

Duquesne University

Duquesne Scholarship Collection

Electronic Theses and Dissertations

Summer 8-5-2023

THE EFFECT OF USING STORY-MAPPING TO ENHANCE READING COMPREHENSION OF STUDENTS WITH LEARNING DISABILITIES IN SAUDI

Omar Alshikhi

Follow this and additional works at: <https://dsc.duq.edu/etd>



Part of the [Special Education and Teaching Commons](#)

Recommended Citation

Alshikhi, O. (2023). THE EFFECT OF USING STORY-MAPPING TO ENHANCE READING COMPREHENSION OF STUDENTS WITH LEARNING DISABILITIES IN SAUDI (Doctoral dissertation, Duquesne University). Retrieved from <https://dsc.duq.edu/etd/2164>

This Immediate Access is brought to you for free and open access by Duquesne Scholarship Collection. It has been accepted for inclusion in Electronic Theses and Dissertations by an authorized administrator of Duquesne Scholarship Collection. For more information, please contact beharyr@duq.edu.

USING STORY-MAPPING TO ENHANCE READING COMPREHENSION FOR
STUDENTS WITH LEARNING DISABILITIES IN SAUDI ARABIA

A Dissertation

Submitted to the School of Education

Duquesne University

In partial fulfillment of the requirements for
the degree of Doctor of Philosophy

By

Omar A. Alshikhi

August 2023

Copyright by
Omar A. Alshikhi

2023

USING STORY-MAPPING TO ENHANCE READING COMPREHENSION FOR
STUDENTS WITH LEARNING DISABILITIES IN SAUDI ARABIA

By

Omar A. Alshikhi

Approved May 11, 2023

Reva Mathieu-Sher, Ed. D, BCBA.D.
Assistant Professor
Department of Educational Foundations
& Leadership

(Committee Chair)

Ara Schmitt, Ph.D.
Professor
Department of Counselor Education and
School Psychology

(Committee Member)

Elizabeth McCallum, Ph.D.
Associate Professor
Department of Counselor Education and
School Psychology

(Committee Member)

ABSTRACT

USING STORY-MAPPING TO ENHANCE READING COMPREHENSION FOR STUDENTS WITH LEARNING DISABILITIES IN SAUDI ARABIA

By

Omar A. Alshikhi

August 2023

Dissertation supervised by Reva Mathieu-Sher, Ed. D, BCBA.D.

Students with specific learning disabilities (SLD) represent between 5% and 10% of the total number of students in public schools in Saudi Arabia (Abu Nayyan, 2015). Further, 80-90% of students with SLD exhibit reading difficulties including difficulties in reading comprehension (Mercer & Pullen, 2009). Although there is a large number of students with SLD that exhibit reading difficulties in Saudi Arabia, there is a dearth of research attempting to understand the specific effectiveness of strategies to improve reading challenges for students with SLD, particularly in the area of comprehension. The current study aimed at investigating the effects of the use of a story-mapping intervention on three students with SLD in Saudi Arabia. The current study employed a single-subject design, specifically, A-B designs, each with a follow-up maintenance phase. Results indicated that the story-mapping intervention was effective in increasing reading

comprehension for all three participants. The three participants also maintained their improvement during the maintenance phase. In addition, the participants and the SLD teacher's responses on the social validity questionnaires, revealed an acceptable social validity rating indicating that the intervention made an impact on the students lives. The limitations of the current study include the small sample size of participants, the absence of face to face instruction, and the absence of standardized reading comprehension measures. Future studies should be conducted to replicate the current study with female students with SLD and students with other types of disabilities which include reading based-challenges in Saudi Arabia (e.g., autism, mild intellectual disabilities, and potentially behavioral disorders).

ACKNOWLEDGEMENT

It is a pleasure to express my thanks and gratitude to my academic advisor, Dr. Reva Mathieu-Sher. She provided me with the time, advice, and motivation that helped me to complete this great academic achievement. I would also like to convey my gratitude to Dr. Schmitt and Dr. McCallum for their patience and efforts during the writing process and implementation of my dissertation. Additionally, I would like to acknowledge my colleagues for our time spent working together in fruitful discussions.

I would like to extend my appreciation to the Saudi Government for helping me achieve my dream by providing me the opportunity to pursue my Masters and Ph.D. in Special Education in the United States. The care, guidance, and financial support Saudi students receive from the government inspires and serves as a motivator for our academic and professional success.

I am also grateful to my family for their continuous support throughout my scholarly journey since 2011. Their love has motivated me to aspire and reach my personal and academic goals. With everyone's ongoing help, support, and advice I have been able to fulfill my dream of obtaining my Ph.D. in Special Education. Thank you.

TABLE OF CONTENTS

	Page
Abstract.....	iv
Acknowledgement.....	vi
List of Tables.....	xi
Chapter I: Introduction	1
Specific Learning Disabilities in the United States.....	1
Special Education in Saudi Arabia.....	3
Specific Learning Disabilities in Saudi Arabia	4
Reading Struggles of Students with Specific Learning Disabilities.....	5
Big Five in Reading.....	6
Reading Comprehension	7
Reading Comprehension in Saudi Arabia	8
Current Reading Comprehension Research in Saudi Arabia	9
Story-Mapping Strategy	10
Purpose of the Study and Research Questions	11
Chapter 2: Literature Review	12
Theoretical Basis of the Story-Mapping Strategy	12
Story-Mapping Intervention	13
Research on Story-Mapping	16
Research on Story-Mapping for Students with Specific Learning Disabilities	17
Research on Story-Mapping for Students with Other Disabilities	20
Summary of Finding.....	21

Parent Delivery of Reading Interventions	22
The Promise of Technology in Parent Delivery of Interventions	25
Chapter 3: Methodology	27
Student Participants	27
Participating Parents/Guardians	28
Setting.....	29
Research Design	29
Sampling Procedures	30
Dependent Variables and Independent Variables	30
Story Maps.....	31
Comprehension Questions.....	32
Comprehension Probes	33
Diagnostics Tests.....	33
Procedure	34
Training	34
Baseline	37
Intervention.....	38
Maintenance	40
Inter-Scorer Agreement	41
Social Validity	41
Treatment Integrity Checklists	43
Data Analysis	43
Chapter 4: Result	44

Overview	44
Training Procedure for Interventionists	44
Baseline	45
Ali	46
Mohammed.....	47
Basel	48
Intervention	49
Ali	50
Mohammed.....	51
Basel	52
Maintenance	54
Inter-scorer Agreement.....	57
Social Validity.....	57
Social Validity (Teacher Version).....	58
Social Validity (Student Version)	58
Treatment Integrity.....	64
Summary of the Result.....	65
Chapter 5: Discussion.....	66
Overview	66
Discussion of Research Findings	66
Connection to Previous Research.....	68
Implication for Policy.....	69
Implication for Practitioners.....	70

Implication for Researchers.....	70
Limitation of the Study	71
Recommendations for Policy	73
Recommendations for Practitioners	74
Recommendations for Future Researchers.....	74
Conclusion.....	75
References	80
Appendix A	97
Appendix B	98
Appendix C	101
Appendix D	102
Appendix E.....	103
Appendix F	104
Appendix G	107
Appendix H	109
Appendix I.....	110
Appendix J.....	112
Appendix K	114
Appendix L.....	115
Appendix M.....	116

LIST OF TABLES

	Page
Table 1. Participants Scores and Means out of 8 Comprehension Questions During the Baseline	46
Table 2. Ali's Reading Comprehension Performance Across all Sessions During the Baseline Phase	47
Table 3. Mohammed's Reading Comprehension Performance Across all Sessions During the Baseline Phase	48
Table 4. Basel's Reading Comprehension Performance Across All Sessions During the Baseline Phase	49
Table 5. Participants' Scores out of 8 Comprehension Questions During the intervention Phase	50
Table 6. Ali's Reading Comprehension Performance Across All Sessions During the Intervention Phase	51
Table 7. Mohammed's Reading Comprehension Performance Across all Sessions During the Intervention Phase	52
Table 8. Basel's Reading Comprehension Performance Across all Sessions During the Intervention Phase	53
Table 9. Ali's Reading Comprehension Performance Across all Sessions During the Maintenance Phase	54
Table 10. Mohammed's Reading Comprehension Performance Across all Sessions During the Maintenance Phase	55

Table 11. Basel’s Reading Comprehension Performance Across all Sessions During the Maintenance Phase	55
Table 12. Social Validity of the Story-Mapping Strategy for the SLD teacher	60
Table 13. Social Validity of the Story-Mapping Strategy for the Participants	63
Table 14. Empirical Research on the Story-Mapping Strategy	77

Chapter One

Introduction

Students with specific learning disabilities (SLD) often exhibit difficulties in reading (Fuchs, et al., 2000; Gersten, et al., 2001), and more specifically in reading comprehension (Jenkins, et al., 2003; Petersen- Brown & Burns, 2011). Research in the area of reading comprehension as it relates to students with SLD has identified different strategies that can be used to overcome reading comprehension problems. One of these strategies is story-mapping, a type of graphic organizer that is used to comprehend narrative texts (Manoli & Papadopoulou, 2012). This strategy has demonstrated a level of effectiveness in the United States, but less information is known about how this strategy might work with learners with SLD in other countries, like Saudi Arabia.

Specific Learning Disabilities in the United States

While several definitions for SLD exist, one definition is primarily used in the United States—that found within the Individuals with Disabilities Education Act (IDEA). The IDEA defines SLD as

A disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, which disorder may manifest itself in [the] imperfect ability to listen, think, speak, read, write, spell, or do mathematical calculations. Such term includes such conditions as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. Such term does not include a learning problem that is primarily the result of visual, hearing, or motor disabilities, or mental retardation, or emotional disturbance, or of environmental, cultural, or economic disadvantage (IDEA, 2004 Section 300.8 (c) (10)).

Thus, the IDEA definition explains that the main causes of SLD are the basic psychological factors such as attention, memory, and perception, which might be exhibited in the form of academic problems such as problems in reading, writing, spelling, and math. Also, the

definition clarifies that any academic problem should not be considered as an SLD when it is resulted of some disadvantages such as a visual, hearing, motor disabilities, intellectual disabilities, emotional disturbance, or environmental, cultural, and economic disadvantages. Additionally, the term SLD might include different conditions such as perceptual disabilities, brain injuries, minimal brain dysfunction, dyslexia, and developmental aphasia (language disorder).

Furthermore, SLD was defined by the National Joint Commission on Learning Disability (NJCLD) as

Learning disabilities is a general term that refers to a heterogeneous group of disorders manifested by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities. These disorders are intrinsic to the individual, presumed to be due to central nervous system dysfunction, and may occur across the life span. Problems in self-regulatory behaviors, social perception, and social interaction may exist with learning disabilities but do not by themselves constitute a learning disability. Although learning disabilities may occur concomitantly with other disabilities (for example, sensory impairment, intellectual disabilities, emotional disturbance), or with extrinsic influences (such as cultural or linguistic differences, insufficient or inappropriate instruction), they are not the result of those conditions or influences.

As shown, NJCLD does not specify that SLD is caused by psychological factors like the IDEA. Rather, SLD as indicated in the NJCLD definition, was referred to a heterogeneous group of disorders that is not specified. Both IDEA and NJCLD clarify that these psychological processes, or the varied disorders, can lead to academic difficulties with reading, writing, and math, as well as other difficulties like thinking and speaking. Both definitions indicate that SLD is not the result of different disabilities like intellectual and emotional disabilities or other conditions such as environmental, cultural, or economic disadvantages (Exclusion Criterion).

According to the U.S. Department of Education (2018), SLD is the largest category among all special education categories. In 2016, students with SLD ages 6 through 21

represented 38.6% (or 2,336,960 students) of all public-school students receiving special education services in the United States (that is 6,048,882 students; U.S. Department of Education, 2018). Seven out of ten students with SLD spend at least 80% of the school day in the regular classroom with typical students (National Center for Learning Disability, 2017).

Special Education in Saudi Arabia

The Ministry of Education in Saudi Arabia officially started to plan for special education services for individuals with disabilities during the 1960s. The main goal was to prepare those individuals with disabilities for improving their quality of life, while also preparing them to be effectively engaged in society (Ministry of Education, 2001). The care and the devotion from the Ministry of Education started with three categories of students with disabilities: students with severe visual impairments, students with severe hearing impairments, and students with mild intellectual disabilities. Special institutions were selected to teach these students, however, the prevailing trend after that became integrating them into regular public schools (Battal, 2016).

In order to make the integration effective and successful, the government of Saudi Arabia has established rules and regulations in order to ensure that all individuals with disabilities receive appropriate education, regardless of the disabilities and the severity of it. First, the authorization in Saudi Arabia guarantees that all students with disabilities, including those with SLD, have the right to receive free and non-discriminatory education. Additionally, the government guarantees that public schools are the general education environment for educating individuals with disabilities (Ministry of Education, 2002). Thus, the government provided the appropriate buildings with devices and other important mechanisms to facilitate all individuals with disabilities' access to the classrooms. Moreover, the government promises that every

student with disabilities has the opportunity to benefit from the transition services, supporting services, early intervention programs, and the individual educational programs (Ministry of Education of Saudi Arabia, 2002; Alquraini, 2010).

Specific Learning Disabilities in Saudi Arabia

SLD was first identified as a formal disability in Saudi Arabia in 1996 (Al-hano, 2006) by the Ministry of Education, the official organization that supervises, plans, and monitors the educational programs in Saudi Arabia (Al Salloom, 1991). Similar to the United States, and to the IDEA definition, SLD is defined in Saudi Arabia as a

Disorder in one or more of the primary and psychological processes, which include understanding and using the written and spoken language, and are exhibited in difficulties in listening, thinking, speaking, reading, writing, and mathematics; these difficulties should not be due to intellectual or sensory disabilities, or any other disability, curriculum, or family status (AbuNayyan, 2001, p. 20).

Although the Ministry of Education in Saudi Arabia did not begin authorizing SLD programs until 1996, these programs have expanded rapidly in the country. In 2014–2015, the number of Saudi public schools that had SLD programs reached 2,393 with 26,225 students with SLD in public schools having benefited from these programs (Ministry of Education, 2015). This number represents between 5%-10% of the total number of students in public schools (Abu Nayyan, 2015).

According to Hussain (2010), students with SLD in Saudi Arabia receive their instruction in resource rooms. These students with SLD are mostly educated in the regular classrooms (Aldabas, 2015) but they are pulled out two or three times a week to receive academic support in resource rooms (Al-Zoubi & Rahman, 2016). Students with SLD in the resource room receive individual or small setting instruction in reading, writing, or math (Hussain, 2010).

Reading Struggles of Students with Specific Learning Disabilities

Reading is a complex skill that is necessary to achieve success in both one's private and professional life (Sperling et al., 2019). According to Ravitch (2010), reading is a cognitive process that involves decoding symbols to extract meaning. Ravitch further noted that two student groups are at risk of struggling with reading—those with SLD and second language learners. In fact, 80-90% of students with SLD exhibit reading difficulties including difficulties in reading comprehension (Mercer & Pullen, 2009). The struggles in reading become more challenging as students with SLD move to higher grades due to applying more complicated reading skills (e.g., reading comprehension) (Josephs & Jolivette, 2016; Ravitch, 2010).

According to Dudley (2005), students with SLD struggle with basic reading skills (e, g., decoding, fluency). Also, students with SLD might have difficulties in terms of using academic vocabulary to communicate. Thus, it is important to realize that comprehension depends not only on the students' general background knowledge about the passage but also on their knowledge of vocabulary used in text (Gersten et al., 2001). Furthermore, students with SLD develop less background knowledge about a text than typically developing students (Shaywitz et al., 2003). As a result, this lack of experience or background knowledge leads to struggles when they are attempting to understand text.

Some students with SLD exhibit comprehension deficits when they approach texts because of their general difficulty in understanding the text-structure (Padeliadu & Antonio, 2104). Text-structure is organizing text by different features such as sequence, compare/contrast, and cause/effect structures (Downing et al., 2002). Akhondi et al. (2011) confirmed that students who are unaware of how a passage is structured might face reading comprehension problems.

This is because understanding the text-structure of any passage or story is an important component of overall comprehension. Typical children, on the other hand, can build a sense of the text-structure, which leads to better understanding of these texts (Gersten et al., 2001). In addition, struggling readers including those with SLD might not use the appropriate strategies or when to use a particular strategy. Strategies seem to be daunting to those students, especially in this age group (Gersten et al., 2001).

Big Five Areas in Reading

No Child Left Behind (NCLB) admits that some students, including those with disabilities, are behind in academic areas including reading. To implement its plan, NCLB emphasizes using evidence-based reading strategies to improve the students' performance in the big five areas in reading: phonemic awareness, phonics, vocabulary, reading fluency, and reading comprehension (National Reading Panel, 2000). Phonemic awareness refers to the concept that the spoken word consists of individual sounds that are combined to make that spoken word: for instance, understanding that the word car consists of three phonemes, which are /k/-/a/-/r/ (Duncan, 2018). Understanding the phonemic awareness skill indicates that the reader is able to break the spoken word into syllables, as well as blending syllables to make a spoken word. Thus, identifying an individual sound of a spoken word is an indicator of gaining the phonemic awareness skill (Duncan, 2018).

Phonics, on the other hand, refers to the connection between letters in written words and their sounds in spoken words. For example, knowing that the letter (M) makes the sound /m/, and the letter (R) makes the sound /r/ (McGuinness, 2006). Understanding the phonic skill indicates that the reader is able to spell and read words because of the established connection between

letters and sounds that the letters make (Duncan, 2018). The phonemic awareness and phonics are significant to the primary grades because they are the foundational skills for vocabulary, reading fluency, and reading comprehension (McGuinness, 2006). The third skill of the big five areas is fluency. Fluency is the concept of reading with speed and accuracy. Fluent readers read text not only quickly and correctly, but also with understanding and appropriate interaction (Klauda & Guthrie, 2008). The fourth reading skill is vocabulary, which is interacting with a word, understanding it, and using it properly. Expanding vocabulary is significant because it helps readers read comprehensively (National Reading Panel, 2000). The fifth reading skill is comprehension. Reading comprehension is the ultimate goal of reading, and can be defined as interacting with text as well as extracting a meaning of the written text (Botsas, 2017). The ability to comprehend text is important for the process of learning, especially in the upper grades of elementary school (Sweet & Snow, 2003). Both vocabulary and comprehension skills are connected because both lead the reader to extract meaning. That is, when vocabulary is linked to individual words, while comprehension is linked to a longer unit (National Reading Panel, 2000).

Reading Comprehension

Reading comprehension has been identified as an important reading skill, and according to Tighe et al. (2015), comprehension is the most important goal of reading. Reading comprehension is defined as a complicated interface between the reader's verbal knowledge, engagement with the text, and usage of reading comprehension strategies (Hall & Barnes, 2017). In order to have successful reading comprehension, readers must have certain fundamentals. First, they need to have the ability to coordinate between reading decoding and the knowledge of the text. Second, successful readers must have the ability to use cognitive strategies while reading. Third, readers must monitor their reading comprehension flow in order to establish a

consistent general picture of the text they are reading (Botsas, 2017).

Indeed, while students may comprehend individual sentences, they may have difficulty comprehending an entire passage (Hall & Barnes, 2017). Difficulty understanding an entire passage may be due to the fact that struggling readers do not have the skills that help them generate inferences that are essential for making sense of what they read; they have difficulties extracting the overall meaning of a written text (Hall & Barnes, 2017). Also, Sadeghi et al. (2016) believe that simply reading text does not indicate that students are understanding each sentence; they state that understanding cannot be limited to either graphing information existing in text or naming the main elements. Rather, understanding relies on the brain interacting and operating with the words; then this process leads the students to assign meaning to the words. Thus, understanding requires fast attention and sorting out the main points that captured the readers' attention (Sadeghi, et al., 2016).

There are several factors that can help students to better understand text. These factors are: (1) knowledge of how text was built, (2) vocabulary awareness, (3) using background knowledge during reading, (4) the ability to read the assigned text fluently, and (5) task persistence. Also, Koda (2007) ascribed reading comprehension problems to different factors that include vocabulary awareness, background about the content, understanding of grammar, metacognitive knowledge, and reading strategies such as story-mapping (Kolligian & Sternberg, 1987).

Reading Comprehension in Saudi Arabia

The Ministry of Education in Saudi Arabia emphasized the importance of reading comprehension as they consider reading comprehension as an important goal that needs to be

achieved by elementary grade students. For instance, the Ministry of Education in Saudi Arabia emphasized the importance of training students in exploring new word meanings, using antonyms and synonyms, identifying the root of a word, choosing the most appropriate word among several meanings, answering detailed questions about text, text analysis, connecting ideas, connecting cause and effects, and providing new titles of passages (Ministry of Education, 2007). However, research in reading comprehension does not keep up with the Ministry's eagerness to better develop reading comprehension in Saudi Arabia.

Al-Nujaidi (2013) found that most Saudi students—including those with SLD—do not read outside of school. In addition, Al-Qahtani (2016) mentioned that Saudi students face reading difficulties due to factors such as students' lack of motivation, the absence of using reading strategies, and little attention from teachers on reading comprehension (with more attention given to reading aloud). On the Performance of International Student Assessment (PISA), Saudi students underperformed in reading comprehension when compared to students from other countries (Ministry of education, 2019).

Current Reading Comprehension Research in Saudi Arabia.

Research in the area of reading comprehension in Saudi Arabia does not satisfy the Ministry of Education's ambition toward developing and improving the academic outcomes amongst students with SLD. Most of the reading comprehension research was conducted on Saudi students who seek to learn English as a foreign language (EFL; e.g., Meniado, 2016; Alyousef, 2006). Comprehension of English text is important, but what is more powerful is the contribution to improving reading comprehension in Arabic since Arabic is the students' mother tongue in Saudi Arabia. Unfortunately, the current limited research related to SLD and reading in Saudi Arabia is not focused on single-subject designs but employs surveys that investigate

teachers' knowledge, perspectives, attitudes, or challenges faced by them (e.g., Al-Zoubi & Rahman, 2016; Alahmadi & El Keshky, 2019). Furthermore, it was observed that all located studies were conducted on elementary grade students (e.g., Al-Mohrej, 2020), as no study has been conducted on older students with SLDs. This can be attributed to the fact that SLD programs designed for middle and high school students with SLD are fewer than those programs for elementary grade students with SLD (Ministry of Education, 2018), however, future researchers should pay attention to this limitation. Finally, most of the reading comprehension research has been implemented in major cities. Therefore, it is necessary to conduct more studies that employ reading comprehension strategies such as story mapping and generalize these studies to other smaller cities across the country.

Story-Mapping Strategy

One strategy that has been used to teach reading comprehension is a graphic organizer. The graphic organizer strategy was originally called advance organizers, then renamed structured overviews (Manoli & Papadopoulou, 2012). The graphic organizer strategy was initiated by Richard Barron (Barron, 1969), but it was rooted in Ausubel's seminal work (1960) as he suggested that advance organizers enhance new information retention even if it is not meaningful. Also, he assumed that information acquisition occurs when prior knowledge and the learners' existing cognitive structure are linked (1968).

One primary type of graphic organizer used to comprehend text is story-mapping. The story-mapping strategy is the use of a visual format to highlight the main events of a story (Reutzel, 1985). Stein and Glenn (1979) primarily imagined that the story-mapping technique would rely on two major elements: (a) setting, including characters and context; and (b) events such as initiating events, responses, plans, actions, outcomes, and reactions. Researchers

continue to use similar elements within story maps, but without grouping them according to Stein and Glenn's two elements. Stagliano and Boon (2009) suggested that a story map can vary from story to story, but that they generally include elements such as setting, character, events, problem, solution, and theme.

Purpose of the Study and Research Questions

The main purpose of this single-subject multiple baseline across participants study is to determine the effectiveness of story-mapping as an academic intervention to improve reading comprehension of third and fourth grade students with SLD in Saudi Arabia. Although the story-mapping strategy has been investigated in the United States, the use of this strategy has not been investigated in Saudi Arabia. It is hypothesized that findings from this study will provide emerging evidence regarding whether or not Saudi students with SLD benefit from a story-mapping strategy, as performance on reading comprehension will be analyzed before and after the story-mapping intervention. This proposed study will address three research questions:

1. What is the effect of a story-mapping intervention on reading comprehension skills of third and fourth grade students with SLD in Saudi Arabia?
2. To what extent are participants able to maintain their reading comprehension skills after the intervention is completed?
3. To what extent is the story-mapping intervention socially valid among students with SLD in Saudi Arabia?

Chapter Two

Literature Review

This chapter describes the theoretical framework that supports the use of the story-mapping strategy to teach reading comprehension. The theoretical framework of schema theory is discussed in terms of definition, and features. This chapter also examines in detail the story-mapping strategy as an academic intervention intended to improve the reading comprehension of students with SLD. Additionally, this chapter examines empirical studies conducted to teach the story-mapping intervention to students with SLD or other disabilities. Finally, because this study includes using Zoom to train parents on the use of the story-mapping strategy to improve their children's reading comprehension at home, this chapter provides a brief discussion of the impact of parent/guardian administration of reading intervention with children at home, as well as the technology-assisted interventions, which play a significant function in training families.

Theoretical Basis of the Story-Mapping Strategy

The story-mapping strategy is derived from schema theory. According to Ormrod (1995), schema theory is rooted in the model of Piaget's developmental theory. Piaget's developmental theory indicates that individuals can process and obtain knowledge when they are able to structure and coordinate information (Ginsburg & Opper, 1988). Piaget views schemas as abstracts that can be defined as a mental unit that describes a set of similar elements or ideas (Ormrod, 1995). Similarly, Rumelhart (1980) developed a theoretical model that confirms that a schema is a structured knowledge designed to represent general thoughts stored in memory. Also, he stated that knowledge is arranged as thoughts that include situations, stories, and series of events that can be represented in different forms of schema. Additionally, Rumelhart described schema as a hook

used to link new information (Englert & Raphael, 1988).

Bartlett was the first psychologist to introduce the concept of schema (1932). Bartlett perceived schema as a general organization of events or story. Schema theory can also be defined as the concept of how readers use their previous learning to understand and get a sense from a text (Rumelhart, 1980). Shen (2008) stated that schemas (e.g., story maps) help students process, organize, and store information in the brain for recall. By utilizing schemas, students are able to receive the new information quickly and think productively. For instance, when readers are aware of the major elements from a story such as characters, major events, and the conclusion, they are more likely to benefit from the story they are reading (Hudson, 1982). Also, Stein and Trabasso (1981) proposed that schemas have the following features: (a) schemas are formed of general knowledge that helps guide the reader to encode, structure, and recall information from text; (b) schemas can be utilized without the reader's conscious knowledge; (c) schemas are assumed to be shared across individuals; and (d) schemas are taught to be relatively constant across time. Thus, story maps are good examples of materials that align with schema theory.

Story-Mapping Intervention

Pressley (2006) suggested that using reading comprehension strategies can help students be successful in reading comprehension. In addition, Cain (2009) argued such strategies help readers be aware of their comprehension flow when establishing a logical illustration of text. One strategy that has demonstrated effectiveness for improving reading comprehension of students with SLD is story-mapping (Onachukwu et al., 2007; Kang et al., 2016), what Marshall (1983) originally coined story grammar (e.g., “the description of typical elements found frequently in stories” [p. 616]). According to Reutzel (1985), a story map is a visual structure that is presented in a form to facilitate the understanding of the story elements. The story-mapping strategy is

defined as a visual process readers use to enhance their reading comprehension skills by highlighting the key information of the story (Boulineau et al., 2004). Similarly, Stetter and Hughes (2010) suggested that the story-mapping strategy is a visual representation of a story to be taught to students to help them visualize the content and better understand the story elements such as characters, settings, major events, and story outcomes.

The story map is designed to show students that all of the components of a certain story are associated. The story map provides students with a visual schema for how most stories are organized and combined. Mathes et al. (1997) defined each element of the story map as (a) main characters—who the story is essentially about, (b) setting—at what location and when the story occurs, (c) problem—what the main character must solve, (d) major events—the most critical events that occur to solve the problem, and (e) story outcomes—whether the problem is solved. The importance of this strategy is it can be beneficial in helping students separate between necessary and unnecessary information and then focus on the necessary information, providing effective participation, transferring input into long-term memory, activating prior knowledge, and predicting the rest of the story (Akyol, 1999).

Many researchers have discussed the effectiveness of using graphic organizer tools including story maps for improving reading comprehension skills among poor readers (Gardill & Jitendra, 1999; Kang et al., 2016; Stenson, 2006). According to Akhondi et al. (2011), visual organizers including story maps help students become familiar with the text and access the information easily. By using text-structure knowledge and a visual organizer such as a story map, students are able to store information in their short-term memories then approach it or connect it to the background knowledge he/she has. Moreover, when this information is related to previous knowledge, it can be stored in the students' long-term memory (Akhondi et al., 2011).

The story-mapping strategy can be used effectively before reading the passage to organize the ideas and previous knowledge about the topic. It can also be used during reading to help the reader get a sense of what he or she is reading. Also, this strategy can be used after reading the passage to review the information provided in the passage (Boulineau et al., 2004). The story maps can be presented differently in terms of the depth of information introduced to students based on their grade-level. For example, story maps can be introduced to kindergarten age students by including the beginning, the middle, and the end of the story. However, they can include more details and information, such as the main character, problem, and solution for older students (Coyne et al., 2009).

Sadeghi et al. (2016) discussed the importance of visual organizer strategies as a part of special education programs to promote students' comprehension. Moreover, Stenson (2006) mentioned that presenting graphic organizers such as story maps to students with SLD can increase their ability to generate relationships between events in the reading passages, then improve their reading comprehension. Also, the use of the story-mapping strategy increases the reader's ability to remember the main ideas of a given text and directs the child's attention to the main elements of the story (Boulineau et al., 2004).

The story-mapping strategy can be employed in schools using two lesson formats (Narkon & Wells 2013). Both formats can be implemented for children with or without SLD, as well as be used to teach groups and individuals. The first format is the expanded lesson that was developed by Hunter (1994). This format was designed to help teachers create clear sequential lessons for students. In this format, the students receive instruction in each story before completing a story map. The implementation of story-mapping lessons in this format can last for 30 to 60 minutes. The expanded instruction format includes six components that can help

teachers organize the lesson properly: (1) anticipatory set where the instructor gets the attention of the students by focusing on the advantage of the task in order to activate the students' prior experience, (2) information such as teaching the main ideas of the story, (3) showing and explaining in detail the story elements, (4) guided practice where the target student works with other students in the classroom and receives direction from the teacher, (5) independent practice (i.e., students practice what they had learned without supervision from the teacher, and (6) conclusion.

The second format that can be used to teach struggling readers is the mini-lesson format. This format is designed to teach students brief lessons (no longer than 20 minutes) that can be provided to the target students. Mini-lessons include three components: (a) before reading, (b) during reading, and (c) after reading instruction. Before reading instruction in a mini-lesson is similar to the anticipatory set, which is the first component in the expanded direct instruction approach. Basically, it prepares the students for the lesson by introducing the lesson and focusing on the importance of it. Reading instruction in this format includes teaching information and modeling. Teachers also can encourage practice on the story map during reading. After reading instruction in a mini-lesson should include individual practice on the story map after reading the story (Narkon & Wells 2013).

Research on Story-Mapping.

All of the studies discussed below are empirical studies that aim at clarifying how the story mapping strategies were executed. Most of the studies were conducted with elementary grade students who have SLD. However, some selected studies were conducted on students with other disabilities such as autism or behavior disorders. Although it was not taken into consideration where the study was conducted, all of the studies discussed below were conducted in the USA

except for one study that was conducted in Germany (see Table 1 for a list of all studies).

Research on Story-Mapping for Students with Specific Learning Disabilities. There are several studies that have investigated the effect of story-mapping on students with SLD. Idol (1987) explored an intervention aimed at increasing the ability of 27 third and fourth grade students, including five students identified with SLD, to identify the elements of a given story. In this study, employing a multiple baseline design across groups, the researcher used a story map in order to teach the participants the story elements throughout the intervention phase. The findings of this study indicated that all participants improved their comprehension skills during the intervention phase. Also, Boulineau et al. (2004) examined the effectiveness of using the story-mapping strategy on six third- and fourth grade students with SLD and they employed a multiple baseline design across participants. Two dependent variables were examined by Boulineau et al. (2004). First, to determine the effectiveness of story-mapping on each participant, they examined the individual performance across different conditions. Second, they looked at the mean performance of all students on each element of the selected story. In the baseline phase, students answered, on average, 31% of the story element questions correctly, with a range of performance from 25% to 35%. The participants then were able to increase their reading comprehension skills during intervention as they answered an average of 84% of the story element questions correctly with a range of performance from 67% to 96%. Also, the result indicated good maintenance of the student's comprehension skills of story elements; they answered, on average, 80% of the comprehension questions correctly during the maintenance phase.

Stagliano and Boon (2009) used a multiple-probe design across participants with three fourth grade students with SLD. The researchers read sample passages to participants and guided

them on how to fill out the story-mapping form correctly and answer the comprehension questions. All participants practiced reading the passage and identifying the story elements independently. Then, they received feedback until they answered at least 80% of the comprehension questions correctly. During the intervention phase, students spent 20 minutes independently completing the story map while reading the text. The responses to comprehension questions during the intervention phase were recorded as well as the identification of story elements. The findings of this study indicated that the story-mapping strategy improved the participants' reading comprehension and improved the skill of identifying story elements. These results were maintained after the intervention ended.

Also, story mapping has been conducted with middle-school students with SLD. For instance, Gardill and Jitendra (1999) conducted a multiple baseline design study across participants to teach reading comprehension using the story mapping strategy to six middle school students with SLD. The study examined three aspects of story-mapping: (a) the extent to which story-mapping strategy impacted reading comprehension skills, (b) the ability to generalize the acquisition of story-mapping strategy to the passages, and (c) the effect of story-mapping on retelling story elements. The intervention in this study included two teachers to guide the students and provide feedback for them. Participants read the story. Then, they were provided a story map form and basal comprehension questions. The teachers recorded the percentage of correct answers for all six participants. Results showed that participants increased the percentage of correct answers to comprehension questions. Also, the participants study maintained their improvements during the generalization and maintenance phases.

Findings from this study are consistent with the findings from Onachukwu and colleagues (2007) as they conducted a multiple baseline design study across participants with six middle

school students with SLD. Onachukwu and colleagues (2007) conducted a training phase prior to the intervention to provide individual instructions and help the participants identify the story elements using the story map. In the training phase, participants were guided until they answered 80% of the comprehension questions correctly. After the students practiced using the story map and identifying the story elements, they began receiving the intervention. During the intervention, the participants individually read a story, completed a story map, and responded to comprehension questions. Participants received intervention until they answered 80% of comprehension questions correctly. Results showed immediate increases in the percentage of correct comprehension questions. The improvement was maintained without the continued use of the story map.

Research on story mapping also has been conducted with high-school students with SLD. Fore et al. (2007) conducted a study with four eleventh grade students with SLD. The study included pre/post-tests, a model phase, and a lead phase. In the model phase, the direct teaching of story-mapping continued for five sequential days for some participants and longer for those who did not meet the criterion of at least 75% accuracy on comprehension questions during four sequential sessions. During the model phase, the teacher helped participants to practice completing the story maps. In this phase, after participants finished the assigned stories, the teacher displayed the story map transparency for participants and explained each story element. In the lead phase, the teacher led the students to construct story maps and going over them. The participants read the assigned story silently and no assistance was provided to them. Also, the participants completed the story maps independently in this phase, and they had to meet a criterion of at least 80% or higher on the comprehension questions. The findings from this study showed that the direct teaching of the story-mapping procedure improved all four students' performance in answering comprehension questions. The mean percentage of the correct comprehension questions for all

students increased from 62.42% to 83.28% after receiving instruction on story-mapping. This high performance was maintained during post-assessments.

Other researchers sought to examine the effectiveness of story mapping intervention on skills other than reading comprehension. For instance, Vallecorsa and deBettencourt (1997) used story mapping to examine the influences of direct teaching of the story map components on reading comprehension and story writing skills of three seventh grade students. Also, the study looked at the transfer of training on general writing skills. The results indicated that there was an improvement in reading comprehension skills including recalling different elements of the story as well as writing performance skills, specifically in writing stories (Vallecorsa & deBettencourt 1997). Similarly, Hennes et al. (2015) conducted a study to examine the effectiveness of using story-mapping on students with SLD who struggle with composition writing. The mapping form used in this study included the following elements: characters, setting, the goal of the story, the problem of the story including major events, and the outcome. Results showed that all participants improved their composition writing skills. Both studies indicate that story mapping can be useful for reading comprehension and story writing skills.

Research on Story-Mapping for Students with Other Disabilities. Babyak et al. (2000) conducted a study with four upper elementary school students who had exhibited some behavior disorders. All students were performing below their current grade level in reading. The participants received individual intervention as they were provided the story map instruction separately. They were taught the characters, settings, main problems, major events, and how the problem was solved. During the intervention, participants were asked to read several stories, retell the stories in their own words, finish a story form, and complete comprehension puzzles related to the stories. Results indicated that the story mapping strategy helped all the participants in increasing the

percentage of correct answers to comprehension questions.

Another study conducted by Browder, et al. (2017) examined the effects of an electronic story-mapping intervention on reading comprehension skills of three elementary school students with autism spectrum disorder (ASD). The researchers employed a multiple probe across participants design. They used an iPad to present story maps. Participants were instructed to identify story elements, listen to age-appropriate stories, and complete electronic story maps. Results indicated the intervention was useful for teaching story element definitions, identifying the story elements on an iPad, and improving correctly answered comprehension questions.

Summary of Finding

Findings from the studies reviewed support the use of the story mapping strategy as all studies demonstrate the effectiveness of using the story-mapping strategy. There are some considerations that were derived from the above studies. First, during story-mapping intervention with elementary school participants, researchers read the story to the participants (e.g., Stagliano & Boon, 2009). This is an indication that researchers sought to have participants correctly pronounce text so no confounding variable impacts the participants' comprehension. This procedure has not been done with older students such as middle-school students (e.g., Gardill & Jitendra, 1999) or high-school students (e.g., Fore et al., 2007) as they are more likely to be able to read passages correctly independently. In addition, it was noted that researchers create story maps for their elementary school participants (e.g., Boulineau et al., 2004), however, when implementing story mapping with high-school participants, the participants were required to create their own story maps (e.g., Fore et al., 2007). In addition, story mapping instruction has been done individually with participants regardless of grade level.

As noted, the story mapping strategy did not only improve comprehension skills but also writing skills (Hennes, et al., 2015; Vallecorsa & deBettencourt, 1997). These outcomes indicate that when students have such a guide or a plan on which to organize text or thoughts, they will be better able to comprehend and write stories. Additionally, from the above studies, it is noted that not only did students with SLD benefit from the story-mapping strategy, but so too did students with problem behavior, and students with autism (Babyak et al., 2000; Browder, et al., 2017). Therefore, given that the findings from the studies reviewed support the use of the story-mapping strategy with students with SLD, the researcher will investigate this strategy in a context where the story-mapping strategy has not been investigated, in Saudi Arabia.

However, the ongoing coronavirus pandemic also necessitated that the current study be implemented virtually (via Zoom), rather than in person, an aspect of implementation that has not yet been tested with this intervention. Although much less is known about parent delivery of interventions and training parents virtually, a very brief overview of the existing literature is provided next to support the changes made in this study.

Parent Delivery of Reading Interventions

Parental involvement is a major factor in children's academic and social performance at school (Ceka & Murati, 2016). Parental involvement has been defined as "any interaction between a parent and child that may contribute to the child's development or direct parent participation with a child's school in the interest of the child" (Reynolds, 1992). Indeed, having parents involved in the educational process greatly affects their children's academic success (Hook & DuPaul, 1999). The reason is that parents can provide one-on-one attention and make an immediate modification as needed (Leach & Siddal, 1990). Because children spend approximately 86.64% of their time at home, parents spend a great deal of time with their

children, affording them a great responsibility in terms of educating their children (Wherry, 2004).

Thus, it is essential to get parents involved in schools from Kindergarten through high school (Anderson, 2000). According to Jaiswal (2017), there are different forms of parental involvement in school that include responding to the school requirements (e.g., attending parent-teacher conferences), arranging appropriate time and place for children to study, and encouraging the appropriate behavior at home (e.g., reading for fun). Also, another form that promotes parental involvement in school is training parents to use different strategies to teach their children how to read (Jaiswal, 2017). Although much less is known about parent-delivered reading strategies in increasing reading comprehension, there is emerging evidence of the effectiveness of parent-delivered reading strategies in increasing reading fluency (Daly & Kupzyk, 2012; Fiala & Sheridan, 2003; Hook & DuPaul, 1999). However, it should be mentioned that reading fluency is an important factor that helps readers comprehend text effectively (Solari et. al., 2017).

Training parents on the use of reading strategies has resulted in improving reading comprehension (Wilks & Clarke, 1988) and reading fluency (Fiala & Sheridan, 2003). The located study that relates to reading comprehension (i.e., Wilks & Clarke, 1988) examines the effectiveness of a training program that prepares mothers to be home reading tutors to develop their children's reading accuracy and reading comprehension. Mothers received a training program that includes teaching important skills involved in reading such as meaning, grammar, and phonic cues. Also, mothers in this training program learned how to choose an appropriate place and time to foster good reading practices for their children. Besides, mothers learned how

to choose a book with an appropriate level of difficulty, and how to introduce that book. Also, they were taught what to do when children read correctly, and when they misread. The result indicated that there was a significant improvement in reading comprehension but less improvement was noticed in reading accuracy (Wilks & Clarke, 1988).

Indeed, parents have employed different methods to teach reading fluency to their children such as modeling, performance feedback, error correction, repeated readings, and direct instruction. For instance, Hook and DuPaul (1999) trained parents on using repeated reading and error correction in order to improve their children's performance in reading fluency. The results showed significant improvement as children improved their reading fluency performance across home and school settings. Another study implemented by Daly and Kupzyk (2012) examined whether training parents on the use of a set of reading fluency strategies (e.g., repeated readings, modeling, error correction, and flashcard instruction) would improve the reading fluency performance of poor readers. The results indicated that oral reading fluency improved across all participants, and that participants generalized their learning across different settings (e.g., school and home). Similarly, Kupzyk et al. (2011) examined the effectiveness of a parent-delivered taped reading program on the reading fluency of two children with reading difficulties. The results indicated that the participants improved their oral reading fluency. Additionally, Persampier et al. (2006) examined the efficacy of a parent-tutoring reading program that aimed at improving the reading fluency of two children with SLD. The training was conducted in one session at school. The reading intervention program consisted of repeated readings (RR; Rashotte & Torgesen, 1985), error correction (O'Shea et al., 1984), and a reward system for a good reading performance (Noell et al., 1998). The results indicated that the participants improved their reading fluency as they increased the total number of words read in a minute

(Persampier et al., 2006). Finally, Fiala and Sheridan (2003) investigated the effectiveness of a paired reading intervention on three third and fourth grade low-performing readers. The reading materials (e.g., tape recorder and audiocassette) were provided to each parent-child pair and matched to the child's instructional level. The paired reading method was used at home for 10 minutes a day, four times a week. The results revealed an improvement in children's reading fluency and accuracy using curriculum-based measurement.

Overall, the findings of the research discussed above suggest that training parents on the use of reading strategies with their children can improve their children's reading comprehension and fluency. Because story-maps are a strategy intended to improve student's reading comprehension, it is anticipated that training parents on the use of the story-mapping strategy will result in increasing children's performance in understanding stories, much like the other reading comprehension strategies revealed in the studies discussed above. However, some conditions should be considered to help aid in a positive outcome: (1) the training is accurately implemented by the researcher; (2) the intervention procedures are accurately implemented by parents, including the use of treatment checklists; and (3) continued follow-up is provided by the researcher throughout implementation of the intervention phase.

The Promise of Technology in Parent Delivery of Interventions

Though none of the studies discussed above utilized parent/guardian administration of the story map intervention specifically, or an online or virtual type of training for parents/guardians, technology (e.g., computers, iPads, and smart phones) plays a big role in training and delivering information to families to improve their children's well-being (Jones, 2014). Moreover, technology can increase the possibility of providing effective evidence-based interventions to a

large population at a low cost (Hall & Bierman, 2015). The hope is that technology-assisted interventions—including those interventions that employ different types of technology such as web-based platforms, discussion forums, mobile devices, and video conferencing—help parents to achieve short-term goals for their children as well as promote their children’s developmental growth (Brooks-Gunn et al., 2002; Hall & Bierman, 2015). Such technology-assisted interventions have enhanced the functions of parents when treating their typical achieving children (Nieuwboer et al. 2013) as well as children with cognitive or behavioral challenges (MacDonell & Prinz, 2017).

Thus, it may be possible to improve students’ reading comprehension by not only having parents serve as interventionists, but by combining intervention training with the use of technology (e.g., computers and iPads). To do so, it may be essential to establish effective communication between the researcher and parents during the baseline, intervention, and maintenance sessions (Jaiswal, 2017). Also, the electronic device that will be employed in this study must be used properly. This depends on the parents’ attitude and acceptance of such technology-assisted interventions as well as the comfort of using such electronic devices (e.g., computers or iPads) during and after the training phase, so the researcher can provide worthy training and continuous follow-up (e.g., communicating through email or video calls) after the training (Hall & Bierman, 2015). Overall, whatever the findings of this study are, this research represents an important step forward in using technology to train parents of children with SLD or other disabilities in supporting their child’s reading comprehension skills.

Chapter Three

Methodology

This chapter describes the methodology used in this study. The chapter provides description of setting, participants, sampling procedure, dependent and independent variables, measures and instrumentation, procedures (e.g., interobserver agreement, social validity, and treatment checklist), research design, and data analysis. The method used in this study is a single-subject design. This method was designed to address three research questions: (1) what is the effect of a story-mapping intervention on reading comprehension skills of third and fourth grade students with SLD in Saudi Arabia? (2) to what extent are participants able to maintain their reading comprehension skills after the intervention is completed? and (3) to what extent is the story-mapping intervention socially valid among students with SLD in Saudi Arabia?

Student Participants

Participants have met three inclusion criteria, so they are recruited for this study. First, all participants had to be diagnosed with SLD. Second, all participants had to be at the third or fourth grade level. Third, based on the diagnostic tests (*Diagnostic Tests for Those with Learning Disabilities in Arabic And Mathematics at The Primary Stages*) that were reviewed with the SLD teacher, participants' reading score had to be below their current grade level. On the other hand, three exclusion criteria were considered. First, participants outside of third and fourth grade were not eligible to participate. Second, students with disabilities other than SLD did not participate in this study. Third, participants whose reading scores are on grade level did not participate in this study.

Three total participants were included in the study. Two students were in fourth grade

and one student was in third grade. All students were enrolled in school in Saudi Arabia and had been previously diagnosed with SLD in reading. The researcher and the SLD teacher initially recruited five potential participants, but two of them were excluded from the study because they did not sign and send the parental consent and assent forms back. Participants were recruited based on analysis of the participants' reading performance using the Individual Educational plans (IEPs) and recommendation of the SLD teacher who works closely with them. Also, students' performance on diagnostic tests was used and discussed with the SLD teacher in order to select the participants. These diagnostic tests are described below.

Participating Parents/Guardians

The parents/guardians (e.g., fathers or mothers) served as the interventionists during all story-mapping procedures with training from the primary researcher. The same interventionists completed the baseline, intervention, and maintenance phases with the student. The interventionists had to hold at least a secondary education (e.g., ensuring they have reading, writing, and basic teaching skills) in order to participate in the study. In addition, the interventionists had to be living with the participants in the same house, so there is a long-term relationship already established. Additionally, the interventionists had to have at least one electronic device with a camera (e.g., computer or iPad) and have access to the internet to use Zoom effectively. Thus, before the training phase, the interventionists were provided a brief survey inquiring whether they meet the three criteria mentioned above (see Appendix A). All recruited parents were eligible to receive training and serve as interventionists in this study. However, because of the COVID-19 restrictions, the training sessions were implemented through Zoom. More information in terms of how training was implemented is detailed below.

Setting

The determination of the target school occurred after the approval from the Ministry of Education in Saudi Arabia. However, two features were considered before requesting approval from the Ministry of Education in Saudi Arabia. First, the target school was required to be a public elementary school for male students in Jeddah, located in western Saudi Arabia. Public elementary schools are the general education environments in Saudi Arabia for educating students with SLD (The Document of Rules and Regulations for Special Education Institutes and Programs, 2002). Second, the school had to include an SLD program. Although participants were recruited from this school, given the ongoing Novel Coronavirus (COVID-19), students are currently assigned to virtual instruction delivered by their teachers. Therefore, this study was conducted through Zoom sessions and did not actually occur in the classroom or school.

Research Design

The researcher used a single-subject design to conduct this study. The purpose of using this design is determining the functional relationship between independent variables and dependent variables, focusing with effort on the target behavior (e.g., reading comprehension) of the participants, and controlling for the potential confounding variables (Hammond & Gast, 2010). Although this method called single-subject design, it involves more than one participant (Wolery et al., 2011). The term "single-subject" arises when a participant's performance is compared to the same participant's performance across different phases. For instance, a participant's responses in a baseline phase are compared to his responses in an intervention phase (Wolery et al., 2011).

The specific type of single-subject design that was used in the study is a series A-B designs, each with a maintenance phase design where “A” represents the baseline and “B” is intervention. This specific type of single-subject design is appropriate because it works well with a behavior (e.g., reading comprehension) that is unlikely to decline after responding to treatment (Kratochwill et al., 2010).

Sampling Procedures

Several steps were taken to recruit participants. First, the researcher sought permission from Duquesne University’s Institutional Review Board (IRB). Second, additional permissions were obtained from the Planning and Development Department of the Ministry of Education in Saudi Arabia in order to implement the study in a public school in Jeddah, Saudi Arabia. Third, a gatekeeper letter was sent to the superintendent of the target school to access the building and implement the study. Fourth, the study proposal was sent to the SLD teacher identified by the superintendent of the target school. Fifth, the participants were selected based on the diagnostic tests and the recommendations of the SLD teacher after considering the selected inclusion and exclusion criteria. Sixth, in order to achieve approval from parents, parental consent forms were sent as hard copies to the participants’ parents (see Appendix B). Finally, students were also asked to sign assent forms that are written in simple language outlining the study (see Appendix C). Both consent and assent forms were delivered in Arabic as it is the participants’ native language.

Dependent Variable and Independent Variable

The dependent variable in this study was the number of correct answers to comprehension questions. The highest possible score a participant could earn is eight because the

number of the comprehension questions is eight and each question is worth one point. The researcher also calculated the percent accuracy.

The independent variable in this study was the story-mapping strategy. The story-mapping strategy is a visual process that readers use to enhance their reading comprehension skills by highlighting the key information of a given story (Boulineau, et al., 2004). Thus, blank story maps were introduced and provided to interventionists as interventionists explained these story maps to the participants at home. Interventionists were trained to use story maps individually through Zoom. Materials used during the training sessions are the story elements that are presented in Appendix D, story maps, and three treatment integrity checklists. During the training sessions, the interventionists were introduced to a PowerPoint presentation about the story mapping strategy (e.g., definition, importance, and benefits). Also during the training sessions, interventionists practiced on identifying the story elements (e.g., main characters, setting, problem, major events, story outcomes) of a selected story from textbook. In addition, the interventionists were taught the steps to implementing the baseline phase, the intervention phase, and the maintenance phase. The training phase is described in detail below.

Measures and Instrumentation

Story Map

The story map was aligned with the comprehension questions as it presents five key elements of each story (i.e., main characters, setting, main problem, major events, and story outcomes). These five elements have been developed previously by Mathes et al. (1997; see Appendix D). Mathes et al. (1997) defined each element of the story map as follows: (a) main characters (who the story is about), (b) setting (where and when the story occurs), (c) problem

(problem that the main character must solve), (d) major events (the most critical actions that occur in the story), and finally, (e) story outcomes (whether the problem is solved).

Comprehension Questions

Comprehension questions served as the dependent measure in this study. The comprehension questions were eight questions adapted from Idol (1987; see Appendix E). These questions are a generic set of comprehension questions as these questions were used with each story. The comprehension questions were selected from Idol's study because these questions are general and appropriate for stories taken from reading textbooks used in Saudi Arabia. Such these questions were translated and understood easily by participants. The comprehension questions inquire about where and when the story occurs, the main characters, other characters in the story, the main problem and how the problem is solved, and the outcomes of the story. The answer to these comprehension questions were short responses related to the story components.

Because some stories did not indicate the story setting (time and place) when reading the text, the participants were instructed to extract where or when the story occurs from the picture as needed. For instance, some pictures indicated whether story occurs during the day or night. Also, the participants were taught that there might be other important characters in the story that needed to be considered beside the main character, so they answer the questions if there was another important character in the story". In addition, to answer the question "what was the main problem in the story?", the participants were instructed that the answer should illustrate the main struggle in the story that the main character is trying to solve, or it can be also the main idea of the story. As for the major events, the participants were notified to write at least two major events taken from the story, so they get a full point (1 point) for the question "what were the

major events that led to the problem?”. In addition, to answer the question “How did the main character solve the problem?”, the participants were taught that the answer should be at least one sentence that indicates the solution in the story, as this solution should be related to the main problem. Finally, the participants were informed that writing any reasonable benefit taken from the story is counted as a correct answer for the question “what was the outcome of the story?”.

Comprehension Probes

The comprehension probes were stories on various topics taken from the *My Beautiful Language* textbook. *My Beautiful Language* textbook was authored by the Ministry of Education (2019) in Saudi Arabia, and is a text that is already available in every classroom. *My Beautiful Language* textbook is designed to teach students to read from first to third grade and to comprehend in fourth to sixth grade (Al-Jarf, 2007). There are two textbooks of *My Beautiful Language* which include the primary textbook and the activity textbook. *My Beautiful Language* textbook consists of different branches of the Arabic Language, which include reading, grammar, dictation, speaking, and calligraphy. The stories in *My Beautiful Language* textbook include characters that are either people or animals. Also, like other stories, stories in *My Beautiful Language* textbook include a main idea, setting, major events, and story outcomes. Thus, the story elements align with the story maps and the comprehension questions that were provided during each reading intervention session.

Diagnostic Tests

The diagnostic tests are criterion-referenced that are developed by the Ministry of Education in Saudi Arabia. The student's performance on these tests is compared to a pre-determined criterion, which is answering correctly 80% of each set of questions on a particular

skill. The diagnostic tests identify the strengths and weaknesses specific to the subject (e.g. reading, writing, and math) on which a student was tested. The first section, called My Language, measures reading and writing but has a primary focus on reading. The writing subsection indicates whether or not participants can write short responses related to the comprehension questions tailored to each story. (Ministry of Education, 2015; Ministry of Education, 2016).

Students who are suspected of being at risk of having SLD, usually, are referred by general education teachers to the resource room where the SLD teacher administers the diagnostic tests in the area of suspected difficulty (Alrubaian, 2014). The diagnostic tests are divided into six levels with each level corresponding to a grade level (i.e. level 1: 1st grade). (Ministry of Education, 2015; Ministry of Education, 2016). It should be noted that the diagnostic tests are existing data that were previously administered by the SLD teacher.

Procedure

Training

Because of the COVID-19 restrictions, the researcher administered the study through Zoom in order to train interventionists on implementing story-mapping instruction. The training phase was a total of five sessions that were implemented individually. Each session lasted for 30 minutes. The researcher provided the necessary materials for the training phase prior to the start of the training phase via email including the story map, the comprehension questions, and the three treatment integrity checklists. To help the SLD teacher to measure accurately for the social validity, the interventionists were informed that they would be observed by the researcher and the SLD teacher for at least 30% of the baseline, intervention, and the maintenance phases.

In the first session of the training phase, the researcher used a PowerPoint presentation to introduce the story-mapping strategy (e.g., definition, importance, and benefits) as it is described in Chapter 2 above. Introducing this primary information about the story-mapping strategy provided the interventionists with general idea about the story-mapping strategy and its worth in understanding stories. Second, the researcher explained to the interventionists the story elements that are defined by Mathes et al. (1997) (see Figure 1). The interventionists were informed that they had to use examples of each element as they teach. Explaining the story elements to the interventionists was accomplished by practicing on identifying and highlighting the story elements of a given story; Each element of the story was highlighted with a specific color. Third, the researcher modeled how to complete the story-maps. Fourth, interventionists practiced on completing blank story maps as they were reading a story.

Figure 1

Story Elements Definitions to Explain to the Participants.

Main characters—who the story is essentially about

Setting—at what location and when the story occurs

Problem—what the main character must solve

Major events—the most critical events that occur to solve the problem

Story outcomes—whether the problem is solved.

In the final four sessions, interventionists administered the story-mapping intervention which allowed the researcher to observe how the interventionists delivered the story-mapping components. The interventionists were also asked to explain to the researcher how to identify the story elements of an assigned story. After the process of teaching, the interventionists completed the story maps with help from the researcher. Finally, interventionists completed the story maps independently.

To ensure that the vocabulary of each passage do not confound participants' comprehension of the text during the baseline, intervention, and maintenance phases, the interventionists explained the challenging vocabulary terms that are already highlighted in the text. The researcher prepared a form that includes three columns: (1) challenging vocabularies, (2) meanings, and (3) examples (see Appendix K). The interventionist simply had read the vocabulary terms, meanings, and examples before the child engaged in reading the story. Thus, the interventionists provided the following researcher-developed instruction to the participants as they placed a copy of the words with their meaning and examples in front of the participant: "Please, listen carefully to the following words and their meanings that I will read from the list. These words might be a little bit challenging. You'll notice that these words are also highlighted in the text, but I will provide definitions and examples to clarify these words before we read." The participants were not required to use this form as they are reading but they had the chance to refer back to the form at any time as needed.

In order to ensure that all phases are implemented accurately, the treatment integrity checklists were explained in detail to the interventionists (see Appendix H, Appendix I, and Appendix J). The researcher practiced with the interventionists to mark the steps that are mentioned in the three treatment integrity checklists. By practicing on marking the steps in the

treatment integrity checklists, the interventionists understood all steps needed to accomplish the three phases. This was done regularly, and assessed by providing a written test that is designed to examine the interventionist's understanding of the baseline, intervention, and the maintenance phases. This test was delivered to the interventionist on the last day of the training phase in a Word document through email. The interventionists answered the test questions and emailed it back to the researcher in 24 hours. The test included ten Yes/ No questions taken from the three treatment integrity checklists (i.e., "During the intervention phase, you should provide feedback on words the participant has difficulty pronouncing". (see Appendix L). The answer key is provided below (see Appendix M). To ensure that the interventionists are ready to move forward to the baseline phase, the interventionists had to achieve at least 80% accuracy or higher (the number of correct answers is at least 8 out of 10).

Baseline

The number of sessions during the baseline phase was determined based on the stability (i.e., consistency) of data. The stability in the baseline phase was established after the third session for all participants (all participants were moved to the intervention phase after the third session of the baseline). The reason is that there is no data point varied more than 50% from the mean of the baseline (Alberto & Troutman, 2009). For more clarification, one participant has scored 2, 3, and 2 points out of eight across three baseline probes, so the mean is 2.33 (none of the first three data points varied more than 50% from the mean).

In the baseline phase, interventionists administered stories from the grade level basal reader (*My Beautiful Language*) to the participants to assess their understanding of stories. The interventionists provided copies of stories that were assigned by the researcher to each participant. Participants were asked to read the complete story aloud. No story maps were

provided during the baseline phase. However, feedback was provided when a participant mispronounces a word. The reason is that the researcher sought to ensure that no confounding factors impact the participants' comprehension in this study. Thus, the interventionists provided the following researcher-developed instruction to the participants: "Please read the story aloud. As you read, I will explain some vocabularies you might be not familiar with, and then continue reading the whole story." After participants finished reading, the interventionists provided copies of the comprehension questions. The interventionists instructed the participants, "Now please answer each question; you cannot use the story while responding to the questions."

Intervention

In this phase, the interventionists implemented the story-mapping instruction. The intervention phase was a total of six individual sessions lasting approximately 30 minutes. In order to explain the story elements to the participants, the interventionists practiced (with their child) three different stories and modeled how to identify the story elements presented in Appendix D during each intervention session. The interventionists explained to the participants the story elements (see Figure 1). Then, for practice purposes, the interventionists asked questions such as the question given in Figure 2 (i.e., "Where did the story take place? What were the major events in the story? Or What was the outcome of the story?"). As mentioned in the "*comprehension questions*" section above, the interventionists explained how to answer comprehension question correctly. For instance, the question "what was the main problem in the story?", the participants were taught that the answer of this question should illustrate the main struggle the main character is facing in the story or it can be the main idea of the story. Then, the interventionists modeled how to identify each element with a specific color. Highlighting the story elements allowed participants to organize these elements, then translate them onto the story

maps.

Figure 2

Reading Comprehension Questions to Practice with the Participants.

Where did the story take place?

When did this story take place?

Who was the main character in the story?

Were there other important characters in the story? Who are they?

What was the main problem in the story?

What were the major events in the story?

How did the main character solve the problem?

What was the outcome of the story?

After the interventionists had finished practicing with the participants, each participant began to read aloud a story from the instructional level basal reader. The interventionists provided the following instructions: “Please read the story aloud. As you read, I will explain vocabulary you might be not familiar with, and then continue reading the whole story.” After the participants read the assigned story, the interventionists reminded the participants to highlight the story elements and then complete the story map. The participants had the chance to review the story map before answering the comprehension questions and were not allowed to use them to answer the comprehension questions (Sorrell, 1990).

In the other five sessions, the interventionists executed exactly what has been done in the first session. However, in order to avoid a ceiling effect (i.e., students know the answers to the

comprehension questions across sessions), the interventionist provided different stories to the participants each session. After the participant was done with identifying the story elements and completing the story maps, they were asked to complete the eight comprehension questions described previously (Idol, 1987) at the end of each story where data points are recorded. Again, the participant was not allowed to use the story map to answer these questions (Sorrell, 1990).

Maintenance

Two weeks after the last intervention phase session, maintenance of students' reading comprehension skills were measured using the eight comprehension questions described earlier (Idol, 1987). This phase included two sessions. Participants responded to one story during each session. In this phase, the participants were asked to read stories from the grade level basal reader that are different from those that were administered during the baseline and the intervention phases. Each participant read the story aloud. The interventionist clarified the challenging words that were previously prepared by the researcher. Because the participants were expected to identify the story elements and complete the story map independently, no assistance from the interventionist was provided except for the clarification of the challenging words. After participants had completed the story maps, the interventionist provided the participant with a copy of the eight comprehension questions (Idol, 1987), providing the following researcher-developed instruction: "Please answer each question; you cannot use the story map you just completed while responding to the questions." As done in the intervention phase, the interventionists have made the participants review the story maps before answering the comprehension questions.

Inter-Scorer Agreement

Inter-Scorer Agreement was measured as a percent agreement. The percent agreement is the simplest way to understand to what extent two or more independent scorers are concordant in terms of scoring probes (Altman, 1991). It was calculated as the number of agreements on the comprehension questions divided by the total number of agreements plus disagreements, multiplied by 100 (Hallgren, 2012). The SLD teacher was the other independent scorer in this study.

After the maintenance phase is completed, the SLD teacher was trained on how to score the probes. The training took place in the resource room and lasted for two hours. The SLD teacher was provided with an example of a story and the eight corresponding comprehension questions that have already been answered and scored by the researcher, so he knew the way that the test should be evaluated. The researcher explained every question to the SLD teacher. The researcher has taught the SLD teacher the story elements and explain every question in detail. For example, the researcher explained to the SLD teacher that the setting can be identified from the text by understanding where and when the story occurs. Also, the SLD teacher was informed that the participants were instructed to identify where or when the story occurs from the picture if the text does not indicate that. Then, the SLD teacher was provided with another story and eight comprehension questions that are answered but not scored, so the SLD teacher and the researcher went over them together. The researcher reviewed the SLD teacher's scoring continually until the SLD teacher mastered the process of scoring (100% accuracy).

Social Validity

Social validity is the “assessment of the social significance of the goals of intervention

procedures, the social acceptability of intervention procedures to attain those goals, and the evaluation of the social importance of the effects produced by intervention procedures” (Gresham & Lopez, 1996, p. 205). Researchers can assess social validity by using different tools such as interviews, rating scales, and questionnaires (Schwartz & Baer, 1991). To ensure that the story-mapping intervention is socially valid, and given that the SLD teacher observed 30% of the baseline, intervention, and the maintenance phases, the researcher had the SLD teacher complete the Social Validity Scale Intervention Rating Profile-15 (I-RP15) developed by Martens et al. (1985; see Appendix F) after the study is completed. Although this social validity scale is dated, it is very appropriate since it covers different aspects such as the appropriateness, importance, and negative side effects of the implementation of such a study. Such social validity scale is also appropriate to be adopted and used as a student version where words and phrases could be smoothly simplified. The IRP-15 is a six-point Likert-type (six-ordered response) scale ranging from strongly disagree to strongly agree that is designed to evaluate the perceived social validity of an intervention (Martens et al., 1985). The researcher also provided another version (student version) of the IRP-15 to the participants to complete at the end of the study. However, some changes are made in order to make the student version of the IRP-15 suitable for participants. First, some words and phrases have been simplified, so participants understand the IRP-15 items. For example, the term “negative side-effects” in the SLD teacher version was changed to the phrase “harm or stress” in the student version. Second, items related to teachers or classroom settings have been removed because the study will be implemented in the home environment. Third, one item has been added that is about whether the length of an intervention session (30 minutes) is appropriate. The student version of the IRP-15 is provided in Appendix G.

Treatment Integrity Checklists

Three treatment integrity checklists developed by the researcher were used in this study to ensure that all phases are implemented accurately. These checklists were used by the interventionists during the baseline phase (6 items; see Appendix H), the intervention phase (10 items; see Appendix I), and the maintenance phase (10 items; see Appendix J). All steps in the three checklists were marked step-by-step as soon as they were executed by the interventionists. Also, to ensure that the procedures are implemented as intended and the treatment integrity checklists were completed accurately by the interventionists, the researcher completed the treatment integrity checklists during his observation of the baseline, intervention, and the maintenance phases via Zoom.

Data Analysis

Researchers using single-subject designs have relied on the use of visual analysis to determine the functional relationship between independent variables and dependent variables (Parker, et al., 2007). Visual analysis in this study was used to present data for readers in formats of a graph. The graph is designed to provide a visual summary of participants' performance during baseline, intervention, and maintenance phases. The visual analysis will clarify three important concepts — level, trend, and variability. The level is “the value on the vertical axis scale around which a set of behavioral measures converge”; levels of behavior may be presented as low or high, the trend is “the overall direction taken by a data path”, and finally, the variability is “how often and the extent to which multiple measures of behavior yield different outcomes” (Cooper, 2007, pp. 169-170).

Chapter Four

Results

Overview

The current study examined the effectiveness of story-mapping as an intervention to improve reading comprehension for third and fourth grade students with SLD in Saudi Arabia. This chapter presents data that has been collected during the baseline, intervention, and maintenance phases, as well as the inter-observer agreement (IOA) and the social validity and treatment integrity of the story-mapping intervention. Data has been collected during six weeks and across 11 sessions to answer three research questions: (1) What is the effect of a story-mapping intervention on reading comprehension of third and fourth grade students with SLD in Saudi Arabia? (2) To what extent are participants able to maintain their reading comprehension skills after the intervention is completed? (3) To what extent is the story-mapping intervention socially valid among students with SLD in Saudi Arabia? The participants were recruited from a public elementary school. The participants involved in this study were a total of three participants with SLD. Two students were recruited from the fourth grade, while one student was recruited from the third grade. The researcher assign parents to virtual instruction through Zoom, then the parents, as interventionists, had instructed the participants at home.

Training Procedure for Interventionists

The training phase was implemented through zoom during five consecutive days. The training phase was a total of five individual sessions that included some training materials such as story maps, story element definition, the comprehension questions, and the treatment integrity checklists. During the training phase, and after practicing with interventionists on using the treatment integrity checklists, all interventionists were able to complete the story maps

independently.

After the training phase has ended, and before the beginning of baseline phase, the interventionists were given a written test in order to measure their competence in implementing the intervention. The written test was delivered electronically through email. The test included ten yes/no questions that were answered and sent back during 24 hours after receiving the test. The passing score for this test was 8 out of 10. The interventionists were allowed to use the training materials (e.g., treatment checklists) to answer this test. All three interventionists had answered 100% correctly that allow the researcher to move to the baseline phase directly after receiving the interventionists' answers.

Baseline

The baseline phase was implemented through Zoom directly after the training phase. The baseline phase lasted for three sessions for all three participants (based on the consistency of data). The participants in this phase have read three different stories (one story during each session). Then, they have been administered to eight comprehension questions at the end of each session. No story maps were provided during the baseline phase, but word correction was provided when a participant mispronounces a word.

The participants' performance during the baseline phase was low as the scores during the baseline phase were in the range between 2 and 4 across all three participants (see Table1). The most frequent elements in the story that student correctly identified are the story setting (place and time) and the main character in the story. Whereas participants faced struggles to correctly identify the main problem in the story, the major events in the story, and how the problem was solved, and the outcomes of the story during the baseline phase (see Table1).

Table 1

Participants Scores and Means out of 8 Comprehension Questions During the Baseline.

Session	Ali	Mohammed	Basel
1	3	3	2
2	4	2	3
3	3	3	2
Mean	3.33	2.67	2.33

Ali

Ali had a mean of 3.33 correct answers out of a total 8 comprehension questions during the baseline phase. In the first session, Ali answered three questions correctly including where the story occurred, the main character in the story, and another important character in the story. Then, Ali answered four and three questions correctly in the second and third sessions respectively. In the second session, Ali could identify where the story occurred, the main character in the story, another important character in the story, and the major events in the story. And, finally, in the third session. Ali could identify where and when the story occurred and the main character in the story. Thus, Ali's scores were consistent and stable, so he was moved to intervention phase after the third session of the baseline phase (see Table 2).

Table 2*Ali's Reading Comprehension Performance Across all Sessions During the Baseline Phase.*

Sessions	Setting (Place)	Setting (Time)	Main character	Another character	Main problem	Major events	Story solution	Story Outcomes
1	√	X	√	√	X	X	X	X
2	√	X	√	√	X	√	X	X
3	√	√	√	X	X	X	X	X

√ = Correct answer X = Incorrect answer

Mohammed

Mohammed, had a mean of 2.67 since he scored 3,2, and 3 respectively in the baseline phase. Mohammed in the first session was able to identify where the story occurred, main character in the story, another important character in the story. In the second session, Mohammed was able to identify the place where the story occurred and the main character in the story. In the third session, Mohammed could identify where and when the story occurred, as well as another important character in the story. The third session, was the only the session that Mohammed could not identify the main character in the story (see Table 3).

Table 3

Mohammed's Reading Comprehension Performance Across all Sessions During the Baseline Phase.

Sessions	Setting (Place)	Setting (Time)	Main character	Another character	Main problem	Major events	Story solution	Story Outcomes
1	√	X	√	√	X	X	X	X
2	√	X	√	X	X	X	X	X
3	√	√	X	√	X	X	X	X

√= Correct answer X = Incorrect answer

Basel

In the first session, Basel answered two questions correctly. He identified where the story occurred and the main character in the story. However, in the second session, he was able to identify where the story occurred, the main character in the story, and another important character in the story. Basel in the third session answered two questions correctly. He correctly identified the place where the story occurred and the main character in the story (such as the first session) (see table 4). Basel obtained a mean of 2.33 correct responses during the baseline phase.

Table 4*Basel's Reading Comprehension Performance Across All Sessions During the Baseline Phase.*

Sessions	Setting (Place)	Setting (Time)	Main character	Another character	Main problem	Major events	Story solution	Story Outcomes
1	√	X	√	X	X	X	X	X
2	√	X	√	√	X	X	X	X
3	√	X	√	X	X	X	X	X

√= Correct answer X = Incorrect answer

Intervention

The intervention phase included six individual sessions for all participants. Each session lasted for about 30 minutes. The intervention phase included teaching the participants the story elements. After reading the story aloud, the participants in this phase learned the definition of each element as defined in Figure 1, Also, they practiced on identifying the story elements by naming and highlighting the story elements with specific colors, then translate the story elements onto the story maps.

The reading comprehension scores during the intervention phase increased as the scores ranged between 5 and 8 out of total eight comprehension questions. During the intervention phase, Ali produced a mean of 7.5, while he had a mean of 3.33 during the baseline phase. Mohammed also improved his performance during the intervention phase as he produced a mean of 6.83, while he had a mean of 2.67 during the baseline phase. Finally, during the intervention phase, Basel produced a mean of 6, while he had achieved a mean of 2.33 during the baseline phase (see Table 5).

Table 5

Participants' Scores out of 8 Comprehension Questions During the Intervention Phase.

Session	Ali	Mohammed	Basel
1	7	6	5
2	8	7	6
3	7	7	6
4	7	6	7
5	8	7	6
6	8	8	6
Mean	7.5	6.83	6

Ali

During the baseline phase, Ali's performance was low with a range of 3 to 4, and a mean of 3.33 out of 8. However, during the intervention phase, Ali's scores improved greatly with a mean of 7.5 and a range between 7 and 8 out of 8 comprehension questions that has been answered correctly. Ali scored 7 out of 8 in the first, third, and fourth sessions. In the first and third sessions, Ali was able to correctly answer the questions that are inquiring about setting (place and time), main character in the story, another important character in the story, the main problem in the story, the major events in the story, and how the problem was solved. However, he could not extract at least one benefit of the story (the outcome of the story). Ali, in the fourth session, was able to answer all of the question correctly except for the question "how was the problem solved". Ali scored 8 out of 8 in the second, fifth, and sixth sessions. Ali was able to answer all of the eight questions correctly during these sessions. Overall, Ali improved his understanding of story comprehension since he had a mean of 3.33 during the baseline phase and then he produced a mean of 7.5 during the intervention phase (see Table 6).

Table 6*Ali's Reading Comprehension Performance Across All Sessions During the Intervention Phase.*

Sessions	Setting (Place)	Setting (Time)	Main character	Another character	Main problem	Major events	Story solution	Story Outcomes
1	√	√	√	√	√	√	√	X
2	√	√	√	√	√	√	√	√
3	√	√	√	√	√	√	√	X
4	√	√	√	√	√	√	X	√
5	√	√	√	√	√	√	√	√
6	√	√	√	√	√	√	√	√

√= Correct answer X = Incorrect answer

Mohammed

Mohamed performance Mohammed's scores ranged between 6 and 8 out of 8 with a mean of 6.83 during the intervention phase. In the intervention phase, Mohammed was able to answer most of the questions correctly. In the first and fourth sessions, Mohammed was able to answer six questions correctly. He could correctly identify most in the story elements but failed at naming the solution of the problem as well as the outcome of the story. The same happened in the fourth session. In the second session, Mohammed could correctly identify seven story elements that are setting (place and time), main character in the story, another important character in the story, the problem in the story, the major events in the story, and the outcome of the story. Also, Mohammed correctly identified seven story elements in the third and fifth sessions that are setting (place and time), main character in the story, another important character in the story, the main problem in the story, the major events in the story, and how the problem

was solved. Mohammed in the sixth session scored 8 out of 8 since he was able to correctly identify the eight story elements (see table7).

Table 7

Mohammed's Reading Comprehension Performance Across All Sessions During the Intervention Phase.

Sessions	Setting (Place)	Setting (Time)	Main character	Another character	Main problem	Major events	Story solution	Story Outcomes
1	√	√	√	√	√	√	X	X
2	√	√	√	√	√	√	X	√
3	√	√	√	√	√	√	√	X
4	√	√	√	√	√	√	X	X
5	√	√	√	√	√	√	√	X
6	√	√	√	√	√	√	√	√

√= Correct answer X = Incorrect answer

Basel

Basel's reading comprehension scores during the intervention phase ranged between 5 and 7 out of 8 at a mean of 6. In the first session, Basel scored 5 out of 8, since he identified the story setting (place and time), the main character in the story, another important character in the story, and the main problem in the story.

In the second, third, fifth, and sixth sessions, Basel obtained 6 out of 8. Basel in the second session was able to correctly identify the story setting (place and time), the main character in the story, another important character in the story, the main problem in the story, and

the major events in the story. In the third session, Basel correctly identified the story setting (place and time), the main character in the story, another important character in the story, the major events in the story, and the outcome of the story. In the fifth session, Basel could identify the story setting (place and time), the main character in the story, another important character in the story, the major events in the story, and the solution in the story. And in the sixth session, Basel was able to correctly identify the story setting (place and time), the main character in the story, another important character in the story, the main problem in the story, and the solution in the story.

The highest score could Basel obtain during the intervention phase was in the fourth session. In the fourth session, Basel obtained 7 out of 8 as he could correctly identify all elements but he failed at identifying the main problem in the story (see table 8).

Table 8

Basel's Reading Comprehension Performance Across All Sessions During the Intervention Phase.

Sessions	Setting (Place)	Setting (Time)	Main character	Another character	Main problem	Major events	Story solution	Story Outcomes
1	√	√	√	√	√	X	X	X
2	√	√	√	√	√	√	X	X
3	√	√	√	√	X	√	X	√
4	√	√	√	√	X	√	√	√
5	√	√	√	√	X	√	√	X
6	√	√	√	√	√	X	√	X

√= Correct answer X = Incorrect answer

Maintenance

The maintenance phase was conducted two weeks after the last intervention session, and it included two sessions for each participant. During this phase, the participant read the story aloud, highlight the story elements with specific colors, and complete the story maps. No assistance was provided in highlighting the story elements and completing the story maps.

Ali scored 8 out of total 8 comprehension questions in both sessions (see table 9) meaning that he answered all questions correctly during the maintenance phase. Mohammed scored 7 in both sessions as he answered all questions correctly except the question “what was the main problem in the story?” in the first session, and the question “what was the outcome of the story” in the second session (see table 10). In the first session of the maintenance phase, Basel scored 6 out of 8 as he was not able to correctly identify the solution in the story and the outcome of the story. Whereas in the second session, Basel scored 7 out of 8 since he was not able to correctly identify the outcomes of the story (see table 11).

Table 9

Ali's Reading Comprehension Performance Across All Sessions During the Maintenance Phase.

Sessions	Setting (Place)	Setting (Time)	Main character	Another character	Main problem	Major events	Story solution	Story Outcomes
1	√	√	√	√	√	√	√	√
2	√	√	√	√	√	√	√	√

√= Correct answer X = Incorrect answer

Table 10

Mohammed's Reading Comprehension Performance Across All Sessions During the Maintenance Phase.

Sessions	Setting (Place)	Setting (Time)	Main character	Another character	Main problem	Major events	Story solution	Story Outcomes
1	√	√	√	√	X	√	√	√
2	√	√	√	√	√	√	√	X

√= Correct answer X = Incorrect answer

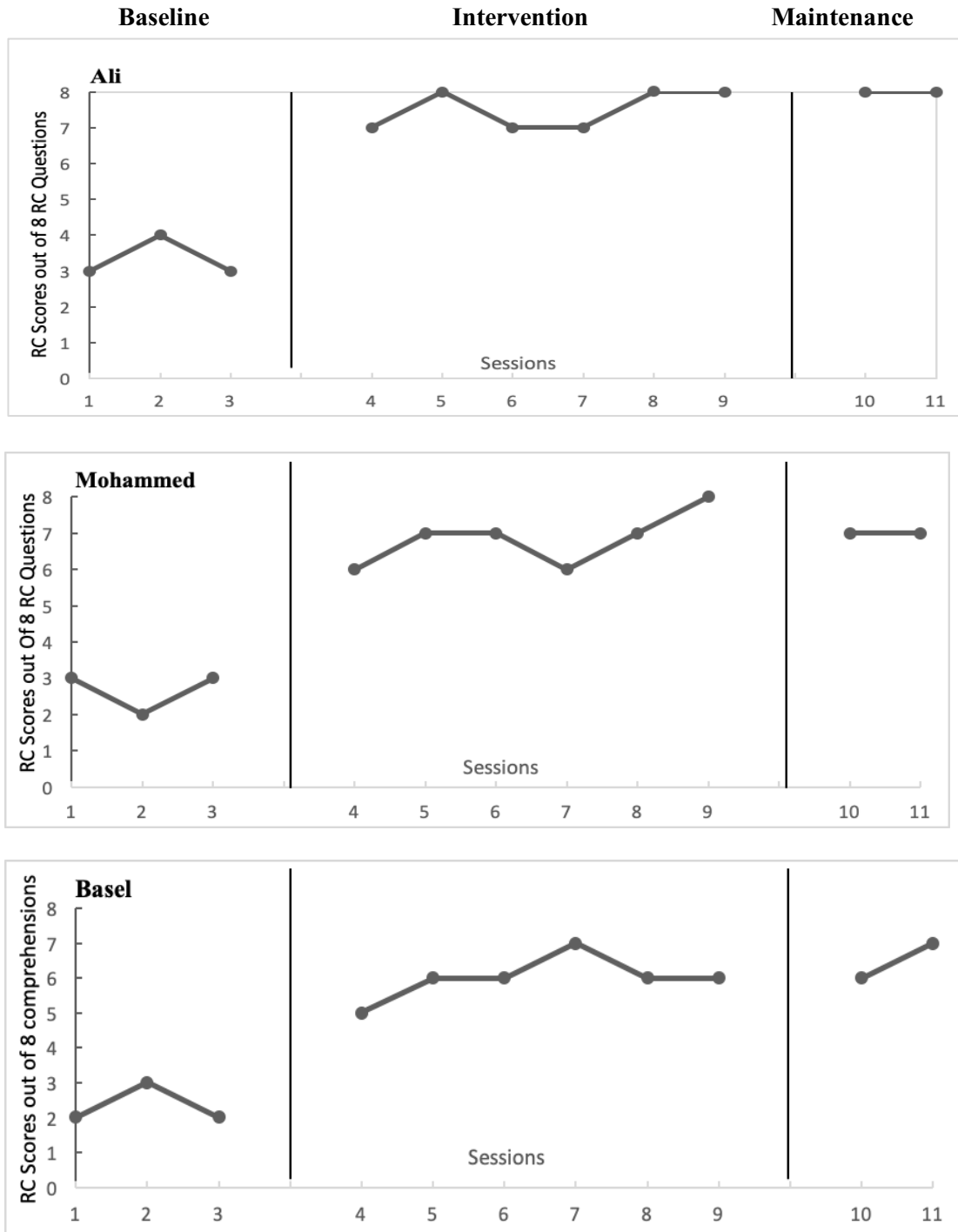
Table 11

Basel's Reading Comprehension Performance Across All Sessions During the Maintenance Phase.

Sessions	Setting (Place)	Setting (Time)	Main character	Another character	Main problem	Major events	Story solution	Story Outcomes
1	√	√	√	√	√	√	X	X
2	√	√	√	√	√	√	√	X

√= Correct answer X = Incorrect answer

Figure 3. Participants' Reading Comprehension Scores During Baseline, Intervention, and Maintenance Phases.



Note. RC= Reading Comprehension

Inter-scorer Agreement

The SLD teacher was the second independent scorer in this study. The SLD teacher was trained on how to score the comprehension questions after training until he mastered the process of scoring. The SLD teacher was provided with a completed story map and the corresponding comprehension questions that had already been answered and scored by the researcher, to ensure that he was adequate training on how to correctly score the so he was familiar with how the comprehension questions are scored. Then, the SLD teacher was provided with another story-map and the corresponding comprehension questions that are answered but not scored.

A total of 12 probes were selected randomly but limited to one baseline probe, two intervention probes, and one maintenance probe for each participant. The inter scorer agreement was calculated as the number of agreements on the comprehension questions divided by the total number of agreements plus disagreements, multiplied by 100 (Hallgren, 2012). For example, when both scorers agreed on all of the eight comprehension questions, the inter scorer agreement would be $8 / (8+0) * 100 = 100 \%$. Since no disagreement was documented between the researcher and the SLD teacher on the selected probes, the inter-scorer agreement is 100 % accurate.

Social Validity

Two IRP-15 questionnaires were delivered in two versions; one to the SLD teacher (teacher version), and another one was provided to the participants (student version). Both teacher version and student version included six-point Likert-type scales (i.e., 1=Strongly Disagree, 2= Disagree, 3 = Slightly disagree, 4 = Slightly agree, 5 = Agree, and 6 = Strongly agree). Also, both versions were transcribed into in Arabic and both have the following options for answers: 1=Strongly Disagree, 2= Disagree, 3 = Slightly disagree, 4 = Slightly agree, 5 = Agree, and 6 = Strongly agree (see Appendix X).

Social Validity (Teacher Version)

The teacher version of the IRP-15 questionnaire was completed by the SLD teacher. This version included 15 items that inquire about the importance, appropriateness, the effectiveness of the intervention, and whether the story mapping intervention had resulted in negative side-effects for students. The lowest possible score for each item is 1 that is for the selection “strongly disagree”, whereas and the highest possible score for each item is 6 for the selection “strongly agree”. Therefore, the teacher version of the IRP-15 should yield a score ranges from 15 to 90, and scores that are higher than 52.50 (58%) should reflect the acceptability of the implementation of an intervention (Von Brock & Elliott, 1987).

The SLD teacher selected “agree” or “strongly agree” on 14 items out of 15 items of the IRP-15 questionnaire (“strongly agree” on 9 items and “agree” on 5 items). However, for statement 10 “This intervention is consistent with those I have used in the classroom settings”, the SLD teacher chose the option “slightly agree” (see Table12). The IRP-15 questionnaire that was completed by the SLD teacher produces a score of 82 (91%) that is higher than 58%. Therefore, based on the SLD teacher perspective that was indicated by the IRP-15 (teacher version), the implementation of the story mapping intervention was acceptable.

Social Validity (Student Version)

The student version of the IRP-15 questionnaire was completed by the three participating students with SLD. This version included 9 statements that inquire about the acceptance, appropriateness, and the effectiveness of the story mapping intervention. The mean of responses was considered on the student version because the student version included three participants’ responses on every item. The lowest possible mean score for each item is 1, whereas the highest

possible mean score for each item is 6. Because the student version of the IRP-15 included 9 items, the mean score should range from 9 to 54.

The parents had read the social validity questionnaires (student version) for participants. The selections from participants has ranged between “slightly agree” and “strongly agree”. All participants circled the option “strongly agree” for statement 1 “This would be an acceptable intervention for my reading comprehension”, statement 3 “I would suggest the use of this intervention to other students, statement 5 “This intervention fits with my struggles in reading comprehension”, statement 6 “I like the procedures used in this intervention”, and finally statement 9 “Overall, this intervention would be beneficial for me”. Whereas responses varied on the remaining statements but ranged between “slightly agree” and “strongly agree” as mentioned previously (see Table13). After summing all mean scores of the nine items, the mean score is 50 out of 54 (92.60%). Therefore, the implementation of the story mapping intervention was acceptable based on the participating students’ perspective that was indicated by the IRP-15 (student version).

Table 12*Social Validity of Story-Mapping Strategies for the SLD Teacher (N=1)**Note; Bolded number is the answer that the SLD teacher selected.*

Statements	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
1. This would be an acceptable intervention for students' reading comprehension.	1	2	3	4	5	6
2. Most teachers would find this intervention appropriate for reading comprehension.	1	2	3	4	5	6
3. This intervention should prove effective in changing students' reading comprehension.	1	2	3	4	5	6
4. I would suggest the use of this intervention to other teachers.	1	2	3	4	5	6
5. The students' reading comprehension problem is severe enough to warrant use of this intervention.	1	2	3	4	5	6

Table 12 (Cont.)

Statements	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
6. Most teachers would find this intervention suitable for students' reading comprehension problem described.	1	2	3	4	5	6
7. I would be willing to use this intervention in the classroom settings.	1	2	3	4	5	6
8. This intervention would not result in negative side-effects for students.	1	2	3	4	5	6
9. This intervention would be appropriate for a wide variety of students.	1	2	3	4	5	6
10. This intervention is consistent with those I have used in the classroom settings.	1	2	3	4	5	6

Table 12 (Cont.)

Statements	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
11. The intervention is a fair way to handle the students' reading comprehension problem.	1	2	3	4	5	6
12. This intervention is reasonable for the students' reading comprehension problem described.	1	2	3	4	5	6
13. I like the procedures used in this intervention.	1	2	3	4	5	6
14. This intervention is a good way to handle the student's reading comprehension problem.	1	2	3	4	5	6
15. Overall, this intervention would be beneficial for the student.	1	2	3	4	5	6

Table 13*Social Validity of Story Mapping Strategies for Participants (N=3)*

Statements	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree	Mean
1. This was an acceptable intervention for my reading comprehension.	1	2	3	4	5	6 (3)	6
2. This intervention improved my reading comprehension.	1	2	3	4	5 (2)	6 (1)	5.33
3. I would suggest the use of this intervention to other students.	1	2	3	4	5	6 (3)	6
4. This intervention did not result in harm or stress on me.	1	2	3	4 (1)	5 (2)	6	4.67
5. This intervention fits with my struggles in reading comprehension.	1	2	3	4	5	6 (3)	6

Table 13 (Cont.)

Statements	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree	Mean
6. I like the procedures used in this intervention.	1	2	3	4	5	6 (3)	6
7. The time used during the intervention session (30 minutes) is appropriate.	1	2	3	4 (2)	5 (1)	6	4.33
8. This intervention is a good way to handle my reading comprehension problem.	1	2	3	4	5 (1)	6 (2)	5.67
9. Overall, this intervention would be beneficial for me.	1	2	3	4	5	6 (3)	6

Treatment Integrity

In order to ensure that procedures during all phases are implemented as planned, three treatment integrity checklists were used during the implementation of the baseline, intervention, and maintenance phases (see Appendix H, Appendix I, and Appendix J). Considering that the interventionists are not actually specialists in the field, and because of the few number of

sessions (11 sessions for each participant), the treatment integrity checklists were used continually during all sessions with each participant (100%). The interventionists marked all steps as soon as they were performed. Using the three treatment integrity checklists during all sessions continually helped the researcher ensure that all phases are implemented with a high degree of accuracy.

Summary of the Result

As illustrated in Figure 2, the results of this study indicate that the story mapping intervention is an effective strategy that improved reading comprehension of students with SLD in Saudi Arabia. The results presented in Figure 2 also indicate that students with SLD were able to maintain their improvement two weeks after the intervention was held. Finally, the current study demonstrated positive socially validity effects, as presented in the teacher version of the IRP-15 (91%) and the student version of the IRP-15 (92.60%). Those high percentages indicate that the implementation of the story mapping intervention was acceptable.

Chapter Five

Discussion

Overview

The current study investigated the effectiveness of a story-mapping intervention on improving reading comprehension skills of third and fourth grade students with SLD in Saudi Arabia. This chapter discusses findings presented in the fourth chapter, consistencies to previous research, implications of the findings for practitioners, researchers, and policymakers. Also, this chapter discusses limitations of the study, and recommendations for future researchers, practitioners, and policymakers.

Discussion of Research Findings

The current study aimed to address the following research questions; (1) what is the effect of a story-mapping intervention on reading comprehension skills of third and fourth grade students with SLD in Saudi Arabia, (2) to what extent are participants able to maintain their reading comprehension skills after the intervention is completed, and (3) to what extent is the story-mapping intervention socially valid among students with SLD in Saudi Arabia. Findings presented in chapter four suggest that the story mapping is an effective strategy for students with SLD. Also, the findings indicate that participants could maintain their reading comprehension skills after the intervention is completed, and the story-mapping intervention was socially valid among students with SLD in Saudi Arabia.

Regarding question formation and scoring results, the answers received were concrete and specific because of the reading comprehension questions' direct connections to essential story elements. For instance, they were taught how to answer the question "how did the main character

solve the problem?” by writing a complete sentence that is a solution related to the main problem. Another example is when answering the question “what were the major events that led to the problem?” The participants were instructed that writing at least two major events taken from the story would be considered correct. Finally, the participants learned how to answer the question “what was the outcome of the story?” by writing any reasonable benefit taken from their reading.

The participants’ performances during the baseline phase was low. Out of 8, Ali scored a mean of 3.33, while Mohammed scored a mean of 2.67, and a mean of 2.33 for Basel. So, the mean performance for all participants was 2.78 out of 8. Thus, participants answered 35% of the reading comprehension questions correctly. The participants’ performances immediately improved during the intervention phase. Out of 8, Ali scored a mean of 7.5, Mohammed scored a mean of 6.83, and Basel had a mean of 6. So, the mean performance for all participants during the intervention phase was 6.78 out of 8, from which it can be interpreted that participants answered 84.75 % of the reading comprehension questions correctly. Moreover, the improvement that participants obtained during the intervention phase was maintained two weeks after that phase ended. Because Ali scored a mean of 8 out of 8 during the maintenance phase, Mohammed scored a mean of 7 out of 8, and Basel scored a mean of 6.5 out of 8, the mean performance for all participants during the maintenance phase was 7.17 out of 8. Thus, the participants answered 90 % of the reading comprehension questions correctly during the maintenance phase. Additionally, both versions of the social validity scales indicated that the implementation of the story mapping intervention was important, satisfying, acceptable, and effective, not only to the participating students with SLD, but also to the SLD teacher who was involved in this study.

Indeed, the dramatic improvement in the intervention and maintenance phases could be referred to the time devoted in teaching story-mapping during these phases. An additional 20

minutes during the intervention and the maintenance phases was sufficient to improve the participants' performance from two, three, and four correct answers in the baseline phase to six, seven, and eight correct answers during both the intervention and maintenance phases (Skinner, 2008).

Connection to Previous Research

The findings of this study align with previous studies that used the story mapping strategy with students with SLD (e.g., Boulineau et al., 2004 and Fore et al., 2007). Additionally, these findings also align with previous studies that used the story mapping strategy with students with other disabilities such as the study conducted by Babyak et al., 2000 on students with behavior disorders and the study conducted by Browder et al. (2017) on students with ASD.

Similar to this study, findings from Boulineau et al., 2004 showed effectiveness when employing the story mapping intervention with students with SLD. In Boulineau et al. (2004), during the baseline phase, participants answered 31 %, as an average, of the reading comprehension questions correctly. This is 4 % below the average of the participants' performances during the baseline phase in our study. As for the intervention phase, the average of the participants' performances in the 2004 study was 84 %, which is very close to the average of the participants' performances during the intervention phase in the current study, which is 84.75 %. Finally, during the maintenance phase, the participants in the 2004 study answered 80% of the reading comprehension questions correctly, while participants in this study could answer 90 % of the reading comprehension questions correctly. Thus, the participants' performances during the baseline, the intervention, and the maintenance phases in the 2004 study are consistent with the participants' performances in the current study.

As noted previously, the findings of this study are consistent with previous studies that

used story mapping with students with other disabilities. For example, Babyak et al. (2000) taught the same story elements investigated in this study (e.g., characters, settings, main problems, major events, story outcomes) to participants with behavior disorders. Babyak's study using story mapping intervention proved to be effective on participants with behavior disorders. Also, the findings of this study align with a study conducted by Browder, et al. (2017) on students with autism. Both the current study and the Browder, et al. study showed that the story mapping intervention can immediately improve participants' performances on reading comprehension and identifying the story elements. Finally, the findings of this study are consistent with the theory behind the story mapping strategy that when information is organized and structured, it is easy to recall (Shen, 2008).

Implications for Policy

The current study indicates the importance of training parents in terms of teaching a new strategy. In fact, not only story-mapping, but also different reading strategies can be delivered to parents to apply these strategies to a larger population of individuals with or without disabilities. Thus, policymakers could enable parents to get a sufficient training on reading comprehension strategies. Also, it is important that policymakers ensure that the reading curriculum includes reading comprehension strategies including story-mapping, as well as reminding the SLD teachers to use these strategies in the classroom. Having these strategies included in the reading curriculum will ensure that SLD teachers practice these strategies with students with SLD and help the students with SLD get exposed to the reading comprehension instructions during the school days. Additionally, policymakers could encourage general education teachers and SLD teachers to activate the individual instruction approach, especially with students with SLD. The reason is that the findings of the current study indicate that the individual instruction is an

effective approach for these students. Thus, it should be considered that teachers including SLD teachers focus on individual teaching rather than classroom teaching when teaching students with SLD.

Implications for Practitioners

The findings of this study suggest guidance and support for general education teachers and SLD teachers in the field. Indeed, the findings of this study can be considered an emerging practical evidence proving that the use of story-mapping strategy is an effective technique to improve students' achievement in reading comprehension. Consequently, teachers are highly encouraged to use story maps in classrooms. Based on the findings of the study and the social validity for participants, the story-mapping procedures were easily used as the interventionists were individually teaching their children at home. Therefore, the story-mapping strategy should be easily employed when teaching story-mapping to improve comprehension for students with SLD.

Considering that the function of the story-mapping strategy is to organize the story and identify the story elements, teachers in the classroom can use the story-mapping strategy to organize writing stories. The story elements employed in this study can be used as a guide to see whether these elements are included as students are writing stories. Further, after learning the story-mapping strategy, students with SLD can read stories meaningfully, so they practice reading with joy, and generalize reading stories outside the school.

Implication for Researchers

The current study is the first study that investigates the effectiveness of the story-

mapping intervention on students with SLD in Saudi Arabia. Therefore, the findings of this study have generated useful guidance for researchers. For instance, researchers can use the same or similar tools (e.g., stories, story maps, reading comprehension questions) if they decide to replicate the current study. This is important to highlight to indicate that this study can be used as a guide for researchers who intend to replicate the current study or conduct a similar study. In addition, researchers might benefit from the process of training entailed by the current study. For example, researchers can set similar criteria when selecting participants to work as interventionists in similar future research. Then, researchers are expected to establish surveys to inquire about whether those participants meet the designed criteria and eligible for training. Also, researchers in the Arab countries could benefit from the two IRP-15 questionnaires since these questionnaires were already transcribed into Arabic. Moreover, the IRP-15 (student version) was adopted as some words and phrase were changed so the items are suitable for third and fourth students with SLD.

Limitations of the Study

The current study is valuable since it is the first study to investigate the effectiveness of the story-mapping intervention on students with SLD in Saudi Arabia. However, like other studies, the current study has some limitations. First, the small sample size of participants that were selected for this study does not help generalize its findings (Arbabshirani et al, 2017). The nature of the single-subject studies is to be conducted on small samples. However, to generalize the findings of a single-subject study, several of these studies must be replicated on participants from the same population on a specific topic (Zuidersma, et al., 2020). Similarly, Maggin et al. (2018) asserted that the findings of a single-subject study can be effectively generalized when a functional relationship between the independent variable and dependent variable exists across

five single-subject studies that include at least 20 participants from one single population, and a minimum of three groups of researchers perform these single-subject studies.

Another limitation is that neither the researcher nor the SLD teacher were teaching the participants with SLD directly. Using direct instruction, illustrated by in-person teaching, would cause positive outcomes compared to the indirect instruction, in which the researcher trained story-mapping teaching to the interventionists, following which interventionists taught it to the participants at home (Serhan, 2020). This indirect instruction approach is also time-consuming as the researcher had to adequately train parents and ensure their understanding before implementing the baseline, intervention, and maintenance phases. Additionally, it requires continuous communication between the researcher and interventionists during the three phases (Jaiswal, 2017).

Another limitation is that each participant was given the same three stories administered in the baseline session again in the intervention phase. Although in the baseline phase there was no teaching on the story mapping, it is possible that students benefited from their reading of the story twice. The current study would be more reliable when reading probes are used only once and not repeated.

Furthermore, there was a potential of having parental bias during data collection as parents were teaching their children and administrating the reading comprehension probes. However, the researcher tried to address this concern by having the interventionists use the three treatment integrity checklists continually, as well as the continuous reminders that the participants' answers during the three phases would not affect their grades or their academic standing in school.

Moreover, another limitation of this study is the absence of standardized reading comprehension measures. In this study, the researcher used stories taken from the *My Beautiful Language* textbook, and the comprehension questions were adapted from Idol (1987; see Appendix E) that align with the story elements that existed in each story. The current study could have been stronger by using standardized reading comprehension measures that include grade-level stories followed by related comprehension questions.

Recommendations for Policy

The current study produced some important recommendations for policy. First, visual organizer strategies including story-mapping should be considered as an important reading comprehension strategy, especially when teaching story comprehension. SLD teachers should be required to document the story-mapping strategy or any other appropriate reading comprehension strategies in the students' IEPs. This will ensure that SLD teachers deliver the most appropriate reading comprehension strategies to their students.

Also, general education teachers and SLD teachers should be trained on using reading comprehension strategies, so they provide these strategies to their students in classrooms and resource rooms respectively. Training should be planned well by the ministry of education in terms of arranging times, places, and choosing the subjects. This is important as there would be a large number of students who would be able to learn said reading comprehension strategies.

In addition, teachers should be required to continually assess students' reading comprehension skills. In light of this, teachers should be prepared enough to use the right assessment and analyze students' data produced by these assessments. Assessing students accurately would provide the teachers a whole picture of the students' performance level, the

best appropriate strategies, and to what extent teachers are able to teach such reading comprehension strategies.

Recommendations for Practitioners

It is recommended that SLD teachers and general education teachers work collaboratively in order to track their students' performance in reading comprehension, especially those with SLD in both the resource room and the regular classroom. Considering that the SLD teachers are usually aware of their students' strengths and weaknesses, the collaboration between them and the general education teachers are highly recommended, so students with SLD receive the most appropriate reading comprehension instructions.

Additionally, SLD teachers and general education teachers should be aware of some factors beyond reading comprehension strategies. For instance, teachers should ensure that students are motivated enough to comprehend by choosing a very enjoyable story or activating their background information. Also, another fact beyond reading comprehension strategies that should be considered is the time devoted to teaching such strategies. These strategies need an adequate time to be fully understood by the students with the consideration of the individual differences of students. Another factor is that teachers should be ready, and therefore trained sufficiently, to instruct and model reading comprehension strategies.

Recommendation for Future Researchers

This study showed the effectiveness of story-mapping intervention as it was implemented on students with SLD in Saudi Arabia. However, all participants involved in the current study are male. Thus, future researchers could replicate the current study with female students with

SLD. Investigating the effectiveness of the story-mapping strategy on girls would provide more evidence about whether the story-mapping strategy is effective for both genders.

Also, because technology has been fully integrated into schools today, future researchers could conduct the story-mapping strategy using technology to teach story-mapping. It is important to employ technology for educational purposes, especially with its widespread use at schools and at home. The story maps can be presented electronically on an iPad for a small group or a smart board for the whole class. The electronic story maps have been conducted by Browder, et al. (2017) on three students with ASD. However, it should be replicated with students with SLD in Saudi Arabia.

The third recommendation is that this study should be replicated with students with other types of disabilities in Saudi Arabia (e.g., autism, mild intellectual disabilities, and behavioral disorders). It is important to focus on other students with mild disabilities who may experience reading comprehension problems. This would also provide emerging evidence about whether the story-mapping strategy is effective for students with disabilities other than SLD.

Conclusion

Overall, the findings of the current study agree with findings produced in previous studies where students with SLD have improved and maintained their improvement in understanding stories. Also, the findings of the current study confirmed that story-mapping intervention is socially valid among students with SLD in Saudi Arabia. The training phase in this study was well performed as the researcher could overcome the challenges of Covid-19 by using Zoom effectively. In addition, the collaboration from interventionists played an important role in making the training phase successful. Finally, the current study made a great contribution to the

field in Saudi Arabia as it is the first study that investigates the effectiveness of the story-mapping intervention on students with SLDs in the country. Therefore, it is likely that this study is replicated using the same or similar tools under similar circumstances.

Table 14*Empirical Research on the Story-Mapping Strategy*

Study	Study population & number of participants	Research design	Assessment used	Result
Idol (1987)	27 students including students with SLD	Experimental/control group	10 comprehension questions made by teacher (primary measure) Oral, curriculum-based assessment Nelson Reading Skills Test Series of group listening comprehension tests taken from different basal reading series	Participants improved their comprehension skills during the intervention phase
Dimino, Gersten, Carnine, & Blake (1990)	32 ninth-grade students, including six low-performing (special education) students	Comparison Group Pre-test/Post-test Design	Story grammar questions, basal questions, written retells theme questions taken from curriculum-referenced tests	Significant improvement in understanding the story components
Vallecorsa and deBettencourt (1997)	Three seventh-grade students with SLD	Multiple baselines across behaviors (i.e., reading and writing)	A Rating Scale developed by MacArthur and Graham (198)	Improvement in reading comprehension skills including recalling different elements of the story as well as improvement in writing performance skills, specifically in writing stories

Table 14 (cont.)

Study	Study population & # of Participants	Research design	Assessment used	Result
Gardill & Jitendra (1999)	Six middle school students with SLD	Multiple baseline design across participants.	Basal comprehension questions	Improvement in percentage of questions answered correctly. maintaining the improvements during the generalization and maintenance phases
Babyak et al. (2000)	Four upper elementary school students with behavior disorders.	Multiple baseline design across participants	Comprehension questions specific to a story elements, developed by Idol (1987)	Increasing the percentage of correct answers to comprehension questions
Boulineau et al. (2004)	Six students with SLD	Multiple baseline design across participants	Teacher-made questions related to the story elements.	Increasing the percentage of correct answers to comprehension questions and increasing the ability of story problem description. However, it did not increase their ability to determine the main idea of a story

Table 14 (cont.)

Study	Study population & number of participants	Research design	Assessment used	Result
Onachukwu et al. (2007)	Six middle school students with SLD	Multiple baseline design across participants	Teacher-made comprehension test & identification of story elements	Increasing in the percentage of correct comprehension questions. The improvement was maintained after intervention
Fore et al. (2007)	Four eleventh grade students with SLD	A multiple probe across participants design	6-10 reading comprehension questions made by the teacher	Improving all four students' performance in answering comprehension questions. The improvement was maintained
Stagliano & Boon (2009)	Three fourth-grade students with SLD.	A multiple-probe design across participants.	Read Naturally (Ihnot & Ihnot, 2007) series. Each passage followed by four multiple-choice questions and one short answer question.	Improvement in reading comprehension. Maintaining the improvements during the maintenance phases
Browder et al. (2017)	Three elementary school students with autism spectrum disorder	A multiple probe across participants design	Reading comprehension questions made by the teacher	Intervention was useful for teaching story element definitions, identifying the story elements on an iPad, and understanding comprehension questions

References

- Abu Nayyan, I. (2015, January 5). Does the idea of mainstreaming students with learning disabilities have succeeded? *Alriyadh Newspaper*. Retrieved from <http://www.alriyadh.com/1010398>
- Abu Nayyan, I. (2001). *Learning Disabilities: Teaching methods and cognitive strategies*. Riyadh, Saudi Arabia: Academy of Special Education. Retrieved from <https://www.aiacademy.info/wp-content/uploads/2019/04/-صعوبات-التعلم-طرق-التدريس-2015-والاستراتيجياتالمعرفية-كتاب-كامل-2015.pdf>
- Akhondi, M., Malayeri, F., & Samad, A. (2011). How to teach expository text structure to facilitate reading comprehension. *Reading Teacher*, 64, 368–372. <https://doi.org/10.1598/RT.64.5.9>
- Alahmadi, N. A., & El Keshky, M. E. S. (2019). Assessing primary school teachers' knowledge of specific learning disabilities in the Kingdom of Saudi Arabia. *Journal of Educational and Developmental Psychology*, 9(1). Retrieved from <http://doi.org/10.5539/jedp.v9n1p9>
- Alberto, P. A., & Troutman, A. C. (2009). *Applied behavior analysis for teachers* (8th ed.). Upper Saddle River, NJ: Pearson Education.
- Al-Jarf, R. (2007). Developing reading and literacy skills in Saudi Arabia. *Online submission*. Retrieved from <https://files.eric.ed.gov/fulltext/ED497944.pdf>
- Al-hano, I. A. (2006). *Representation of learning disabilities in Saudi Arabian elementary schools: A grounded theory study* (Unpublished doctoral dissertation). University of

- Wisconsin-Madison, Madison, Wisconsin. Retrieved from <https://search.proquest.com/openview/de70e9a7e3c7c7abfcff3835c4f41a6e/1?pq-origsite=gscholar&cbl=18750&diss=y>.
- Alquraini, T. (2010). Special education in Saudi Arabia: challenges, perspectives, future possibilities. *International Journal of Special Education*, 25, 139-147.
- Altman, D. G. (1991). *Practical statistics for medical research* (reprint 1999). CRC Press: Boca Raton, Florida.
- Alyousef, H. S. (2006). Teaching reading comprehension to ESL/EFL learners. *Journal of language and learning*, 5(1), 63-73. Retrieved from <https://pdfs.semanticscholar.org>
- Al-Zoubi, S. M., & Rahman, M. S. B. A. (2016). Mainstreaming in Kingdom of Saudi Arabia: Obstacles facing learning disabilities resource room. *Journal of Studies in Education*, 6(1), 37-55. <https://doi.org/10.5296/jse.v6i1.8800>
- Anderson, S. A. (2000). How parental involvement makes a difference in reading achievement. *Reading improvement*, 37(2), 61-61.
- Arbabshirani, M. R., Plis, S., Sui, J., & Calhoun, V. D. (2017). Single subject prediction of brain disorders in neuroimaging: Promises and pitfalls. *Neuroimage*, 145, 137-165.
- Babyak, A. E., Koorland, M., & Mathes, P. G. (2000). The effects of story mapping instruction on the reading comprehension of students with behavioral disorders. *Behavioral Disorders*, 25, 239–258. Retrieved from <https://journals.sagepub.com/doi/pdf/10.1177/019874290002500301>

- Botsas, G. (2017). Differences in strategy use in the reading comprehension of narrative and science texts among students with and without learning disabilities. *Learning Disabilities: A Contemporary Journal*, 15, 139–162. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1141985.pdf>
- Boulineau, T., Fore III, C., & Hagan-Burke, S., & Burke, M. D. (2004). Use of story-mapping to increase the story-grammar text comprehension of elementary students with learning disabilities. *Learning Disability Quarterly*, 27, 105–121. <https://doi.org/10.2307/1593645>.
- Browder, D. M., Root, J. R., Wood, L., & Allison, C. (2017). Effects of a story-mapping procedure using the iPad on the comprehension of narrative texts by students with autism spectrum disorder. *Focus on Autism and Other Developmental Disabilities*, 32, 243–255. <https://doi.org/10.1177/1088357615611387>.
- Brooks-Gunn, J., Berlin, L. J., & Fuligni, A. S. (2002). Early childhood intervention programs: What about the family? In J. P. Shonkoff, & S. J. Meisels (Eds.), *Handbook of early childhood intervention* (2nd edition, vol. 1, pp. 549–588). Cambridge University Press.
- Cain, K. (2009). Children’s reading comprehension difficulties: A consideration of the precursors and consequences. In C. Wood & V. Connelly (Eds.), *Contemporary perspectives on reading and writing* (pp. 59–76). Routledge.
- Ceka, A., & Murati, R. (2016). The Role of Parents in the Education of Children. *Journal of Education and Practice*, 7(5), 61–64.

- Cooper, J. O., Heron, T. E., & Heward, W. L. (2007). *Applied behavior analysis, 2nd ed.* Pearson.
- Coyne, M. D., Zipoli, R. R., Chard, D. J., Faggella-Luby, M., Ruby, M., Santoro, L. E., & Baker, S. (2009). Direct instruction of comprehension: Instructional examples from intervention research on listening and reading comprehension. *Reading & Writing Quarterly, 25*, 221–245. <https://doi.org/10.1080/10573560802683697>
- Daly, E. J., & Kupzyk, S. (2012). An investigation of student-selected and parent-delivered reading interventions. *Journal of Behavioral Education, 21*(4), 295-314.
- Dimino, J. A., Gersten, R., Carnine, D., & Blake, G. (1990). Story grammar: An approach for promoting at risk secondary students' comprehension of literature. *Elementary School Journal, 91*, 19–32. Retrieved from <https://www.jstor.org/stable/1001992>.
- Downing, J. A., Bakken, J. P., & Whedon, C. K. (2002). Teaching text structure to improve reading comprehension. *Intervention in School and Clinic, 37*, 229–233. <https://doi.org/10.1177/105345120203700406>
- Dudley, A. M. (2005). Rethinking reading fluency for struggling adolescent readers. *Beyond Behavior, 15*, 16–22. Retrieved from <https://eric.ed.gov/?id=EJ845906>.
- Duncan, L. G. (2018). Language and reading: The role of morpheme and phoneme awareness. *Current developmental disorders reports, 5*(4), 226-234.

- Englert, C. S., & Raphael, T. E. (1988). Constructing well-formed prose: Process, structure, and metacognitive knowledge. *Exceptional Children*, *54*, 513–520.
<https://doi.org/10.1177/001440298805400604>.
- Fiala, C. L., & Sheridan, S. M. (2003). Parent involvement and reading: Using curriculum-based measurement to assess the effects of paired reading. *Psychology in the Schools*, *40*(6), 613–626. <https://doi.org/10.1002/pits.10128>.
- Fore III, C., Scheiwe, K., Burke, M. D., & Boon, R. T. (2007). Teaching a Story Mapping Procedure to High School Students with Specific Learning Disabilities to Improve Reading Comprehension Skills. *Learning Disabilities: A Multidisciplinary Journal*, *14*, 233–244 . Retrieved from <https://eric.ed.gov/?id=EJ803313>.
- Gardill, M. C., & Jitendra, A. K. (1999). Advanced story-map instruction: Effects on the reading comprehension of students with learning disabilities. *The Journal of Special Education*, *33*, 2–17. <https://doi.org/10.1177/002246699903300101>
- Gersten, R., Fuchs, L. S., Williams, J. P., & Baker, S. (2001). Teaching reading comprehension strategies to students with learning disabilities: A review of research. *Review of Educational Research*, *71*, 279–320. <https://doi.org/10.3102/00346543071002279>.
- Ginsburg, H. P., & Opper, S. (1988). *Piaget's theory of intellectual development*. Prentice-Hall, Inc. Retrieved from <https://psycnet.apa.org/record/1987-98474-000>.
- Gresham, F. M., MacMillan, D. L., Beebe-Frankenberger, M. E., & Bocian, K. M. (2000). Treatment integrity in learning disabilities intervention research: Do we really know how

treatments are implemented? *Learning Disabilities Research & Practice*, *15*, 198–205. https://doi.org/10.1207/SLDRP1504_4.

Gresham, F. M., & Lopez, M. F. (1996). Social validation: A unifying concept for school-based consultation research and practice. *School Psychology Quarterly*, *11*, 204–227. <https://doi.org/10.1037/h0088930>.

Hallgren, K. A. (2012). Computing inter-rater reliability for observational data: an overview and tutorial. *Tutorials in quantitative methods for psychology*, *8*, 23. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3402032/>.

Hall, C., & Barnes, M. A. (2017). Inference Instruction to Support Reading Comprehension for Elementary Students with Learning Disabilities. *Intervention in School and Clinic*, *52*, 279–286. <https://doi.org/10.1177/1053451216676799>

Hall, C. M., & Bierman, K. L. (2015). Technology-assisted interventions for parents of young children: Emerging practices, current research, and future directions. *Early childhood research quarterly*, *33*, 21-32.

Harris, M., Andrews, K., Gonzalez, A., Prime, H., & Atkinson, L. (2020). Technology-Assisted Parenting Interventions for Families Experiencing Social Disadvantage: A Meta-Analysis. *Prevention Science: The Official Journal of the Society for Prevention Research*.

- Hammond, D., & Gast, D. L. (2010). Descriptive analysis of single subject research designs: 1983-2007. *Education and Training in Autism and Developmental Disabilities*, 45, 187-202.
- Hennes, A.-K., Büyüknarci, Ö., Rietz, C., Grünke, M. (2015). Helping children with specific learning disabilities to improve their narrative writing competence by teaching them the use of the story maps strategy. *Insights into Learning Disabilities*, 12(1), 35-56.
Retrieved from <https://www.researchgate.net/publication/277015775>
- Hook, C. L., & DuPaul, G. J. (1999). Parent tutoring for students with attention-deficit/hyperactivity disorder: Effects on reading performance at home and school. *School Psychology Review*, 28(1), 60–75 Retrieved from <http://www.nasponline.org/publications/periodicals/spr/volume-28/volume-28-issue-1>
- Hudson T. (1982). The effects of induced schemata on the “short circuit” in L2 reading. *Language reading*, 32, 1–31. <https://doi.org/10.1111/j.1467-1770.1982.tb00516.x>
- Hussain, O. (2010). *Evaluation of preparation program for teachers specializing in learning disabilities in Saudi Arabia* (Unpublished doctoral dissertation). The University of New Mexico, Albuquerque. Retrieved from <https://digitalrepository.unm.edu/cgi/viewcontent.cgi>.
- Idol, L. (1987). Group story mapping: A comprehension strategy for both skilled and unskilled readers. *Journal of Learning Disabilities*, 20, 196–205. Retrieved from <https://journals.sagepub.com/doi/pdf/10.1177/002221948702000401>

- Idol, L., & Croll, V. J. (1987). Story-mapping training as a means of improving reading comprehension. *Learning Disability Quarterly*, *10*, 214–229. Retrieved from <https://journals.sagepub.com/doi/pdf/10.2307/1510494?>.
- Jaiswal, S. K. (2017). Role of Parental Involvement and Some Strategies That Promote Parental Involvement. *Journal of International Academic Research for Multidisciplinary*, *5*(2), 95-103.
- Jones, D. J. (2014). Future directions in the design, development, and investigation of technology as a service delivery vehicle. *Journal of Clinical Child and Adolescent Psychology*, *43*, 128–142. Retrieved from <http://dx.doi.org/10.1080/15374416.2013.859082>.
- Jones, D. J., Forehand, R., Cuellar, J., Kincaid, C., Parent, J., Fenton, N., & Goodrum, N. (2013). Harnessing innovative technologies to advance children’s mental health: Behavioral parent training as an example. *Clinical Psychology Review*, *33*, 241–252.
- Josephs, N. L., & Jolivette, K. (2016). Effects of peer mediated instruction on the oral reading fluency skills of high school aged struggling readers. *Insights into Learning Disabilities*, *13*, 39–59. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1103672.pdf>
- Klauda, S. L., & Guthrie, J. T. (2008). Relationships of three components of reading fluency to reading comprehension. *Journal of Educational psychology*, *100*(2), 310.
- Koda, K. (2007). Reading language learning: crosslinguistic constraints on second language reading development. *Language Learning*, *57*, 1–44. <http://dx.doi.org/10.1111/0023-8333.101997010-i1>.

- Kratochwill, T. R., Hitchcock, J., Horner, R. H., Levin, J. R., Odom, S. L., Rindskopf, D. M., & Shadish, W. R. (2010). Single-case designs technical documentation. *What works clearinghouse*. Retrieved from <https://files.eric.ed.gov/fulltext/ED510743.pdf>
- Kang, E. Y., McKenna, J. W., Arden, S., & Ciullo, S. (2016). Integrated reading and writing interventions for students with learning disabilities: A review of the literature. *Learning Disabilities Research & Practice, 31*(1), 22-33. Retrieved from <https://onlinelibrary.wiley.com/doi/pdf/10.1111/ldrp.12091>.
- Kolligian, J., & Sternberg, R. J. (1987). Intelligence, information processing, and specific learning disabilities: A triarchic synthesis. *Journal of Learning Disabilities, 20*, 8–17. Retrieved from <https://journals.sagepub.com/doi/pdf/10.1177/002221948702000103>.
- Kupzyk, S., McCurdy, M., Hofstadter, K. L., & Berger, L. (2011). Recorded readings: A taped parent-tutoring intervention. *Journal of Behavioral Education, 20*(2), 87-102. doi:10.1007/s10864-011-9123-z.
- Leach, D. D. og Siddall, S. W. (1990). Parental involvement in the teaching of reading: A comparison of hearing reading, paired reading, pause, prompt, praise, and direct instruction methods. *British Journal of Educational Psychology, 60*, 349-355. doi:10.1111/j.2044-8279.1990.tb00951.x.
- MacDonell, K. W., & Prinz, R. J. (2017). A review of technology-based youth and family-focused interventions. *Clinical Child and Family Psychology Review, 20*, 185–200. doi: [10.1007/s10567-016-0218-x](https://doi.org/10.1007/s10567-016-0218-x)

- Maggin, D. M., Cook, B. G., & Cook, L. (2018). Using single-case research designs to examine the effects of interventions in special education. *Learning Disabilities Research & Practice, 33*(4), 182–191. <https://doi.org/10.1111/ldrp.12184>
- Manoli, P., & Papadopoulou, M. (2012). Graphic organizers as a reading strategy: Research findings and issues. *Creative education, 3*, 348. Retrieved from <http://dx.doi.org/10.4236/ce.2012.33055>.
- Marshall, N. (1983). Using story grammar to assess reading comprehension. *The Reading Teacher, 36*, 616–620. Retrieved from <https://www.jstor.org/stable/20198293>.
- Martens, B. K., Witt, J. C., Elliott, S. N., & Darveaux, D. X. (1985). Teacher judgments concerning the acceptability of school-based interventions. *Professional Psychology: Research and Practice, 16*(2), 191–198.
- Mathes, P. G., Fuchs, D., & Fuchs, L. S. (1997). Cooperative story mapping. *Remedial and Special Education, 18*(1), 20-27. Retrieved from <https://journals.sagepub.com/doi/pdf/10.1177/074193259701800105>.
- McGuinness, D. (2006). *Early reading instruction: What science really tells us about how to teach reading*. MIT Press.
- Meniado, J. C. (2016). Metacognitive Reading Strategies, Motivation, and Reading Comprehension Performance of Saudi EFL Students. *English Language Teaching, 9*(3), 117-129. <https://doi.org/10.5539/elt.v9n3p117>.
- Mercer, C. D., & Pullen, P. C. (2009). *Students with learning disabilities* (7th ed.). Pearson.

Meyer, B. J., Brandt, D. M., & Bluth, G. J. (1980). Use of top-level structure in text: Key for reading comprehension of ninth-grade students. *Reading research quarterly*, 72–103.

Retrieved from <https://www.jstor.org/stable/747349>.

Ministry of Education (2015) *A guide for teachers of students with learning disabilities in Saudi Arabia*. Retrieved from

<https://departments.moe.gov.sa/SPED/products/Documents/TeacherIdguide.pdf>.

Ministry of Education. (2015). *A Statistical Brief of Special Education Programs and Institutes for the Academic Year 2014/2015*, General Administration of Special Education, Riyadh, Saudi Arabia.

Ministry of Education (2016). *Diagnostic tests for students with learning disabilities in Arabic and mathematics at the elementary level*. Retrieved from

<https://departments.moe.gov.sa/SPED/products/Documents/testld.pdf>.

Ministry of Education (2001). *Guiding Principles for Special Education Institutes and Programs*, General Administration of Special Education, Riyadh, Saudi Arabia.

Ministry of Education (2002). *The Document of Roles and Regulation for Special Education Institutes and Programs*, General administration of Special Education, Riyadh, Saudi Arabia.

Ministry of Education (2001). *Guiding Principles for Special Education Institutes and Programs*, General Administration of Special Education, Riyadh, Saudi Arabia.

McGuinness, D. (2006). *Early reading instruction: What science really tells us about how to teach reading*. MIT Press.

Narkon, D. E., & Wells, J. C. (2013). Improving reading comprehension for elementary students with learning disabilities: UDL enhanced story mapping. *Preventing School Failure: Alternative Education for Children and Youth*, 57, 231–239.
<https://doi.org/10.1080/1045988X.2012.726286>.

National Reading Panel. (2000). *Report of the National Reading Panel: Teaching children to read*. Washington, DC: National Academy Press. Retrieved from
<https://www.nichd.nih.gov/sites/default/files/publications/pubs/nrp/Documents/report.pdf>

Nieuwboer, C. C., Fukkink, R. G., & Hermanns, J. M. (2013). Peer and professional parenting support on the Internet: A systematic review. *Cyberpsychology, behavior, and social networking*, 16(7), 518-528.

Onachukwu, I., Boon, R. T., Fore, C., & Bender, W. (2007). Use of a story mapping procedure in middle school language arts instruction to improve the comprehension skills for students with learning disabilities. *Insights on Learning Disabilities*, 4, 27–47.

Ormrod, J. (1995). *Human learning*. (2nd ed.). Merrill.

Padeliadu, S., & Antoniou, F. (2014). The relationship between reading comprehension, decoding, and fluency in Greek: A cross-sectional study. *Reading & Writing Quarterly*, 30, 1–31. <https://doi.org/10.1080/10573569.2013.758932>

- Persampieri, M., Gortmaker, V., Daly III, E. J., Sheridan, S. M., & McCurdy, M. (2006). Promoting parent use of empirically supported reading interventions: Two experimental investigations of child outcomes. *Behavioral Interventions: Theory & Practice in Residential & Community-Based Clinical Programs*, 21(1), 31-57.
- Pressley, M., & Gaskins, I. W. (2006). Metacognitively competent reading comprehension is constructively responsive reading: How can such reading be developed in students?. *Metacognition and Learning*, 1(1), 99-113.
- Ravitch, D. (2010). *The death and life of the great American school system: How testing and choice are undermining education*. Basic Books.
<https://doi.org/10.1080/15582159.2010.526867>
- Re-Authorization of the Individuals with Disabilities Education Act, Pub. L. No.108-446, §614, 118 Stat. 2647 (2004).
- Reutzel, D. R. (1985). Story maps improve comprehension. *The Reading Teacher*, 38, 400-404.
Retrieved from <https://www.jstor.org/stable/20198799>.
- Reynolds, A. J. (1992). Comparing measures of parental involvement and their effects on academic achievement. *Early Childhood Research Quarterly*, 7(3), 441-462.
[https://doi.org/10.1016/0885-2006\(92\)90031-S](https://doi.org/10.1016/0885-2006(92)90031-S).
- Rumelhart, D. E. (1980). Schema: The building blocks of cognition. In R. J. Spiro, B. C. Bmce, & W. F. Brewer (Eds.), *Theoretical issues in reading comprehension* (pp. 33-58). Lawrence Erlbaum.

- Sadeghi, E., Afghari, A., & Zarei, G. (2016). Shadow-reading effect on reading comprehension: Actualization of interactive reading comprehension: (A Vygotskyan view!). *English Language Teaching ELT*, 9, 130–138. <http://dx.doi.org/10.5539/elt.v9n3p130>.
- Schwartz, I. S., & Baer, D. M. (1991). Social validity assessments: Is current practice state of the art? *Journal of Applied Behavior Analysis*, 24, 189–204. Retrieved from <https://www.ncbi.nlm.nih.gov/pmc/articles>.
- Serhan, D. (2020). Transitioning from Face-to-Face to Remote Learning: Students' Attitudes and Perceptions of Using Zoom during COVID-19 Pandemic. *International Journal of Technology in Education and Science*, 4(4), 335-342.
- Sheaha, M. H. (2004). *Factors related to job dissatisfaction among special education teachers in Saudi Arabia* (Doctoral dissertation, University of Northern Colorado). Retrieved from <https://search.proquest.com/docview/305136158?pq-origsite=gscholar>.
- Shaywitz, S. E., Shaywitz, B. A., Catts, H., Dickman, E., Eden, G., Fletcher, J., & Viall, T. (2003). Defining dyslexia, comorbidity, teachers' knowledge of language and reading. *Annals of Dyslexia*, 53, 114. Retrieved from <http://web.macam.ac.il/~offprint/73002.pdf>.
- Shen, Y. (2008). An exploration of schema theory in intensive reading. *English Language Teaching*, 1, 104–107. Retrieved from <https://files.eric.ed.gov/fulltext/EJ1082790.pdf>.

- Skinner, C. H. (2008). Theoretical and applied implications of precisely measuring learning rates. *School Psychology Review, 37*(3), 309-314. Retrieved from <https://doi.org/10.1080/02796015.2008.12087878>
- Sperling, M., Barwasser, A., & Grünke, M. (2019). The effects of a reading racetrack intervention on the sight word fluency of learning disabled elementary school students with German as second language. *Insights into Learning Disabilities, 16*(1), 79-90.
- Stagliano, C., & Boon, R. T. (2009). The effects of a story-mapping procedure to improve the comprehension skills of expository text passages for elementary students with learning disabilities. *Learning Disabilities: A Contemporary Journal, 7*, 35–58.
- Stein, N. L., & Trabasso, T. (1981). What's in a story: An approach to comprehension and instruction. *Center for the Study of Reading Technical Report; no. 200*. Retrieved from https://www.ideals.illinois.edu/bitstream/handle/2142/18031/ctrstreadtechrepv01981i002_00_opt.pdf
- Solari, E. J., Grimm, R., McIntyre, N. S., Swain-Lerro, L., Zajic, M., & Mundy, P. C. (2017). The relation between text reading fluency and reading comprehension for students with autism spectrum disorders. *Research in Autism Spectrum Disorders, 41*, 8-19.
- Sweet, A. P., & Snow, C. E. (2003). Rethinking reading comprehension. New York, NY: Guilford.
- Tighe, E. L., Wagner, R. K., & Schatschneide, C. (2015). Applying a multiple group causal indicator modeling framework to the reading comprehension skills of third, seventh, and

tenth grade students. *Reading and Writing*, 28, 439–466. <https://doi.org/10.1007/s11145-014-9532-1>.

U.S. Department of Education, National Center for Education Statistics. (2018). *Digest of education statistics, 2017*(NCES 2018-070). Retrieved from <https://files.eric.ed.gov/fulltext/ED592104.pdf>.

U.S. Department of Education. (2018a). *40th Annual Report to Congress on the Implementation of the Individuals with Disabilities Education Act*. Washington, DC. Retrieved from <https://www2.ed.gov/about/reports/annual/osep/2018/parts-b-c/40arc-for-idea.pdf>.

Vallecorsa, A. L., & deBettencourt, L. U. (1997). Using a mapping procedure to teach reading and writing skills to middle grade students with learning disabilities. *Education and Treatment of Children*, 20, 173–189. Retrieved from <https://www.jstor.org/stable/42899487>.

Von Brock, M. B., & Elliott, S. N. (1987). Influence of treatment effectiveness information on the acceptability of classroom interventions. *Journal of School Psychology*, 25(2), 131-144. Retrieved from [https://doi.org/10.1016/0022-4405\(87\)90022-7](https://doi.org/10.1016/0022-4405(87)90022-7).

Wherry, J. H. (2004). The influence of home on school success. *PRINCIPAL-ARLINGTON-*, 84(1), 6-7. Retrieved from <https://www.naesp.org/sites/default/files/resources/2/Principal/2004/S-Op6.pdf>.

Wilks, R. T., & Clarke, V. A. (1988). Training versus nontraining of mothers as home reading tutors. *Perceptual and Motor Skills*, 67(1), 135-142.

<https://doi.org/10.2466/pms.1988.67.1.135>

Wolery, M., Dunlap, G. & Ledford, J. R. (2011). Single-case experimental methods: suggestions for reporting. *Journal of Early Intervention*, 33, pp. 103–9.

<https://doi.org/10.1177/1053815111418235>.

Zuidersma, M., Riese, H., Snippe, E., Booij, S. H., Wichers, M., & Bos, E. H. (2020). Single-subject research in psychiatry: facts and fictions. *Frontiers in Psychiatry*, 11, 539777.

Appendix A

Parents/ Guardians Survey

This survey is created for parents/guardians in order to ensure their eligibility to participate in the study.

Please answer the questions given below.

1. What is your highest level of education

- Elementary school
- Middle school
- High-school
- Post-secondary education (e.g., Bachelor, Master, or doctoral)

2. Do you live in the same house with your child who would participate in this study?

- Yes
- No

3- Do you have an electronic device (e.g., laptop, tablet) with a camera for video conferencing?

- Yes
- No

4- Do you have access to the internet?

- Yes
- No

5- Do you have a Zoom account?

- Yes
- No

Appendix B

Parental Consent for Parents/Guardians and their Children to Participate in a Research Study Duquesne University, Pittsburgh, PA

.....
Title of Study: The Effect of Using Story-Mapping to Enhance Reading Comprehension of Students with Specific Learning Disabilities

Investigator:

Name: Omar Alshikhi Department: Counseling, Psychology, and Special Education.
University: Duquesne University Email: alshikhio@duq.edu
Phone number: _____

.....
Introduction

- Your child is being asked to participate in a research study examining the effectiveness of the story-mapping strategy in increasing reading comprehension among children with specific learning disabilities.
- Your child was selected as a possible participant because he is in third/fourth grade and he is enrolled in the specific learning disabilities program.
- We ask that you read this form and ask any questions that you may have before allowing your child to participate in this study.

Purpose of Study

- The purpose of the study is to examine the effectiveness of using the story mapping strategy on three third and fourth grade students with specific learning disabilities.
- The researcher assumes that using the story mapping strategy will increase reading comprehension of students with specific learning disabilities.
- Ultimately, this study will be published as a doctoral dissertation

Description of the Study Procedures

- If you decide to allow your child to participate in this study, he will work with you for about 30 minutes a day across three to four weeks.
- You will participate and provide story-mapping instruction to your child after you receive training on story-mapping.

- During the baseline phase, your child will take pre-tests (8 comprehension questions) in the first week of the study to determine his performance in reading comprehension before receiving story-mapping instruction.
- During the intervention phase, you will teach your child using the story-mapping strategy.
- During the maintenance phase, your child will be asked to use the story mapping strategy without any assistance from you.
- To ensure the accurate implementation of the study procedures, at least, 30% of the baseline, intervention, and the maintenance phases, or at least one baseline session, two intervention sessions, and one maintenance session will be observed by the researcher and the SLD teacher.

Risks

This study does not include any risks beyond those typically found in a classroom. However, it is possible that your child might experience some frustration with answering reading comprehension questions. If your child exhibits any discomforts of being in this study he can always stop participating.

Benefits of Being in the Study

As a result of participating in this study, you will contribute to the research by helping to determine whether the story mapping strategy improves reading comprehension of elementary grade students with SLD.

Confidentiality

- The researcher will not use your child's name when this study is published.
- All grade records, research records, and personal information will be kept confidential.

Payments

- You/your child will collectively receive one SR150 gift certificate that can be used in Jarir Bookstore anywhere in Saudi Arabia. The SR150 gift certificate will be provided after all aspects of the study have been completed.

Right to Refuse or Withdraw

- The decision to participate in this study is entirely up to you and your child. **You are under no obligation to provide consent for your child to participate in this study.**
- You may withdraw your child from the study *at any time* without affecting his or your relationship with the researcher and the SLD teacher.
- Your child has the right to withdraw completely from the study at any point during the process; additionally, you have the right to request that the researcher not use any of the response that your child has provided to date.

Right to Ask Questions and Report Concerns

- You have the right to ask questions about this research study and to have those questions answered by me before, during or after the study.
- If you have any further questions about the study, at any time feel free to contact me, Omar Alshikhi, at alshikhio@duq.edu or by cellphone at +966541190737.
- If you like, a summary of the results of the study will be sent to you at no cost.

If you have any other concerns about your rights as a research participant that have not been answered by the investigators, you may contact the Duquesne University Institutional Review Board at irb@duq.edu

- If you have any problems or concerns that occur as a result of your child's participation, you can report them to the IRB using the contact information above.

Consent

- Your signature below indicates that you have decided to participate and allow your child to participate in this study, and that you have read and understood the information provided above. You will be given a signed and dated copy of this form to keep, along with any other printed materials deemed necessary by the study investigators.

Name of Child (print): _____

Name of Parent/Guardian (print): _____

Signature of Parent/Guardian: _____ Date: _____

Signature of Investigator(s): _____ Date: _____

APPENDIX D

Story Title:

Main Characters:

- 1-.....
- 2-.....
- 3-.....

Setting:

.....
.....

Problem:

.....
.....
.....
.....
.....

Major Events

- 1-.....
- 2-.....
- 3-.....
- 4-.....

Story outcomes

.....
.....
.....
.....

Appendix E

1. Where did this story take place?

.....

2. When did this story take place?

.....

3. Name the main character in the story?

.....

4. Name one more important character in the story?

.....

5. What was the problem in the story?

.....

.....

6. What were the major events that led to the problem?

.....

.....

.....

7. How did the main character try to solve the problem?

.....

.....

8. What was the outcome of the story?

.....

.....

Appendix F

Social Validity Scale Intervention Rating Profile-15 (for the SLD Teachers)

Student Number:

Teacher completing this form:

Date:

The purpose of this questionnaire is to obtain information about the effectiveness of the story mapping intervention for students with SLD. Please circle the number that best describes your agreement or disagreement with each statement.

1 = Strongly Disagree 2 = Disagree 3 = Slightly Disagree 4 = Slightly Agree 5 = Agree 6 = Strongly Agree.

Statements	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
1. This would be an acceptable intervention for students' reading comprehension.	1	2	3	4	5	6
2. Most teachers would find this intervention appropriate for reading comprehension.	1	2	3	4	5	6
3. This intervention should prove effective in changing students' reading comprehension.	1	2	3	4	5	6
4. I would suggest the use of this intervention to other teachers.	1	2	3	4	5	6
5. The students' reading comprehension problem is severe enough to	1	2	3	4	5	6

warrant use of this intervention.						
6. Most teachers would find this intervention suitable for students' reading comprehension problem described.	1	2	3	4	5	6
7. I would be willing to use this intervention in the classroom settings.	1	2	3	4	5	6
8. This intervention would not result in negative side-effects for students.	1	2	3	4	5	6
9. This intervention would be appropriate for a wide variety of students.	1	2	3	4	5	6
10. This intervention is consistent with those I have used in the classroom settings.	1	2	3	4	5	6
11. The intervention is a fair way to handle the students' reading comprehension problem.	1	2	3	4	5	6
12. This intervention is reasonable for the students' reading	1	2	3	4	5	6

comprehension problem described.						
13. I like the procedures used in this intervention.	1	2	3	4	5	6
14. This intervention is a good way to handle the student's reading comprehension problem.	1	2	3	4	5	6
15. Overall, this intervention would be beneficial for the student.	1	2	3	4	5	6

Appendix G

Social Validity Scale Intervention Rating Profile-15 (for Students)

Student Number:

Date:

The purpose of this questionnaire is to obtain information about the effectiveness of the story mapping intervention for students with SLD. Please circle the number that best describes your agreement or disagreement with each statement.

1 = Strongly Disagree 2 = Disagree 3 = Slightly Disagree 4 = Slightly Agree 5 = Agree 6 = Strongly Agree.

Statements	Strongly disagree	Disagree	Slightly disagree	Slightly agree	Agree	Strongly agree
1. This would be an acceptable intervention for my reading comprehension.	1	2	3	4	5	6
2. This intervention will improve my reading comprehension.	1	2	3	4	5	6
3. I would suggest the use of this intervention to other students.	1	2	3	4	5	6
4. This intervention would not result in harm or stress on me.	1	2	3	4	5	6
5. This intervention fits with my struggles in reading comprehension.	1	2	3	4	5	6

6. I like the procedures used in this intervention.	1	2	3	4	5	6
7. The time used during the intervention session (30 minutes) is appropriate.	1	2	3	4	5	6
8. This intervention is a good way to handle my reading comprehension problem.	1	2	3	4	5	6
9. Overall, this intervention would be beneficial for me.	1	2	3	4	5	6

Appendix H
Treatment Integrity Checklist for Baseline Phase

Steps to Implementing Baseline Phase	Completed		Comments
	Yes	No	
The interventionist makes sure that the participant is ready to read the story (e.g. sitting on his chair and has a pencil).			
The interventionist provides to the participant with a copy of a story taken from the instructional level basal reader.			
The interventionist explains the words that are already highlighted in the text.			
The interventionist requests the participants to begin reading the story loudly.			
The interventionist provides feedback on words the participant has difficulty pronouncing.			
The interventionist administers the eight comprehension questions.			

Appendix I

Treatment Integrity Checklist for Intervention Phase

Steps to Implementing Intervention Phase	Completed		Comments
	Yes	No	
The interventionist makes sure that the participant is ready to read the story (e.g. sitting on his chair and has a pencil).			
The interventionist provides to the participant with a copy of a story taken from the instructional level basal reader.			
The interventionist explains the words that are already highlighted in the text.			
The interventionist requests the participants to begin reading the story loudly.			
The interventionist provides feedback on words the participant has difficulty pronouncing.			
The interventionist explains the story elements to the participant by naming and explaining each element.			
The interventionist asks the participant to identify each element with a specific color.			

The interventionist asks the participant to translate the story elements onto the story maps.			
The interventionist makes sure that participants review the story maps before answering the comprehension questions.			
The interventionist administers the eight comprehension questions.			

Appendix J
Treatment Integrity Checklist for Maintenance Phase

Steps to Implementing Maintenance Phase	Completed		Comments
	Yes	No	
The interventionist makes sure that the participant is ready to read the story (e.g. sitting on his chair and has a pencil).			
The interventionist provides to the participant with a copy of a story taken from the instructional level basal reader.			
The interventionist explains the words that are already highlighted in the text.			
The interventionist requests the participants to begin reading the story loudly.			
The interventionist provides feedback on words the participant has difficulty pronouncing.			
The interventionist explains the story elements to the participant by naming and explaining each element.			
The interventionist asks the participant to identify each element with a specific color.			

The interventionist asks the participant to translate the story elements onto the story map independently.			
The interventionist makes sure that participants review the story maps before answering the comprehension questions.			
The interventionist administers the eight comprehension questions.			

Appendix K

Word	Meaning	Example

Appendix L

Questions to be given to the interventionists to measure understanding of the training phase	Yes	No
1- During the baseline phase, the story maps will be provided to the participants to ensure their understanding of stories.		
2- Feedback on words that the participant has difficulty pronouncing will be provided during all phases.		
3- During the baseline phase, the eight comprehension questions will not be administered.		
4- Story elements will be explained during the intervention phase.		
5- During the intervention phase, each story element will be identified with a specific color by the participants.		
6- During the intervention phase, participants are not allowed to review the story maps before answering the comprehension questions.		
7- During the intervention phase, the participants will begin reading the story aloud.		
8- Challenging words will not be explained during the maintenance phase.		
9- During the maintenance phase, participants can review the story maps before answering the comprehension questions.		
10- The maintenance phase lasts for two sessions.		

Appendix M
The Answer Key

The question number	Yes	No
1		✓
2	✓	
3		✓
4	✓	
5	✓	
6		✓
7	✓	
8		✓
9	✓	
10	✓	