising students. Students often greatly value faculty that are focused on their roles as mentors and advisors (Bair, Haworth, & Sandfort, 2004) and increased focus on student advising could have possibly affected the overall retention of students as noted in Tables 1 and 2. Furthermore, the emeritus faculty were able to serve as new faculty mentors regarding teaching and advising and served as committee members for doctoral students whose committee members or chairs left the university. In this time of need, Emeritus faculty filled a gap that directly contributed to students completing their programs. Faculty from two other departments in the college also agreed to provide new faculty mentorship and doctoral committee support. Support from these faculty members made it possible for graduate students who lost their committees to re-form committees and complete their studies and for new faculty

to gain knowledge and confidence in advising and mentoring, which was essential in improving student retention.

Many faculty believe that the issue of student retention would be solved if more qualified applicants were admitted (Tinto, 2006). Student-faculty interactions were likely affected by this perception, with the possibility that a greater degree of support or a stronger student-faculty relationship was inadvertently built for students with higher entry qualifications. Regardless of the truth of this belief, in response to accreditation concerns, in Summer 2015 the grade point average (GPA) standard for the special education graduate program admittance changed from a minimum 2.5 provisional admittance (3.0 regular admittance) to a minimum 2.8 provisional admittance (3.0 regular admittance). This was a matter of more closely following existing procedures rather than creating new procedures and particularly affected those seeking admittance to the alternative licensure strand as applicants to this program typically had lower GPA's than applicants to the other strands. Additionally, in Summer 2015, the program stopped provisionally admitting international students with English Language testing (TOEFL and IELTS) scores that were below university graduate school admittance cut-off scores. Finally, the program stopped admitting international students with sponsoring agency restrictions to no more than nine credits of online coursework for their entire program. These changes had the effect of decreasing admission of doctoral students and alternative licensure students. These changes may have contributed to a lower number of students admitted to the Spring 2017 semester and could likely affect future retention more than the retention of graduate students currently in the program (Table 3).

Retention and Changes to Established Traditions

Student retention can be attributed to institutions with long standing traditions that allow students to secure a job upon graduation (Berger & Braxton, 1998; Thomas, 2002); however, long standing traditions are difficult to maintain when multiple departmental and leadership changes have disrupted established traditions. From Fall 2014 to Fall 2017 the department and program leadership changed multiple times, for a total of three department heads and three program directors. The first and second department heads had specializations in areas other than special education and the second and third department heads were hired as interim department heads. A program director was hired beginning Fall 2015, after a year in which program director functions were completed primarily by the department head with no specialization in the field of special education. After two years, the program director role and functions were returned to a different (interim) department head with a doctorate in special education. Students want to know that an institution will help them realize their goals (Berger & Braxton, 1998), but multiple changes in leadership can create difficulties in maintaining traditions. Leadership changes were noticed and discussed by graduate students. These changes potentially affected student retention and could be a contributing factor for the students that exited without citing a reason (N=6), as well as those students changing departments (N=2) (Table 4). Berger and Braxton (1998) also suggested that the fit between a student and institution has been a factor in retention. Exiting students may have felt that the fit between themselves and the department no longer existed in relationship to leadership changes. In addition to changes in leadership, the department experienced multiple changes to the special education program strands as well.

Between Fall 2014 and Fall 2017 three MA program specializations were ended (i.e., multicultural/bilingual special education, early childhood special education, and a special education reading emphasis). Students who may have initially chosen the institution for one of these specific degree options may have exited the program because their individual goals could no longer be realized due to the removal of their chosen strands (Berger & Braxton, 1998; Thomas, 2002); however, a new group of students may have been attracted because a graduate certificate program in autism had started. Student exits, as represented in Table 5 and Table 6, could possibly be attributed to the loss of these particular specializations. On the other hand, enrollment from Fall 2015 to Spring 2017 remained stable (Table 3) and could have been a result of the new certificate program in autism. The removal of specializations and the creation of the new certificate were in direct response to the specific areas of expertise of the newer faculty members. Further, the deletion of these specializations likely affected current students who were enrolled in each of these strands as students either had to pursue a different specialization or discontinue their graduate studies.

Finally, as part of these strand changes, the program also increased online offerings. Even though online courses provide a level of convenience for students, the change may have had an impact on retention depending on graduate student preference for online or traditional course offerings. Vaquera (2007) explained that longitudinal changes that affect student interaction with the educational environment can result in a slow attrition of students. As noted in Table 3, even with the shifts in course offerings to include method of instruction (i.e., online versus face-to-face) and actual courses being offered, student enrollment still remained stable.

Student retention for the program could be attributed to many factors, but in response to the multiple changes taking place, faculty attempted to honor agreements from prior faculty advisors and administrators while still meeting new program requirements. Many of the actions by faculty effectively built relationships with students in alignment with Tinto (2006), Golde (2000, 2005) and Thomas (2002). Additionally, faculty revised documents, materials, and assessments to match the new program requirements. This was particularly necessary for those students who sought to resolve advising concerns by using program documents rather than seeking the support of their advisor(s). One challenge continually faced by some students was the push to come to campus for advising because of their daytime roles as public school teachers and afternoon and evening family and coursework commitments. For this set of students, retention may have depended on "their own individual resourcefulness and determination" (Moriarty et al., 2009, p. 374) as they interpreted the available information rather than using personal connections with faculty as an initial step in resolving concerns. Updating materials additionally provided stability in moving forward which is essential in developing increased student confidence and in allowing students to focus on scholarly activity rather than uncertain procedural matters. Faculty actions, (i.e., honoring previous agreements, revising program materials, assessments, and documents) made in efforts to establish effective relationships with students, could have contributed to the overall 83% average retention rate for newly admitted students (Table 1) and the overall 77% average for graduate program retention (Table 3).

Finally**,** a less immediate but relevant visible program component that may have affected retention was the change in assessment practices. The volume of assessment-related changes across a short time span additionally may have limited faculty availability for mentorship and

engagement in new research projects, which may have also affected retention (Tinto, 2006). The assessment changes that took place had an effect on the established expectations for students and may have affected overall retention. Between Fall 2014 and Fall 2017 multiple changes in college and program assessment occurred. The staff member responsible for data collection related to assessment for the college changed three times, which required three sets of procedural changes, some of which affected uploading requirements for MA students pursuing licensure. In addition, over the academic year of Fall 2014 to Spring 2015 the university implemented a new writing-to-learn departmental expectation and data collection goal as part of university Higher Education Learning Commission (HLC) assessment, which affected some components of course content. This change affected how students were scored as writers in special education coursework because a detailed rubric was now used to evaluate written assignments by students. The rubric may not have been in alignment with what students had previously experienced in producing written work in the department. Although this change may have been subtle, a shift in student expectations was present and may have had an effect on retention. This change may have compromised the fit between the student and the institution in that a new focus on student writing did not previously exist and could have had an impact on retention (Berger & Braxton, 1998; Tinto, 2006). Much of the development for the writing assessments took place during the Spring 2015 semester; therefore, students entering in the Fall 2015 semester experienced the greatest impact from the writing assessment initiative. Yet, as noted in Table 1, the retention rate for newly admitted students in Fall 2015 remained at 92%. This could suggest that while the impact of the writing assessment was great for faculty who worked to reformat assignments and develop the assessment rubric, this specific change may have had little-to-no effect on student retention.

In an additional assessment change, the regional accrediting body changed from National Council for Accreditation of Teacher Education (NCATE) to Council for the Accreditation of Educator Preparation (CAEP), requiring new procedures and content for data collection and reporting for accreditation review and resulting in changed evaluation documents for licensure students. Further, the state department of public education redesigned its system for evaluating teacher education programs while at the same time implementing these changes in reviewing college programs. Students may or may not have had knowledge of these changes as they occurred; however, data collection standards changed for faculty and become more rigorous as evidenced in data in Tables 2-5 beginning in Fall 2015. This change may have been difficult for faculty, but also fortuitous as we are now able to more closely examine trends among students enrolled throughout special education strands. Because faculty can consider student data more closely, mentoring, advisement, and the overall student experience can be positively affected to increase student retention (Tinto, 2006; Thomas, 2002; Vaquera, 2007). As noted in Table 1, there was an upward trend for overall student retention beginning for students newly admitted in Spring 2015 and continuing into Spring 2017.

Further assessment change occurred which was perhaps more critical to the retention of students. This change involved the movement of the state teacher assessment for licensure to a new, more rigorous, computer-based exam in Spring 2016. The state department of education raised the cut score for the new exam in the Spring 2017 semester. This was a troubling reality for students in that some graduate students were having difficulty passing the exam even before cut scores were raised. In addition to the few direct effects described, all of these changes (HLC, CAEP, state)

may have resulted in program evaluations that would positively or negatively influence graduate student decisions to stay in their programs. As evidenced in Table 4, there were students (N=3) who exited the program due to poor performance and this could have been related to the new licensure exam cut scores.

Finally, and directly relevant to the graduate student experience of the program, in Spring 2016 the master's level comprehensive exam content and procedures were changed from an individually scheduled oral defense to a written multiple choice and essay assessment completed in a group setting. Students were now faced with a rigorous exam that could prevent graduation. As students transitioned into the new expectations for the exam, graduation rates experienced a slump (i.e., Spring 2016 N=5 and Fall 2016 N=3). Fortunately, with faculty support as well as students becoming accustomed to the new exam requirements and expectations, graduation rates improved (N=11) in the Spring 2017 semester (Table 3).

All of these programmatic changes caused a large shift in previously established institutional traditions and expectations for students, such that student retention was affected. Yet, student retention and graduation rates remained relatively stable over the three year period as adjustments were made.

Limitations

Limitations of this study were inherent in the current data collection systems for the program as data was provided as an archival dataset. For example, using this dataset, we were unable to determine if students were retained in specific strands or chose to change strands within the program. This was the result of the prior data collection methods that preserved the semester entry date but relocated the student's data to the new strand without additional comments. Therefore, new program data collection policies are needed to adequately collect data on student retention when a student changes from one strand to another strand in the same program. This is worthwhile because analyses of data for students who changed strands could assist in determining areas of programmatic appeal and concern that could later affect retention. Additionally, the data does not include students who were newly admitted or who were labeled non-completers if they were "admitted but did not attend" as evidenced by registration in courses. Understanding this very early program attrition would be useful in adjusting recruitment strategies to target greater enrollment for students who may be more likely to stay. Finally, the level of detail in the dataset available for the Fall 2014 and Spring 2015 semesters was more limited than the other data due to faculty, staff, and program changes, making it impossible to include these semesters for Tables 2-5.

Conclusion and Implications

We cannot apply a definitive causal relationship between the changes that occurred and the faculty responses; however, a trend in a fluctuating retention of students is evident in the data. Any number of additional reasons could have contributed to the decision for students to complete or exit their strands, including multiple matters that were not connected to faculty actions. These other matters may have been based on student actions or characteristics or other systemic

considerations. Examples may include a student's individual level of motivation, academic skills, financial aid, family support, family responsibility, and time commitments.

In reviewing the archival dataset in conjunction with current research in the area of retention, we found that institutional change affecting student contact and involvement, student to faculty interactions, and the long-standing, established institutional traditions (Tinto, 2006; Thomas, 2002) appear to have affected student retention. Fortunately, the average overall retention and enrollment over the four-year period remained stable (excluding retention for students newly admitted in Spring 2015). Further, the retention literature describes the clear role of faculty in promoting retention (Tinto 2006) and we continue to consider this role in determining appropriate actions to support students while existing in a continually changing system.

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Is Practice in a Mixed-Reality Environment Better than Role Play for Promoting Implementation Fidelity of the Constant Time Delay Procedure for Special Education Undergraduates?

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Abstract

Preservice undergraduates should acquire many skills in their teacher preparation program that support them as future effective teachers. For special education preservice teachers, one of these important skills is teaching with the constant time delay procedure, an evidence-based practice for teaching learners with moderate or severe disabilities. In this study, participants first learned to use the constant time delay procedure in class and then practiced the procedure either with an avatar in a mixed-reality environment (experimental group) or with a peer in a classroom role play activity (control group). Participants then used the procedure to teach vocabulary words to a learner. A pre-experimental group design was used to compare the fidelity of implementation of the procedure for both groups. A paired t-test compared the number of correct constant time delay trials implemented for participants in both groups and found no significant difference between types of experience (mixed-reality or role play) and correct use of the procedure. Implications for practice include a discussion of what additional instructional supports preservice undergraduates might need to implement the constant time delay procedure with fidelity.

Keywords: constant time delay procedure, implementation fidelity, mixed-reality environment, role play

Is Practice in a Mixed-Reality Environment Better than Role Play for Promoting Implementation Fidelity of the Constant Time Delay Procedure for Special Education Undergraduates?

Preservice special education teacher candidates preparing to teach learners with moderate or severe disabilities (e.g., learners with moderate or severe intellectual disability, autism) will likely learn systematic prompting with feedback procedures during their teacher preparation program. These procedures are effective for teaching these learners a wide variety of skills (see comprehensive literature reviews by Hudson, Browder & Wood, 2013; Spooner, Knight, Browder, & Smith, 2012). Systematic prompting with feedback procedures have roots in the principals of applied behavior analysis and involve teaching focused on specific, measurable responses, using specific prompting and prompt fading procedures for the acquisition of these responses (including reinforcement), and planning for the generalization and maintenance of the response (Collins, 2012).

One of the most common of these procedures for promoting learning in the classroom for learners with developmental disabilities is the time delay procedure (Collins, 2012). The time delay procedure is an evidence-based practice for teaching these learners a variety of skills, including print and sight word recognition (e.g., Browder, Ahlgrim-Delzell, Spooner, Mims, & Baker, 2009), mathematics (e.g., Browder, Spooner, Ahlgrim-Delzell, Harris, & Wakeman,

2008; Hudson, Rivera, & Grady, 2018), and science (Spooner, Knight, Browder, Jimenez, & DiBiase, 2011). The time delay procedure can be either progressive (where delay intervals are slowly increased by waiting progressively larger increments of time across sessions) or constant (where only two delay intervals are used). The constant time delay procedure is easiest to implement because teachers only manage two delay intervals (Collins, 2012).

To use the constant time delay procedure, the controlling prompt is presented concurrently with the target stimulus during initial instruction (0-s delay) and then a consistent number of seconds is inserted (e.g., 5-s delay) to allow the learner to respond before delivering the controlling prompt during subsequent instruction. The prompts are naturally faded as learners begin to make correct responses by themselves before the controlling prompt is delivered. The steps for implementing the constant time delay procedure to teach vocabulary words are described in Figure 1.

Zero Second Time Delay	
Step 1:	Secure the learner's attention (e.g., "Ready?")
Step 2:	Show a vocabulary word (i.e., the stimulus) followed quickly by a prompt to read the word (e.g., task direction) and the correct response.
Step 3:	Praise correct responses with descriptive verbal praise (e.g., "Good job. You're right. The word is _____.")
Step 4:	There should be no errors on these trials unless the student refuse to respond.
Repeat until the student consistently answers correctly with the zero second time delay, then move on to five second time delay.	
Five Second Time Delay	
Step 1:	Secure the learner's attention (e.g., "Ready?")
Step 2:	Show a vocabulary word (i.e., the stimulus) followed quickly by a prompt to read the word (e.g., task direction).
Step 3:	Wait five seconds for the student to respond. If correct before the prompt, go to step 4. If error, go to step 5. If no response, say the correct response and have learner repeat it after you, then go to step 4.
Step 4:	Praise correct responses with descriptive verbal praise (e.g., "Good job. You're right. The word is _____.")
Step 5:	Correct errors by saying the correct response and encouraging learners to wait for help if they do not know the word.

Figure 1. Steps of Constant Time Delay Procedure

Active learning experiences, such as role play simulations, can be used to enhance understanding and development skills for preservice teachers in important skills such as constant time delay. Recently, based largely on work at the University of Central Florida (see Dieker, Hynes, Hughes, & Smith, 2008), technology has been developed which can provide active learning experiences to preservice teachers in which they interact with virtual student avatars in a mixed-reality environment called TeachLivE™. In 2015, TeachLivE™ was commercialized as Mursion, which is available to universities and other institutes of higher education for teacher training (Dieker, Hynes, Hughes, Hardin, & Becht, 2015; Kaufman & Ireland, 2016). Using this technology at the university level for teacher preparation is another way for instructors to create simulated

scenarios for preservice teachers to practice and receive feedback on newly acquired skills, such as the constant time delay procedure, in a safe, managed environment.

Several studies have used the mixed-reality environment to enhance important teacher skills with preservice students. For example, Hudson, Voytecki, Owens, and Zhang (2019) and Hudson, Voytecki, and Zhang (2018) used teaching scenarios focused on typical classroom situations (e.g., establishing class rules, introducing a new unit of instruction) in the mixed-reality lab to provide special education undergraduates opportunities to practice the classroom management skills they learned in class. Students taught avatars three times over the semester and the avatars' intensity of behavior increased each time. Similarly, Judge, Bobzien, Maydosz, Gear, and Katsioloudis (2013) used a mixed-reality environment to teach preservice teachers to use differential reinforcement of incompatible behaviors to increase verbal responding by the virtual student avatar. Additionally, Dawson and Lignugaris/Kraft (2017) used a mixed-reality environment to provide repeated practice and structured feedback to improve preservice special educators' delivery of specific praise and error correction.

With the increasing availability of mixed-reality technology for universities to use in their teacher preparation programs, is it better than role play simulations? Role play simulations are active learning experiences commonly used to teach important skills in teacher preparation programs (Rao & Stupens, 2012). It was hypothesized a priori that practice using the constant time delay procedure in the mixed-reality environment would result in greater implementation fidelity for participants than role play; therefore, the null hypothesis stated that there would be no difference between the groups' implementation fidelity of the constant time delay procedure. The purpose of this study was to compare the implementation fidelity of the constant time delay procedure for two groups of preservice undergraduates. The experimental group was comprised of students in one section of the course who practiced teaching with the constant time delay procedure in the mixed-reality environment. The control group was comprised of students in the other section who practiced teaching with the constant time delay procedure in a role play simulation in the classroom. The research question asked was:

1. Does practice in a mixed-reality environment (Mursion lab) result in better implementation fidelity of the constant time delay procedure for special education undergraduates than practice in a role play simulation?

Method

Interventionist

The study was implemented by the author, an assistant professor with four years teaching experience in higher education. The professor had previously taught the face-to-face course in which the study took place four times. For this study, two sections of the course were used; one section served as the experimental group and the other section the control group. Both sections met twice a week for 75 min, used the same textbook, covered the same content, completed the same assignments, and followed the same course sequence. Over the semester, there were 35 absences in the experimental group and 33 absences in the control group.

Participants

University students. Thirty-six undergraduate students aged 18-22 years participated in this study (see Table 1). None of the participants had experience teaching learners using the constant time delay procedure.

Table 1
Characteristics of Study Participants

	Experimental ($N = 18$)		Control ($N = 18$)	
Characteristic	*n*	%	*n*	%
Age				
18	1	5.6	0	0.0
19	9	50.0	10	55.5
20	7	38.8	4	22.2
21	1	5.6	3	16.7
22	0	0	1	5.6
Gender				
female	17	94.4	18	100.0
male	1	5.6	0	0.0
Ethnicity				
Caucasian	16	88.8	18	100.0
Hispanic	1	5.6	0	0.0
Asian	1	5.6	0	0.0
Major				
Special Education	17	94.4	18	100.0
*Other	1	5.6	0	0.0
University Classification				
Freshman	4	22.2	2	11.1
Sophomore	10	55.6	12	66.7
Junior	4	22.2	2	11.1
Senior	0	0	2	11.1

Note. * = special education minor.

Sampling Procedure. Convenience sampling was used in this study because the groups being studied already existed (Gay, Mills, Airasian, 2009). The sample size of 38 included all students enrolled in two sections of the course; however, two students, one from each section, were not included in the results because they did not submit a videotape of themselves teaching using the constant time delay procedure.

Settings

University classroom. The control group practiced teaching a peer in their university classroom where their class was held. The classroom was situated in a large university building used by the College of Education for teacher preparation programs. The building was located on the campus of a large, 4-year university in an urban city in the Southeastern United States.

Mursion mixed-reality lab. The experimental group practiced in a mixed-reality lab (Mursion lab) located in the same building as the classroom. The lab was designed to look and

feel like an actual classroom (e.g., decorated bulletin boards, a white board). Additionally, the lab contained four tables and 12 chairs around the perimeter of the room for observation purposes. The mixed-reality environment was made possible through Mursion, a technology program available through a Mursion use license, a large 90" screen on an adjustable wall mount for displaying the avatars, integrated ceiling microphones and a rotating high definition web camera, and a computer to run the associated software. The microphones and cameras throughout the lab allowed a person off-site (called an interactor) to control the actions of the avatars and to interact with the participants in real time. When it was their turn to teach, participants sat at a table in front of the screen where the avatars were displayed to teach their lessons. The participants could see and hear the avatars on the screen in real time which provided a real-life experience for the participants. Likewise, the interactor could see and hear the participant sitting at the table in front of the monitor, as well as see the materials used in their lessons (e.g., vocabulary word cards).

Measures

Participant informed consent and demographic questionnaire form. In compliance with the University's Institutional Review Board policies, at the beginning of the semester during a face-to-face class meeting, all participants were given a written description of the study that included the purpose of the study and their rights as participants in the study. The course professor then reviewed the salient parts of the study description and answered questions regarding the study. When a consensus of understanding was obtained, participants completed a demographic questionnaire form in which they reported their age (in years), gender, ethnicity, and special education track (i.e., general curriculum special education [program for teaching students with mild disabilities], adapted curriculum special education [program for teaching students with moderate/severe disabilities], or other). Additional information about the participants' university classification (i.e., freshman, sophomore, junior, senior) and attendance was collected by the professor from the course rosters and attendance sheets (see Table 1).

Constant time delay teaching videos. Participants submitted a videotape of themselves using the constant time delay procedure to teach five vocabulary words. The videos were evaluated for implementation fidelity of the constant time delay procedure (see Figure 1). Each participant delivered 10 0-s delay trials and 10 5-s delay trials for a total of 20 trials. When all parts of a trial were correct, the trial was scored as correct. When one or more parts of a trial were incorrect, the trial was scored as incorrect. For example, if the participant failed to give a task direction, but completed all other parts of the trial correctly, the trial was scored as incorrect. Data were summarized as number of correct trials out of 20 for each participant. In addition to collecting trial data, evaluators also noted on the evaluation form if an instructional cue (e.g., Are you ready?) was given when the lesson began and if a verbal transition was provided to the learner when the lesson moved from the 0-s delay round to the 5-s delay round (e.g., In this next round, I'm going to wait to see if you can read the card before I help you.)

Interobserver agreement data. Thirty-six videos were submitted for evaluation. One video was used to train the second observer and interobserver agreement data were collected on 15 of the remaining 35 videos (43%). The second observer was a third-year undergraduate student who had taken the course the previous year and was familiar with the constant time delay

procedure; however, the student was not currently taking a course from the professor, reducing the risk that the student would be unable to disagree with the interventionist's observations. The interventionist trained the second observer by providing the assignment directions and reviewing the steps involved in delivering constant time delay procedure with fidelity. Then the interventionist provided a copy of the constant time delay evaluation form and explained the procedure for evaluating a participant video using the form. Based on the second observer's questions, slight modifications were made to the form's key to clarify how to record observed and missing/incorrect behaviors on the form.

Next, both observers independently scored the same video using the evaluation form and made a decision about each trial (correct or incorrect). Then the independent observers compared their findings for each trial using a trial-by-trial method. When both observers reached the same conclusion about a trial, an agreement was recorded. When both observers' conclusions were not the same, a disagreement was recorded. The percent of interobserver agreement was found by dividing the number of agreements by the number of agreements plus disagreements and multiplying by 100 percent (Billingsley, White, & Munson, 1980). During training, all disagreements were discussed, and a consensus reached by reviewing the video together. A minimum of 100% agreement was required on the training video before the observers moved forward. Once this criterium was reached, the interventionist evaluated the remaining 35 videos and the second observer independently evaluated 15 videos for the purpose of calculating interobserver agreement. The interobserver agreement results indicated that the two independent observers agreed on 294 of the 300 trials compared, which resulted in an interobserver agreement of 98%.

Research Design

Pre-experimental group design. A static-group comparison involving two nonrandomly formed groups was used in this experiment. Both groups received instruction on the use of the constant time delay procedure and, after the teacher training, the experimental group practiced using the constant time delay procedure to teach an avatar to read vocabulary words in the Mursion lab and the control group practiced using the constant time delay procedure to teach a peer to read vocabulary words in a university classroom. Following their practice simulations, participants selected different people outside of class to teach, and recorded themselves using the constant time delay procedure to teach vocabulary sight words. These recordings were evaluated for implementation fidelity by the professor and a trained second observer for the purposes of calculating interobserver agreement.

Constant time delay procedure training. All participants received the constant time delay training during their regular scheduled 75 minute class time. The training included the following steps:

1. Before class, participants read a constant time delay procedure handout for homework that included a thorough description of the 0-s delay and time delay rounds, a sample script for using constant time delay to teach expressive word identification, and tips for what to do if students made too many errors, did not wait, or were not imitating the prompt.

2. During class, the professor used a PowerPoint presentation to describe the procedure's steps and then the professor and a volunteer from the class modeled the use of the procedure to teach a discrete skill.
3. The participants viewed a video of a teacher using the constant time delay procedure to teach number identification to a group of learners with moderate intellectual disability during an early numeracy lesson.
4. The professor provided participants with a constant time delay data sheet and described how it is used to collect data when using the procedure.
5. In pairs, participants practiced implementing the constant time delay procedure and collecting data on student responses. The in-class activity involved teaching his/her partner five nonsense words using the constant time delay procedure. Participants took turns being the teacher and the student. The teacher delivered the constant time delay instruction and collected data on student responses. The student made errors and waited for prompting to give the teacher opportunities to practice responding to and collecting data on a variety of student responses.
6. Following the in-class activity, participants reflected on their experiences with the constant time delay procedure activity as a group and the professor answered questions about the steps in delivering the procedure or collecting data on the data sheet.

Constant time delay practice activity assignment. The week following the in-class training, participants in one section (experimental group) completed a constant time delay practice activity in the Mursion lab and participants in the other section (control group) practiced in a role play simulation in the classroom. The activity included these steps: (a) select five science or reading vocabulary words appropriate for a middle school student, (b) create cards for each vocabulary word, (c) create a constant time delay script to use during the lesson, (d) create a data sheet for the lesson, and (e) teach the vocabulary words using the constant time delay procedure. Participants had three minutes to teach the vocabulary words, first delivering 10 0-s delay trials (each vocabulary word twice) and then 10 5-s delay trials and used the prepared data sheet to record student responses as the lesson unfolded. Participants in the experimental group completed the procedures described above with one exception. In the Mursion lab, a group of five middle school-aged student avatars appeared on the screen and participants were told to select one of them to teach. Participants were also asked not to select the same student avatar twice in a row to keep the teaching experiences different.

Videotaped constant time delay lesson. After the practice sessions were completed, participants taught a similar lesson to another person of their choice and videotaped it. Participants were given written directions containing the assignment details and the professor reviewed the directions during a face-to-face class meeting. To prepare for the lesson, participants completed the same steps required for the practice lesson (i.e., select five vocabulary words, create vocabulary word cards, create a constant time delay script, and prepare a constant time delay data sheet). Then they videotaped their lesson in its entirely and submitted the video and data sheet to the professor for evaluation. The written directions reminded participants to include: an introduction informing the learner why the lesson is being taught, 10 0-s delay trials and 10 5-s delay trials, descriptive verbal praise for correct responses, error correction for errors, scores for student responses on the data sheet, and a lesson conclusion thanking the learner for participating in the lesson.

Results

This study compared the implementation fidelity of the constant time delay procedure following practice in the mixed-reality environment or in a role play simulation in a university classroom. A paired-samples *t*-test was conducted to compare the number of correct constant time delay trials from the mixed-reality and role play conditions. There was not a significant difference in the scores for the mixed-reality ($M = 11.67$, SD = 7.12) and role play ($M = 11.61$, SD = 7.88) conditions; $t(34) = .022$, $p = 0.98$. These results suggest that the type of environment did not influence the number of correct constant time delay trials implemented by participants.

Participants in both conditions correctly completed approximately the same number of constant time delay trials resulting in similar results for both types of practice environments. These results agreed with the null hypothesis because there was not a significant difference between the groups' implementation fidelity. The mean for the experimental group ($M = 11.67$) and the mean for the control group ($M = 11.61$) indicate that participants implemented an average of 11/20 trials correctly. These results have important implications for practice.

Regardless of the type of practice environment, nearly 61% of participants implemented trials incorrectly to such extent that the percent of correctly implemented trials was below 85%. In fact, one participant in the experimental group and three participants in the control group delivered none of the 20 trials correctly. The number of participants and types of errors during the 0-s delay round for the experimental and control groups are presented in Table 2. These results may not be surprising given that participants were novice constant time delay users. However, given that implementation of evidence-based practices with fidelity is a concern in special education (Courtade, Test, & Cook, 2015), an analysis of these errors may provide a deeper understanding about what undergraduate students failed to learn about implementing the constant time delay procedure in this course. During 0-s delay trials, participants in the experimental group made errors in four parts of the trial while the control group made errors in three. Both groups made the most errors in delivering the task direction and descriptive verbal praise.

Table 2

Number of Participants and Types of Errors During 0-s Delay Round

	Experimental ($N = 18$)		Control ($N = 18$)	
Error/Omission	*n*	%	*n*	%
Task Direction	5	27.8	7	38.9
Simultaneous Presentation	1	5.6	1	5.6
Wait Time	1	5.6	0	0
Descriptive Verbal Praise or Error Correction Procedure	7 0	38.9 0	5 0	27.8 0
Data Recording	0	0	2	11.1

The same information for the 5-s delay round is presented in Table 3. During the 5-s delay rounds, the experimental group made errors in three parts of the trial while the control group made errors in four. Like the results from the 0-s degree rounds, both groups made the most errors in delivering the task direction and descriptive verbal praise. Additionally, during the 5-s delay round, several students from both groups made errors in data recording. Most data recording errors resulted from not recording errors in their learner's responses correctly on the data sheet (something that would not happen in 0-s delay trials because the learner does not have an opportunity to say the wrong answer before being prompted with the correct answer). Many of the participants who made an error in one trial continued to make the same error in other trials. For example, if a participant made an error in delivering the task direction in a trial, they likely continued to make the same error in subsequent trials. Interestingly, a few students in both groups also delivered only ten trials (five each for 0-s and 5-s) instead of the 20 trials required for the lesson. Three participants (16.7%) in the experimental group and two participants (11.1%) in the control group only delivered five trials for each delay round.

Table 3
Number of Participants and Types of Errors During 5-s Delay Round

	Experimental (N = 18)		Control (N = 18)	
Error/Omission	*n*	%	*n*	%
Task Direction	5	27.8	5	27.8
Simultaneous Presentation	0	0	1	5.6
Wait Time	0	0	0	0
Descriptive Verbal Praise or Error Correction Procedure	6 0	33.3 0	5 1	27.8 5.6
Data Recording	5	27.8	4	22.2

Other information collected on the participants' performance from the videotaped constant time delay lessons included delivering an instructional cue at the beginning (e.g., Are you ready?), transitioning from 0-s delay round to the 5-s delay round (e.g., Now I am going to give you an opportunity to read the word before I tell you.), and providing a closing to the lesson (e.g., Thank you for learning some science vocabulary words with me today.). Most participants completed these steps; however, three participants in the experimental group (16.7%) and one participant in the control group (5.6%) failed to provide a verbal transition from the 0-s delay round to the 5-s delay round. Likewise, one participant in the experimental group (5.6%) and three participants in the control group (16.7%) failed to provide an ending to their lesson to learners. All participants delivered the instructional cue prior to delivering the constant time delay trials.

Discussion

The constant time delay procedure is well documented in the literature as an evidence-based practice for learners with development disabilities (e.g., Browder et al., 2009, Author et al., 2018) and, as such, it is an important skill for preservice teachers to acquire when preparing to teach this population. It is also documented in the higher education literature that active engagement promotes understanding and skill acquisition for learners (Leko et al., 2015). Two types of active learning practice used at the university level to teach important skills such as the constant time delay procedure are role play and mixed-reality simulations. The results from this study indicated that there was no difference in the implementation fidelity of the constant time delay procedure between the participants who practiced with avatars in the mixed-reality lab and participants who practiced with peers in a role play simulation in the classroom.

It is possible that there was no difference in the fidelity of implementation between the groups because participants were novice users of the constant time delay procedure. When initially acquiring a skill, the type of environment used to practice using it may not matter at that stage of learning. Repeated guided practices for both conditions might have yielded better information but given the finite amount of time in the semester to cover the large amount of content required in the course (e.g., other aspects of systematic instruction, other evidence-based practices), repeated practice may not be possible.

Another thought is that, given the large number of errors some participants made in their constant time delay lessons, perhaps individual feedback from the professor on their videotaped lesson performance, including information on the errors made in delivering the constant time delay procedure and/or recording learner data, would have improved the implementation fidelity for low-scoring participants. Leko et al. (2015) described the need for *deliberate practice with performance feedback* in teacher preparation, stating that it was "foundational to the development of effective performance over time" (p. 30) for special education teachers. Deliberate practice builds on the current level of knowledge and skills in conjunction with expert feedback on performance.

Implications for Practice

The first implication for practice is that practice with simulated role play was as effective as practice in a mixed-reality lab in promoting implementation fidelity of the constant time delay procedure for the participants in this group. In fact, 14 participants (38.9%), including seven participants from each group, delivered the constant time delay procedure with 85% accuracy or better (17-20 correct trials). This is good news for teacher preparation programs who do not have access to costly mixed-reality labs because no additional equipment is needed for role play simulations. However, it is important to emphasize that the role play experience participants had in this study was highly structured and as close to real life as possible. In an almost real-life role play experience, students participate in a role playing experience that is as close to the real experience as is possible, allowing students to apply their skills in a simulated but safe environment (Rao & Stupens, 2012).

In this study, participants' almost real-life role play simulation included creating a teaching script describing what they would say during their lesson to teach the targeted vocabulary words to

their learner and to respond to learner responses (i.e., correct responses, errors, no responses) as well as scripting how they would introduce and close the lesson, and transition from one delay round to another, just as they would in a typical teaching situation. Then participants delivered their three-minute lessons and recorded learner responses on a data sheet in real time while they taught the lesson. To optimize participant engagement, when they were not involved in the role play simulation as the teacher or learner, participants collected implementation fidelity and learner response data on other participants and then shared these data in a debrief meeting after the role play simulations were finished. Also, to optimize observational learning, because only two participants were involved in the role play simulation at a time, other participants observed the role play simulations of their peers. Lastly, during role play simulations, participants were privy to the feedback given by the professor that was focused on the performance of the participant who was teaching.

Limitations and Suggestions for Future Research

The results of this study should be interpreted considering the following limitations. First, a static-group comparison where each group served as the control for the other group without random assignment is a pre-experimental design. While pre-experimental designs are valuable when the research question is exploratory in nature (such as the one in this study), the pre-experimental design does not allow the results to be generalized to other groups (Gay et al., 2009). Future research should consider randomly assigning participants to conditions and implementing a pre-test. This would allow a more rigorous group research design to be implemented. Another consideration is that social validity data were not collected from the participants about their experiences. Social validity data findings could offer insight into students' experiences, likes, and dislikes of each type of simulation. Future research should collect social validity data from participants to gain their insights.

Next, while much effort was made to ensure that the participants' experiences were similar in both the mixed-reality and role play simulations, there could have been subtle differences between the two groups. For example, the number of times the professor paused teaching simulations to deliver feedback was not recorded for either of the practice groups. Perhaps one group received more feedback which could potentially affect the fidelity of implementation in their video-taped lessons. Future research should record the number of times feedback was given as well as the type of feedback given to better evaluate the effect of this feedback on participant performance.

Participant choices also varied in the person they selected to teach for the videotaped lesson. Some participants opted to teach a student with disabilities from a practicum setting while others chose a friend or family member to teach. When the learners being taught were independent readers, participants were required to teach nonsense words. When the learners were individuals with disabilities, participants were required to teach vocabulary words that were meaningful to the learner such as vocabulary words needed for an upcoming science unit. It is possible that differences in learners could have impacted the participants' fidelity of implementation of the constant time delay procedure. For example, participants teaching a learner with disabilities may have approached the teaching activity differently than participants teaching a friend or family member. Future studies may want to control for these differences by requiring participants to videotape only learners with disabilities.

The type of skill being taught might have also affected the implementation fidelity of the constant time delay procedure. Participants were required to teach an academic sight word recognition skill (vocabulary words) to their learners using the constant time delay procedure. Constant time delay procedure is an effective procedure for teaching both academic and functional life skills (Collins, 2012) and it is possible that if the participants used the constant time delay procedure to teach a real life or functional skill (e.g., cooking), the results might have been different. Since this area was unexplored in the current study, the question could be explored in future research.

Conclusion

This study investigated whether practice with avatars in the mixed-reality Mursion lab was better than practice with peers in a role play simulation in the classroom for special education undergraduates learning to use the constant time delay procedure. An evaluation of correctly implemented constant time delay trials from a teaching video submitted by participants after practicing the procedure either with avatars in the mixed-reality lab or peers in a role play simulation in the classroom found no difference in implementation fidelity between the two groups. In fact, results indicated that over half of the participants failed to implement the procedure correctly regardless of the practice environment indicating that novice learners need more practice and feedback to be proficient users of the constant time delay procedure.

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From the Golden Rule to the Platinum Rule: Strategies for Advancing Toward Cultural Proficiency for Special Educators

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Abstract

Special educators must make cultural proficiency a lifelong journey of personal awareness, cultivation of empathy, and behavioral adjustments to create inclusive environments for students with disabilities who also come from or identify with culturally diverse backgrounds. We discuss strategies for increasing cultural proficiency at the micro (individual), mezzo (group), and macro (whole schools) levels of practice. The commitment to have culturally proficient schools is an excellent indication that minority students will thrive academically (Peo, 2015). This does not require becoming an expert on all ethnicities and cultures; however, it does require learning simple strategies, such as a shift from a fixed to a growth mindset, and the subsequent transition from the Golden Rule to the Platinum Rule. This leads to promotion of the positive practices of inclusion, equity, and effective management of prejudices.

Keywords: Cultural Proficiency, Inclusion, Intersectionality, Critical Race Theory, Special Educators, School Personnel

Addressing the Need for Cultural Proficiency

"Cultural proficiency is a model for individual transformation and organizational change" (Lindsey, Robbins, & Terrell, 2009, p. 4). Cultural proficiency is not something that is achieved upon completion of a training program or seminar, but an ongoing thought process that examines past and current values and beliefs. With the constantly changing demographic of the United States (US) through immigration, it is imperative that special educators and other school personnel are invested in this journey. According to the US Census (2018), from 2007 to 2017, the percentage of non-Hispanic White children enrolled in kindergarten through eighth grade in US public schools decreased from 56.7% to 49.9% suggesting that half of this population now consists of races and ethnicities other than non-Hispanic White children. In the fall of 2015, children enrolled in kindergarten through 12th grade were 26% Hispanic, 15% African American, 5% Asian/Pacific Islander, 1% American Indian/Alaska Native, and 3% from two or more races (National Center for Education Statistics, 2019). Additionally, all children in US public schools, 15% had diagnosed disabilities (Lipkin & Okamoto, 2015).

Students who receive special education services in the US come from increasingly diverse intersections of identity including race, ethnicity, religion, class, socioeconomic status, and sexual identity. For example, students may also identify as Lesbian, Gay, Bisexual, Transgender, and Questioning (LGBTQ). According to the GSA Network (n.d.), schools can encourage the

formation of Gay-Straight Alliance student clubs to support, advocate, and create safe schools for students who identify as LGBTQ. Despite the increasing diversity in schools, special educators and other school personnel continue to struggle with making cultural adaptations to the curriculum and appropriate accommodations for students and their intersecting identities.

To special educators and other school personnel, it may seem they only need to be concerned with students in their disability identity; however, when other characteristics of students' identities are not addressed through the special education process, a culturally proficient approach is lacking (Adera & Manning, 2014; Conroy, 2017). This approach may be overwhelming to special educators, but there are simple, yet effective, strategies for moving from the Golden Rule to the Platinum Rule belief, as described in this article. The strategies described will support special educators in meeting the academic and support needs of students and their intersections of identity.

The Golden Rule and Platinum Rule

Ronnedal (2015) defined the Golden Rule as "You ought to treat others as you want to be treated by them" (p. 221) and the Platinum Rule as "You ought to treat others as they want to be treated by you" (p. 221). The author suggested the use of the Golden Rule and Platinum Rule in various contexts. For example, the Golden Rule approach may be required in a context where you do not have the opportunity to get to know the wants and needs of people prior to interacting with them, whereas the Platinum Rule can be utilized in settings where you have more frequent communication with others. For the purposes of this article, it will be assumed that the Platinum Rule would be preferable in the special education school environment.

According to Schulz (2015), a negative aspect of the Golden Rule is it reinforces ethnocentric views by assuming what is preferable to me will also be preferable to you. When school personnel can come from a space of empathy or an understanding of how others feel (Oxford dictionary, n.d.), this is in line with the Platinum Rule. Thus, they are well on their way toward cultural proficiency. The Platinum Rule requires taking the time to get to know students and their diverse identities to provide the academic supports and services to excel not only academically, but socially and emotionally as well. One avenue for which this can be accomplished is through development of the appropriate legal documents that guide special education services and supports.

The federal laws that mandate special education services and supports to children with disabilities is the Individuals with Disabilities Education Act and Section 504 of the Rehabilitation Act (Lipkin & Okamoto, 2015). The legal documents created in schools for students with disabilities are referred to as the Individual Education Program (IEP) and 504 accommodation/modification plan (School Psychologist files, 2019). Not all students have the same academic, cultural, and social/emotional needs, but with time constraints, it can be tempting to give all students very similar goals and accommodations in their IEP or 504 plans. Yet, if special educators and school personnel are invested in the Platinum Rule, they have created a culture of creativity in developing goals, inclusion, and cultural proficiency. In the following sections, we organized the concepts and strategies needed at various systemic levels in

the cultural proficiency journey, as well as those needed in the transition from the Golden Rule to the Platinum Rule (Table 2).

Strategies for Achieving the Platinum Rule

Fixed and Growth Mindsets

Kohn (2015) criticized Dweck's (2016) work on the growth mindset, indicating there was too much emphasis focused on changing the mindset at the micro (students) level of practice in school settings rather than changing the mindset at macro (communities, schools, systems) levels to create top-down change, which is typically more effective. Applied within the cultural proficiency model (Ryong Lee, 2015), the growth mindset can encourage special educators and school personnel to create safe school environments, promote academic success, and prevent bullying of students with disabilities. By setting these expectations, they are supporting the development of self-determined students who are fully included within their schools.

Ryong Lee (2015) developed *The Two Mindsets of Cultural Competency* and applied it to the fixed and growth mindset work of Dweck (2016). Ryong Lee (2015) described those in the fixed mindset as exhibiting a sense of being nice people, and therefore, already having achieved competence. The overall outcome of people in the fixed mindset is they are stagnant, focused on perfection, and spend much time avoiding discussions to hide vulnerability. They worry others will see their incompetence, so they spend much time defending their lack of action and pessimistic views. Rather, special educators and other school personnel should adopt behaviors consistent with the growth mindset approach.

In contrast to the fixed mindset approach, Ryong Lee (2015) described those in the growth mindset as increasingly culturally proficient because they learn from mistakes, take risks to learn more about other cultures, move on after setbacks, and view their discomfort with diverse students as growth rather than failure. When special educators and other personnel have a growth mindset and a culturally proficient approach, they have better relationships with students.

Dweck (2016) posited that children who feel understood by their teachers are given permission to be themselves, are more comfortable, and therefore more likely to exhibit the growth mindset in their learning environment. They feel they can express themselves artistically, play creatively and freely, and are more willing to take risks academically to work through tough academic problems. The logical conclusion is that when teachers and other adults adopt a growth mindset, they will influence children in their care to also adopt a growth mindset.

The more exposure a child has to the growth mindset, the better the outcomes for the child. Research conducted by Dweck (2016) suggested that when parents send fixed mindset messages to their children, they encourage perfectionism rather than true acceptance of their children's identity development. When parents send growth mindset messages, children truly feel an emotional connection and have permission to be their true selves. This is directly in line with the Platinum Rule in which children are treated the way *they* want to be treated and not the way teachers, parents, or other adults feel it would be best for children to be treated. This applies to all children, including those with disabilities. They will be more motivated to learn when they

believe special educators and other school personnel can empathize and connect with them, which shows interest in how they identify.

Privilege

The Oxford dictionary (n.d.) defines privilege as "a special right, advantage, or immunity granted or available only to a particular person or group." Learning to be aware of one's privileges in life should not be looked at from a negative view, but rather a way to grow and help create inclusiveness and social justice. When important conversations about privilege are avoided because of personal discomfort, this is the embodiment of privilege (Brown, 2018; Walker, Poole, & Murray, n.d; Whiting & Cutri, 2015).

Whiting and Cutri (2015) surveyed teacher education students and their identification of personal privileges after completing a course in multicultural education. All students identified privileges in their lives and, as a result, reported an improved ability to see through the lenses of their future students who come from diverse racial, ethnic, and socioeconomic backgrounds. Despite the requirement of White teacher education students to engage in coursework related to diversity, Cross (2005) explains that racism is upheld in many institutions, including within teacher education, albeit implicitly. "White privilege is maintained through invisible, insidious operations of power that foster whiteness and racism. This power is no longer enacted primarily through physical violence but is mostly achieved through more symbolic power" (Cross, 2005, p. 267). This implicit racism defines a concept of "new racism" as opposed to the explicit racism that occurred only a few decades ago.

Implicit Bias

It is human nature to have automatic biases and stereotypes towards people with diverse characteristics such as age, disability, education, obesity, English language proficiency, race, ethnicity, disease/diagnosis, socioeconomic status, and sexual orientation (Price-Wise, 2009). Since bias and prejudice is so common, special educators and other school personnel must engage in self-reflection, so they may become aware of and manage the implicit biases they might have of students and their intersecting identities.

One strategy to become aware of implicit bias is through engagement in an online exercise termed *The Implicit Association Test*. It is a tool to become aware of implicit bias, or subconscious beliefs, held toward people with disabilities and other diverse groups (Project Implicit, 2011). The test results are not meant to cause a person to feel shame or embarrassment, nor is one expected to share their results with others. It should, however, be a pathway for discussion within an open, trusting environment, to encourage honesty and growth about how various factors across the lifespan influence bias (Northen, 2009).

Processing the results of the *Implicit Association Test* in a safe setting can help special educators and other school personnel manage prejudice and bias the next time they encounter someone with whom they have an emotional reaction based on race, ethnicity, appearance, behavior, or other diverse characteristics. To help manage prejudice, try to understand the reasons for the reaction and engage in empathy (other person perspective taking), acknowledge that all that is known about this person's history is from their immediate appearance and behavior, make a concerted effort to suspend negative thinking and treat the person with the dignity and respect

they deserve as a fellow human being. These strategies are especially important when the behavior or appearance of students with disabilities triggers feelings of bias on a daily basis.

Identity-First or Person-First Language; Intersectionality

The Platinum Rule is directly in line with a concept known as 'identity-first' which takes into consideration how students identify themselves from varying intersections and aspects of diversity. Is it best to use identity-first or person-first language? Some students may prefer to be called 'autistic' because it considers their identity-first rather than person-first language, which would be stated as 'a student with autism.' Ultimately, each student should be asked if they prefer identity-first, person-first, or both (Dunn & Andrews, 2015). "We argue that psychologists should adopt identity-first language alongside person-first constructions to address the concerns of disability groups while promoting human dignity and maintaining scientific and professional rigor" (Dunn & Andrews, 2015, p. 255). Both in practice and in the literature, special educators and other school personnel must advocate for the social justice of students by listening to their stories of identity to gain empathy and insight into their lived experiences.

Lydia X. Z. Brown (n.d.) eloquently describes *their* identity in the following statement:

> Since I was a junior in high school, I have been deeply invested and grounded in autistic, neurodiversity, and disability movements and communities. My work is somewhere in the middle of where disability rights and disability justice crash into each other. I am an organizer, advocate, and activist committed to intersectional struggles for life, love, and freedom with/for disabled people at multiple margins. As an autistic and multiply-disabled, queer, agender/nonbinary/genderqueer trans, East Asian transracial and transnational adoptee of color, this work is often about my own survival and refusal to disappear quietly. I'm also a person with quite a bit of privilege, as a U.S. citizen fluent in English, college educated, raised with access to middle and upper-middle class resources, and from an intensely Christian background on Turtle Island, or what most call the United States of America. But even in spaces my privilege has gotten me into, I, like most marginalized folks who have the audacity to simply *exist*, have survived more trauma and abuse than anyone should ever have to.

By describing *their* identity, Lydia X. Z. Brown (n.d.) was able to provide the foundation for others to understand what has affected their life both positively and negatively. Special educators can obtain similar identity information from their students through assessment, and they should fill in any gaps through family visits and try to cultivate IEPs and 504 plans that meet the diverse learning needs of each of their students. Although the efforts in getting to know students at a deeper level may feel overwhelming to special educators and other school personnel, the potential for improved relationships, trust, and students' abilities to learn would feel far more rewarding.

The diverse characteristics of students is known as 'intersectionality.' Crenshaw (1989) founded the term 'intersectionality' with the purpose of describing discrimination of Black women based not only on skin color, but also gender. Today the term is more widely used to include the intersection of identities of people who come from multiple oppressed populations (Sumi et al., 2013) and what that looks like when those identities all meet in the middle, or the intersection (Figure 1). Intersectionality is "an approach that identifies multiple social identities in any single

person's experience and examines the reproduction of systemic patterns of privilege and marginalization based on racism, classism, sexism, heterosexism, and other manifestations of societal advantage and disadvantage." (Varghese, 2016, p. S144). For example, an African American female student with a disability living in poverty has recently disclosed that she is gay. Each of these elements of her identity comes together to compound the potential for increased marginalization and discrimination. Wintner, Almeida, and Hamilton-Mason (2017) reported that educators who make concerted efforts to understand the intersections of their students' identities will already be well on their way to building culturally proficient schools.

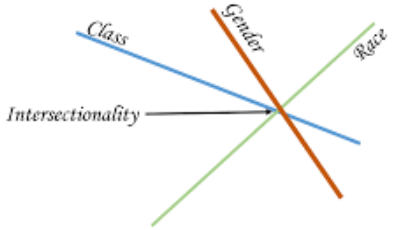

Figure 1. Intersectionality diagram (Fabre, 2017)

Microaggressions

Microaggressions are "acts of interpersonal discrimination that are often subtle and harmful," (Wintner et al., 2017, p. 594) and many culturally and racially diverse people in the US fall victim to microaggressions, including students receiving special education services. Kohli and Solorzano (2012) reported special educators and other school personnel can unknowingly reinforce microaggressions through actions such as incorrectly pronouncing students' names and not attempting to learn proper pronunciation. Additional examples of microaggressions include statements such as "You don't look disabled," and "Wow! Your English is very good."

Microaggressions maintain ableism, which is the belief that people without disabilities are superior and therefore people with disabilities should behave the same way as those without disabilities (Storey, 2007). Davila (2015) interviewed Latina/o students with disabilities in their special education school setting focusing on perceived microaggressions. Special educators, school personnel and other students exhibited microaggressions toward the Latina/o students in the form of lowered expectations, apathy, and bullying, which, according to Davila (2015), clearly diminished their potential for academic, social, and emotional growth.

In several studies, targets of microaggressions were listed as students from intersecting identities including race, ethnicity, family makeup, disability, weight, appearance, and religion (Kohli, Pizarro & Nevarez, 2017; Wintner et al., 2017). Students who came from one or more of these backgrounds were at higher risk of being targeted (Wintner et. al, 2017). The authors also noted that students who are most often targets of microaggressions and exclusion have delays in social skills, a distinguishing hallmark of students with AIDD (Wintner et al., 2017; Litvack, Richie, &

Shore, 2011). Therefore, this population is at high risk of experiencing microaggressions and even further delays in social skills.

Wintner et al. (2017) interviewed 10 school social workers from 10 different K-8 schools to determine whether they witnessed or heard of microaggressions toward students from other students, educators, and other school personnel. All 10 social workers stated they had either observed or heard about student-to-student microaggressions in their schools, and over half indicated staff-to-student microaggressions. Student-to-student microaggressions typically occurred during times of transition from one activity to the next, when students were not supervised. The school social work participants cited social media and text messaging as a significant contributor to microaggressions, starting as early as the fourth grade. Most of the social workers interviewed pointed out the need for staff and student bias awareness education to combat microaggressions.

Wintner et al. (2017) discussed school social work intervention and prevention strategies for microaggressions that focus on social skills building, social emotional learning programs, school climate improvement, and involvement of families and the community. Social work participants stated teachers wanted to focus on prevention and cultural proficiency but felt pressured by the academic curriculum requirements. Despite what special educators and other school personnel might believe, addressing microaggressions is not time consuming as there are simple yet effective strategies that include daily mindfulness (Clay, 2017). For example, just because a student is Latina/o and uses a wheelchair for mobility, do not ask them to speak for all Latina/o people, or for people who utilize wheelchairs. Microaggressions between students should not be ignored just because it may not be related to their schoolwork. When microaggressions occur from either colleagues or between students, address it and avoid the bystander approach. It should be made clear this type of behavior will not be condoned.

Even when it is made clear this type of behavior will not be condoned, much of the time people are not aware they are conveying microaggressions and thus need to be educated on the topic. Microaggressions are often automatic. It is unfortunate that the media and society continue to shape the thoughts and beliefs that sustain microaggressions. In *Dare to Lead*, Brown (2018) advised it is best to advocate for what is right rather than stay quiet. If one sees something happening that maintains the status quo, speak up and challenge it. The broader concept of Critical Race Theory provides an understanding of the systems that uphold microaggressions.

Critical Race Theory

Critical Race Theory (CRT) arose from the civil rights social action crusade and has interdisciplinary origins that include the studies of law and sociology (Abrams & Moio, 2009; Sleeter, 2017). CRT provides ideas for dissecting how race, as a social construct, and racism have been upheld systemically through seemingly culturally sensitive behaviors such as “color blindness”, which is ignoring or pretending not to see race (Abrams & Moio, 2009; Sleeter, 2017). CRT argues “color blindness” typifies and maintains racism by the refusal of White people to give up any power to people of color through refusal to acknowledge their race. CRT debates against the stance that “color blindness” is more important than being aware of race (Abrams & Moio, 2009). In other words, in the school setting, special educators and other school personnel should avoid being “color blind.” Instead, they should be sensitive to children of color

and the supports they might need to create equity in the classroom rather than simply treat all children equally. Although there is always a focus on "fairness" in schools, the focus should be on supporting children from culturally diverse backgrounds and less privilege to ensure their social, emotional, and academic success.

The tenets of CRT can be implemented through a model termed the Cultural Proficiency Continuum (CPC). Abrams and Moio (2009) and Kohli et al. (2017) discussed concerns in the literature about this model promoting "color blindness" and diverting attention away from the implicit or 'new racism.' The authors stated these concerns could be resolved through strategies such as writing measurable goals, objectives, and action steps related to the CPC. Accountability can be attained by including these goals in annual performance evaluations. Additional strategies include counteracting school cultures that focus on the voices of White people by encouraging people of color to gain power by telling their stories and embracing their intersectionality (Abrams & Moio, 2017).

Cultural Proficiency Continuum

In their influential 1989 monograph, Cross, Bazron, Dennis, and Isaacs laid the groundwork for a cultural competence hierarchy termed the Cultural Proficiency Continuum (Table 1) which focused on expanding the ability of micro (individual), mezzo (group), and macro (community, school) level entities to provide culturally competent care to minority populations. In their monograph, Cross et al. (1989) focused on the development of improved services to racially diverse children diagnosed with severe emotional disabilities.

Table 1
The Cultural Proficiency Continuum

Cultural destructiveness	Cultural incapacity	Cultural blindness	Cultural pre-competence	Cultural competence	Cultural proficiency

Note: *Cecil County Public Schools SlideShare (n.d.).*

The CPC moves from culturally destructive behaviors to culturally proficient ones. Reflection and dialogue are essential processes for school personnel and organizations engaged in a journey toward cultural proficiency (Ward, 2013). During the transition along the CPC, Ward (2013) emphasized "a reflective journey in which school personnel learn about themselves as individuals and their organization as a culture" (p. 29). The individual reflective journey translates to a micro level of practice, whereas learning about the organizational culture translates to a macro level of practice. The mezzo level of practice applies to any smaller group learning and discussion that may occur. An important first step is to assess which stage along the CPC a person or organization lies. The following describes the hierarchy from cultural destructiveness through cultural proficiency.

Cultural Destructiveness. See the difference, stomp it out. "Why are those kids speaking Chinese at lunch?" (Cecil County Public Schools, n.d.). According to Lindsey et al. (2009), these are behaviors focused on the elimination of all cultures that are different from the superior culture. The goal here is to obliterate cultures and, thus, the individuals within those cultures (Cross et al., 1989).

Cultural Incapacity. See the difference, make it wrong. "The apple doesn't fall far from the tree." (Cecil County Public Schools, n.d.). These are behaviors that detract and aim to show cultures different than the superior culture as defective (Lindsey et al., 2009). Implicit and explicit bias operates in this category and the organization has inadequate knowledge regarding how to support children from minority backgrounds (Cross et al., 1989).

Cultural Blindness. See the difference, act like you don't. "Everyone learns the same." (Cecil County Public Schools, n.d.). These are behaviors in which the superior culture refuses to recognize other cultures (Lindsey et al., 2009). This is the middle of the continuum where the belief is that color, race, and difference, in general, goes unnoticed (Cross et al., 1989). This is also known as color-blindness. Ethnocentrism is perpetuated by ignoring and silencing the fact that race, culture, disability, and other diverse factors are important to consider in teaching approaches, policies, and practices. Color blindness ultimately upholds the power and privilege of the dominant race (Kohli et al., 2017; Sleeter, 2017).

Cultural Pre-Competence. See the difference, respond to it inappropriately. "Make sure you do an activity for Black History month." (Cecil County Public Schools, n.d.). There is knowledge among school personnel that cultural competence is lacking, yet there is no real direction on how to work towards it (Lindsey et al., 2009). There is evidence of advancement through achievement of one or two goals, yet this can lead to a mistaken sense of cultural competence through methods such as tokenism (Cross et al., 1989).

Cultural Competence. See the difference, understand the difference that difference makes. "I think it is interesting to look at another's perspective through another lens." (Cecil County Public Schools, n.d.). These are behaviors that add to cultures different from the superior culture (Lindsey et al., 2009). In this stage, "culturally competent agencies seek minority staff whose self-analysis of their roles has left them committed to their community and capable of negotiating a bicultural world" (Cross et al., 1989, p. 17).

Cultural Proficiency. See the difference, respond positively. Engage and adapt. "Thank you for calling the parents and explaining in Spanish about our field trip." Differentiate to the needs of all learners (Cecil County Public Schools, n.d.). These are behaviors that strive to always glean information about other cultures with positive regard and embrace students from diverse groups (Lindsey et al., 2009). "At the culturally proficient end of the spectrum, adults educate all students to high levels, which includes knowing, valuing, and using students' cultural backgrounds, languages, and learning styles within the context of teaching" (Ward, 2013, p. 29). At this step, all personnel involved with a school system need to participate in ongoing activities to continually learn how to improve services to children from diverse backgrounds (Cross et al., 1989, p. 18).

Strategies for Advancing from the Golden Rule to the Platinum Rule

Micro (individual) level

Through their work and experience along the CPC in special education and social work settings, the authors of this article offer several micro level interventions for special educators and other school personnel. At the surface level, posters of the CPC hierarchy can be posted conspicuously

in offices and hallways as a reminder of the important work to be done. Minority organization or advocacy groups can be found in the community or joined online through subscriptions to email listservs, newsletters, and social media pages. Seek to learn more about cultural competence through professional development opportunities that challenge thoughts, beliefs, and encourage new ways of thinking about diverse populations. Utilize Fisher's (n.d.) "Multicultural Awareness & Diversity Essential Cultural Self-Assessment Worksheet Collection: A printable tool for helping increase multicultural awareness." Complete a professional development module on critical practices for anti-bias education (Teaching Tolerance, n.d.).

In the book titled *Dare to Lead*, Brene Brown (2018) encourages challenging oneself through personal vulnerability in order to learn new concepts and skills, and, thus, gain confidence in the journey along the CPC. At a deeper level, the Platinum Rule advocates that special educators and other school personnel should always engage in empathy or by imagining themselves in the shoes of students and their parents. Individually, they must look within their own worldview, including the family beliefs and values that shaped current attitudes. When one can understand childhood experiences and how these affect current fixed thoughts and behaviors, it is easier to gain perspective as to why families from different cultures behave differently and have different priorities in life (e.g. child rearing, importance of academics, etc.). When special educators and other school personnel understand these differences, they are better able to manage stereotypes and prejudices to provide the most appropriate learning environments.
Pratt-Johnson (2006) recommends establishing trust and effective cross-cultural communication with students and parents. This includes listening actively with regard to student and parent concerns. Special educators and other school personnel might also seek out cultural liaisons in the community that can provide some guidance in navigating issues that arise among students and families of diverse backgrounds.

It is also critical to understand the difference between equality and equity. Giving all students the same supports despite their unique learning, social, and emotional needs is equality, whereas giving all students the specific supports they need to be as successful as other students is considered equity (Skiba, Simmons, Ritter, Gibb, Rausch, Cuadrado, & Chung, 2008). Equality is in line with the Golden Rule and equity is associated with the Platinum Rule.

Mezzo (group) level

Ward (2013) suggested special educators and other school personnel engage in reading to become culturally proficient. This can be accomplished through a monthly "Culture and Diversity" book club where school personnel can discuss books such as *The Absolutely True Diary of a Part Time Indian* (Alexie, 2007). Book selections should focus on memoirs and personal stories from students and their families, including those from multiple intersections of identity.

Additional mezzo level interventions include specific considerations in matching students to the most appropriate classroom setting, including the students' individual needs, the dynamics of the classroom, teacher experience, methods of assessment and evaluation, family needs, and level of parent-teacher collaboration (Delmolino & Harris, 2012). Embedded in these considerations among students, parents, and teachers are elements of their culture, ethnicity, and diversity.

Finally, all special educators and school personnel should attend school board meetings in groups to advocate and engage in difficult conversations about subtle and persistent racism, privilege, microaggressions, and bias. Sleeter (2017) emphasized the focus of social action on group benefits as opposed to benefits of persons singly. One person should not refuse to participate simply because they do not see themselves as part of the problem.

Macro (organization/community) level

When cultural competence initiatives are implemented from the top down through administrative buy-in and incorporated into current policies and procedures, they are more likely to be successful and sustainable and to influence a larger number of people (National PTA, 2016). The school administration can complete a cultural competence organizational assessment which can be found on various websites such as the National Education Association (n.d.) and the National Center for Cultural Competence (n.d.). Assessments can be conducted within one school, but ideally district wide to make a meaningful (macro level) impact. The Parent Teacher Association (PTA) at each school should be encouraged to implement the National PTA Diversity and Inclusion Toolkit (2016). Additional strategies to promote cultural proficiency include disseminating posters and fliers district-wide that remind school personnel of the elements of cultural competence, along with prioritizing cultural proficiency as an ongoing topic of mandatory professional development days.

On a macro level of practice, Kohli et al. (2017) advocated for challenging educational institutions to pledge time and resources focused on honest conversations and analysis to defy the 'new racism' that is present in school systems across America utilizing expertise from across disciplines. "With these tools, education scholars, policymakers, practitioners, and activists will be better equipped to disrupt the 'new racism' of K–12 schools and move us further toward a racially just educational system" (Kohli et al., 2017, p. 196). Essentially, there needs to be transparency with open dialogue across all levels of education provision, including special education, to address "the elephant in the room," which is the lack of cultural humility.

Table 2
The Golden Rule and Platinum Rule Indicators

The Golden Rule	Platinum Rule
*Fixed Mindset	*Growth Mindset
*Equality	*Equity
*Unaware of personal privilege, microaggressions	*Mindful of personal privilege, microaggressions
*Not aware of many biases, stereotypes	*Awareness and management of biases and stereotypes
*Disability focus	*Intersectionality focus

*Lower end of cultural proficiency continuum	*Higher end of cultural proficiency continuum
*Lack of action at micro, mezzo, and macro levels	*Engaged in action at micro, mezzo and macro levels
*Little to no efforts in striving for cultural competence	*Active in lifelong journey toward cultural competence

Note: *Strategies for advancing from the Golden Rule to the Platinum Rule*

Summary

Students who receive special education services in schools have more to their identities than their disabilities. With a Platinum Rule approach (Table 2), special educators, school administrators, and other school personnel can engage in activities that combat microaggressions, stereotypes, prejudice, and implicit bias. This engagement leads to a school climate inclusive and respectful of students with disabilities. Furthermore, a growth mindset, combined with equity, empathy, acknowledgement of privilege, and a combination of person-first and identity-first language exhibits the power of the Platinum Rule.

When school administration commits to the work of cultural proficiency, the excitement, expectation, and dedication will spread to special educators and other school personnel. Students from diverse backgrounds will benefit academically, socially, and emotionally. Cultural proficiency needs to be a lifelong personal and professional journey. There are numerous additional strategies not listed in this paper for becoming culturally proficient, but it takes the willingness and commitment of each person individually, as a group, and as an institution to explore them.

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Answering Wh-Questions with the Support of Graphic Organizers: Effects on 8th Graders with Autism Spectrum Disorder

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Abstract

Students with an autism spectrum disorder (ASD) are being educated in general education content classrooms that use lessons directed to whole groups of students which limit use of visually presented material. For some students with ASD, having limited visual support hinders their abilities to process and comprehend material. Research shows promising results associated with the use of a graphic organizer to increase comprehension accuracy. The purpose of this study was to document the relationship between using a graphic organizer and increasing reading comprehension for students with ASD. The study used a single-subject, multiple-baseline design across participants to evaluate whether the use of a graphic organizer impacted the accuracy of answering *wh*-questions for grade-level social studies content. Participants included four eighth-grade students with ASD in an urban public school. Results supported current research by showing an increase in comprehension skills with the use of a graphic organizer.

Answering Wh-Questions with the Support of Graphic Organizers: Effects on 8th Graders with Autism Spectrum Disorder

In the past two decades, two legislative laws have significantly influenced inclusive opportunities for students with disabilities. The Every Student Succeeds Act (ESSA, 2015) and the Individuals with Disabilities Education Improvement Act (IDEIA, 2004) have mandated participation, increased access, and heightened rigor in the general education curriculum for all students, including those with disabilities. While students are generally experiencing greater participation in inclusive settings, meaningful understanding of general curriculum content continues to be a daily struggle for many students with disabilities. Scores from the National Center for Education Statistics (NCES, 2009) suggest that fourth- and eighth-grade students with disabilities who took part in the test did not understand the grade-level text well enough to comprehend the reading passages (Jitendra & Gajria, 2011). Review of the data from NCES (2017) indicates that scores in reading remain relatively the same for students in 8th grade with an average scale score of 230 in 2009 and 232 in 2017. Similarly, students in 4th grade scored an average of 221 in 2009 and 222 in 2017.

Comprehension Difficulties in ASD

Students with ASD often have additional struggles with reading comprehension based on the compounding social deficits that accompany their disability (Cronin, 2014; Finnegan & Accardo,

2018; Henderson, Clarke, & Snowling, 2014; Jacobs & Richdale, 2013). They experience a "triad of impairments" in the areas of social language and communication, social interaction, and social imagination (Wing & Gould, 1979). This triad affects reading comprehension by imposing difficulties in understanding the perspectives, thoughts, and feelings of others. Students with ASD have difficulties understanding character motivation and subsequent actions based on emotional states. They also struggle to problem-solve and predict events. These skills are related to understanding the perspectives of others and intricacies of social interaction (Carnahan, Williamson, & Christman, 2011; Cashin & Barker, 2009; Fleury & Lease, 2018) which play a large role in comprehending texts in multiple content areas.

To address practices for improving reading comprehension that target the deficits often seen in students with ASD, it is critical to investigate current evidence-based practices in the fields of both reading and autism. As Spencer, Evmenova, Boon, and Hayes-Harris (2014) have noted, much of the existing research focuses on spelling, writing, and direct-instruction practices for mixed elementary grade levels rather than the more in-depth processes involved in comprehension (e.g., mental imagery, connection with prior knowledge, and interpreting meaning from the text). Finnegan and Mazin (2016) recognize that "this position is especially for teachers of students with ASD... as no evidence-based practices in teaching reading comprehension have been identified (p. 190)" for this population.

Evidence-Based Strategies in Comprehension

Teachers of students with ASD rely on evidence-based practices from other student populations and attempt to interpret and modify processes to benefit students with autism (Finnegan & Mazin, 2016). Strategies identified from the National Reading Panel (NRP, 2000), the National Autism Center (NAC, 2015), and the National Professional Development Center on Autism Spectrum Disorder (NPDC, 2014) serve as their main guides. These organizations focus on identifying reading strategies for students from preschool to grade 12, and general content strategies for students with autism. While both the NAC and NPDC do not address reading comprehension, both resources identify practices that show promise when applied to instruction in reading. Detailed information on strategies can be found in the reports on the websites of both the NAC (2015) and NPDC (2014).

Additional research on the use of a visual support for reading comprehension can be found in Whalon and Hanlon's (2008) investigation of the NRP strategy of cooperative learning. Results indicated increases in unprompted question generation and response during reading instruction. Participants were provided a graphic organizer in the form of a visual story map following the intervention which further increased frequency of question generation and response (Whalon & Hanlon, 2008). Evidence from multiple areas shows promise for the use of visual supports to increase reading comprehension skills for students with ASD.

Graphic Organizers as Visual Supports

Applying the use of graphic organizers to the reading process holds promise for students with ASD by providing a visual framework that shows connections between ideas and promotes the ability to incorporate new learning into existing learning (Kim et al., 2004). Theoretical support for the use of graphic organizers to visually connect ideas and relationships has its roots in Ausubel's meaningful learning theory (Ausubel, 1963). Meaningful learning theory argued that

concept maps and graphic organizers serve as a concrete framework for students to relate existing knowledge to new learning (Kim et al., 2004). Kim et al. (2004) provided further evidence to support Ausubel's theory in their review of literature from 1963 to 1997 which reported on the success of various graphic organizers in increasing reading comprehension. The following graphic organizers were evaluated and found to be effective in either teacher or research directed interventions: semantic organizers, cognitive maps with mnemonic, cognitive maps without a mnemonic, and framed outlines.

Significance and Purpose of the Study

Research has shown that students with disabilities struggle to understand grade-level texts well enough to comprehend what is being addressed in reading passages. This is particularly true for passages in the social sciences (Hall et al., 2013; Jitendra & Gajria, 2011; Swanson, Wanzek, Vaughn, Roberts, & Fall, 2015). The present study set out to investigate the effects of providing access to graphic organizers to increase reading comprehension for students with autism. This study investigated the following research questions: (1) Is there a functional relationship between the use of graphic organizers and reading comprehension as measured by answering *wh*-questions in grade level social studies content for students with ASD? (2) Can teachers be trained to implement the graphic organizer intervention with fidelity? (3) What is the social validity of using graphic organizers in an inclusive general education classroom for students with ASD as measured by feedback from parents, student participants, and teachers?

Method

Participants

With approval from the university institutional review board, four eighth grade students with autism spectrum disorder (ASD) were recruited from an urban junior high school in the southwest United States. The researchers targeted this population given that historically students receiving special education services in grade eight do not meet the passing standard for content knowledge in social studies (AEIS, 2011). The school represented a convenience sample based on the school district in which the first author works. Participants, meeting the following criteria were selected for inclusion in this study. Each student:

(a) had an educational determination of ASD based on district protocols in agreement with the *Diagnostic and Statistical Manual of Mental Disorders* (APA, 2013) and using standardized measures administered by a licensed specialist in school psychology (LSSP);

(b) had IQ ranges from 65 to 120 as measured by a Wechsler Intelligence Scale for Children (WISC), Kaufman Assessment Battery for Children (KABC), or Woodcock Johnson IV (WJ-IV) (Schrank, McGrew, Mather, & Woodcock, 2014);

(c) had the ability to speak in full sentences; make personal needs known; answer factual and literal *wh*-questions; understood vocabulary common to typically developing same-age peers, based on a review of the full individual evaluation (FIE) including but not limited to, results of a current Assessment Test of Pragmatic Language, the Pragmatics Profile, or the Adaptive Behavior Assessment, if available;

(d) were between 13 to 14 years of age; and

(e) had a designated IEP time in a curriculum that reflected services and support for social studies content in a general education setting.

Students who had a history of challenging behaviors, including significant tantrums or aggression, were excluded from participation to maintain the focus on improving reading comprehension and not compound the intervention with behavior shaping techniques.

Data summaries for each participant were gathered by reviewing the student's most recent Full and Individual Evaluation (FIE), which law mandates must be reviewed and considered every three years. The FIE dates, comprehensiveness of evaluation summaries, and tools used for assessing the components of autism, language, cognitive, and achievement components varied among the participants (pseudonyms used; see Table 1 for results).

Participant 1: Jack. FIE date: 2016. A 14-year-old Caucasian male, identified as a student with ASD through several diagnostic measures (see Table 1). In the area of language, Jack was within the normal range and verbally communicated his ideas, preferences, and needs using complex sentence structures. He presented with a comorbid diagnosis of an Intellectual Disability which is consistent with some individuals on the autism spectrum. Based on the *Woodcock Johnson IV Tests of Achievement* (WJ IV.), Jack also met criteria for dyslexia. The examiner noted that Jack's General Intellectual Ability (GIA) score from the *Woodcock Johnson IV Tests of Cognitive Abilities* (WJ IV COG, 2014) was not cohesive with the subtest information, which should not be interpreted as reliable. Jack was administered the *Adaptive Behavior Assessment, Third Edition* (ABAS-3) to identify his overall areas of strength and weakness. Summary recommendations noted the importance of emphasizing Jack's strength of Visual Processing by providing visual material.

Participant 2: Kevin. FIE date: 2013. A 14-year-old Asian male, educationally identified as having severe ASD via the *Childhood Autism Rating Scale, Second Edition–High Functioning Version* (CARS2-HF). His numeric score of the *Autism Diagnostic Observation Schedule* (ADOS-2) was not reported in the FIE results. However, the summary statement supported that Kevin's overall performance fell within the autism classification. In the area of language, Kevin showed an impairment in pragmatic language. While formal testing indicated Kevin performed below peers his age, he verbally communicated his preferences and needs using compound and complex sentence structures. Kevin usually understood what was said to him and asked for help when needed. Kevin rarely answered questions or participated in classroom discussions. Kevin's cognitive performance was found to be below the average range. However, the examiner stated that the results should be viewed with caution due to Kevin's diagnosis of autism. Achievement testing was assessed using the *Classroom Assessment Scoring System* (CLASS), a criterion-referenced assessment tool in which Kevin performed at the beginning first-grade level at the time of the assessment in 2013. Unfortunately, FIE did not contain any more recent data on achievement.

Participant 3: Ethan. FIE 2012. A 14-year-old Caucasian male identified as having ASD as indicated using the CARS-2-HF (mild-moderate category) and the module 2 of the ADOS-2. The ADOS-2 overall numeric score was not reported in the FIE results, but the summary statement supported that Ethan's performance fell within the autism classification. In the area of language, Ethan showed an impairment in pragmatic language and performed below his same-aged peers. He verbally communicated his preferences and needs using compound and complex sentence structures. Ethan usually understood what was said to him and asked for help when needed. It was noted that Ethan rarely answered questions or participated in classroom discussions. Ethan showed to be in the average range of intelligence. Ethan was also noted to be below the average range by his teacher in the areas of communication and functional academics as per the KABC-II. The examiner noted that Ethan's intellectual functioning and adaptive behavior scores were not consistent. Formal or informal achievement testing was not reported in the current FIE. Because Ethan had intellectual scores in the average range, it was concluded that Ethan performed on or close to grade level.

Participant 4: Daniel. FIE date: 2014. A 13-year-old Caucasian male educationally identified with ASD using the *Autism Spectrum Rating Scales* (ASRS) and ADOS. Two teacher ratings on the ASRS revealed Daniel had difficulty relating to children and tolerating changes in routine, used language in an atypical manner, engaged in unusual behaviors, and had problems with attention and/or impulse control. However, these behaviors were not significant enough to impact his participation in the present study. The examiner reported that parent ratings on the ASRS indicated Daniel had difficulty tolerating changes in routine, used language in an atypical manner, engaged in unusual behaviors, overreacted to sensory stimulation, and had difficulty focusing. In the area of language, Daniel expressed himself using complex sentences, answered when called on after being given a "wait time," and asked for clarification when needed. Daniel had cognitive performance within the average range, and his adaptive behavior was consistent with his intellectual functioning. Formal or informal achievement testing was not reported in the current FIE. However, with intellectual scores in the average range, it was concluded that Daniel was performing on or close to grade level.

Table 1.
Assessment Summary for Participants

Participant	Assessment	Score	Conclusion
Jack 14 yr.	ASRS	Social Communication = 68 (T) 64 (P) Peer Socialization = 77 (T) 68 (P) Social Emotional = 66 (T) 58 (P) Behavioral Rigidity = 71 (T) 60 (P) Sensory Sensitivity = 65 (T) 59 (P)	ASD
	ADOS-2, module 3	8	ASD
	TOPL-2	87	Normal range
	WJ IV-COG	67	Noted not cohesive with subtest information; interpret as not accurate
	ABAS-3	Below average	Below average in communication & functional academics; visual processing strength
	WJ IV	Math Problem Solving = 95 Basic Reading = 68 Comprehension = 79 Reading Fluency = 58 Math Calculations = 77 Written Expression = 67	Overall below average reading comprehension & reading fluency

Note: ABAS-3 = Adaptive Behavior Assessment, ADOS-2 = Autism Diagnostic Observation Schedule, ASD = autism spectrum disorder, ASRS = Autism Spectrum Rating Scale, P = Parent, T = Teacher, TOPL-2 = Test of Pragmatic Language, WJ IV-COG = Woodcock Johnson IV Tests of Cognitive Abilities, WJ IV = Woodcock Johnson IV Tests of Achievement. Numbers indicate the specific edition of the particular assessment.

(Continued)

Table 1.
Assessment Summary for Participants – cont'd

Participant	Assessment	Score	Conclusion
Kevin 14 yr.	CARS2-HF	37	Severe ASD
	ADOS-2, module 3	Score not reported	ASD
	Pragmatic Profile	104	pragmatic language impairment
	KABC-II	Below average range	viewed with caution
	ABAS-2	Teacher only report = 71	Below average in communication & functional academics; strength in visual processing
	CLASS	Beginning 1st grade	Assessment in 2013
Ethan 14 yr.	CARS2-HF	28	Mild to moderate ASD
	ADOS-2, module 2	Score not reported	ASD
	Pragmatic Profile	104	pragmatic language impairment
	KABC-II	Average	
	ABAS-2	Teacher report only = below average	Below average in communication & functional academics
	Achievement testing	Not reported	
Daniel 13 yr.	ASRS	Score not reported	Atypical for language, changes in routine, & sensory stimulation
	ADOS	Communication = 3 Reciprocal Interaction = 8	ASD
	TOPL-2	102	Average
	WJ IV-COG	Average	
	Adaptive Behavior (noted informal assessment)	Average	
	Achievement testing	Not reported	At grade level

Note: ABAS-2, 3 = Adaptive Behavior Assessment, ADOS-2 = Autism Diagnostic Observation Schedule, ASD = autism spectrum disorder, ASRS = Autism Spectrum Rating Scale, CARS2-HF = Childhood Autism Rating Scale-High Functioning, CLASS = Classroom Assessment Scoring System, KABC = Kaufman Assessment Battery for Children, TOPL-2 = Test of Pragmatic Language, WJ IV-COG = Woodcock Johnson IV Tests of Cognitive Abilities, WJ IV = Woodcock Johnson IV Tests of Achievement. Numbers indicate the specific edition of the particular assessment.

Setting

This study took place in a public-school classroom setting. Baseline and intervention sessions were conducted in a specialized support classroom designed to provide instruction to students receiving special education services. Environmental materials included a chair and desk of appropriate size for each participant and a chair for the interventionist.
The interventionists sat at a 45- to 90-degree angle across the table from the student. Each session lasted no longer than 30 minutes.

During the baseline and intervention phase of training, the teacher and student were present. The first author and independent observer attended periodically to conduct data collection for inter-rater reliability. The generalization phase included the implementation of a graphic organizer into an inclusive general education social studies classroom at the eighth-grade level. Prior to the intervention, baseline probes were taken in the general education setting for just one component of the treatment package (answering *wh*-questions) for each participant. The probe information is included in the data reporting.

Instrumentation and Materials

The district assesses all students on the *Istation Internet-based assessment Indicators of Progress* (ISIP; Mathes & Torgesen, 1998*)*. The ISIP provides assessments and curriculum lessons in reading and math, and the district uses it to obtain students' independent reading levels so teachers may provide targeted reading instruction. Typical grade-level peers score between 278 and 289 in comprehension on the ISIP reading ability assessment. This assessment was utilized with participants to ensure that text selection for intervention was on a level commensurate with each participant's score and at an independent reading level. Participants recruited for this study had scores ranging from 240 to 277 in comprehension on the ISIP reading ability assessment. These scores were used to analyze texts for readability, vocabulary, and decoding. Passages were identified from leveled readers that closely aligned to the topics to help control for external bias and maintain the intervention's fidelity. The texts chosen for the study covered general topics for eighth-grade social studies content based on the general education scope and sequence and state curriculum standards.

A series of eight words for sorting and eight teacher questions based on the social studies passage were developed by the researcher. The questions had two questions from each category: *who*, *what*, *where*, *what doing/what for* which matched the categories on the graphic organizer used in the intervention. Participants were provided with the graphic organizer template at the beginning of the session (Figure 1), a reading book appropriate for the participant, and a bookmark to track reading if needed for the intervention sessions. Participants were also provided with a visual schedule or "to-do" sheet detailing which reading needed to occur and how many questions needed to be answered after the reading.

Who	What
Where	What Doing/What Purpose

Figure 1. Graphic Organizer

Experimental Design

The study used a single-subject multiple-baseline (A-B and generalization) design across participants to investigate the impact of a graphic organizer on answering *wh*-questions in a staggered phase change design. There were three phases in the study including baseline, intervention and generalization.

Baseline phase. The data collection at baseline for answering *wh*-questions used a concurrent design with a staggered phase change in the participants' classrooms. Typical instruction procedures in the school's general education social studies classroom involved the teacher lecturing on content while the students had access to a note page or summary of reading high points on their desks. Standard practice was for students to read passages or to listen to the lecture and answer *wh*- questions about the content. Thus, baseline procedures comprised of the standard instructional practices without having the graphic organizer present. Data collection for the baseline phase for *wh*-questions began at the same time for all participants. Once data stability, a minimum of four data points, was reached for the first participant and intervention was introduced, baseline continued for the remaining participants. This cycle was repeated for participants two, three, and four until the last participant entered the intervention phase.

Intervention phase. Intervention was conducted until a change occurred in the measured behaviors. The intervention phase for the second participant began when the data points for the first participant's intervention phase showed an upward trend evident after 3 to 5 data points. This rolling introduction of the intervention phase was used for the remaining two participants. Intervention sessions were conducted in the same location as the baseline phase.

The interventionists introduced the materials for the lesson at the beginning of each session and stated the topic. This allowed the participants to preview the material for any unknown words and ask questions for clarification. Then, the participants were instructed to read the passage. When the participants were finished, the interventionists provided the index cards that contained individual words from the reading. The participants were instructed to place the words in one of the four categories on the graphic organizer.

Once the participants had sorted the words (regardless of accuracy) onto the graphic organizer, the interventionists presented eight index cards, each containing a question related to the reading. At the end of each session, the interventionists reviewed the number of correct responses with the participants and provided verbal praise for correct answers. Sessions for intervention were conducted weekly.

Follow-up phase. After the intervention phase concluded and a minimum of a 1-week break was given due to the statewide testing calendar, three follow-up sessions were conducted for each participant. This follow-up phase was conducted in an inclusive general education classroom for social studies or in the special education classroom depending on time of day. Classroom procedures were similar to a typical lesson format described in the baseline phase. It consisted of a traditional teacher lecture with note page or reading summary document on their desk but also included a graphic organizer with word sorting cards to help answer *wh*-questions related to the lesson. These sessions were completed either in the general education classroom or in a special education classroom following the class period. The general education teachers' schedules and participants' comfort levels determined where the sessions were conducted.

Interventionists

Teacher interventionists. Two teachers provided intervention to the participants. These teachers were the participants' current support teachers and were certified in K–12 special education and 4–8 generalist. The female teacher had 14 years of teaching experience while the male teacher had four years of teaching experience. The participants' special education teachers served as the interventionists to (1) minimize the potential heightened anxiety of the participants with ASD due to changes in personnel, (2) increase the participants' abilities to transfer the learned skills across tasks by conducting the intervention with familiar teachers in the setting where they were expected to perform the skills, and (3) increase the flexibility of the intervention session scheduling of the teachers.

Interventionist training. The first author trained each teacher responsible for intervention in the following areas: (a) creation and use of the graphic organizer, (b) data collection procedures, and (c) steps in the intervention implementation. Training involved a combination of approaches to ensure student understanding and success upon implementation as well as a discussion of presentation of materials. Both interventionists demonstrated the ability to present the material for intervention following the protocol in the training session at 100% mastery based on researcher observation. The first author addressed both nonverbal body language and paraverbal language to maximize the neutral presentation of information. While nonverbal language consists of body language and gestures, paraverbal language refers to a person's tone, volume, and cadence of speech. Training in paraverbal language was given to minimize unintended teacher influence.

During training, the interventionists had opportunities to ask questions and practice the intervention and receive implementation feedback. Total training time was estimated at 30 minutes per interventionist and was completed prior to implementing it with the student participants. Training occurred at each interventionist's junior high campus during the planning period. Training sessions were recorded on an Apple iPad®.

An instructional specialist employed by the district served as an independent observer and teacher fidelity rater. The independent observer was present for two intervention sessions per participant. Following observation of two sessions, the independent observer then viewed the electronic recording of the training sessions and rated sessions according to the checklist for lesson presentation to ensure fidelity across support teachers.

Data Collection and Analysis

This study measured reading comprehension as the dependent variable. In doing so, it used a graphic organizer designed with four categories corresponding to the topics of the *wh*-questions asked following a reading passage. Topic headings were; *who*, *what*, *where* and *what for*. Data obtained for answering *wh*-questions were graphed as percent correct for analysis. Data collection involved noting responses to *wh*-questions. Effect sizes were also calculated using the Percentage of Non-overlapping Data (PND). Interpretation ranges for effectiveness with PND are: 91% to 100% highly effective, 71% to 90% moderately effective, 50% to 70% minimally effective, and below 50% not effective.

Interobserver Agreement

Interobserver agreement (IOA), defined as the agreement between independent observers on intervention responses, was calculated to ensure integrity of the measurement process. The first author served as the primary observer, and an instructional specialist supporting the campus served as the secondary observer. The IOA consisted of four sessions for answering *wh*-questions. During the follow-up phase, the primary and secondary observers scored three sessions for answering *wh*-questions. The primary and secondary observers privately recorded correct and incorrect responses of answering *wh*- questions.

The IOA for the intervention phase was 100% for all sessions rated. Both the primary and secondary observers indicated 100% agreement for *wh*-questions answered across sessions observed for each participant with each interventionist. During follow-up probes, the IOA was also 100%, as both observers indicated 100% agreement across participants.

Social Validity

Social validity relates to the acceptability of the goals, methods, and outcomes of treatments by consumers (Wolf, 1976). A questionnaire was developed to support the work of Reichow, Doehring, Cicchetti, and Volkmar (2011). Six of the seven indicators met by the questionnaire were: (a) consumers are satisfied with results, (b) clinically significant behavior changes are achieved, (c) a socially important dependent variable exists, (d) the study is time and cost effective, (e) independent variable intervention was conducted by people who typically come into contact with the participant, and (f) intervention occurred in a natural environment. The only criterion not addressed was the comparison between students with and without disabilities. The questionnaire was distributed to the parents, teachers, and participants at the study's conclusion. The results of the questionnaire were analyzed by reporting value ratings on all six questions across audiences. Results were compared according to question and audience.

Results

Figure 2 illustrates the data on the use of a graphic organizer to answer *wh*-questions. Data were collected on the percentage of questions answered correctly. Data results for answering *wh*-questions mirrored those noted in Bethune and Wood (2013) with participants experiencing an increase in the number of questions answered correctly during intervention and follow-up phases. Prior to intervention, baseline probes for *wh*-questions were conducted in the general education setting. Ethan was the only participant who answered one question correctly in that phase. Due to schedule restrictions with state and district-wide testing, no more than a total of 8 sessions were conducted per participant. Data were graphed using Microsoft Excel and visually inspected for level stability and trends, compared to the participants' baseline measures, and interpreted. Data were visually analyzed for immediacy of effect.

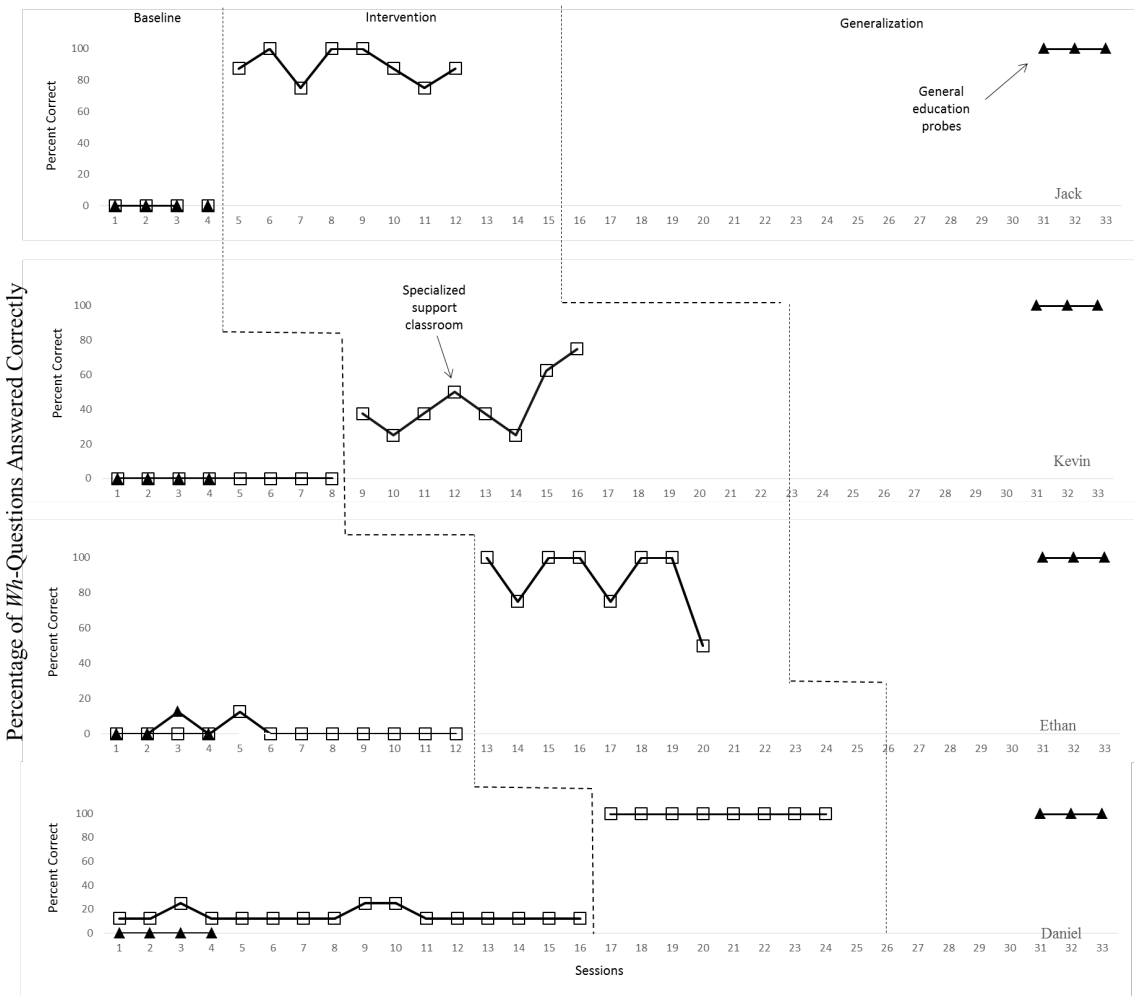

Figure 2: Percentage of correctly answered *wh*-questions.

Triangles represent maintenance probes for answering *wh*-questions. Squares represent baseline and intervention responses for *wh*-questions.

Results for Each Participant

Jack. Baseline data for Jack was 0% in the specialized setting and 0% for general education probes. During intervention, data for answering *wh*-questions ranged from 75% to 100%. Jack's data for the maintenance phase probes was 100%. Median for Jack during intervention was 93.9%. The data also showed a stable and flat trend line. There was an immediacy of effect upon introducing the intervention. The PND score was100% which is interpreted as a highly effective effect size.

Kevin. Baseline data for Kevin was 0% in the specialized setting and 0% for general education probes. During intervention, data for answering *wh*-questions ranged from 25% to 62.5%, with an overall average of 42%. Kevin's data for the maintenance phase probes was 100%. Median for Kevin during intervention was 37.5%. There was also some variability in the data with an upward trend. There was an immediacy of effect upon introducing the intervention. The PND score was 100% which is interpreted as a highly effective effect size.

Ethan. Baseline data for Ethan was 0% in the specialized setting and 12.5% for general education probes. Ethan was able to answer one question asked of him in both settings prior to intervention at the time of observation. During intervention, data for answering *wh*-questions with the graphic organizer ranged from 50% to 100%. Ethan's data for follow-up phase was 100%. Median for Ethan during intervention was 100%. Stability would have been met with one additional data point in the 20% range. There was some data some variability in the data with a mostly flat trend line. However, the last data point appeared to be an outlier as Ethan's accuracy greatly decreased compared to the previous intervention data. There was an immediacy of effect upon introducing the intervention. Despite the outlier, the PND score was 100%, which is interpreted as a highly effective effect size.

Daniel. Baseline data for Daniel was 12.5% in the specialized setting and 0% for general education probes. Daniel was able to consistently answer one to two questions in the specialized setting prior to intervention. During intervention, Daniel answered all *wh*-questions during all sessions yielding 100%. Data for the follow-up phase were also 100%. Median for Daniel during intervention was 100% with, all of his intervention sessions at 100%. Trend data indicated a flat line; and upon introducing the intervention there was an immediacy of effect. The PND score was100% which is interpreted as a highly effective effect size.

Table 2 summarizes the percentage of correctly answered *wh*-questions at baseline and intervention, noting mean, median, and range for each participant.

Table 2.
Mean, Median, and Range of Wh-Questions Data

	Baseline			Intervention		
Participant	Mean	Median	Range	Mean	Median	Range
Jack	0	0	0	90.7	93.9	75-100
Kevin	0	0	0	42.25	37.5	25-62.5
Ethan	0	0	0-1	87.5	100	50-100
Daniel	1.2	1	1-2	100	100	0

Procedural/Implementation Fidelity

This study also examined whether there was a functional relationship between teacher training, implementation of intervention fidelity, and participant success. Evidence shows teachers were trained to implement the intervention. Procedural fidelity measures included data evaluating two components identified in the work of Lynch and O'Donnell (2005). The first component was related to process components which address the quality of delivery. This fidelity measure was included in the intervention description as the interventionist received training prior to implementation (Lynch & O'Donnell, 2005). Intervention fidelity was measured through observation using the Fidelity of Implementation Checklist (Table 3), which denoted areas covered in the training of teachers prior to implementation of the intervention. The checklist allowed for consistency of implementation and assessed for procedural fidelity across interventionists during intervention. Two intervention sessions were observed by the first author and the second observer. The first author and the second observer then reviewed the recorded training session independent of each other and scored components using the checklist for implementation. Fidelity of Intervention was achieved at 76.5% for both interventionists. The observers marked 13 of the 17 steps as *Yes* to indicate the steps were completed by the interventionists. The four steps that were marked *No* were steps related to the use of the "to-do" list. As noted in Table 3, these steps were not needed for the intervention presentation as the participants understood the steps in the task after the first presentation session.

All participants understood the process after the first session and were able to sort words on the graphic organizer independently. Answering *wh*-questions increased across all participants during the intervention, which could be correlated to the use of a consistent routine established by the interventionists and the checklist.

Procedural fidelity processes also included measures in the structure of intervention. The following were evaluated (Lynch & O'Donnell, 2005): (a) adherence to the unit of study—Was the unit delivered as written? (b) exposure—Were length, time, and skills received as intended? (c) program differentiation—Were there differences from the standard curriculum? Data for 20% of the sessions during intervention were assessed. Measures in the structure of intervention included monitoring the session lesson plans and analyzing the completed data sheets to ensure adherence to the unit of study and time sequence outlined in the intervention description. The third area under structure of intervention measures did not present fidelity concerns since the curriculum was state approved for grade-level social studies.

Table 3.
Fidelity of Intervention Implementation Checklist Results

Category	Step	Interventionist	
		1	2
Session setup	Place the table and chairs in their proper positions.	Y	Y
	Prepare the "to-do" list.	Y	Y
	Place the materials for the session ("to-do" list, graphic organizer, and reading text) on the table.	Y	Y

Procedures for beginning intervention	Greet the student.	Y	Y
	Present the session topic. Teacher will state the topic. Teacher will ask the participant to preview material for any unknown vocabulary.	Y	Y
	Present the session "to-do" list.	Y	Y
	Check for understanding. Teacher will ask the participant to read the "to-do" list.	N	N
	Verbally direct the student to the reading material and graphic organizer.	Y	Y
	Allow the student time to read the passage.	Y	Y
Procedures following reading of the passage	Refer to the "to-do" list to indicate what has been concluded and what is next.	N	N
	Present 8 cards with words on them for sorting.	Y	Y
	Allow the student to sort the cards on the graphic organizer.	Y	Y
	Remove the organizer to the side of the work space.	Y	Y
	Use the "to-do" list to indicate what is next.	N	N
	Ask the student the set of questions.	Y	Y
	Record responses as correct or incorrect.	Y	Y
	Refer to the "to-do" list to indicate the conclusion of the session.	N	N

Note: Y = yes, N= no. The "to-do" list was not needed for any participants following the initial intervention session.

Social Validity

For the final research question, a social validity questionnaire designed to obtain information from the stakeholder groups to address three factors was used. The indicators of (a) *satisfaction* and (c) evidence of *socially important variables* were used as identified in Reichow et al. (2011). The social validity indicator, (b) *significant behavior change*, was achieved based on the intervention and outcome results. Additional data answered whether the use of a graphic organizer proved useful to the participants which further addressed indicators (b) and (c). The overall design of the study addressed the final indicator (d) *overall time and cost effectiveness* (Reichow et al., 2011).

All four students, both teachers, and two parents completed their questionnaires (80% return rate). Overall results from students indicated they felt the intervention was explained well (n = 2)

or explained pretty well (n = 2). Three of the students indicated that the intervention was very important to them in comprehending reading passages in social studies content. The fourth student indicated it was somewhat important to comprehending reading passages. Teachers reported high satisfaction in all areas for the intervention and high value in the intervention continuing to make a difference in comprehension. One teacher reported being very satisfied with the overall intervention results and both teachers reported yes on positive progress with continued intervention. Both parents indicated the intervention would continue to make a difference in comprehension, seeing the importance of using it to teach comprehension, and that their child had expressed frustration with schoolwork periodically in the past. Results suggest using graphic organizers in an inclusive general education classroom for students with ASD yields high social validity in six of the seven criteria identified by Reichow et al. (2011).

Discussion

The purpose of this study was to extend the existing research in reading comprehension for students with ASD. Specifically, the degree of impact of graphic organizers on reading comprehension as measured by answering *wh*-questions in social studies content. The aim was to provide evidence that supported the use of graphic organizers in content areas other than reading to benefit students with ASD in gaining knowledge and skills in a variety of core content classes. Results of the data gathered for the three research questions demonstrated graphic organizers have the potential to help students with ASD understand content more successfully, teacher training on implementation of the strategy may impact student success, and teachers, participants and parents see the strategy as holding relatively high social validity.

Research question (RQ) 1 hypothesized whether there was a functional relationship between the use of graphic organizers and reading comprehension measured by evaluating the answering of *wh*-questions in grade level social studies content for students with autism. The intervention yielded increases for all participants in answering *wh*-questions. There was an immediacy of effect observed with all four participants upon introducing the intervention phase, and there were no overlapping data when comparing the baseline data against the intervention data, thus, yielding highly effective intervention effects across all participants. These results support similar findings by Bethune and Wood (2013), Iguatova (2013), and O'Conner and Klein (2004). Their studies measured the participants' abilities to answer questions about text read. They reported an increase in answering questions and found functional relationships between the use of graphic organizers and correct responses to questions.

RQ2 addressed whether teachers could be trained to implement the intervention with fidelity. Findings indicated teachers utilized the checklist for intervention with 76.5% fidelity (13 of 17 steps). All four participants learned the sequence of the intervention after the first session, and three participants (Ethan, Jack, and Daniel) were able to set up the intervention with no teacher prompting and worked independently through the sessions after the second session. Kevin required verbal prompting to begin reading through the fourth session. However, a strength for this study was that the participants quickly showed they did not require a "to-do" list. Therefore, the "to-do" steps were not presented as the participants perceived them as unnecessary and unauthentic. While the percentage of correct adherence to the fidelity of intervention procedures

was lower due to the omission of four steps deemed as unnecessary by the interventionists, overall satisfaction and ease of intervention was strengthened.

RQ3 addressed whether participants, parents, and teachers found the use of graphic organizers in an inclusive setting for students with ASD as socially valid. Using the components identified in the research of Reichow et al. (2011), results received from the three groups indicated strong social validity for the intervention. Areas of strength included (a) easy to implement the intervention, (2) required little to no time or materials, (3) resulted in immediate behavior changes and (4) the intervention was valuable to student success.

Implications for Practice

Using teachers as primary implementers strengthened the existing relationships with campus grade-level staff and minimized further anxiety potentially produced for students with ASD when introduced to new personnel. Additionally, findings showed high social validity for the intervention with relatively low teacher preparation and training required. By incorporating the intervention into a teacher's existing planning time, it has the potential to be highly beneficial for students with autism while minimizing the additional strain on teachers' planning processes for lesson preparation.

Limitations and Directions for Further Research

While the intervention procedure implemented in the current study yielded strengths, there are notable limitations and implications for future research. One potential limitation was that the participant intervention phases were concluded at a set number of sessions rather than extending sessions across participants. The intervention sessions were limited, and follow-up probes were delayed due to district testing schedules and the teachers' lesson schedules. As a result, probes for follow-up were not collected until some weeks following the conclusion of the intervention, and the delay varied for each participant with the first participants experiencing a longer break than the last participant. Ethan's data specifically, denotes a significant limitation in the 8th session. Future research is needed to determine if differences exist when the participants are in the intervention phase for more than eight sessions and when the participants receive the same break period across tiers before the follow-up phase begins. Extended intervention sessions are important to ensure data stability using the 80%-20% rule (Gast, 2010; Haegele & Hodge, 2015) across all participants.

Further, the intervention may have been strengthened by investigating the use of different visual supports. As students with ASD continue to have access to inclusive settings, it will be important for researchers to continue to extend the work of Kim et al. (2004) by conducting investigations using cognitive mapping or mnemonic devices. A consideration for future researchers is to design a similar study utilizing a graphic organizer for answering wh-questions from a text passage that is read aloud by a teacher. This would allow investigators to measure a student's ability to respond after listening to the text instead of reading it independently. Future research should also consider using other visual support strategies in academic subject areas beyond social studies with varying ages of students. Findings would provide direction on implementation for practitioners across multiple content and grade levels. One additional area that would strengthen the results of this study is to replicate the study with more than four students as using a small participant pool limits the generalizability of the findings.

In closing, the findings from this study show that with a little time and effort, teachers can implement the use of graphic organizers in a way that allows students to successfully answer wh-questions during social studies lessons. By using socially valid strategies that are not time consuming to develop, to train, or to implement, they have the potential to increase a teacher's willingness to use those strategies for students with ASD. Graphic organizers are concrete tools that can assist teachers in authentically engaging students with ASD in their classrooms and, therefore, potentially maximize the student's academic potential.

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Investigating the Journal Impact Factor of Special Education Journals Indexed in the Social Sciences Science Edition from Web of Science

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Abstract

The purpose of this study is to investigate the impact factors of special education journals in indexed in the "Education, Special (ES)" category of the Social Sciences Citation Index (SSCI) (Web of Science, WoS) as well as considering some bibliometric indicators. As an alternative metric of the journal impact factor (JIF), JIF quartiles were considered, finding that high impact factor journals (Q1) publish more papers than expected (max: 54.76% -min: 38.67%), whereas low impact factor journals (Q4) publish less papers (max: 21.28% -min: 14.97%) in the period 2014-2018. In addition, it is found that the share of self-citations among journal quartiles are almost on the same level and there is no significant relationship between the impact factor and the journal self-citation ($r=0.005$, $p>0.05$). The impact factor is strongly positive correlated ($r=0.854$: for 5-year JIF) with the citedness of the median journal paper and with the journal h-index ($r=0.718$ for 5-year JIF). Furthermore, it is found a strong positive correlation between h-index and the number of published articles in journals ($r=0.723$). However, even the impact factor is a valuable indicator for citations of a paper, it is still far to be the perfect indicator for the expected citations of a paper in a journal due to the high degree of skewness of the citation's distribution of papers in a journal. It has been found that citation distributions over 80% of special education journals exhibit high degree skewness (skewness>1) without significant differences by journal quartiles. During the period 2014-2018 the impact factor of the special education journals has increased linearly while the journal-self citation rates have decreased in a similar way. The results obtained for special education have been compared with other fields and compatible/incompatible situations have been discussed.

Keywords: citation analysis, journal impact factor, journal quartiles, special education journals.

Investigating the Journal Impact Factor of Special Education Journals Indexed in the Social Sciences Science Edition from Web of Science

Academic journals play a primary role among the official communication languages of science in the process of building, disseminating and using knowledge. However, in Social Sciences, a significant part of the academic research is still not published in international journals but in national journals, book chapters, or monographs (Sivertsen & Larsen, 2012). In Educational Research, a discipline at the interface of social sciences and humanities, for example, the books

are still widely used as a communication tool (Hicks, 2012; Nederhof, 2006). However, the greater interaction of the area with other disciplines, the broadening of the topics studied, and the dissemination of the research produced in international collaboration, has made academic journals more and more prominent in the area (Engels, Ossenblok, & Spruyt, 2012; Henriksen, 2016; Larivière, et al., 2006; Pajić, 2015; Rowlinson, et al., 2015). The competitive environment created by the increasing number of academic journals in the field of education and the idea, as in other fields, of "publish or perish" among the researchers and the question of "quality or quantity?" in the studies conducted came up (McGrail, Rickard, & Jones, 2006). Therefore, it is becoming more and more important to follow the publications produced in academic journals in the field of education and to analyze the citation relationship networks between the publications based on various criteria.

Nowadays, articles published in journals in the Science Citation Index (SCI), Social Sciences Citation Index (SSCI) and Arts & Humanities Citation Index (AHCI) citation indexes in the Web of Science (WoS) database are widely accepted in the academic community as quality research. Apart to be an abstract database, WoS is a citation database, which calculates the citations received by every single paper indexed in the database. From these citations, several citation indexes are created, the most popular is the journal impact factor (JIF). JIF is defined as the number of citations in the current year to items published in the previous two years, divided by the total number of scholarly citable items published in those same two years (Garfield, 1972). In other words, JIF is a prediction for the average number of citations that an article can expect to receive. The JIFs are calculated and published annually in the Journal Citation Report (JCR) published by Clarivate Analytics (formerly part of Thomson Reuters).

Although the journal impact factor is the most widely used bibliometric indicator to assess the quality of a paper, it has several limitations: the different citation culture in different disciplines, the two-year citation window, the highly skewed distribution of citations among the papers published in a journal, the inclusion of journal self-citation in the calculation or the definition of the citable documents used in the calculation, which makes possible their manipulation as a result of editorial policies (for a detailed discussion see: Archambault & Larivière, 2009; Hammarfelt & Rushforth, 2017; Larivière & Sugimoto, 2019; Peters, 2017; Seglen, 1997). After all these criticisms, evaluating the articles published in journals by looking only at the impact factors can be really "mortal sin" (as quoted by Van Noorden from Van Rann, 2010). However, the concern that evaluation of the research can be subjective among peers, and the opinion that high impact journals in the WoS database accept articles only after being accepted by expert referees in the field, lead to accept more and more the evaluation criteria based on bibliometric indicators. In fact, such trends we see, can be interpreted as being caught up in the "fatal attraction" of bibliometric methods (Van Raan, 2005). Despite the inherent limitations of the journal impact factor, bibliometric tools in countries where nepotism prevails can provide an objective and consistent assessment for researchers and allow making fast, fair and transparent decisions (Tang & Hu, 2018). The JIFs are simple and easy to calculate and produce, under some circumstances, accurate results for the evaluation of journals, researches or researchers, because of these reasons and above all, because none of the alternative bibliometric indicators suggested was successful, make JIF the most used bibliometric indicator (Tregoning, 2018).

Although there is a great interest in journal impact factor within the research ecosystem, the skewness in citation distribution, the inclusion of the journal self-citation, and the citation window limited to 2 years, make that the use of JIF is still intensely discussed. As a result of this discussion, the five-year journal impact factors and journal impact factors without self-citations have been calculated and are now available in the JCR. However, the two-year journal impact factor including self-citations continues to be the dominant form and remains the gold standard (Larivière & Sugimoto, 2019). Meanwhile, Clarivate Analytics has begun to create reports that show highly self-cited or abnormal citation patterns as a precaution against efforts to increase journal impact factor, which has been called "journal impact factor engineering" (Reedijk & Moed, 2008). Fortunately, and probably as a result of these reporting practices, cases of citation stacking have decreased over time (Clarivate Analytics, 2020a). Regarding the criticism that a limited number of cited articles in journals may increase the impact factor of the journal, a median impact factor approach has been proposed to replace the citations received by all articles published in the journal (Rousseau, 2005; Sombatsompop, Markpin, & Premkamolnetr, 2004). The main approach considered is the idea that the median article is equidistant from the most cited article and the least cited articles (Garfield & Pudovkin, 2015). However, the study conducted by Garfield and Pudovkin (2015) for different categories in the SCI and SSCI, found that there is a very high correlation between (traditional) journal impact factors and the citedness of the median journal paper (Pearson's correlation coefficient is r, close to 1).

On the other hand, new indicators (such as h-index, SCImago Journal Rank, Eigenfactor, etc.) have been developed to be used as an alternative or in combination with JIF (Cai et al., 2019; Larivière & Sugimoto, 2019). Among these alternative indicators, perhaps h-index is the most popular (Hirsch, 2005), which was originally developed for evaluating researchers and attracted a great interest in the literature in a very short time (Schubert & Schubert, 2019). According to the definition by Hirsch (2005), "A scientist has index h if h of his or her N_p papers have at least h citations each and the other (N_p-h) papers have $\leq h$ citations each" (p.). After a short time, Braun et al. (2006) proposed a h-index for evaluating the scientific impact of journals. The journal h-index can be calculated as follows "Retrieving all source items a given journal form a given year sorting them by the number of times cited, it is easy to find the highest rank number which is still lower than the corresponding times cited value. This is exactly the h-index of the journal for given year" (Braun, Glänzel, & Schubert, 2006, p.). Since the h-index has been considered to be a robust metric for evaluating journals, correlation between journal impact factors and h-index values has been a subject of many studies in various fields (for a detailed discussions see: Bar-Ilan, 2010; Bornmann, Marx, & Schier, 2009; Harzing & van der Wal, 2009; Hodge & Lacasse, 2011; Liu & Wan, 2012; Liu, 2020 Stern, 2014; Yuen, 2018). Most of these studies find strong positive correlations between the journal impact factors and journal h-index.

The field of Education in WoS is represented by two categories in SSCI, "Education, Special" and "Education and Educational Research" and one in SCI "Education, Scientific Disciplines". While the "Education, Scientific Disciplines" category focuses on education-related studies in scientific disciplines such as Medicine, Engineering, Nutrition and Biochemistry, the "Education and Educational Research" category has broad spectrum of publications and includes all kinds of educational research. On the other hand, "Education, Special" (ES) is a more specific category compared to the other two and covers resources that are concerned with the education and

development of people with special needs, including the gifted as well as those with learning disabilities.

As known, bibliometrics is an effective method to analyze the research trend of a specific field and is an important tool to explore the impact of scientific field, the impact of researchers, and the impact of articles (Pritchard, 1969). Therefore, there is a significant growing interest in educational researches due to the increase in internationalization and interdisciplinary work, and as a natural consequence of this, academic journals have become progressively more important (Engels, Ossenblok, & Spruyt, 2012; Henriksen, 2016; Larivière, et al., 2006; Pajić, 2015; Rowlinson, et al., 2015). On the other hand, as emphasized by Liu (2020), bibliometric research about special education journals is inadequate and the systematic evaluations of journals in the ES category appear to be rare and outdated (Sabatino, 1981; Swanson, et al., 2013; Summers, 1986; Togia & Tsigilis, 2006; Zurita, Merigó, & Lobos-Ossandón, 2016). It should not be forgotten that although the ES category is a more thematic category of the education field, it is an important branch of education (Rumrill, Cook, & Stevenson, 2020). For example, the National Center for Education Statistics reported that seven million students, whose ages vary between 3 to 21, (14 percent of all public students) in the US had special services, and 34% of them had specific learning disabilities (NCES, 2019). Therefore, it is very important to have the evaluation of the quality of academic journals for researchers, administrators, and academic libraries. Also, these qualified academic journals are increasingly used to publish research results and share ideas and best practices in this field (Liu, 2020). Thus, it is crucial to cover the entire field of special education since there is a gap in research exploring the validity of JIF in this area. Furthermore, this study will contribute to the literature on the bibliometric research on special education journals.

The Purpose of the Research

Based on the previous discussions on the journal impact factor, the following questions were answered, considering the impact factors of special education journals in the ES category in the SSCI:

- RQ1: What is the share of papers published, the average citation values per paper, the journal self-citation rates and the uncitedness share of papers by journal quartiles?
- RQ2: What is the relationship between journal impact factor and: i) the number of citations received by the journal's median article, ii) the journal self-citation rates, and iii) the journal h-index values?
- RQ3: At what level is the skewness in the citation distribution of the journals? Are there any significant differences of the skewness by quartiles?
- RQ4: What is the trend and temporal stability of impact factor values and journal self-citation rates between 2014 and 2018?

Methodology

Data were extracted from special education category of SSCI (WoS database) in January 2020. Only “articles” and “reviews” document types were considered, named “papers” through the study.

For RQ1, RQ2 and RQ3, the reference year was 2014. In 2014, 1,714 documents were indexed in the ES category. Of these, 1523 are articles (84.25%) and reviews (4.61%), representing 88.86% of all documents. Other important document types were editorial material (4.32%) and book reviews (3.91%). There are 39 journals indexed in the category in that year. However, since there is no data from these journals for "Volta Review" for 2014 and later years and the journal "International Review of Research in Developmental Disabilities" is published in book series format, both journals were excluded from the evaluation. The remaining 37 journals were indexed regularly between 2014-2018. The publishers of these journals are exclusively from two countries: 25 from the USA (67.6%) and 12 from the UK (32.4%). The publication language of all these journals is English.

For RQ1, RQ2 and RQ3, the journals were grouped by 2014 JIF quartiles. Briefly, the journals under the same category are ranked from the highest impact factor to the lowest and divided into its quartiles. Those in the first quartile are classified as Q1 (within the top 25% of journal impact factor among a certain category), the ones in the second quartile as Q2, those in the third quartile as Q3, and finally those in the fourth quartile as Q4 (within the lowest 25% of journal impact factors) among a certain category (Clarivate Analytics, 2020b).
For RQ4, the research was extended to the period 2014-2018. Although 41 different journals were indexed in the special education category during this period, only 37 journals were considered, those indexed in all the years of the 2014-2018 period, to avoid missing data. The publication language of all these journals is English.

Findings and Discussion

In this section, findings related to research problems were given and the results were discussed with relevant literature.

Findings and Discussion for RQ1

Table 1 shows the share of papers, the average citation per paper, the percentage of uncited papers, the average impact factor and journal self-citation rate by journal quartiles in 2014.

Table 1
Bibliometric Indicators by Journal Quartiles Journals of the ES Category

Journals	**Q1**	**Q2**	**Q3**	**Q4**	**All quartiles**
Papers (% papers)	834 (54.76)	245 (14.84)	234 (12.60)	210 (17.79)	1523 (100.00)
Average citations per paper	14.70	12.64	8.53	7.19	12.38
Average JIF	2.007	1.407	0.824	0.458	1.154
Uncited papers (% uncited papers)	23 (2.76)	10 (3.98)	12 (4.17)	22 (9.96)	66 (4.00)
Journal self-citation rate	16.62	13.69	11.47	14.92	14.20

Note: Papers published in 2014 and citations counted at January 2020.

As shown in Table 1, the journals with high impact factors publish much more than the 25% theoretically expected. In order to check the robustness of this fact for the ES category, the share

of papers published by journal quartiles were examined for a longer period of time, from 2014 to 2018. Similar results were obtained, the share of papers published in Q1 varying from 38.67% to 54.76% in the period 2014-2018 while the share of papers published in Q4 varied from 14.97% to 21.28%. Based on this data, it can be concluded that journals with the highest impact factors publish much more papers than journals with the lowest impact factor in ES category.

This conclusion is in agreement with previous studies in the literature. Liu et al. (2016), for example, analyzed 8,506 journals from the 2015 JCR Science Edition, and calculated the share of articles and reviews published by quartile journals in each subject category. For journals associated with more than one quartile of different categories, the specific journal and publications published in this journal were allocated to only one quartile to avoid the double counting problem using both the "optimistic mode (this journal is allocated to the higher quartile)" and the "pessimistic mode (this journal is allocated to the lower)". Under these assumptions, it was found that 45% of papers were published in Q1 in the optimistic mode and still over one-third papers in pessimistic mode. Similarly, Miranda and Garcia-Carpintero (2019) analyzed the share of articles and reviews published in each quartile in the 25 largest research categories in SCI-E (covering more than 50% of total publications in the database) and found that the average share of articles and reviews in Q1 was 38.4%, although varying largely from 17.1 to 88.9%, depending on the category. Liu et al. (2018) carried out a similar study using the optimistic mode for the 2016 JCR SCI and SSCI sections, again considering only articles and reviews. They obtained similar share of papers published in Q1 in Science Edition (44%) but found this share of papers in Q1 is slightly lower in the case of SSCI journals (33%) but still much higher than the 25% theoretically expected.

According to the literature, the share of papers published in Q1 in ES category (from 38.67% to 54.76% in the period 2014-2018) are in line with the results obtained for Science journals but much higher than expected for Social Sciences journals. Although the ES category is included in SSCI, it shows similar features with SCI journals.

As expected, the average citation rates by papers published in Q1 journals were higher than in other quartiles. In particular, the average citations of papers published in Q1 journals was double than the citations of papers published by Q4 journals (14.70% vs. 7.19%). However, the differences in citations among quartiles are much lower than in other scientific areas previously studied, especially using the JCR Science Edition. The citations received by papers published in Q1 were 1.17, 1.72 and 2.04 times greater than in Q2, Q3 and Q4 journals. In the study carried out by Miranda & Garcia-Carpintero (2019) for the 25 largest SCI categories, it was found that the citations of papers published in Q1 were 2.5, 4.1 and 7.3 times greater than in Q1, Q2, Q3 and Q4 journals. In a previous study of the authors focused on Education and Educational Research, the citations received by papers published in Q1 journals were 1.62, 2.19 and 4.23 times higher than papers published in Q2, Q3, Q4 journals, respectively (Orbay, Karamustafaoglu & Miranda, 2020). Thus, even considering Social Sciences categories and related categories, the differences in average citations received by papers published in Q1 are much lower in ES than in other categories.

Similarly, there are not large differences in the journal self-citation rates by quartiles, varying from 11.47% to 16.62%, and without any clear trend. In the previous study of carried out by the

authors focused on Education and Educational Research, the journal self-citation rate was slightly higher (average 19.50% considering all quartiles), and increased with the journal quartiles, from 16.28% in Q1 to 18.09% in Q2, 19.43% in Q3 and 24.19% in Q4 (Orbay, Karamustafaoglu & Miranda, 2020). The values obtained for ES are similar to a large-scale study carried out by Larivière Sugimoto (2019). They obtained an average of the self-citation rates for all disciplines of the 2016 JCR of around 12% but varying largely among the disciplines. In particular, the greatest journal self-citation rates were found in the field of Arts and Humanities (20-25%), then decreased in Social Sciences categories (around 14%) and the lowest values were obtained for Clinical Medicine and Biomedical Research (between 5 and 10%). To analyze the impact of the journal self-citation percentages on the quartiles where the journals were grouped, a new grouping of the journals excluding the self-citation rate was carried out. As a result, 29 of the 37 journals (78.38%) remained in the same quartile, which means the effect of journal self-citation is not much important in JIFs and grouping of journals by JIF quartiles.

Even the uncitedness was evaluated 5 years since publication, the uncitedness rates are surprisingly much lower than in other research areas, especially in Q3 and Q4, probably due to the lower differences in the average citations per paper in the different journal quartiles commented before. For example, in Education and Educational Research category (papers published in 2015 and uncitedness evaluated 4 years since publication), the average uncitedness of papers was 2.45% in Q1 and 5.07% in Q2 but was as high as 10.43% in Q3 and 27.95% in Q4.Corresspondingly, in a large and comprehensive study of the 25 largest SCI categories (papers published in 2015 and uncitedness evaluated 3 years after publication), the uncitedness rate was found as 1.7% for Q1 and 6.2% in Q2, but again much higher in Q3 and Q4: 13.0% in Q3 and 27.5% in Q4 (Miranda & Garcia-Carpintero, 2019). A global 4.0% of uncited papers in ES category 5 years since publication demonstrates the use of papers published in academic journals indexed in SSCI is very high in the scientific community.

Although the uncitedness rates are not very high in ES category, at least 5 years since publication, it is also important to comment that uncited papers do contribute academically to science or can be used by academic communication channels outside the WoS database (Garg & Kumar, 2014). In addition, papers with little or no citation should not be overlooked by the distinguished editorial reviews and reviews of competent referees in their fields (Garfield & Pudovkin, 2015).

On the other hand, it is interesting to comment papers published in journals in SCI are cited in a very short time, while studies published in journals in SSCI are known to be cited longer (Archambault & Larivière, 2010; Miranda & Garcia-Carpintero, 2018). However, 96.0% of papers published in SE area were cited 5 years since publication, which is a high value in Social Sciences and even for Sciences journals. The average citation values of papers published in journals in the category of ES in the period 2014-2018 are given in Table 2. As seen in Table 2, the average number of citations received by articles increases regularly every year. Therefore, articles with little or no citation in the ES category have the potential to be cited in the future. In addition, the fact that the average citation rate for the ES category is increasing steadily over time and supports the idea that it may be more appropriate to use impact factors calculated by using the five-year citation window rather than the two-year citation window, especially in the social sciences (Archambault & Larivière, 2010).

Table 2
The Changing of the Average Citations of Papers for the ES Category Over Time.

Year	2014	2015	2016	2017	2018	2019	Sum
2014	0.38	1.27	1.90	2.37	2.44	2.83	11.19
2015	---	0.34	1.20	1.97	2.18	2.79	8.48
2016	---	---	0.34	1.14	1.85	2.63	5.96
2017	---	---	---	0.39	1.16	2.15	3.70
2018	---	---	---	---	0.35	1.50	1.85

Findings and Discussion for RQ2

One of the most argued limitations on the impact factors is that the journal self-citation rates can be high, and this may increase journal impact factors artificially. Based on the 2014 data, the correlation between journal impact factor and journal self-citation rates for journals in the ES category was investigated and no significant relationship was found between them ($r=0.005$, $p>0.05$). In order to test the robustness of this data, the correlation was also tested separately for each year between 2014 and 2018 and again it was found that there was not significant relationship between these variables. In the literature, there are some examples from large-scale studies on this subject. McVeigh (2002), for example, found a very weak negative correlation ($r=-0.192$) between impact factor and journal self-citation rate in her study covering 4816 journals in SCI. Likewise, Larivière ,& Sugimoto (2019) found a very weak negative correlation ($r=-0.312$) in their study using the 2016 JCR data. On the other hand, the relationship between impact factor and journal self-citation rates has often been the subject of studies for different categories, and there were cases where there was negative, positive or no significant relationship was obtained (for a detailed discussions see: Frandsen, 2007; Heneberg, 2016; Huang & Lin, 2012 and references therein).

As previously emphasized, other of the important criticism points on impact factor is the potential high degree of skewness in the citation distributions of the papers published in a journal. In other words, a limited number of articles in a journal can influence largely the value of the impact factor and thus, the impact factor being only a poor predictor of the expected citation of a paper published in a journal as it is based on the average citations of papers published in the journal. Therefore, it is obvious that the journal impact factor will be far from representing all the articles in the journal. Based on these discussions, instead of taking the average citation value, if all the articles published in the journal are ranked from the highest cited article to the lowest cited article and we focus on the median citations of the articles published in the area, this concern is partially avoided (Garfield & Pudovkin, 2015). Namely, the article with the median citations of the articles published in a journal is equally distant from the limited number of articles that is likely to be highly cited and the articles with little or no citation. A strong positive correlation ($r=0.762$) was found between the two-year journal impact factor and the citedness of the median journal paper for journals in the ES category using the 2014 JCR data. On the other hand, a higher positive relationship ($r=0.813$) was found between the five-year journal impact factors of the same journals and the citedness of the median journal paper (Figure 1). Although the behavior of ES is slightly different from other social sciences, it is well known that articles in the social sciences are rarely cited and these articles can only reach their citation peak ten years later after they are published, while articles in SCI are cited immediately after they are published in the journals and then the citations rate goes down rapidly (Archambault &

Larivière, 2010). In SE area, most of the articles were cited but they followed a different trend than in Sciences, i.e. they were more gradually cited within the five years since publication cited, the citations did not go down rapidly after the first two years since publication. Therefore, the five-year window can be the minimum requirement to determine the effect of social sciences publications, as recognized previously by other authors (Archambault & Larivière, 2010; Glanzel & Moed, 2002; Miranda & Garcia-Carpintero, 2018).

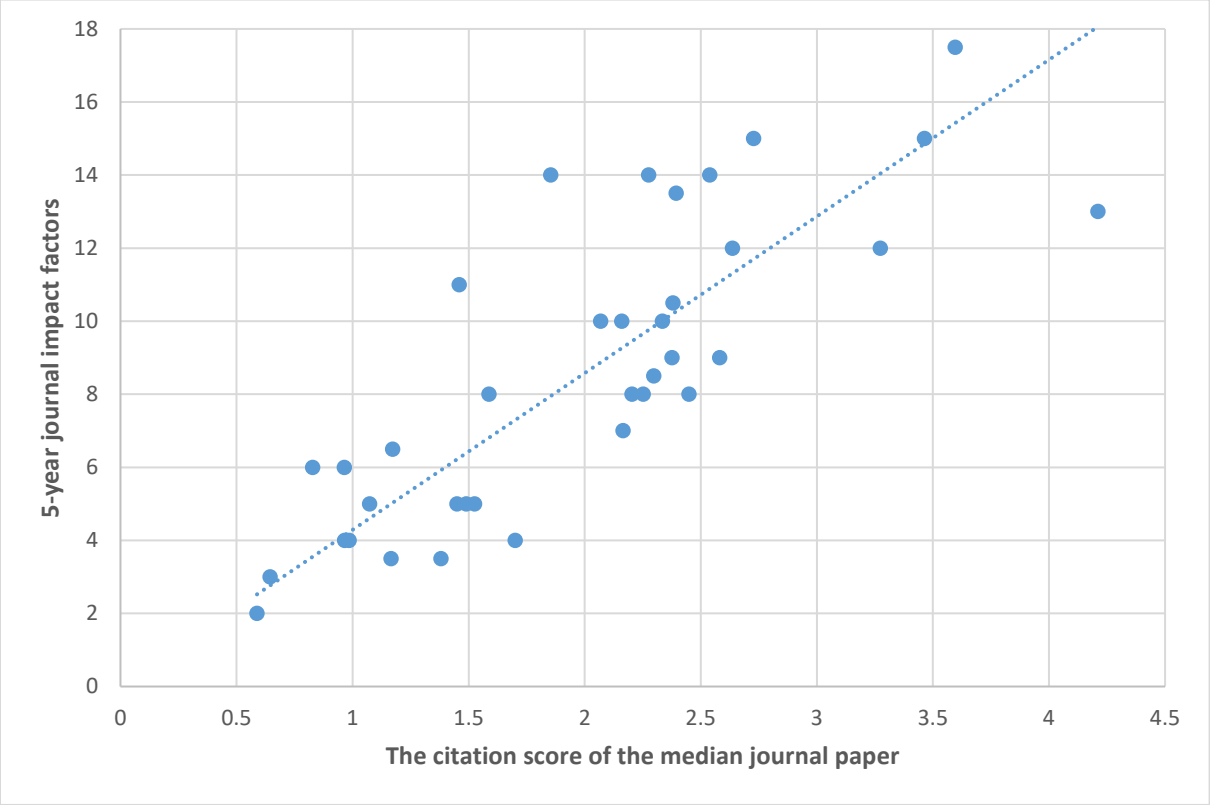

Figure 1
Correlation Between Journal Impact Factor and the Citation Score

Note: Correlation between the five-year journal impact factor and the citation score of the median paper for papers published in 2014 in the ES category.

These data are in agreement with previous literature. For example, it was a similar strong positive relationship (r=0.864) between the 2-yr JIF and the citedness of the median journal paper in a previous study focused on Education and Educational Research (Orbay, Karamustafaoglu & Miranda, 2020). Garfield & Pudovkin (2015) in their study for five different categories also found a very high positive correlation of over 0.9 for the categories in science between the JIF and the median citation of papers published in a journal. On the other hand, they emphasized that the correlation coefficient for the "Information Science & Library Science" category in SSCI was a very strong positive relationship (r=0.879), but it was partially low compared to science fields, for example 0.994 for the “Physics, Condensed Matter” category and 0.990 for the “Genetics & Heredity” category in SCI.
However, the fact that there is a strong positive correlation between the impact factors of the journals and the median citedness of the papers in a journal does not mean that there is no skewness in the citation distributions of the journals. Therefore, this situation was discussed in detail in RQ3.

Table 3 summarizes the correlation values between the impact factor (2-yr and 5-yr) with other bibliometric indicators for the 2014 reference year. As seen in Table 3 and Figure 2, there is a positive correlation (r=0.636-0.718) between 2-yr and 5-yr JIFs and h-index values. In a similar study (Liu, 2020) on the fifty-seven special education journals selected inside and outside of SSCI, it was found that there was a strong positive correlation (Spearman’s rho ρ=0.842-0.865) between 2-yr and 5-yr JIFs and h-index values. This result is also consistent with the present study.

On the other hand, when the quartile groupings of the journals were made separately according to the 5-year journal impact factors and then the 5-year h-index (h5-index) values in 2018, only 20 of the journals (54.05%) remain in the same quartile, while 9 journals go to the upper group, 7 journals fall into one subgroup and 1 journal into two subgroups. While the journals in Q1 and Q4 quartiles are less affected in the rankings, inter-group transitions are mostly seen among the journals in Q2 and Q3 quartiles. Such a trend is in line with similar studies in the literature (Haghdoost, Zare & Bazrafshan, 2014; Nieuwenhuysen & Rousseau, 1998; Pajić, 2015). Although highly correlated, the groupings made according to journal impact factor and h-index values show some differences. One of the main reasons for this difference can be explained by the fact that journals that publish a limited number of articles during the year have naturally low h-index values (Bar-Ilan, 2010; Harzing & van der Wal, 2009). Based on this interpretation, it is observed that there is a strong positive correlation (r=0.723) between the h-index values of the journals and the number of papers published by the journals for the ES category. Eliminating the advantages (disadvantages) caused by the high (low) h-index values for journals publishing a large (limited) number of papers, the h-index values calculated for each journal are divided by the number of papers published by the journals in that period, and the relative h-index values are calculated (Orbay, Karamustafaoglu & Oner, 2007; Rousseau, 2006). In this new case, it is found that there is a moderate positive correlation (r=0.505) between five-year journal impact factors and relative h-index values. This level correlation better explains why groupings made according to journal impact factors and h5-index values show differences.

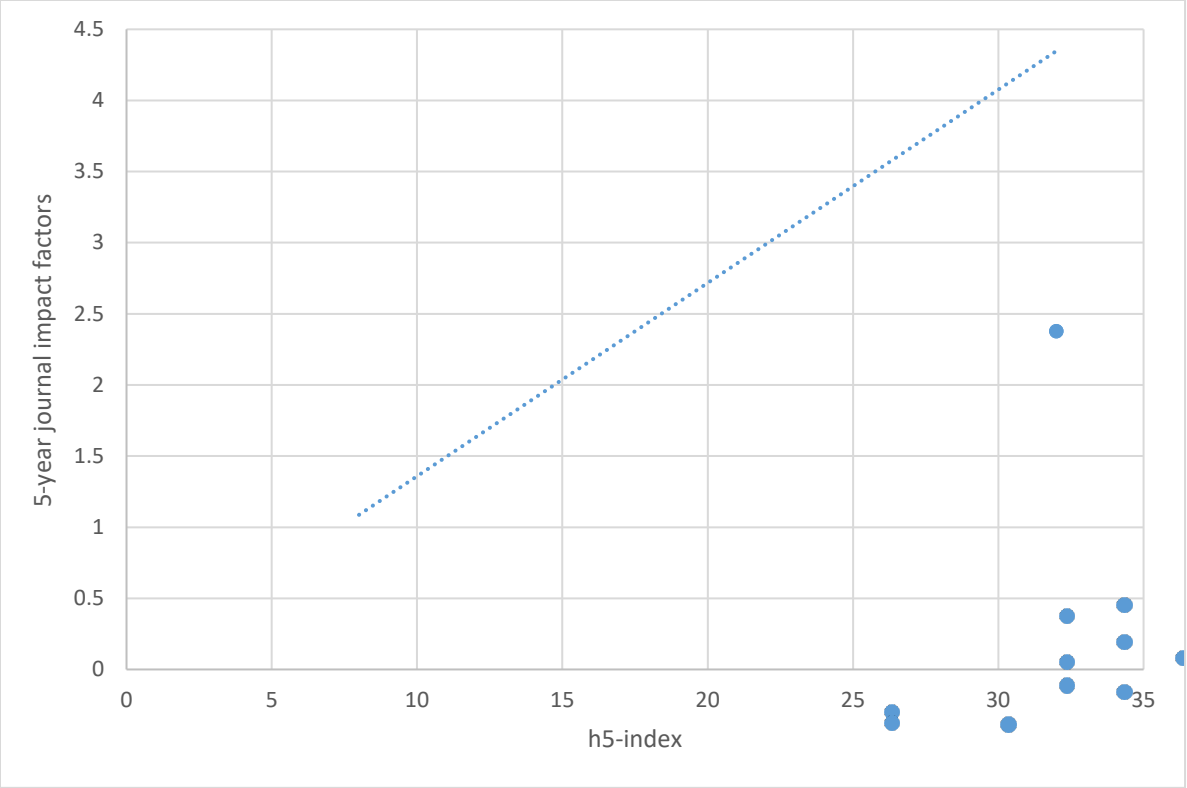

Figure 2
Correlation Between Journal Impact Factor and h5-Index

Note: Correlation between 5-year journal impact factors and h5-index values for the ES category from 2014 to 2018.

Table 3
Pearson Correlation Matrix Among Some Bibliometric Indicators for Published Papers in the ES Category.

Bibliometric indicators	***A***	***B***	***C***	***D***	***E***
A 2 Year journal impact factor-2016	1	0.826*	0.762*	0.829*	0.636*
B 5 Year journal impact factor		1	0.813*	0.854*	0.718*
C The citation score of the median journal paper			1	0.908*	0.586*
D Average citations per paper				1	0.632*
E h-index					1

Note: Significantly correlated when the significance level is set at 0.01 (two-tailed)

Findings and Discussion for RQ3

To study the degree of skewness of the citation distributions in journals, the skewness of the citation distributions by papers published in 2014 in each of the 37 journals was analyzed (citations counted in January 2020). As expected, in all the journals but one "Learning Disability Quarterly" (skewness=-0.176 and kurtosis=-1.032: negative-skewed distribution), positive-skewed distributions were obtained, the skewness ranging from -0.176 to 3.537, which means the distribution of citations in the journals is skewed to the right and has a long right tail. The average value for the 37 journals analyzed is 1.498 (median=1.272). Most of the journals (30 out of 37, 81.08%) have highly skewed distribution of citations (skewness>1), five journals (13.51%) have moderately skewed distributions (0.5<skewness<1) and only one journal "Reading & Writing Quarterly" (skewness=0.492) has an approximate symmetric distribution of citations (skewness<0.5). The degree of skewness of the citations distributions in ES is lower than in Education and Educational Research, according to a previous study following the same methodology (Orbay, Karamustafaoglu & Miranda, 2020). In this case, the average skewness for the 231 journals in the Education and Educational research area was 2.00 (median =1.65). Kurtosis varied from -1.032 to 15.030, with an average value of 2.878 (median=1.267). Meanwhile, as expected, it was found a very strong correlation between skewness and kurtosis (r=0.972) due to the skewness and kurtosis of a probability distribution are not independent. If k is the full kurtosis of a distribution and γ is the skewness, $k \geq 1+\gamma^2$.

As seen in RQ2 section, although there is a clear correlation between the impact factor and the median citations received by the papers, this does not mean the impact factor is the perfect indicator of the expected citations of paper published in a journal as a high skewness in the distribution curves for citations has been observed. Some important deviations in citation rates can still be found in journals having similar JIFs. If we look further in detail the data in Figure 1, we can observe that for several journals having a similar impact factor, i.e. ~ 2.25, the citation score of the median paper varies largely from around 7 to 14.

Another approach to study the skewness of the citations distributions is to analyze the percentage of citations received by the most cited papers, i.e. the top 5%, top 10% and top 20%. Table 4 shows the share of citations received by the most cited papers in the ES category by years in the period 2014-2018.

Table 4
The share of Citations Received by the Top 5%, Top 10% and Top 20% Papers for the ES Category.

Year	2014	2015	2016	2017	2018
5%	20.19	21.29	22.67	21.36	25.46
10%	32.96	33.21	35.12	34.26	40.70
20%	50.88	50.63	53.34	53.33	60.80

As seen in Table 4, the top 10% cited papers receive 35.25% total citations (average in the period 2014-2018). However, the degree of skewness in ES is lower than in other scientific fields, e.g. Albarrán & Ruiz-Castillo (2011) found that, on average in 22 scientific fields, the 9-10% most cited articles account for about 44% of all citations. Similarly, Orbay et al. (2020) found that the 10% most cited papers in Education and Educational Research Area received 41.0% total citations. In this aspect, it is interesting to mention the results from Bornmann & Leydesdorff (2017) who found a decreasing share of total citations received by the top 10% cited papers in a large-scale study in Social Sciences from 75.6% in 1990, to 56.4% in 2000 and 45.1% in 2010. Although decreasing the share of citations received by the top 10% cited papers in Social Sciences, it seems ES has a lower degree of skewness than other Social Sciences research areas.

Meanwhile, it was investigated if there were significant differences in the skewness or kurtosis obtained by different JIF quartiles (Table 5). However, using the Kruskal Wallis test, no significant differences were obtained. Only the skewness and kurtosis from Q2 journals showed a marked different behavior compared to others: the skewness and kurtosis of Q2 journals are significantly lower (1.146 and 0.713, respectively) compared to the average of Q1, Q3 and Q4 (of Q2 journals is 1.611 and 3.56, respectively).

Table 5
The Kruskal-Wallis Test Results for Skewness and Kurtosis among the Journal Quartile in 2014

	Skewness Mean	Kurtosis Mean
Q1	1.604	3.409
Q2	1.146	0.713
Q3	1.631	3.344
Q4	1.598	3.927
Chi-Square	1.624	2.365
p	0.654	0.500

Findings and Discussion for RQ4

Descriptive statistics for the impact factors of journals in the category of ES between 2014-2018 are given in Table 6. As seen in Table 6, the journal impact factors in the ES category increased from 1.154 (median=1.118) to 1.460 (median=1.525) during the studied period.

Table 6
Descriptive Statistics of the Impact Factor for the ES Category from 2014 to 2018.

Year	Paper Count	Average number of references used by papers	M	Me	SD	Max	Min
2014	1523	46.9	1.154	1.118	0.634	2.745	0.239
2015	1304	48.0	1.128	1.071	0.619	2.796	0.197
2016	1293	48.9	1.222	1.206	0.571	2.714	0.412
2017	1274	48.1	1.361	1.186	0.631	3.340	0.500
2018	1289	49.1	1.460	1.525	0.663	2.854	0.447
	Overall	***48.2***	***1.265***	***1.221***	***0.613***	***2.890***	***0.359***

Note: M=Mean, Me=Median, SD=Standard Derivation, Max=Maximum, Min=Minimum

In a similar study (Togia & Tsigilis, 2006) for the ES category, covering the period 2000-2005, it was observed that the journal impact factor increased from 0.643 (median=0.617) to 0.793 (median=0.655). If we consider the previous study (Togia & Tsigilis, 2006) and the current study together, the journal impact factors of journals in the ES category have increased approximately twice. This is actually expected because the journal impact factor can vary depending on the field characteristics and time, which are good arguments to use journal quartiles instead of the absolute value of JIF. This is called journal impact factor inflation (Althouse, et al., 2009). The main causes for this factor inflation are the following: the growth of the field, the growth in the average number of citations used per paper or the lower average citation age, the increase in the collaboration with other disciplines, the increased rate of citation for journals included in the WoS database, the increase in international collaborations and the increase in the number of authors of a paper are the main factors (Althouse, et al., 2009).

One of the main reasons for large JIF increase with time is usually the field growth, however, the JIFs in ES category increased largely even the number of the papers indexed in the category decreased significantly (15% decrease, from 1,523 to 1,289). To explain this behavior, it is important to comment that the ES category has a very close relationship with other disciplines. In fact, only 7 of the 37 journals in the ES category are only in the ES category (18.9% of journals), while 22 journals are in two (59.46%), 7 journals are in three (18.92%) and 1 journal in four categories at the same time (2.70%). ES category is related to 8 different categories, especially the following three: Rehabilitation, Psychiatry, and Psychology-Developmental categories. In fact, if we consider the subject categories of the citing papers to papers of SE area, it was found that only 22.79% were from Education Special area but 23.60% papers from Rehabilitation category, 13.11% from Psychology Developmental, 12.40% from Education and Educational Research, 8.66% from Psychology Educational and 8.57% from Psychiatry. If we study the increase in the number of papers published in these areas, the increase in the number of articles and reviews increased largely from 2014 to 2018: a 12.94% in Rehabilitation, 24.95% in Psychology-Developmental, 27.20% in Education and Educational Research, 27.34% in Psychology Educational and 30.05% in Psychiatry. This is a strong argument supporting the increase in the citing sources to papers published in ES area and thus, the field growth, despite the number of papers published in ES category decreased from 2014 to 2018.

Other factor contributing the JIFs increase could be the increase in the number of references (citing sources) for the papers published in the area. In this sense, after examining the JCR and

the WoS data for the ES category, we can observe that the average number of references used by papers increased only slightly, from 46.9 in 2014 to 49.1 in 2018. Another factor explaining this behavior could be an important increase in open-access papers published in the area was observed. If only 2.13% of the papers of the SE area were published as open-access in the period 2000-2005 (Togia & Tsigilis, 2006), the share of papers published as open-access increased to 16.09% in the period 2014-2018. And it is a well-known fact that papers published as open access are more cited than regular papers (restricted access) (Piwowar et al., 2018; Swan, 2010).

Another well-known factor increasing the number of citations received and thus the JIFs is the international collaboration. The international cooperation rate, however, maintained almost constant in the period 2014-2018. The international collaboration for the 10 most productive countries was 36.96% in 2014, 38.06% in 2015, 38.82% in 2016, 33.77% in 2017 and 36.61% in 2018 (average 36.56% in the period 2014-2018).

Similarly, the fact that team studies come to the forefront rather than individual studies in education researches also influences increasing the journal impact factor. A scale that can be counted as an important criterion of teamwork is the number of authors in the researches. Henriksen (2016), in his research covering the sub-disciplines of social sciences, found that researches in the field of special education were published as two authors between 1980-2005 and three authors (median value) since 2010-2013. As a result of our examination for the 2014-2018 range, the average number of authors and median values per paper are given in Table 7. As seen in Table 7, the average number of authors in the ES category has reached the limit of four authors. Therefore, we can say that the lone scholar in the ivory tower is a rare phenomenon in the special education field, as well as observed in most areas of Social Sciences (Ossenblok, Verleysen, & Engels, 2014).

Table 7
The Average and Median Number of Authors Per Paper for the ES Category.

Year	**2014**	**2015**	**2016**	**2017**	**2018**
Average Author Count [Median]	3.79 [3]	3.87 [4]	3.86 [3]	3.79 [3]	3.88 [3]

The changes in the journal self-citation rate of the journals in the ES category between 2014 and 2018 were analyzed and it was observed that this rate had significantly decreased from 14.20 (median=12.05) in 2014 to 10.54 (median=8.50) in 2018. Descriptive statistics values for the period 2014-2018 are given in Table 8.

Table 8
Descriptive Statistics of the Journal Self-citation Rates for the ES Category from 2014 to 2018

Year	**M**	**Me**	**SD**	**Max**	**Min**
2014	14.20	12.05	11.14	46.17	0.00
2015	16.52	14.61	13.43	62.18	0.00
2016	14.16	13.16	11.59	55.86	0.00
2017	11.78	9.70	7.06	26.69	0.00
2018	10.54	8.50	8.51	34.97	0.00
Overall	***13.44***	***11.60***	***10.35***	***45.17***	***0.00***

Note: M=Mean, Me=Median, SD=Standard Derivation, Max=Maximum, Min=Minimum.

The trend analysis method (Tolmie, Muijs, & McAteer, 2011) is used to determine whether there is a special form of journal impact factors and journal self-citation rates increase or decrease in the ES category. As a result of the investigations, it was found that the journal impact factor tended to increase linearly ($F_{1,36}$ =20.706, p<0.001, η^2=0.365), while the journal self-citation rate linearly decreased ($F_{1,36}$ =8.361, p=0.006, η^2=0.188) for the ES category during that period (Significance level p=0.05 and Confidence Intervals-CI are 95%).

It is generally desirable that impact factors should not excessively fluctuate from a year to another one (Aguillo, 1996; Glänzel & Moed, 2002Smart, 1983; Pajić, 2015; Sutter & Kocher, 2001; Togia & Tsigilis, 2006). In previous study, Smart (1983) focused on education journals, utilized Pearson's correlation coefficients in order to estimate such fluctuations and found the impact factor was stable. However, from a technical point of view, the use of Pearson correlations coefficients for quantifying such fluctuations may not be appropriate due to the fact that yearly impact factor datasets are longitudinal, hence, yearly observations are nested within the previous year's observations (McGraw & Wong, 1996). As an alternative method of quantification, McGraw & Wong (1996) suggested using intraclass correlation coefficient (ICC) that is a quantity which shows the level of agreement among observations. This quantity may take values between 0 and 1: the highest values (close to 1) being preferred. Values less than 0.5 are indicative of poor reliability, values between 0.5 and 0.75 indicate moderate reliability, values between 0.75 and 0.9 indicate good reliability, and values greater than 0.90 indicate excellent reliability (Koo & Li, 2016).

Journals in ES category had an ICC estimate of 0.755 (95%CI=0.632 to 0.852) for their impact factors over time, meaning that journals in this category had stable impact factors. On the other hand, Togia & Tsigilis (2006) evaluated the stability of impact factors of ES category journals for the time interval of 2000 and 2005, and they estimated the ICC as 0.640 (95%CI=0.471 to 0.802) which indicated that there were more fluctuations at the ES category journal impact factors at that time.

With the same logic, research could examine the stability of self-citations over time. The results of this study indicated that the ICC estimate for the self-citations was 0.516 with a 95% confidence interval of (0.369, 0.669). A stable self-citation over time would be more desirable. In fact, it may not be possible due to the fact unique researcher self-citation behavior as well journal specific editorial policies may have systematic impact on that ICC.

Conclusions

In recent years, academic journals have started to become the primary communication instrument among researchers in social sciences and taken a central role in constructing, disseminating, and using the knowledge. In academic specialties such as education research, many stakeholders in the profession have an interest in reliable and accurate measurements of the quality of academic journals. Therefore, bibliometrics are often used to guide readers, academic institutes and researchers to analyze academic excellent of research and individual journals. A number of bibliometric indicators has been developed but none of them has gained enough popularity to become a real alternative factor to the journal impact factor. Thus, the journal impact factor is the most used indicator in determining of prestige, reputation, and quality of the academic journals.

For this reason, it was necessary to carry out a comprehensive study of the JIF and JIF quartiles in the area to predict the expected citations of a paper published in a journal and compare the main strengths and limitations of this indicator in comparison to other related areas.

First, the production of papers for ES category by journal quartiles was studied. It was found that high impact journals (Q1) publish more papers than expected (55% total papers), whereas low impact factor journals (Q4) publish less papers than expected. The share of papers published in Q1 journals is slightly higher than in Sciences but much higher than in Social Sciences. Q1 journals published papers with higher average citations per paper and lower uncitedness rates, however, the differences among quartiles are lower than in other research areas. In addition, it is found that the share of self-citations among journal quartiles are almost on the same level and there is no significant relationship between the impact factor and the journal self-citation ($r=0.005$, $p>0.05$).

The impact factor is strongly positive correlated ($r=0.854$: for 5-year JIF) with the citedness of the median journal paper and with the journal h-index ($r=0.718$ for 5-year JIF). Even the journal self-citation rates and the degree of skewness of the citations distributions in ES area is lower than in other research areas, the JIF is still far to be the perfect indicator to predict the citations of a paper. In fact, it was found that citation distributions over 80% of special education journals exhibit high degree skewness (skewness>1) without significant differences by journal quartiles.

Within only five years (2014-2018), the impact factor of the special education journals increased 26.52% (from 1.154 to 1.460), even the number of papers published in the area decreased 15%. Although the growth of collaborative works and open access can have an influence, the main factor explaining this fact seems to be the strong interaction of ES are with other research areas. As commented earlier, only 22.79% of citing papers to papers published in the ES area were from journals indexed in SE area. In these related areas, the number of papers published had increased 25-30% in the period 2014-2018, which justify the increase in citing sources and field growth, even the number of papers indexed in ES category decreased.

To understand the relative rank of the journals in the ES category, intraclass correlation coefficients were calculated for journal impact factor and self-citations, which demonstrated the impact factors remained relatively stable (no changes in the journal rank by quartiles), but the change of self-citations fluctuated.

The bibliometric findings for the ES category may be useful to enrich the discussion about the journal-based evaluation system and debate whether the use of journal quartiles is appropriate for comparisons among researchers. The validity and usefulness of impact factors depend largely on the research area. According to the presented results, in ES area, the journal self-citation rates and the skewness of the citations distributions are lower than in other research areas. Although the JIF is still not the perfect indicator of expected citations, and despite its limitations, the use of journal impact factor is probably the first stage to start using bibliometric tools to provide objective and consistent assessment of researchers in countries or research areas with less experience in evaluating the science and researchers.

Limitations

We are aware that this study has a few limitations. First, because of the comprehensive coverage of special education which covers emotional, cognitive, behavioral, or physical disabilities and intellectual giftedness, this study only examined the ES category journals in the SSCI which all of them are in English language. Important special education journals in other languages (such as German, Chinese and French) are not included. Second, we analyzed only "articles and reviews" published in the ES category journals (these two document types representing 88.86% total publications), since we think that the dataset predominantly represents the industry standard, even so other datasets are emerging. Finally, bibliometric indicators based on citation number are time-dependent indicators and can change over time.

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Experiences of a Student with Learning Disability in Science: Supporting Students to Enhance Learning

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Abstract

Most students with disabilities in the United States receive science instruction in general education classrooms; however, little is known about the academic success for students with learning disabilities (LD) in these classes. This case study takes place in an inclusive science classroom that used an inquiry approach to learning science and reports on the experience from the perspective a 6th grade student with LD. Data was collected over the course of a science unit and data sources included student and teacher interviews, observations, and student portfolio documents. Results indicated that the student acquired science content and process knowledge but struggled to demonstrate the knowledge gained. Implications for classroom practices to support students with LD include that science teachers must utilize an array of performance measures to accurately assess students' science knowledge and utilize supports, including peer supports, in inclusive science classrooms to further engage students in science inquiry-based instruction.

Keywords: *special education; inclusive education; curriculum and instruction; science*

Experiences of a Student with Learning Disability in Science: Supporting Students to Enhance Learning

Science education affects everyone; even individuals whose work in the future takes them outside the field of science (NRC, 2012). Students demonstrate an understanding of how the world works by absorbing new information and applying this knowledge to future experiences (Scruggs, Mastropieri, Berkeley, & Graetz, 2010). With the rise of educators and policymakers supporting equal education for all students and a stronger emphasis in Science, Technology, Engineering and Mathematics (STEM) (Baker, 2009), it is increasingly important to understand how to support all students, including students with learning disabilities (LD), in science classrooms.

Science Education and Inquiry

The Next Generation Science Standards (NGSS), stands as a guide for science curriculum, instruction, assessment, and professional development for science teaching in the United States (US) (NGSS Lead States, 2013). These standards strongly support the use of inquiry in science education, which is largely different than practices often observed in traditional US science classrooms that often include passive teaching through textbooks and lecture-based instruction.

Inquiry can take on many forms within a science classroom. Open inquiry is described as pure student discovery with no teacher guidance (Watt, Therrien, Kaldenberg & Taylor, 2013), whereas structured inquiry allows students to engage the thoughts and practices of a scientist while still receiving instructional support (Watt et al., 2013). Support provided through structured inquiry allows for student misconceptions, if any, to be addressed at their onset, rather than allowing students to get too deep in the investigation (Therrien, Taylor, Hosp, Kaldenberg, & Gorsh, 2011). The change from traditional instruction to inquiry-based science instruction in US science classrooms means the focus is not on rote learning, but rather the exploration of science in practice (NGSS Lead States, 2013).

Students with LD and Science

Students with LD in the US have demonstrated academic difficulty in science, especially at the middle school level (NAEP, 2011). This may be due to the diverse demands science curriculum places on cognitive performance (Brigham, Scruggs, & Mastropieri, 2011). Researchers note that difficulty in inductive and deductive thinking, inherent in scientific reasoning, might hinder the academic achievement of students with LD in science (Mastropieri, Scruggs, Boon & Carter, 2001). In addition, acquiring science content knowledge, especially vocabulary, is difficult for some students with LD, even when engaged in activities-oriented learning (Scruggs, Mastropieri, Bakken, & Brigham, 1993). Furthermore, characteristics such as difficulty with spoken or written language and completing math calculations, typical of students with LD, may pose a challenge for students during scientific investigations (Brigham et al., 2011).

As science instruction moves from passive instruction of textbooks and lectures to inquiry-based instruction, it is important to consider the needs of students with LD. Science instruction conducted through inquiry-based experiences, adapted practice and review provide beneficial instruction that may allow students with LD the opportunity to close the achievement gap between general education students (Mastropieri, Scruggs, Mantzicopoulos, Sturgeon, Goodwin, & Chung, 1998). These approaches to science instruction often interact with the strengths of many students with LD (e.g., learning through experience and concrete examples) and de-emphasizes relative weaknesses (e.g., independent study from text) (Scruggs et al., 2013). Supporting the needs of students with LD is imperative to ensure students experience meaningful investigations, connect investigations to previous and future science activities, and understand the association between investigations and core science concepts (NRC, 2012).

Purpose of Study

Although the inclusion of students with LD in general education classes is rising in the US, especially in science classrooms, supports for students with LD are not frequently provided and there is concern regarding *how* and *if* they truly access the curriculum (Artiles, Kozleski, Dorn, & Christensen, 2006). Few researchers have studied the acquisition of science knowledge in inclusive settings by students with LD (Jimenez, Browder, Spooner, & Dibiase, 2012). Furthermore, research is needed to learn how students with LD engage in inquiry-based instruction in science classrooms, particularly given that science has been notably challenging for students with LD (Brigham et al., 2011). Thus, the research addressed in this article examined the experiences of a middle school student with LD, as he acquired science process knowledge related to three specific dimensions of inquiry including (a) asking questions and defining problems, (b) planning and carrying out investigations, and (c) analyzing and

interpreting data, through inquiry-based instruction in an inclusive science class. Additionally, we looked at how the student engaged with the curriculum to acquire science process and content knowledge, and the strategies he and his teachers used to facilitate his understanding.

Methods

This case study took place in a US middle school in a large metropolitan area that had a diverse population of about 700 students where about 65% of students were from underrepresented racial/ethnic groups and 53% came from low income households. School demographics included students with limited English proficiency (8%) and students with disabilities (14%). The case study reported here was conducted in the paradigm of qualitative inquiry using a case study design (Yin, 2018) and took place in the context of a larger research project (author, 2018).

The Context

This case study occurred in one public school where the researcher has had extensive interactions with the school. The school was intentionally selected for the following reasons: (a) the school adopted a curriculum that utilizes inquiry-based instruction, (b) all science teachers receive professional development through the district on implementing science curriculum, and (c) inclusive science classroom practices included the use of special education supports for the duration of the class period on a daily basis. Mrs. Vargas's inclusive science class which consisted of 26 students including three students with disabilities was selected for this study after she volunteered to be part of the research (author, 2018). Ms. Vargas was a certified 6^{th} – 12^{th} grade science teacher and was in her fourth year of teaching. A special education paraprofessional, Ms. Brewer, was present daily for the full duration of the period to provide additional support for students with disabilities in the classroom.

Ecology unit. The case study started two weeks into the school year as Ms. Vargas was beginning an ecology unit. Students engaged in life science throughout the duration of the nine-week unit. Ms. Vargas noted students should be able "to describe how the complex interactions between everything that's living and non-living in the world affect each other and how any small change has a great impact". The beginning of 6^{th} grade demonstrated a clear change in science instruction given the increased rigor of the Next Generation Science Standards (NGSS) and the change from elementary to middle school, where science tends to be conducted in a lab setting. Ms. Vargas explained the ecology unit was placed at the beginning of the year to allow for lessons outdoors exploring the environment. She also noted that in years past, the unit lasted only three weeks. Due to the newness of the science standards, the school provided time for individual grade level science teachers to meet with a professional science consultant to create a detailed unit aligned to the NGSS. Once Ms. Vargas worked to align the ecology unit to the NGSS, adding several inquiry lessons, the unit became a total of nine weeks. Four completed inquiry investigation lessons (see Figure 1) were discussed in depth during student interviews.

Figure 1: Highlighted Lessons

Highlighted Lessons	**Evidence**			
	Lesson Objective	*Asking Questions and Defining Problems*	*Planning and Carrying Out Investigations*	*Analyzing and Interpreting Data*
Forest Preserve Field Trip	Conduct a true authentic science investigation.	Students explored the forest and identified 10 questions. List was narrowed to one testable question.	Students identified an area of the forest to conduct the investigation.	Students created a data table and graph. Then determined an answer to their question.
"Oh Deer!"	Simulate carrying capacity along with limiting factors for a deer population.	What happens to a deer population as the population increases and it has limited resources, and what happens as those resources run out?	Students were divided into two groups, deer and resources. Students chose a symbol (e.g., food, water or shelter). "Deer" students found a "match" among the resources. Deer who did not find a match became a resource.	Students graphed data and answered questions about the increase and decrease in population over time. Data was then compared to data in a real-life deer population to see if their experiment matched what happens in nature.
Courtyard Ecology	Conduct an exploratory study to understand the terms "biotic" and "abiotic"	What is living or used to be living? What is non-living?	Students explored the courtyard and completed a data chart.	Data was categorized as (a) living or once was living, and (b) non-living.
Children's Book Assessment	Assess student's ability to answer scientific questions by analyzing data.	Students should describe: (a) What is happening in the animal populations at that time? (b) Did the animals have anything to do with each other's populations? (c) Why are the populations rising and falling?	Investigation was not conducted. Students were given a real graph of data from the Wolves and Moose of Isle Royale, an island off of Lake Superior.	Students analyzed a graph of two animal populations

The Case

Of the students who agreed to participate in the larger study, Jonas was selected for the student case study since he qualified for LD in multiple areas, thus potentially yielding the most influence on the understanding of science process knowledge development (Patton, 2014). At the start of his 6th grade year, Jonas, a Latino, was almost 12 years old. He began his schooling in Pre-K at a public school in a large metropolitan city in the US. Since his parents at that time noted that Jonas spoke Spanish at home and English at school, Jonas was tested in kindergarten using the World-Class Instructional Design and Assessment; however, it was determined that English language learner services were not necessary. Records show that Jonas was enrolled in this school from Pre-K through April of his 4th grade year when he became eligible for special education services, just prior to his family's move out of the district. In May of his 4th grade year, Jonas was enrolled in an elementary school in his current school district. His attendance remained consistent, only missing one day of school during 4th grade, however there was a spike of 12 absences during his 5th grade school year. School report cards in 5th grade highlighted Jonas's difficulty with spelling, grammar, sentences, reading fluency, and work habits including following directions, organization, listening skills and self-control. Jonas's most recent assessment scores are shown in Table 1.

Based on his state Standards Achievement Test (SAT) and Reading Curriculum-Based Measurement (R-CBM) scores, it is evident that Jonas struggled in the area of reading. According to the Measure of Academic Progress (MAP) test, Jonas's reading Lexile was 550-705L. While his reading MAP score fell in the average range, which is a typical score for Jonas based on historical scores, this test differs from the others as it is untimed. Math achievement scores also indicated academic difficulty.

Table 1
Jonas Achievement Scores

Assessment	Score	Range
AimsWeb R-CBM (Reading Fluency)	< 10th Percentile	Well Below Average
Measure of Academic Progress (MAP)		
Reading	30th Percentile	Average
Math	2nd Percentile	Well Below Average
Standard Achievement Test (SAT)		
Reading	160	Below Standards (160-206)
Math	186	Below Standards (175-216)

Jonas qualified for special education services due to a Specific Learning Disability in the areas of reading fluency, written expression, math calculation and math reasoning. According to his most recent Individualized Education Plan (IEP), Jonas received 1,004 minutes of special education services per week. His educational placement included an inclusive general education setting for 89% of his day. However, Jonas received special education services for 57% of his school day as some of Jonas's classes were co-taught by a special educator. In order to support Jonas throughout the school day, he received preferential seating, tests read aloud, a calculator, and help with organization.

Data Collection

The science curriculum centered on understanding the "big picture" rather than the memorization of specific facts (Scruggs et al., 2013). The NGSS recommends *multiple means of action and expression*, a guiding principle of Universal Design for Learning (UDL) (CAST, 2011), to assess students' acquisition of science knowledge (NGSS Lead States, 2013). To address this need, multiple instruments were used for data collection including (a) student portfolios, (b) observations and (c) interviews. All data was collected over a period of three months at the start of the school year.

Student portfolio. As a part of the classroom's science curriculum, students engaged in inquiry-based instruction and participated in several lab investigations to explore Ecology. Student portfolios were a collection of documents turned in for credit and served as evidence of Jonas's learning. Documents included homework, classwork, labs and assessments. Jonas's completed work was collected every two weeks for review by the researcher. Artifacts were reviewed for evidence demonstrating the three dimensions of inquiry (i.e., asking questions and defining problems, planning and carrying out investigations, and analyzing and interpreting the data) to demonstrate Jonas's science process knowledge.

Observations. Jonas was observed every two weeks in his science classroom throughout the nine-week science unit (n = 4). The researcher acted as an observer and did not interact with the students in any way throughout the full 55-minute period. Observations consisted of detailed notes of classroom happenings and focused on Jonas's interactions with the science material in the classroom.

Student interviews. Jonas participated in three interviews, each lasting approximately 15-20 minutes. All interviews were digitally recorded and were conducted during a non-academic period. The first and second interviews were conducted three weeks and six weeks into the nine-week unit. Questions focused on strategies Jonas used to learn information in class and the effort Jonas felt he put into learning the material. Specific classroom artifacts were shown to Jonas to allow him to recall particular lessons, address his thoughts on learning lesson objectives, and demonstrate knowledge of the three dimensions of inquiry focused on during the unit. The final interview took place after the unit's conclusion. Similar to the first two interviews, questions addressed strategies, effort, and classroom artifacts. Additionally, Jonas was questioned on his preferred strategies or practices used by the science teacher, ability to comprehend science content, and how he engaged in the science curriculum.

Educator interviews. Ms. Vargas, Jonas's teacher, participated in two digitally recorded interviews lasting about 25 minutes. Prior to the unit, questions regarded her goals and objectives for student learning, method of support utilized in their classroom, and accommodations and modifications required by Jonas's IEP. The interview also asked about Jonas's strengths and weaknesses that may have an impact on his learning and how she planned to address these potential concerns throughout classroom instruction. Ms. Vargas also participated in a second interview at the end of the study that had her debrief about her teaching including what went well and what she would have changed, how she felt Jonas was supported in the classroom, and her interpretation of Jonas's performance and science process knowledge gained throughout the unit.

Data Analysis

Codes involving the three dimensions of inquiry were pre-determined, whereas the remaining codes emerged through data analysis. Yin (2018) recommends starting analysis with a small question, identifying evidence to address the question and draw tentative conclusions. Using the pre-determined codes for knowledge of inquiry, a small question was asked about Jonas's knowledge of inquiry (e.g., Can the student ask a scientific question?). Evidence among all data sources that addressed the question was collected onto a data analysis matrix. This process was then repeated for the student's ability to plan and carry out investigations and analyze and interpret data.

Once evidence was collected on the student's knowledge of inquiry, a descriptive approach was used in the identification of causal links to assist with the analysis (Yin, 2018). Emerging topics from the data were considered to be potential causal links to student's knowledge of inquiry and addressed student's engagement in curriculum and strategies used in science classrooms. Themes were placed on the data analysis matrix for continued analysis. Conclusions were drawn to gain an overall sense of Jonas in a science inclusive classroom.

Several methods were used to ensure the reliability of themes that emerged from the data. First, multiple interviews were conducted with the student and educators in an effort to ensure reliable data through building trust with the participants. Second, triangulation of interviews, observations, and student portfolio documents served as a verification process built into data collection (Miles et al., 2013). The use of multiple sources of data is a strength in case study research as it provides the researcher the opportunity to identify converging lines of inquiry (Yin, 2018). Third, a second coder ensured reliability of coded data. Code definitions became clearer and more refined through the process of code-checking (Miles et al., 2013). Finally, in order to ensure instruction was not influenced by observational notes, yet still gain insight into what happened during observations, educators engaged in member checking observation field notes once all observations were completed.

Results

The case study findings are organized into three themes that emerged from the data: (a) knowledge of inquiry demonstrated through the three dimensions of inquiry, (b) engagement in the curriculum, and (c) strategies used during science.

Knowledge of Inquiry

Due to Jonas's difficulty with organization, student portfolio documents do not always display knowledge of inquiry as several assignments were never turned in. This is reflected in Jonas's grade for the unit as he earned a 52% F. Ms. Vargas expressed concern in her interview, "He has great ideas and he knows a lot about the topics, but when it came to actually getting it out on paper, there was a lot of wasted class time." However, in speaking with Jonas, he was able to verbalize more knowledge than his work revealed. Ms. Vargas noted this discrepancy:

> He had a ton of background knowledge. I think he really does have a firm grasp of these relationships. I don't know that all of his work shows it, but in conversations with him and hearing his conversations with other students and with myself, he does seem to have a firm grasp on [inquiry].

Asking questions and defining problems. Evidence showed Jonas's ability to ask scientific questions was inconsistent. When reflecting on the forest preserve field trip during his interview, Jonas was able to state his question, "Is there more bugs on tree stumps, or is there more bugs in plain grass?" In another lesson, "Oh Deer!", Jonas was absent when students participated in the inquiry activity. Jonas's absence may have impacted his understanding of the lesson as he was unable to identify a question the class was trying to answer or describe the investigation process. Written assessments showed similar discrepancy of Jonas's knowledge. Given Jonas's eligibility for a learning disability in the area of written expression, this disconnect may be due to Jonas's difficulty expressing himself through writing. For example, Jonas was unable to identify a scientific comparison question on his classroom-based assessment. Students were asked to write a testable scientific comparison question and Jonas responded "Wath is wather made up uv [What is water made up of]?" While this question is testable, it lacks a scientific comparison.

Planning and carrying out investigations. Planning and carrying out investigations revealed similar discrepancy. Jonas described how he planned and carried out his forest preserve investigation to answer his scientific question, "We looked at both areas [tree stumps and plain grass]. There was a bunch of fallen logs, so we flagged that area out with our team marker, and we saw - we looked for bugs." While Jonas provided detail for how he carried out the investigation, he described a struggle with the aspect of planning out the investigation by sharing, "To tell the truth, we just grabbed random stuff and just started measuring." Given Jonas's absence during the "Oh Deer" investigation, evidence was not collected on his ability to plan and carry out the investigation.

Analyzing and interpreting data. While evidence showed Jonas demonstrated the most success with analyzing and interpreting data, some discrepancy was still evident. Jonas was able to analyze and interpret the data he collected in the forest, "Our count for the logs were 19 [bugs]. Our count for the grass was 24 [bugs]. We decided that grass had the bigger majority." Similarly, Jonas was able to discuss the "Oh Deer" data. He explained, "I wasn't here for the game, but I took a shot in the dark and ended up making the shot. I guess it was pretty spot on. I did copy the number of deer per round." Jonas described his process after the data was collected, "We made it into a graph of years, and by years, I mean rounds. The number of deers for each year in each round goes up and down. Goes up, down, up, down, up, down, down, then it goes back up."

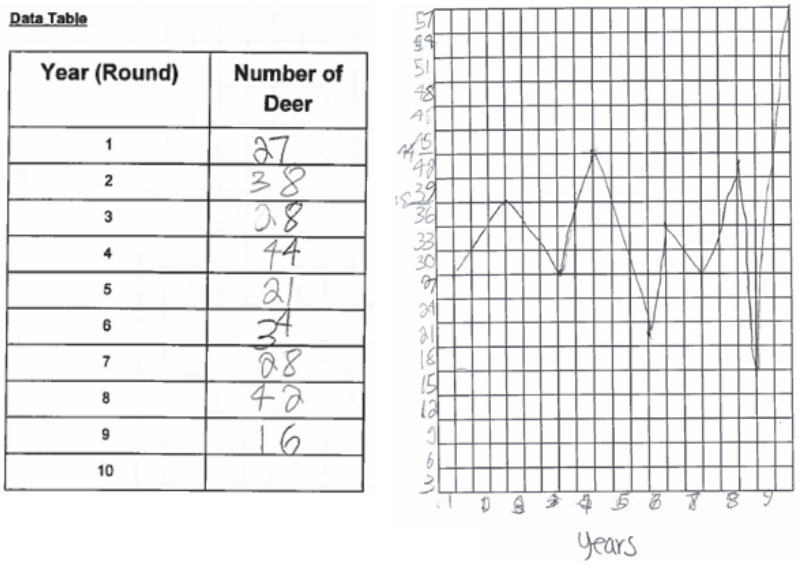
As shown in Figure 2, Jonas used the number of deer counted in each round of the "Oh Deer" lesson, to create a graph. He further explained that this means the deer population is increasing and decreasing due to the resources available to the deer.

> The number of resources that there are. Deers need grass, so they have to have grass, water and sunlight to survive. The resources were getting lower and lower and lower and higher and higher and higher round to round.

However, Ms. Vargas described some difficulty with Jonas's ability to interpret the data. "[Jonas] did really nice and understood-demonstrated- that knowledge on the right-there, relating directly to the lab questions. Then when it had to compare the two [inquiry and real-life deer

populations] he got a little confused." Furthermore, Jonas did not demonstrate proficiency with analyzing data on his classroom-based children's book assessment. Ms. Vargas noted, "Jonas had a really good storyline and was really interested in telling me about whales and squid. He did not include any data from the graph." Jonas noted his lack of completion of the assessment, "As a matter of fact, I didn't really get to finish the book because I had limited time, so I submitted what I had left. What I had done."

Figure 2. Jonas "Oh Deer" Artifact



Data Table

Year (Round)	Number of Deer
1	27
2	38
3	28
4	44
5	21
6	34
7	28
8	42
9	16
10	

Engaging in Curriculum

Jonas continued to demonstrate difficulty with the curriculum throughout the unit. When asked if there was anything challenging for him in the unit, Jonas acknowledged "Keeping up" was difficult and that a slower pace would be helpful for his learning. He noted that his homework was completed, from "time to time." Furthermore, Jonas did not identify ways to overcome challenges in science. When asked "If something is challenging, what would you do?", Jonas replied, "Out of sight, out of mind, I always say."

Ms. Vargas noted Jonas's difficulty with the science curriculum, "He understood/demonstrated that knowledge on the right-there, relating directly to the lab questions. Then when it had to compare the two [populations], he got a little confused." Observations also showed Jonas's difficulty with the curriculum. Throughout each class period, Ms. Vargas checked in with the class, "Show of hands: If I show you an example could you write down an example of population?" Jonas was observed to half raise his hand showing his uncertainty in his knowledge.

Jonas's also showed difficulty with curricular vocabulary. For example, Jonas was unable to verbally define ecosystem, "It's where a large group, a community, but its different ecosystem than what it was before. It could have been plains, trees and all that there. Here I specified and said like a forest biome type of thing." He even had difficulty pronouncing the vocabulary. In discussing the term "predation," Jonas stated, "Preda – predatin – augh, I can't say these words.

Predator?" When discussing vocabulary further Jonas's difficulty continued to appear, "This one's supposed to mean – I just got confused. I think I might have made a mistake. I think commensal [commensalism] – wait, okay, my mind just got blown in 22 million pieces." When presented with assignments related to vocabulary, Jonas found ways to gain credit without understanding the content, such as counting the number of letters needed on a worksheet and guessing.

In the Ecological Relationships lesson, students watched videos of animals in their natural habitat through National Geographic's "Critter Cam". While Jonas acknowledged the help of visuals to support his learning, he noted the challenge of abstract content. When asked "Is there anything that would help you learn the information better?" Jonas responded, "Unless you have a free pass to California or Florida or something to go explore whales and octopuses and squids." This response is in line with documents from student portfolios indicating Jonas's low scores on artifacts where Jonas engaged in abstract activities.

Strategies Used in Science

Student strategies. When asked directly, Jonas was unable to identify strategies he used in science class. However, throughout his interview, Jonas described strategies he used for learning in the science classroom. When asked, "What have you found helpful in learning the material?", Jonas acknowledged, "My peers. Sometimes I ask them, 'Wait, what?' They help me respond, talk to me about what's going on." Peers also provided Jonas support in structuring their lab groups. Jonas explained his group's strategy of role assignments for each lab, "Everybody got a role. Everybody did something in particular. We all decided, 'Who wants this? Who wants that? Who wants to do this? Who wants to mix that?" Jonas continued to describe his experience working with peers, "We've done a lot of activities and group work. [Ms. Vargas] sometimes lets us pick our own partners, so I know exactly who I should be with and who not to be with. I just have a good sense of what to do." Jonas then described his decision in selecting a partner in class, "Every time she lets us be with one person, I pick a random person. I know [Brittany], she's bossy, but she's a hard worker. [Jimmy] and I are in the same class. We're, I won't say slackers, but more like we work but we get off track from time to time." When explaining this difference in partners, Jonas noted that his partner selection often depends on his motivation to complete work on a given day.

Technology was as a strategy that Jonas noted he used as a way to access supports he needed. While Jonas completed his homework independently, he shared "From time to time I text Ms. Vargas on Canvas to ask her questions." Canvas is a Learning Management System the school uses for all teachers and students to teach, learn, and communicate electronically. Observations showed Jonas used his iPad frequently in class. When given the option to use paper or an iPad, Jonas selected using his iPad for daily lessons.

Teacher strategies. While Jonas received some help, support from teachers on each task was no more than given to all other students. When asked what IEP accommodations were used to support Jonas, Ms. Vargas noted support outside of the classroom, "I checked in with him a lot. He is in the Homework Club so I gave him pretty specific directions on, 'Here's what I want you to complete today.' He didn't always follow them, but I tried to give him extra breakdown of the

tasks." She also shared, "There was a lot of pretty intense reading. I did make it fewer for him and just checking in with him. [Ms. Brewer] checks in with him a lot." Ms. Vargas also noted what would help him more, "Just spending more time with him, but in a perfect world." Observations revealed frequent teacher check-ins with Jonas redirecting him back to the classroom task. For example, during a lab activity, Ms. Brewer approached Jonas and his partner, "How many molecules did you make?" [Jonas had a book open and was reading it]. Jonas are you listening to this?" Jonas put the book down and returned to the lab activity.

Jonas acknowledged videos provided in the classroom were also beneficial to his learning. "I'm only the visual kind of guy, not the 'Okay, I'll just read this and see if I can picture something'." Observations showed the use of visual materials were helpful to his understanding of science content. During class, Ms. Vargas checked in with Jonas as he viewed a video:

> Ms. Vargas: This looks like video 3. I notice your paper. Did you watch video 2 [Nothing written]? Did you notice what was interacting?
> Jonas: The little fish cleans the big fish, the little fish gets food and big fish gets rid of parasites. I learned this from PBS kids.
> Ms. Vargas: You just want to jot that down. You seem like you got this.

Ms. Vargas and Ms. Brewer were observed to continually check in with Jonas throughout this activity. Additionally, Ms. Brewer was frequently observed reading aloud the directions. While Ms. Vargas and Ms. Brewer did not refer to all accommodations in Jonas's IEP, observations and interviews revealed specific support provided to Jonas.

Discussion

The focus of this study was to investigate the experiences of a student with LD as he acquired science process knowledge, through inquiry-based instruction in an inclusive classroom. Results shed light on assessing students with LD's understanding of science process knowledge, engagement in inquiry-based science curriculum, and utilizing supports in inclusive science classrooms.

Assessing Student Knowledge

Designing rigorous science assessments that allow students to demonstrate knowledge and apply information to deepen their understanding of science learning is a challenge for educators (NRC, 2012). Jonas was frequently asked to demonstrate his knowledge of science concepts through typical means, completing "paper and pencil" tasks or the electronic equivalent. Even when engaged in inquiry, Jonas was required to show his process through writing. Ms. Vargas noted that when engaged in conversation, Jonas was able to orally demonstrate understanding of science concepts; however, as a result of poor work completion Jonas received a low science grade. Ms. Vargas commented on the report card, Jonas "has great science background knowledge but struggles to focus during class. [He] struggled to turn in complete assignments. [Jonas] did not turn in multiple assignments and turned in many assignments late. [He] struggled on our 3 assessments." At the conclusion of the science unit, Jonas's grade remained an F. Flexible instruction and assessment, through UDL, may showcase the diverse talents, abilities, and learning styles of diverse students in today's classrooms (McPherson, 2009). Allowing

students with LD the opportunity to demonstrate their knowledge through a variety of means may better capture students' overall knowledge of science processes.

On one occasion, students in the class were able to demonstrate their knowledge in a more creative way, by completing an Ecology children's book as an assessment. This was especially challenging for Jonas, because the high demand in reading and writing may have hindered his ability to truly show his science knowledge. As Morgan, Farkas, Hillemeier, and Maczuga (2016) indicate poor reading skills may increase students difficultly in acquiring science knowledge. Jonas's assessment included minimal data analysis, use of curricular vocabulary, and demonstration of knowledge surrounding ecological relationships. While all students were given several days to complete their assessment, Jonas reported insufficient time to complete his assessment and Ms. Vargas expressed difficulty assessing his ability to analyze data, which was the goal of the assessment. Although the purpose of assessment accommodations is to enable students with disabilities to demonstrate their true knowledge of curricular concepts, in reality classroom teachers in general education settings in the United States do not always provide these supports in the manner intended (Scanlon & Baker, 2012). Large class sizes, lack of professional development, and the time and organization required to deliver instruction using UDL principles can be barriers to this method of science instruction (Marino, 2010). While Ms. Vargas had extensive professional development related to science and the use of inquiry instruction, lack professional development surrounding UDL may have been a barrier for the use of UDL in her classroom.

Engagement in Inquiry Based Science Curriculum

Overall Jonas felt positive about inquiry-based instruction, particularly because most of the lessons were hands-on. This format allowed Jonas to better understand the science concepts presented, but not all parts of unit were able to be taught concretely as some materials (e.g., marine animals) were not available in a science classroom. According to Jonas, the abstract nature of some unit activities hindered his understanding of science concepts. This observation falls in lines with what we know about teaching science; that abstract phenomena studied in science classes is difficult for teachers to make accessible to all students (Puttick & Mutch-Jones, 2015).

While addressing misconception is an important aspect of science instruction, students must remain continually engaged in inquiry (NRC, 2012). Jonas was able to share his experience with the forest preserve field trip better than any other inquiry lesson. This may be due to the type of inquiry task. By definition, the forest preserve field trip is a form of structured inquiry as students were provided guidance as they made decisions on their experiment; however, this inquiry lesson provided significantly more student choice than the remaining lessons. Students were able to ask their own scientific question, plan and carry out their investigation and analyze their findings. Whereas in other lessons (e.g., "Oh Deer!"), the class was given a question to investigate and while students carried out investigation and analyzed data, they did not plan their investigation. Incorporating an aspect of open inquiry, where students are able to choose what they will investigate, may lead to better student understanding.

Utilizing Supports in Inclusive Classrooms

It is important that students with LD are able to access the science curriculum (National Science Foundation, 2002), so many schools in order to facilitate this employ paraprofessionals to work with LD in inclusive settings (Giangreco, Smith, & Pinckney, 2006). With a paraprofessional in the classroom, what has been noted is that many times the general educator defers the responsibility of instruction and support of students with LD to the paraprofessional (Carter et al., 2015). In this case study, the science teacher indicated that the supports she provided Jonas in class were the typical ones that she would do for other students in the class. Given that Jonas was not provided with accommodations noted on his IEP during his time in the science class, it is likely that this was due to a lack of knowledge of the teacher's part for how to effectively provide support to students with LD during science. This lack of teachers' knowledge of the learning needs of students with LD and how to modify instruction to meet their needs may lead to students with LD to struggle academically in inclusive classrooms (Mumba, Banda, & Chabalengula, 2015). The experience that Jonas had in this science class, unfortunately is typical of many students with disabilities in inclusive classes in that they often do not receive differentiated instruction or are not provided with individualized accommodations (e.g., Mayrowetz, 2009).

Throughout the Ecology unit Jonas acknowledged the support of his peers to aide in learning. While students worked with one another, it was evident that peers were not intentionally or systematically supporting Jonas as a means of strategic instruction. We know that successful peer interventions rely on complicated systematic instructional routines involving the tutoring or reciprocated tutoring among students, or cooperative learning between groups of students, to learn academic content (Fuchs & Fuchs, 2009), which was not observed in this study. However, with structured peer interventions all students can benefit, making it a worthwhile instructional strategy in inclusive classrooms (Menesses & Gresham, 2009).

Group work may have had an impact on Jonas's ability to engage in inquiry. Both the forest preserve field trip and the "Oh Deer!" lessons were conducted in groups. Based on classroom observations, Jonas more often participated and remained engaged in the lesson during group work. However, Puttick and Mutch-Jones (2015) note that students' high engagement does not guarantee students truly "make meaning" of the lesson. Assessments show that when asked to demonstrate knowledge of inquiry independently, Jonas struggled to do so. While Jonas relied on peers for support, interviews and observations indicate his general education peers are not always aware of how to play a supportive role in the classroom.

Jonas could not identify tools that helped him learn in the classroom, and he often reported completing work independently. Jonas welcomed teacher support when working in groups; however, when working independently, Jonas indicated his use of "google" for support rather than raising his hand and asking for assistance. Field, Sarver, and Shaw (2003) note that self-advocacy skills are a necessity of students in middle school as it is a key developmental time for learning. Many students with LD lack the self-awareness needed to recognize when they need assistance (Schreiner, 2007). Research suggests students with LD should be explicitly taught their individual needs and rights (e.g., accommodations) (Mishna, Muskat, Farnia, & Wiener, 2011). Understanding his needs, asking for help, and having personal strategies to succeed in the classroom may have helped Jonas acquire knowledge in the inclusive classroom.

Implications for Practice

The transition to middle school has been noted as challenging for all students to access science curriculum, especially students with LD (Puttick & Mutch-Jones, 2015). Since students with LD are expected to master science content (Brigham et al., 2011), the need for effective instruction which supports students with LD in science inclusive classrooms using inquiry-based curriculum is imperative. Understanding the needs of students with LD is critical to providing them with effective instruction. Diversity among students in inclusive classrooms requires general education teachers to coordinate differentiated materials and activities, which drastically complicates their roles (Fuchs & Fuchs, 1994). Since students with LD are increasingly being included in general education classrooms, effective support for these students in inclusive settings is imperative to produce positive academic outcomes (McLeskey & Waldron, 2011).

There is a clear need for general education pre-service and in-service professional development on implementing UDL in science inclusion classrooms, especially when utilizing an inquiry-based curriculum. UDL refers to a scientifically validated framework that focuses on educational practices to promote learning for all students through flexible content delivery, student knowledge demonstration, and engagement with the curriculum (CAST, 2011). Consistent with the implementation of NGSS, UDL provides multiple means for students to demonstrate knowledge through *multiple means of action and expression*, which allows teachers to accommodate learner variability by removing barriers to accurately measure the science knowledge gained by all students in the classroom (CAST, 2011). Using these principles to guide assessment for students with LD plays on student strengths while minimizing weaknesses often characteristic of the student's disability.

Another commonly endorsed approach to supporting students with LD in inclusive classrooms is the use of peer interventions (e.g., Scruggs, Mastropeiri, & Marshak, 2012). Inquiry-based instruction engages students in science related activities and allows students to work in groups, which has been seen as an effective strategy for students with LD and for science learning (NGSS Lead States, 2013; NRC, 2012). Since working in groups is a typical activity in science class, teachers can more easily incorporate peer interventions in the classroom to accommodate the needs of students with LD while at the same time supporting the needs of all the students (Scruggs, Mastropieri, & Marshak, 2012).

Structured inquiry may provide an effective means for incorporating the use of peer-intervention strategies. According to Therrien and colleagues (2017), students with LD learning inquiry-based instruction that incorporates the use of explicit instruction, like structured inquiry, have demonstrated more content knowledge than when using discovery learning. Since structured inquiry intends to provide scaffolding to guide students initial acquisition of content and then fade supports as necessary (Watt et al., 2013), using peer tutoring during inquiry, as described, would allow the gradual release of student support to accommodate the diversity of students in inclusive science classrooms.

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The Role of Effective Communication in Co-teaching to Increase Student Achievement

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Acknowledgments: I would like to thank my instructor Dr. Emily Rutherford, the principal, the assistant principal, the local education agency, and my mom for helping me conduct this study. Your generosity and help are cherished. I am truly grateful.

Abstract

Lack of verbal communication between General and Special Educators is hindering co-teaching implementation in the classroom. The purpose of this study was to investigate the role verbal communication has in educator collaboration and ways to improve co-teaching practice. Four high school General Educators were surveyed over their opinions on communication's role in collaboration and over their opinions on classroom co-teaching. Data from the surveys were later compared to previous findings in the literature. Results show that findings between the literature and surveys are similar, but respect, trust, and power dynamics also affect co-teaching practice. Further research into communication's role is highly recommended.

Keywords: Co-teaching, Student Achievement, Communication, Collaboration

Introduction

Co-teaching is an international term that describes the actions of two educational professionals teaching a class together (Keeley, 2015). Six models of co-teaching are used. In Europe, the models are called 1.) One -Teach, One-Observe, 2.) One-Teach, One-Drift, 3.) Station Teaching, 4.) Parallel Teaching, 5.) Alternative Teaching, and 6.) Team Teaching (Brawand & King-Sears, 2017, p. 217). Similar models exist in the United States. In Texas the following models are designated for use by the Texas Education Agency (TEA) (Co-Teaching a How-To Guide: Guidelines for Co-Teaching in Texas, n.d):

1. One-Teach, One-Observe: One teacher provides instruction while the other observes students.
2. One-Teach, One-Assist: One teacher teaches, while the other teacher assists in behavior management, managing materials, answering students' questions, and anything else needed.
3. Station Teaching: Teachers divide students into groups and teach course content in "stations".
4. Parallel Teaching: A class is divided in half. One-half of the students are taught by a General Educator and the other half is taught by the Special Educator.
5. Alternative Teaching: Students are divided into groups. One teacher teaches the main lesson to a large group. The other teaches the same lesson to a smaller group, but a simpler version.
6. Team Teaching: Teachers teach the lesson together.

Increases in student achievement have been shown to be positively correlated with co-teaching, along with the minimization of student misbehavior, and decreases the student to teacher ratio (Sweigart & Landrum, 2015). Technology, like Google Docs, has created a platform where teachers can collaborate despite having different schedules (Scruggs & Mastropieri, 2017, p. 286) Co-teaching has also been shown to increase teachers' implementation of Evidence-Based Practices (EBP), which has been proven to increase teachers' instructional skills.

However, lack of verbal communication between General and Special Educators, which is required for co-teaching to work, is hurting General and Special Education student achievement. Both a lack of time and training have created an obstacle for proper inclusion to occur. Fixing the lack of communication is important because Special Education is slowly moving away from the discrepancy model to Response to Intervention (RTI). In RTI, students are identified using a three-tiered system. In tier one, all students are screened and taught in the general education classroom without supports. Students who do not make adequate progress move to tier two, where small group instruction is provided. Students who need additional supports move to tier three, where Special Education occurs. Figure one (Morin, 2014) and figure two depict the RTI process. Both figures are shown in Appendix A.

According to IDEA 2004, students identified as needing Special Education, or students with disabilities, must be educated with their non-disabled peers in the Least Restrictive Environment (LRE) to the maximum extent that is appropriate (Carson, 2015). Special Education students must be identified as soon as possible, so services can be provided to them in a timely manner. Co-teaching in the General Education classroom is the least restrictive choice and most favored. Other environments include pull out, Behavior Academic Classroom (BAC), and Community-Based Instruction (CBI). These environments should only be used if necessary. Thus, RTI Co-teaching should be used first.

If effective, the co-teaching model will identify and provide services to Special Education students quickly, early, and without labeling them. Unfortunately, the lack of communication is resulting in Special Education students being re-labeled. To make matters worse, students are being re-segregated, which goes against case law of *Brown v. Board of Education* (Walker, 2014; Reardon & Owens, 2014), and are failing standardized tests, which leads to teachers being blamed for "not doing their job" (Morgan H., 2016).

Lack of verbal communication has been found to result from a lack of time, training, and trust in other studies. For example, Solis, Vaughn, Swanson, and McCully found that General Educators felt ill-equipped to teach students with special needs (Solis, Vaughn, Swanson, & McCulley, 2012) because they weren't adequately trained. Dev and Hynes (2015) found many teachers felt that their degree plan did not prepare them for co-teaching. Logan and Wimer (2013), also found similar results, and that clashing beliefs of the General Educator and Special Educator were contributing to the problem. Morgan (2016) found teachers value inclusion. However, how can teachers do inclusion effectively if there is no time and little training?

Unfortunately, although many studies found positive results on interventions that increased student achievement (i.e., Botteg et al., 2015) and many studies found factors that hindered co-teaching, no studies covered how to increase co-teaching communication. It is therefore critical

to fill in this gap of knowledge because communication/collaboration depends on teachers that are adequately trained, that have effective planning time, the necessary resources, and trust among their colleagues. If anyone of these critical factors for co-teaching is lacking, student achievement might decrease.

The purpose of this study was to investigate possible ways to improve co-teaching inclusion in high school content area classrooms. Four secondary education content area teachers from a high school in North Texas were surveyed about their opinions on co-teaching. The data collected from these teachers were then compared with data found in other studies. The goal was to collect as much data as possible so one day another researcher can create a possible model that teachers can use to collaborate together.

Literature Review

As mentioned in the introduction, verbal communication is important for collaboration to occur. For communication to be effective, however, both teachers must communicate with each other. It is essential that communication is a two-way process instead of just one-way because one-way communication leads to a collaboration breakdown which results in decreased student achievement. Figures three and four show diagrams of proper and improper communication.

Proper communication requires planning time, resources, training, respect, and trust. Figure five shows the elements required for proper communication. Unfortunately, issues like lack of time make the implementation of proper communication difficult. These issues were found in other studies across the world and over many years. To find these studies, four databases were used to collect articles. They are the following: 1) EBSCOhost's Academic Search Complete, 2.) EBSCOhost's Eric, 3.) The United States Department of Education, and 4.) Google Scholar.

All articles ranged between the dates of 2003-to 2018 and were assessed for relevance using the following questions:

- Is the article between ten to fifteen years old?
- Is the article peer-reviewed?
- Is the article relevant to the researcher's research?
- Is the article a primary source?
- Were the participants in the study either certified teachers or pre-service teachers?

The literature revealed that effective verbal communication and/or collaboration is meeting, planning, and teaching together, but lack of time and training prevented collaboration from occurring. Differing attitudes towards co-teaching and the definition of co-teaching, as well as lack of trust, were also found to impact implementation. Morgan (2016) conducted interviews, surveyed teachers, administrators, and students (using survey monkey), and took notes in the form of personal reflections. She found effective collaboration involved in sharing responsibilities in the classroom. She also found teachers valued collaboration and that co-teaching reduced negative stigmas on their students, but felt uncomfortable doing it due to the lack of trust.

Logan and Wimer (2013) investigated teachers' attitudes towards inclusion. Surveys were given to 203 teachers and consisted of three parts, demographics (for example, race, years of teaching, etc.) level of agreement using a Likert style scale, and a comments section. They found teachers' attitudes towards inclusion varied, but teachers in High School valued inclusion the most. Dev and Hynes (2015) interviewed eleven Special Educators. Twenty-nine questions were asked. They found teachers had mixed views of inclusion. One teacher believed students could thrive in inclusion. Another believed older students struggled in communicating their needs and instruction in inclusion. Teachers agreed, however, that their degree plan did not adequately prepare them for inclusion and that lack of time also negatively impacted inclusion. Teachers also identified three factors for successful inclusion. The first was pre-service teacher education for inclusion settings. The second was changes in attitudes towards co-teaching programs.

Robinson (2016) found, after conducting a study investigating the cultural beliefs and practices of general and special educators, that most believed themselves to be culturally responsive to other cultures and RTI, but lack of parent collaboration, language barriers, lack of trained personnel, and lack of time hindered its implementation. Clashes in beliefs and lack of data-based resources to make data-based decisions were also identified.

Solis, Vaughn, Swanson, and McCulley (2012) conducted a meta-analysis of 146 studies and found attitudes towards inclusion determined their perceptions and practice. General education teachers felt ill-equipped and wanted scheduled time to collaborate, but due to time constraints, lack of resources, and lack of training (from the Special Educator), many general educators couldn't. Thus, most general education teachers favored the One-Teach One-Assist method and used it the most.

Unfortunately, One-Teach, One Assist, although most common, may not work. The co-teaching models should be varied, which is favored by students. Keely (2015) conducted a pilot study of students' and teachers' perceptions of co-teaching models. She found students preferred Station Teaching, Parallel Teaching, and Team Teaching over One-Teach, One-Assist. She also found although teachers showed no statistical significance overall the co-teaching Models, students perceived an imbalance of authority between teachers when One-Teach, One-Assist was used. This fact was concerning because students should see and experience the authority of both teachers equally.

Self-Efficacy was also found to positively correlate with the amount of collaboration and student achievement. Goddard and Minjung (2018) conducted a study examining teacher's perceptions of collaboration, differentiated instruction, and self-efficacy. Surveys were collected across 1,623 elementary school teachers. They found a positive correlation between collaboration and teacher self-efficacy. Banerjee, Stearns, Moller, and Mickelson (2017) tested the academic achievement of 21,260 students. They found students who had teachers with high job satisfaction achieved higher on reading than students with teachers with low job satisfaction. Teachers who collaborated were more likely to have higher job satisfaction versus teachers who didn't.

Interventions that raised student achievement were also discovered. Bottge et al. (2015) investigated the effects of collaboration on Enhanced Anchored Instruction (EI) in math classrooms. Twenty-five inclusive math classrooms in middle schools participated. Researchers

found students who were in EI classrooms with high special education support scored on their posttest significantly higher than students who didn't (p<.001, *CI* of 99%) Collaboration between teachers played a role in the increase in student achievement. Unfortunately, no studies were found to address how to increase communication during co-teaching and thus, increase student achievement. Thus, this study investigated teachers' views of co-teaching. The goal was to investigate possible ways to increase communication and, as a result, increase effective co-teaching and student achievement.

Methods

As mentioned in the literature, time, resources, trust, training, and attitudes were factors that teachers of previous studies highlighted that impacted co-teaching effectiveness. As such, these were the factors investigated in my study. Since co-teaching research was quantitative in nature, I chose to conduct a quantitative phenomenological research study that had a Social Constructivist worldview. As mentioned in the introduction, the purpose of this study was to investigate possible ways to improve co-teaching inclusion in high school content area classrooms. Questions started off as broad to allow investigation of positive and negative effects on co-teaching:

1. **Question One:** What affects co-teaching?

2. **Question Two:** How can effective co-teaching be increased?

Specific sub-questions were later developed to as a guide:

Question One

1. What effect does co-teaching have on teacher efficacy and job satisfaction?
2. What effect does co-teaching have on student achievement?
3. What strengthens co-teachings' positive effects on student achievement?
4. What is effective verbal communication between special education and general education?
5. How does communication play a role in effective co-teaching?
6. What are the positive academic consequences of effective teacher communication on co-teaching?
7. What are the negative academic consequences of ineffective teacher communication on co-teaching?

Question Two

1. What is hindering effective verbal communication between special education and general education teachers?
2. How can high school inclusion teachers increase co-teaching collaboration/communication with each other for their students' benefit within the classroom?
3. How do we effectively build up verbal communication, and co-teaching practices, between General Education teachers and Special education teachers in order to build up student achievement?

Originally, I planned to conduct a qualitative study using a survey, interviews, and observations. The IRB board, however, voiced concerns that data collection may not get done due to lack of time because this study was done the last semester of my master's in Special Education program. Therefore, I agreed to conduct a quantitative study using only the survey.

Obtaining consent from the Local Education Agency (LEA) was also difficult due to the LEA requiring an IRB number. This issue was problematic because I was required to have LEA approval to gain approval from the IRB. Thus, obtaining the needed approval took longer than usual and resulted in no time to conduct reliability and validity tests. The IRB decided they would allow the needed approval for my study without approval from the LEA and school, thus ending the gridlock, but I understandably had to provide them with their approval before data collection could begin.

Context and Participants

As a special educator, I didn't want my biases playing a role in my interpretation of results. Therefore, I chose to select teachers using systematic random sampling. I wanted to specifically investigate experienced General Educators' views from each content area: Mathematics, English Language Arts, Science, and Social Studies. As a result, I decided data from teachers of each of these content areas with at least three years of teaching experience would be used. Athletic coaches, teachers of electives, Special Education teachers and teachers with teaching experience of two years or less were excluded.

Participants were selected from a local High School in Texas. Because little research existed over the effect of co-teaching in high school, I chose the one closest to where I live as the research site. I went to the chosen site, spoke to one of the school vice principals who saw and approved the survey. He then made several copies and sent out a mass email to at least two teachers from each core, to Special educators, and two elective teachers. asking if they would like to voluntarily participate in a research study. After a week, I was sent an email by the same vice principal to pick up the surveys. I got nine surveys back but chose only four teachers that met my criteria. Both men and women participated in the study. Years of teaching experience ranged from three to nineteen. Demographics of the participants chosen were as follows: one Social Studies teacher, two Math teachers, and one ELAR teacher. Other teachers who participated were either Special Educators, teachers with teaching experience two years or less, or were teachers of electives. Because they didn't meet my criteria, their data were excluded from being analyzed.

Data Measures/Instrument

I used Microsoft Word to create a survey that was used for data collection. The reason for creating the instrument was because no current instrument existed. The range and mean were not calculated since this study started off as a qualitative study, but then turned into a quantitative study. Because this was originally a qualitative study, the goal of using the survey was to analyze common themes identified from previous studies to the current study, therefore, data were codified and analyzed across participating teachers on a Microsoft Excel spreadsheet. Later, data was compared to other studies to see if my data matched findings from the previous literature, but only after all teachers returned the completed surveys to me.

The survey consisted of twenty-five questions and required participants to indicate their opinions of Co-teaching. Questions one through twelve required participants to circle and explain their answers. Questions twelve through fifteen required teachers to circle whether they believed something was True or false. The last questions required teachers to write their answers down and explain their opinions about co-teaching.

Validity was defined as the level of how much the survey matched research questions investigated. Reliability was defined as what level the questions were consistent across teachers' answers. Due to lack of time during the semester, no reliability and validity tests were done. Reliability and validity, however, were assumed. Thus, the reliability and validity of the instrument were unknown and could be incorrect.

Procedures

IRB approval permission from the Local Education Agency and the school principal's permission were received prior to beginning the study. I later contacted and met with the assistant principal to discuss the procedure of the research study, the risk of harm, and what participants qualified for the study. I also thoroughly explained that teachers will be completing a survey consisting of twenty-five questions overs their co-teaching opinions. A mass teacher email was sent out by the vice principal afterward. Participants were informed of their right to pull out of the study at any time, that they will remain anonymous, and the risk of harm was low. Participation was also voluntary. Participants were then given a consent form to sign and a survey to fill out in their spare time.

After receiving an email from the assistant principal to pick up the surveys, I picked up the instruments and analyzed them for common themes. For confidentiality reasons and data analysis purposes, all participants were assigned a number as an alias. Thus, their names were changed to protect their anonymity. Answers given by teachers were placed in an Excel spreadsheet for analysis. Then, results were compared to primary source literature to see if my findings matched those in previous studies.

Results of Data Analysis

Results indicate that all respondents agree that co-teaching has positive effects on student achievement. They like the fact that co-teaching allows multiple methods of content delivery, it reduces the student-to teacher-ratio, and provides positive student outcomes. All respondents also agree that co-teaching can increase teacher efficacy and job satisfaction, but only if teachers can work in sync; teacher pairs must work well together. This result is critical because job satisfaction has been shown to correlate with student achievement. Three out of four teachers agree that teachers should be trained to co-teach, however, two teachers disagree, because not all teachers should co-teach, and some teachers can work well together with no formal training. All participants agree that communication is important, that time can impact co-teaching and that co-teaching can improve high school Inclusion.

On questions eight and nine, all respondents agree that effective co-teaching can improve student achievement in their classrooms, but on question ten, respondents disagree that they know all co-teaching models. Two respondents are neutral on question ten, while one disagrees, and another agrees. All respondents indicated they use the One-Teach One-Assist method the most. Only two teachers used other co-teaching models.

On questions 12-15, all participants agreed that co-teaching needs improvement; they site all questions as true. Respondents report they use anywhere from zero to two hours a week to plan for co-teaching. All teachers believe planning time and training plays a big role in effective co-teaching. Trust as well as communication, time, and flexibility are also indicated by the teachers as essential to co-teaching. However, the teachers indicated a lack of time, inflexibility, empathy, lack of respect, and teamwork as factors that hurt co-teaching.

To improve co-teaching, all respondents highlighted the need for training the most. They believe teacher education programs should prepare teachers to co-teach. According to the respondents, faculty professional development programs should also better train co-teachers, and these professional development programs should be provided more than once a year. Taking parts of another already effective training program and incorporating them into the co-teaching program was suggested. Better selection of co-teaching teacher pairs and having them experiment using different co-teaching models is also suggested. The full results of the survey are displayed in Table 1.

Discussion

The results state that for co-teaching to really work well, there must be trust, respect, teamwork, and open communication between both teachers. All these ingredients are the foundation of any effective co-teaching classroom. For co-teaching to start off right, teacher pairing needs to be done either late spring or early summer before the next school year starts because it could take that long for both parties to get to know each other, and come together for course planning for effective student benefit, and to increase student achievement.

Findings from the surveys are similar to findings across the literature. Both the literature and participants say co-teaching needs important improvements, and that lack of time, training, and trust can negatively impact co-teaching. In the literature, Logan and Wimer (2013) and Dev and Hynes (2015) found attitudes play a role in how teachers perceive co-teaching. This finding, however, may only be true if respect, emphasized by the teachers in this study, exists. If respect does not exist, no effective collaboration can occur. Trust and respect are not automatically given between teachers; they have to be earned.

Despite their differences, teachers should aim to work together as a team. Adequate co-teaching planning time must be given. Training in co-teaching also needs to occur. The similarities echoed between the literature and this study show the necessity of creating a training program that prepares pre-service and experienced teachers to co-teach, but teachers also need to respect each other, and be willing to experiment with different co-teaching methods. Collaboration is fundamental for co-teaching to work. Therefore, we need to stop asking what we can do to improve co-teaching and just do it.

Limitations and Recommendations

Despite similar findings to the literature, this study has some limitations. First, no tests of the survey's reliability and validity were implemented. Thus, there is a chance the survey produced

unreliable and invalid results. Second, this study only focused on views from general educators. It is advisable that a similar study investigating views of special educators be conducted. Lastly, I was not present as teachers took the survey. Therefore, there's the possibility the teachers did not understand some questions.

Only a survey was conducted. Conducting the survey again as well as interviewing teachers and conducting classroom observations is recommended. For further study, it is also recommended that a researcher conducts a similar study in other high schools, a middle school, and an elementary school. That way, the researcher can see if views of teachers from different grades are consistent across the literature and grade levels. However, the reliability and validity of the survey test must be done first. Therefore, the researcher should run a content validity test, give the survey to raters, and conduct a pilot run of the survey to see what answers to expect once surveys come back. Replication of this study is also recommended.

Conclusion

Co-teaching is an international teaching method in which two teachers share a space to teach classroom content. This study investigated ways to improve to-teaching using views of four experienced general educators as reference. Results show that time, training, trust, communication and respect are fundamental for co-teaching to work. Similar findings exist in previous studies. Therefore, in order for us to make a difference, teachers need to work together as a team. All parties need to respect one another, get rid of their pride, and work together for the students' benefit and achievement. Until this fix happens, improvement to co-teaching will not occur. People need to do less talking and more listening. In the end, we are all on the same team. Stop thinking of ourselves and start thinking of our students. That way, co-teaching is improved, which will result in increased student achievement.

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Kayla Fells lives in Wichita Falls, Tx. Kayla got her Bachelor's degree in the Spring of 2017 and 1st Master's degree in Special Education at Midwestern State University in Fall 2018 and is currently pursuing her 2nd Master's degree in Curriculum and Instruction from the University of North Texas. The reason Kayla chose the subject of Co-Teaching in Special Education Inclusion is because she understands disabilities personally. As an adult born with a disability, she is and has been since starting in Kindergarten in Special Education programs, and a special needs student all her life. She's been a 504 student all through school, including all through her college years, and personally knows firsthand the struggles that this group of students face on a daily basis. Some of Kayla's interests are artificial flower making and Evidence-Based Practice research which she learned from her mother who also graduated from Midwestern State University with her Bachelor's in Social Work in Spring 2017.

Figure 1: RTI Pyramid. This graphic organizer demonstrates how Special Education works. Every student starts on tier one and moves up one down the continuum based on their academic needs.

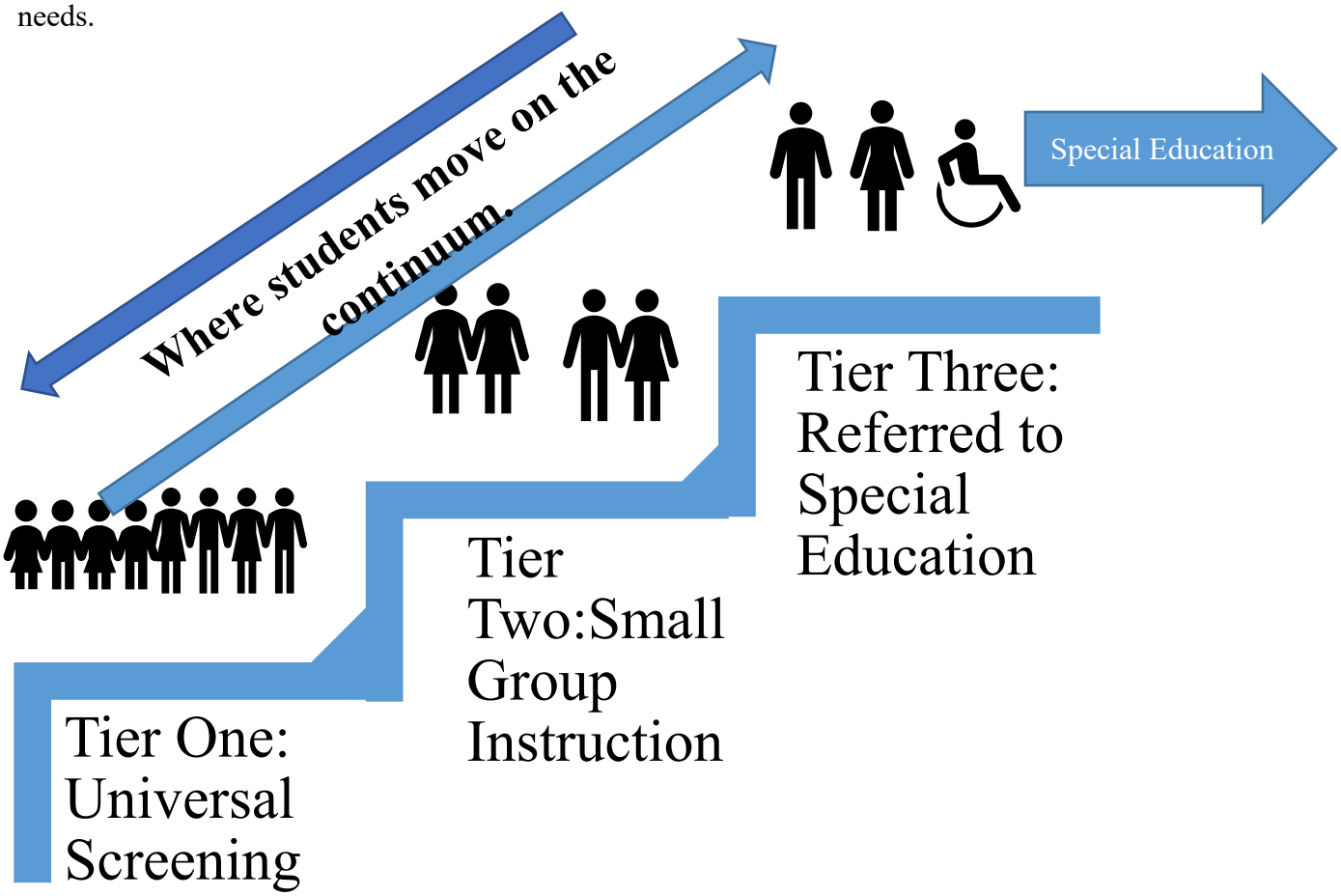
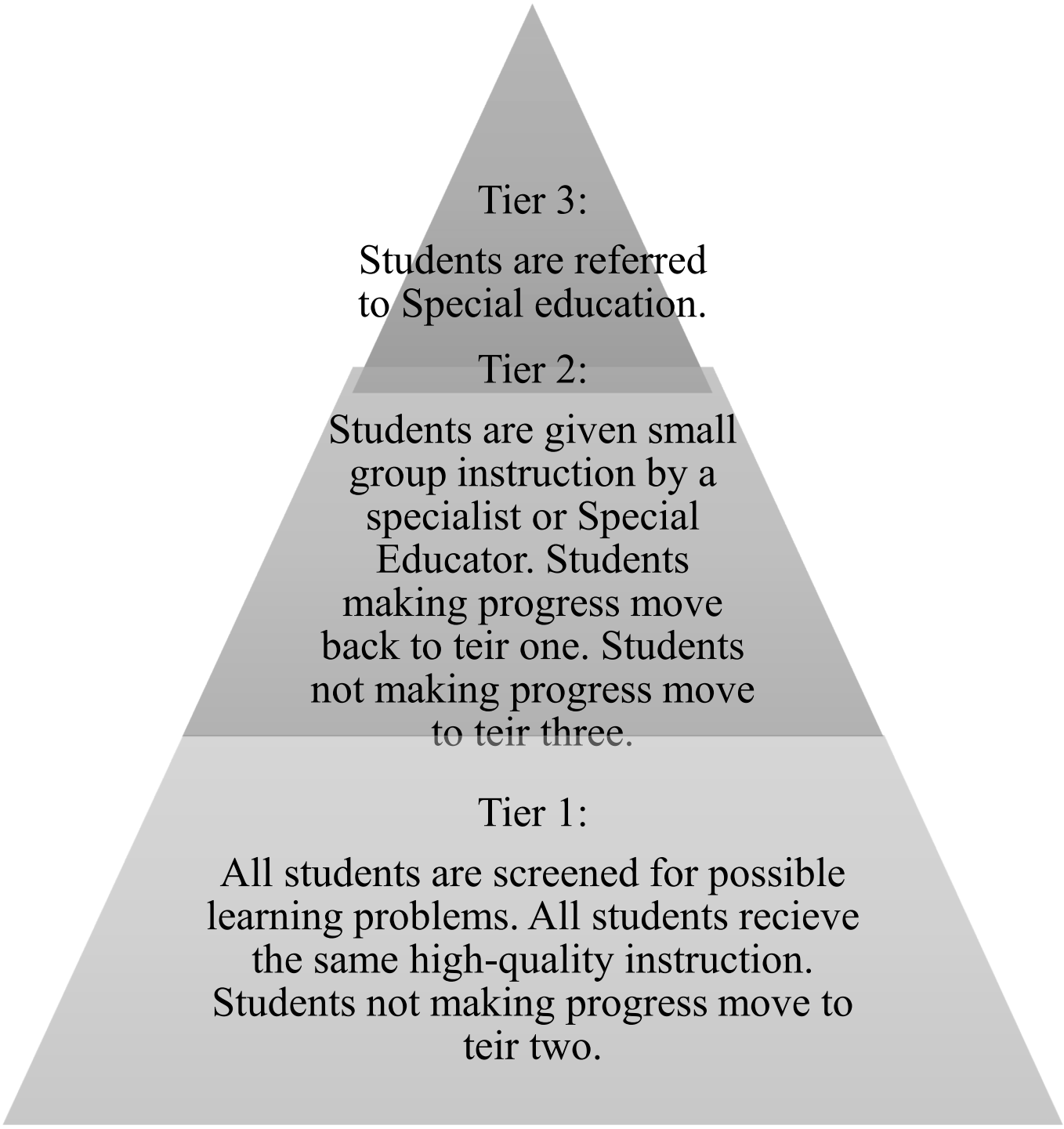


Figure 2: RTI Staircase. This graphic organizer, created by the author also demonstrates how Special Education works but in a staircase format. Every student starts on the tier one or the 'first step' and moves up one down the continuum (stairs) based on their academic needs. The higher the step, the more intense the intervention needed. This graphic was created to better illustrate Response to Intervention tier because no other illustration exists, which may be hard to understand.



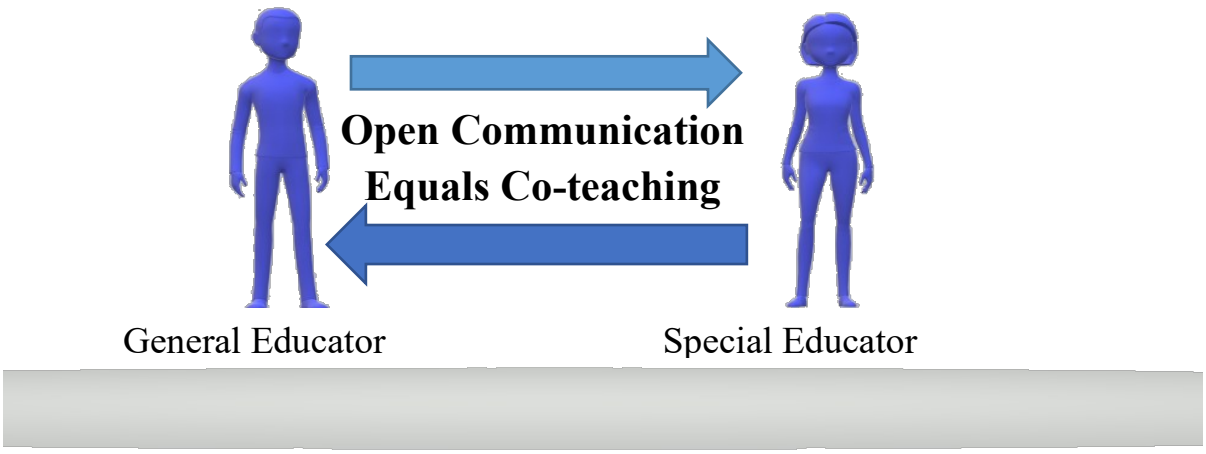


Figure 3: Proper Co-teaching Communication. This illustration demonstrates proper communication, which is open communication between both teachers.

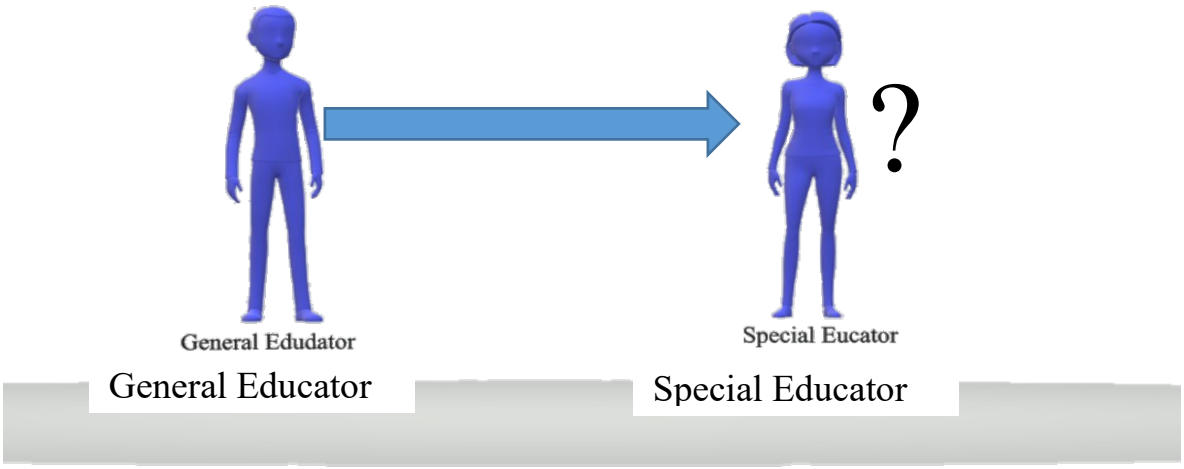


Figure 4: Improper Co-teaching Communication. This illustration demonstrates improper communication.

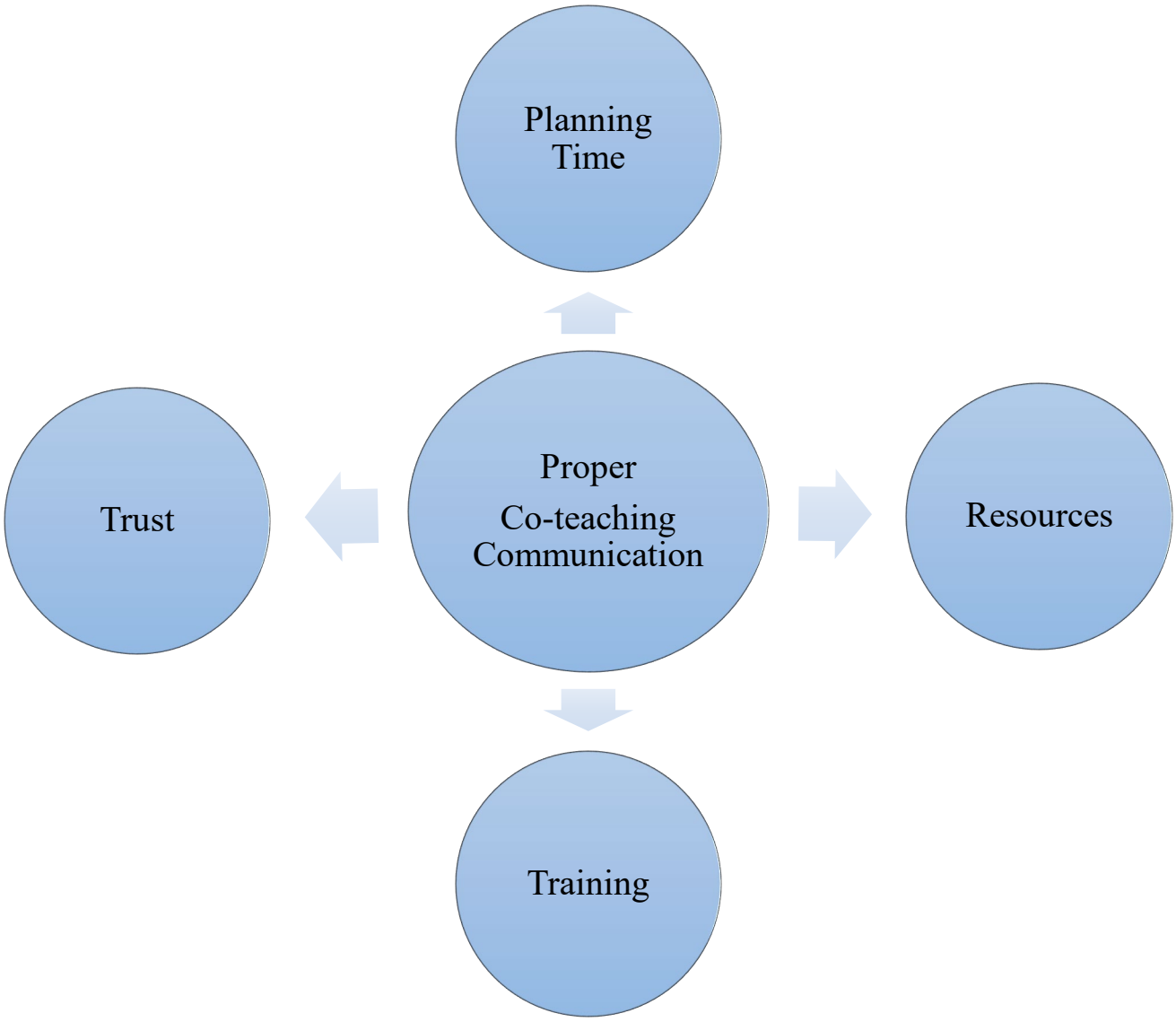


Figure 5: Essential Elements for Proper Communication. The graphic organizer highlights factors essential for proper co-teaching. If anyone of these factors is lacking, proper co-teaching won't occur.

Co-Teaching Survey

Name: Teacher #

Years of Teaching: _____

Subject: _____

For questions 1-12 please circle your answer. Also explain your answer if asked

1. **Co-Teaching can have positive effects on student achievement**

Strongly Agree Agree Neutral Disagree Strongly Disagree N/A

Explain:_____

_____

_____

_____

_____

_____

_____

2. **Co-Teaching increases teacher efficacy and job satisfaction.**

Strongly Agree Agree Neutral Disagree Strongly Disagree N/A

Explain:_____

_____

_____

_____

_____

Figure 7: Co-teaching Survey. This the co-teaching survey that the author created and used because none exist.

3. In your opinion, should teachers be specifically trained for Co-Teaching?

Yes No

Explain:

_____

_____

_____

_____

4. Verbal communication is important for effective Co-Teaching

Strongly Agree Agree Neutral Disagree Strongly Disagree N/A

5. Collaboration is important for effective Co-Teaching

Strongly Agree Agree Neutral Disagree Strongly Disagree N/A

Explain:_____

_____

_____

_____

_____

_____

_____

6. I believe that time can affect Co-Teaching.

Strongly Agree Agree Neutral Disagree Strongly Disagree N/A

Figure 7: Co-teaching Survey (Continued)

Explain:_____

_____

_____

_____

_____

_____

7. Effective Co-Teaching can improve High School Inclusion

Strongly Agree Agree Neutral Disagree Strongly Disagree

I Don't Know

8. Effective Co-Teaching can improve Student Achievement

Strongly Agree Agree Neutral Disagree Strongly Disagree N/A

9. Effective Co-Teaching can improve my classroom

Strongly Agree Agree Neutral Disagree Strongly Disagree N/A

10. I understand all models of Co-Teaching.

Strongly Agree Agree Neutral Disagree Strongly Disagree N/A

11. Which form of Co-Teaching do you use the most?

One-Teach One-Assist Parallel Teaching Station Teaching

One-Teach One-Observe Alternative Teaching Team Teaching I Don't Know

Why (If you don't know, just put not applicable. If you don't want to answer, write I choose not to answer)

Figure 7: Co-teaching Survey (Continued)

Circle True or False. On the last one, explain your answer

12. Co-Teaching needs improvement

True False

13. Co-Teaching needs improvement for the secondary level (High School)

True False

14. Verbal Communication can Improve Co-Teaching

True False

15. Trust plays a role in Co-Teaching and verbal communication.

True False

Explain:

Figure 7: Co-teaching Survey (Continued)

Write your answers the following questions

16. What can affect the implementation of Co-Teaching? Explain:

_____

_____

_____

_____

_____

_____

17. How much time do you spend planning Co-Teaching? (Please give a number) ____

18. Do you believe that time plays a factor in effective Co-Teaching? (Yes/No) _____

19. **Explain your answer to question 18.**

_____

_____

_____

_____

20. Do you think training plays a big role in Co-Teaching? (Yes/No) _____

21. **Explain answer to question 20.**

_____

_____

_____

_____

Figure 7: Co-teaching Survey (Continued)

22. Do you believe trust is essential to Co-Teaching? (yes/no)_____

23. **What do you believe hurts implementing Co-Teaching the most?**

_____

_____

_____

_____

_____

24. **Explain answer to question 23.**

_____

_____

_____

_____

_____

_____

25. How can we increase effective Co-Teaching in High School?

_____

_____

_____

_____

Figure 7: Co-teaching Survey (Continued)

Comments:

Figure 7: Co-teaching Survey (Continued)

	Teacher 1	Teacher 2	Teacher 3	Teacher 4	Theme	Contrasting Views
Question 1: The positive effects of co-teaching on student achievement	Agree	Agree	Strongly Agree	Agree	All the respondents agreed that different teaching methods can help students understand concepts more clearly. The reduced student-to-teacher ratio allows teachers to give more attention to the student. co-teaching allows for multiple ways of content delivery and provides more learning opportunities.	co-teaching can increase teacher efficacy and job satisfaction, but only if co-teachers can work in sync. co-Teachers must identify and use individual gifts. co-teaching requires a solid relationship between co-teachers and that develops over time.
Question 2: The increase in teacher efficacy and job satisfaction through co-teaching.	Agree	Agree	Strongly Agree	Neutral	All respondents agree co-teaching allows one teacher to teach a small group, while the other teacher can focus and home in on particular student weaknesses. Team building occurs with co-teaching, which helps teacher morale.	
Question 3: Opinion-should teachers be trained for co-teaching.	No	Yes and No	Yes	Yes	Three out of four respondents agree training in co-teaching can define boundaries and clarify responsibilities. Training can maximize the effects on student achievement.	Two out of four teachers disagree that teachers should be specifically trained for co-teaching. Not all teachers can or should co-teach. Some teachers work easily together to see that their student goals are achieved.

Table 1: Views of Co-teaching

	Teacher 1	Teacher 2	Teacher 3	Teacher 4	Theme	Contrasting Views
Question 4: The importance of verbal communication for effective co-teaching.	Agree	Strongly Agree	Strongly Agree	Strongly Agree	All respondents agree verbal communication is important for effective co-teaching	
Question 5: The importance of effective collaboration in co-teaching.	Agree	Strongly Agree	Strongly Agree	Strongly Agree	All respondents agree collaboration between teachers can sharpen teaching skills. Two heads are better than one. Teaching across content and curricular lines strengthen student understanding.	
Question 6: The belief that time can affect co-teaching.	Agree	Agree	Agree	Strongly Agree	All respondents agree that time can affect co-teaching. There is not enough, too little, or no time at all. co-teaching can solve time constraints. Effective co-teaching requires teachers to develop a good relationship, which takes time to develop.	
Question 7: The belief that effective co-teaching can improve High School Inclusion.	Agree	Agree	Agree	Strongly Agree	All respondents agree effective co-teaching can improve High School Inclusion	

Table 1 Continued: Views of Co-teaching

	Teacher 1	Teacher 2	Teacher 3	Teacher 4	Theme	Contrasting Views
Question 8: The belief that effective co-teaching can improve Student Achievement.	Agree	Agree	Agree	Strongly Agree	All respondents agree effective co-teaching can improve student achievement.	
Question 9: The belief that effective co-teaching can improve my classroom.	Agree	Agree	Agree	Strongly Agree	All respondents agree co-teaching can improve their classrooms.	
Question 10: Respondents understand all models of co-teaching.	Disagree	Neutral	Neutral	Agree	Two out of four respondents are neutral on understanding all models of co-teaching.	One teacher disagrees that he/she understands all models of co-teaching. One teacher agrees that he/she understands all models of co-teaching
Question 11: Which model of co-teaching is used most by respondents.	One-Teach One-Assist and Parallel Teaching	One-Teach One-Assist	One-Teach One-Assist and Team Teaching	One-Teach One-Assist	All teachers use One-Teach One Assist.	Two teachers use other forms of co-teaching.
Question 12: co-teaching needs improvement.	True	True	True	True	All agree co-teaching needs improvement.	
Question 13: co-teaching needs improvement for the secondary level of education.	True	True	True	True	All agree co-teaching needs improvement for the secondary level, High School.	

Table 1 Continued: Views of Co-teaching

	Teacher 1	Teacher 2	Teacher 3	Teacher 4	Theme	Contrasting Views
Question 14: Verbal communication improves co-teaching.	True	True	True	True	All agree verbal communication can improve co-teaching.	
Question 15: For both co-teaching and verbal communication to occur there needs to be trusted.	True	True	True	True	All respondents agree that respect and trust play a role in co-teaching. No one teacher can dominate the other. Teachers must work together. There is no time to work together.	
Question 16: What affects the implementation of co-teaching? Explain.					All respondents agree that planning time, respect, and trust in each other affects co-teaching implementation.	
Question 17: How much time is spent on co-teaching planning. (Please give a number)	1 hour	2 hours per week	0 hours due to teaching Honors classes	2 hours per week	Respondents use between 0-2 hours on co-teaching planning time per week	
Question 18: The belief that time plays a factor in effective co-teaching.	Yes	Yes	Yes	Yes	All respondents agree that time plays a factor in effective co-teaching.	

Table 1 Continued: Views of Co-teaching

	Teacher 1	Teacher 2	Teacher 3	Teacher 4	Theme	Contrasting Views
Question 19: Explain answer to question 18					Due to no planning time, teachers must do the best they can with what they have.	
Question 20: Does training play a big role in co-teaching? (Yes/No)	Yes	Yes	Yes	Yes	All respondents agreed that training plays a big role in co-teaching.	
Question 21: Explain answer to question 20					All respondents stated that there is not enough professional development and they are not trained across curriculum lines. If teachers are not trained, then co-teaching will not be effective.	
Question 22: Is trust essential for co-teaching.	Yes	Yes	Yes	Yes	All respondents agree that trust is essential for co-teaching.	
Question 23: What is the belief that hurts co-teaching implementation the most?	Time	Inflexibility	Empathy for students	Both support, respect, and trust are needed, as well as working together as a team.	All respondents stated that time, respect, and support are essential.	
Question 24: Explain answer to question 23.					Most teachers believe that time, open-mindedness to different teaching methods and student compassion are all essential for co-teaching to work.	

Table 1 Continued: Views of Co-teaching

	Teacher 1	Teacher 2	Teacher 3	Teacher 4	Theme	Contrasting Views
Question 25: How can effective Co-teaching be increased in High School?					Professional development in faculty and teacher education training programs. The better co-teacher pairing will also increase effective co-teaching. Be willing to experiment with co-teaching models and take parts of already incorporated installed programs that are successfully used and add them into the co-teaching program.	

Table 1 Continued: Views of Co-teaching

Author Guidelines for Submission to JAASEP

JAASEP welcomes manuscript submissions at any time. Authors are completely responsible for the factual accuracy of their contributions and neither the Editorial Board of JAASEP nor the American Academy of Special Education Professionals accepts any responsibility for the assertions and opinions of contributors. Authors are responsible for obtaining permission to quote lengthy excerpts from previously-published articles.

Authors will be notified of the receipt of their manuscripts within 14 business days of their arrival and can expect to receive the results of the review process within 75 days.

All submissions must have a cover letter indicating that the manuscript has not been published, or is not being considered for publication anywhere else, in whole or in substantial part. On the cover letter be sure to include your name, your address, your email address, and your phone number

As much as possible, typescript should conform to the following:

- Method of Manuscript Submission: Send Manuscripts should be submitted electronically with the words "Submission" in the subject line.
- Language: English
- Document: Microsoft Word
- Font: Times New Roman or Arial
- Size of Font: 12 Point
- Page Limit: None
- Margins: 1" on all sides
- Title of paper: Top of page Capitals, bold, centered,
- Author(s) Name: Centered under title of paper
- Format: Feature Manuscripts should follow the guidelines of fifth edition of the
- Publication Manual of the American Psychological Association (APA).
- Figures and Tables: All should be integrated in the typescript.
- Abstract: An abstract of not more than 150 words should accompany each submission.
- References: Insert all references cited in the paper submitted on a Reference
- Page

Submission of Articles: Submissions should be forwarded by electronic mail to the Editor, Dr. George Giuliani at editor@aasep.org