

Enhancing Metacognition for the Reading Comprehension of Students with Learning Disabilities
in an Inclusive K-12 Setting: A Review of the Literature

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Abstract

In this paper, I review empirical studies that utilized metacognitive strategies to enhance reading comprehension of students with learning disabilities (LD) in a K-12 inclusive setting in the last 10 years. I also explore the effect of explicit metacognitive instruction on students identified with other types of disabilities as well as non-disabled individuals in an inclusive classroom. First, I provide brief theoretical frameworks on inclusive education, learning disabilities, and critical factors in reading comprehension instruction for students with LD. Second, I review recent studies on metacognitive strategies to improve reading comprehension of students with LD in inclusive settings. The review of the literature indicated that instruction of metacognitive strategies for students with LD improved reading comprehension for all students in an inclusive environment regardless of disability or non-disability status. Finally, I discuss some conclusions and suggestions for future research.

Keywords: Metacognition, explicit strategy instruction, reading comprehension, learning disabilities, inclusion, K12 education.

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Introduction

Reading is a complex task that involves the integration of a range of cognitive processes such as attention, working memory, long-term memory along with linguistics processes to comprehend a written text (Fletcher, Lyon, Fuchs, & Barnes, 2007; Lorch, & van den Broek, 1997). As students move to higher academic grades in K-12, poor reading ability becomes a strong predictor of school failure (Schmidt, Rozendal, & Greenman, 2002). First, students *learn to read*; they are expected to decode a series of signs and convert them into sounds. Later, students are required to *read to learn*; they are expected to construct meaning from textbooks and other written materials, which demands effective reading skills for academic success. For this reason, the identification of effective instructional practices to teach reading to all students is necessary in any classroom.

The largest high-incidence disability group in schools is learning disabilities (LD) (i.e., about 43% of all students with disabilities; U.S. Department of Education, 2011). Approximately 4.8% of all school-aged students (ages 6 to 17) in the United States are identified with LD (U.S. Department of Education, 2011). The majority of these students with LD experience difficulty with reading comprehension and monitoring their thinking process (Mercer & Pullen, 2009; Schmidt, Rozendal, & Greenman, 2002). Students who lack metacognition skills are unlikely to construct meaning from written text, connect meaning to words, make inferences, draw conclusions, recall and summarize information, and actively monitor their comprehension (Jitendra, Hoppes, & Xin, 2000).

The purpose of this paper is to (a) review the literature to see how metacognitive strategies can enhance reading comprehension of students with LD in a K-12 inclusive setting and (b) analyze how instructional strategies designed for students with LD can enhance reading comprehension for other individuals in an inclusive classroom. In the following sections, I introduce theories and research on a) inclusive education, b) learning disabilities, and c) critical factors in reading comprehension instruction for students with LD. Second, I describe the literature review procedures, results, and limitations of recent studies on metacognitive strategies to improve reading comprehension of students with LD in inclusive settings. Finally, I discuss findings from the literature review and future research directions.

Theoretical Framework

Inclusive Education

The inclusion of every student in general education classrooms is widely regarded as desirable for equality and human rights. There is a robust national and international legal foundation that demands inclusion and equal access to education. Such legislative acts and initiatives are stated in the following: The Convention on the Rights of Persons with Disabilities of the United Nations (2008), the Individuals with Disabilities Education Improvement Act of 2004 (IDEA), the No Child Left Behind Act of 2001 (NCLB), Section 504 of the Rehabilitation Act, The Americans with Disabilities Act (ADA), the Higher Education Opportunity Act of 2008 (HEOA) and The National Educational Technology Plan (U.S. Dept. of Education, 2010).

Inclusion is about educating all children together regardless of their level of ability, background, or status (McLeskey, Rosenberg, & Westling, 2013). Apart from students with disabilities, other students that might need to support to succeed are those from diverse cultural

or linguistic backgrounds, students at risk, and gifted and talented learners (McLeskey, et al., 2013). Inclusive education values human differences and fosters a society without discrimination. All students that are included participate actively in the academic and social activities of the school and are accepted by others (McLeskey, et al., 2013). During this process, teachers' support and instruction are necessary to ensure that social interactions are beneficial to all students (Corbett, 2001).

Some have argued that too much emphasis has been placed on facilitating access of students with disabilities to their neighborhood schools and too little emphasis on improving students' outcomes (McLeskey & Waldron, 2011). Some parents, teachers, and administrators do not agree with *full inclusion* or teaching students with disabilities in general education classes for the entire school day (McLeskey & Waldron, 2011). They believe that highly specialized instruction only for students with disabilities is sometimes necessary (McLeskey & Waldron, 2011).

However, a well-designed inclusion program offers social and academic benefits to both groups of students with and without disabilities. For example, students with disabilities improve their work habits, self-confidence, willingness to take risks, and attentive behavior (Dore, Dion, Wagner, & Brunet, 2002; Foreman, Arthur-Kelly, Pascoe, & King, 2004). Students without disabilities benefit socially through inclusion through increased personal growth, understanding of disability related issues, appreciation and acceptance of others, and feelings of accomplishment as they help others (Carter & Hughes, 2006; Salend & Duhaney, 1999).

Conversely, poorly designed inclusive programs may have negative effects on academic outcomes for students with and without disabilities (Pivik, McComas, & Laflamme, 2002). And

even when inclusive programs are well designed, some students with disabilities might not make as much academic progress as expected (Lindsay, 2007). Research has also revealed that simply placing students with disabilities in general education classrooms does not automatically improve their social skills or social status (Carter, et al., 2008).

In order for inclusion to be successful, there must be collaboration among general teachers, special educators, administrators, and parents (Eisenman, Pleet, Wandry, & McGinley, 2011). Resources, including both personnel and materials, should be available to provide appropriate supports for students. There is a need for differentiated instruction, professional development for teachers, and ongoing feedback and assessment. Some educationally meaningful *accommodations* and *modifications* are required in many cases to support students with disabilities (Ketterlin-Geller & Jamgochian, 2011). Accommodations change how students learn or how knowledge is demonstrated; for example, students might be allowed to read aloud, use large-print font materials or a word processor (Ketterlin-Geller & Jamgochian, 2011). Modifications change the objectives and content of learning; for instance, students are allowed to use lower-level reading materials or a dictionary or they are allowed to write a shorter assignment although the depth of their knowledge can be reduced (Ketterlin-Geller & Jamgochian, 2011). Accommodations and modifications are not meant to be just advantageous for students with disabilities over their non-disabled.

In the last few years, the number of students with disabilities who are educated in general education classrooms has significantly increased (McLeskey, Henry, & Hodges, 1998). However, many teachers tend to give the same accommodations to all students with disabilities regardless of their specific needs (Strobel, Arthanat, Bauer, & Flagg, 2007). Two groups of students with and without disabilities do not necessarily learn the same way and do not have the

same needs. Typical accommodations are identified as “extra time to complete work, task break-down into smaller, more manageable pieces, priority seating, color coding materials, providing typed notes, and reading aloud” (Strobel, et al., 2007 p. 92).

Learning Disabilities

As stated earlier, more students with learning disabilities (LD) are included in general education classrooms than any other students with disabilities. About 43% of students with disabilities are identified as having a learning disability (U.S. Department of Education, 2011). The most commonly used definition of learning disability is provided by the Individuals with Disabilities Education Improvement Act of 2004 (IDEA), as follows:

Specific Learning Disability means a disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in the imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculation, including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia, and developmental aphasia. Specific learning disability does not include learning problems that are primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage. (IDEA, 2004 Sec. 602[30])

According to IDEA (2004), a child can be identified as having a specific learning disability if he or she does not achieve adequately for his or her age or does not meet state-approved grade-level standards in one or more of the following areas: “oral expression, listening comprehension, written expression, basic reading skills, reading fluency skills, reading comprehension, mathematics calculation, mathematics problem solving” (IDEA, 2004 Sec.

300.309). Achievement discrepancy cannot be explained by poor teaching, other disabilities, limited English proficiency, or any kinds of environmental, cultural or economic disadvantages.

Identification of students with learning disabilities. From the 1970s until recently, the primary approach that educators used to identify students with LD was *unexpected underachievement* (a.k.a., *a severe discrepancy*) (McLeskey, et al., 2013). A specific learning disability used to be diagnosed by contrasting students' intellectual and achievement test results (Schultz, Simpson, & Lynch, 2012). When a discrepancy was detected, it could not be explained by factors such as cultural, environmental or economic disadvantages. The reliability and the validity of this *unexpected underachievement* method have been criticized. Gresham and Vellutino (2010) found that measures of 'intelligence' are not a strong predictor of reading achievement or responsiveness to remedial instruction. More importantly, this "wait-to-fail" approach requires that a student significantly fell behind his or her grade level, which makes it hard to reduce the discrepancy early on (Gresham & Vellutino, 2010).

Preventive approaches have been proposed such as *Response to Intervention* frameworks (RTI) (Fletcher, Denton & Francis, 2005). RTI seeks to provide support to all students and prevent academic failure of those who struggle with the curriculum. In the first tier, all students receive high-quality instruction in the general education classroom. Then, educators use screening measures to determine which students need additional support. These students are referred to Tier 2, where instruction may include small groups, peer tutoring, structured teaching, and other strategies. For those individuals who continue to struggle, Tier-3 instruction is provided and includes more intensive and individualized interventions along with eligibility for special education services (McLeskey, et al., 2013).

Although several states have adopted an RTI approach to the identification of students with LD (Zirkel & Thomas, 2010), there is some criticism about the effectiveness of RTI as an identification model (Kavale, Holdnack, & Mostert, 2006; Reynolds & Shaywitz, 2009). IDEA 2004 allows states to continue to use a severe discrepancy approach, or a combination of these methods to identify students with LD.

Characteristics of students with learning disabilities. The major characteristic of the learning disability category is its heterogeneity (Mercer & Pullen, 2009). This diversity has led to the categorization of different subtypes of LD according to detected patterns of performance in areas such as reading, writing, and math calculations and problem solving (Fletcher, Lyon, Fuchs, & Barnes, 2007). Nevertheless, academic underachievement is a common characteristic among students with LD.

Students with LD have a range of cognitive deficits that contribute to their learning problems. As mentioned earlier, not all students with LD exhibit the same characteristics. However, the most common problems are related to working memory, attention, metacognition, and monitoring their thinking processes (Mercer & Pullen, 2009). Problems with the memory needed to perform a particular task (*working memory*) impact the ability to see something, think about it, and act on this information (Feifer, 2011; Siegel, 2003). Approximately 25% of students with LD also have Attention Deficit and Hyperactivity Disorder (ADHD) (DuPaul, 2007). ADHD is defined as “a persistent pattern of inattention and/or hyperactivity-impulsivity that is more frequently displayed and more severe than is typically observed in individuals at a comparable level of development” (APA, 2000, p.85).

Students with LD may experience social and motivational problems as well. Social skills are a quality for many students with LD, but researchers estimated that approximately one third of these students had social-skills deficits (Lerner & Johns, 2009). In the classroom setting, students with LD can easily become the target of bullies (Weiner, 2004). Motivation of students with LD can be negatively influenced by persistent difficulty and frustration in learning content. Some students become passive learners and develop a negative attitude toward learning such as *learned helplessness* (Lerner & Johns, 2009). These students passively react to tasks and often do not even attempt to engage in a learning task without the teacher telling them what to do.

Critical factors in reading comprehension instruction for students with LD

During the early stages of reading instruction, students with LD often have difficulty acquiring the developmental skills related to reading, including orthographic and phonological awareness. Instruction of students with LD is often aimed at improving their word recognition, fluency, and comprehension skills (Abbott, Reed, Abbott, & Berninger, 1997). Although decoding problems can hinder reading comprehension (e.g. dyslexia), research showed that many students with learning disabilities also have strategy deficiencies (Schmidt, Rozendal, & Greenman, 2002).

One essential factor for the reading comprehension of students with LD is metacognition (Wong, 1987). Watson, Gable, Gear, and Hughes (2012) have identified other six critical factors, namely: “working memory capacity and other executive processes, prior knowledge, motivation, vocabulary, text coherence, and text structure” (p. 80). In this section, I will briefly discuss these seven critical factors for the reading comprehension of students with LD.

Metacognition. Metacognition is defined as “one’s knowledge concerning one’s own cognitive processes or anything related to them” (Flavell, 1976, p. 232). Two components of metacognition have been discussed: one is *knowledge of cognition*; and the other is *regulation of cognition* (e.g. Schraw, 1998). *Knowledge of cognition* can be defined as one’s awareness of his/her own cognition or cognition in general (Schraw, 1998). This metacognitive awareness facilitates understanding of strategies that help to complete a certain task successfully and how, when and why those strategies are helpful (Schraw, 1998). *Regulation of cognition* can be defined as the activities that help to control the process toward completion of the task; regulation of cognition can include “planning, monitoring, and evaluation” (Schraw, 1998. p. 115).

Studies of skilled and less skilled readers indicated that in addition to essential skill-based strategies such as decoding, poor readers also lacked metacognitive strategies (Wong, 1987). The reading performance of struggling students has improved significantly when they are taught explicit metacognitive strategies that are characteristics of good readers (deBettencourt, 1987). Non-disabled students have also shown enhanced reading skills as a result of specific metacognitive strategies instruction (Berkeley, Marshak, Mastropieri, & Scruggs, 2011; Emery, 1996; Faggella-Luby, Schumaker, & Deshler, 2007).

Working memory capacity and other executive processes. Working memory capacity and other executive cognitive processes such as behavioral inhibition, planning and organization have been associated with deficits in reading comprehension (Swanson, Kehler, & Jerman, 2010). Working memory is the system that actively maintains multiple pieces of transitory verbal and nonverbal information in the mind, which allows us to manipulate and process information (Becker, & Morris, 1999). Many students with LD are unable to control the interference of

irrelevant verbal information from working memory, which results in low levels of retention and comprehension (Pimperton & Nation, 2010; Watson, Gable, Gear, & Hughes, 2012).

Prior knowledge. Prior knowledge of a specific topic helps students understand and remember textual information more easily, regardless of their age or reading ability (Kamalski, Sanders, & Lentz, 2008). Thus, prior knowledge is an important factor that bolsters students' learning and comprehension of new information. Prior knowledge also increases the likelihood that the student will remember and comprehend the reading material at a deeper level (Kamalski et al, 2008). Teachers need to teach not only specific reading strategies but also the content required for knowledge schemata, especially because students with LD are likely to have a deficient prior knowledge base (Watson, et al., 2012).

Motivation. Students who have an interest in the reading material are more likely to be motivated to actively process the content (Alexander, Kulikowich, & Schulze, 1994). Morgan and Fuchs (2007) conducted a meta-analysis of research on reading skills acquisition and motivation and found that a significant correlation existed between these two variables. This relationship was found to be bidirectional, which means that reading achievement and motivation to read can predict each other across time (Morgan & Fuchs, 2007). Many students with LD are less likely to actively engage in learning tasks or to be sufficiently motivated to make an effort to understand a written text because they tend to lack intrinsic motivation (Logan, Medford, & Hughes, 2011).

Vocabulary. Vocabulary knowledge is important for students to understand narrative and expository texts in various academic disciplines such as science and math (Seifert & Espin, 2012; Taylor, Mraz, Nichols, Rickelman, & Wood, 2009). One evidence-based strategy for

promoting vocabulary development has been to teach students the use of prefixes/suffixes (Ebbers & Denton, 2008). If the student with LD is an English language learner, further accommodations and support might be required (Swanson, Orosco, & Lussier, 2012).

Text coherence. The text density and complexity of textbooks can pose challenges to many struggling readers (Mastropieri, Scruggs, & Graetz, 2003). Text coherence is the degree to which a reader can comprehend the relationships between different ideas and thoughts communicated in the text (Watson et al., 2012). Problems in coherence might be caused because many textbooks contain “conceptual gaps.” These gaps occur when the reader is unfamiliar to some concepts or relationships between ideas that are not explicitly stated in the text (Watson, et al., 2012). Conceptual gaps require readers to make inferences in order to make connections among the various concepts being discussed (McNamara & Kintsch, 1996).

Text structure. Text structure refers to the way how ideas are organized and presented in a text (Saenz & Fuchs, 2002). Students with LD and poor reading comprehension may have limited knowledge of various text structures such as descriptive, narrative, expository or argumentative texts. Poor readers usually find narrative texts easier to understand since their structure is quite simple -characters, setting, actions, and resolution- compared to expository or argumentative texts (Saenz & Fuchs, 2002). Knowledge of text structure can facilitate understanding and enhance students’ retention of the information (Watson et al., 2012).

Metacognitive Approaches to Reading Comprehension in Students with LD in Inclusive Settings

Metacognitive knowledge and regulation can be improved using a variety of instructional strategies (Schraw, 1998). Several metacognitive strategies have been identified to improve comprehension for students with LD. Some strategies include: the use of self-monitoring strategy, semantic mapping, inferences, graphic organizers, reciprocal teaching, theme identification, collaborative strategic reading, summarizing content, and underlying structure (Kim, Linan-Thompson, & Misquitta, 2012). The general assumption is that students who are conscious of how they study and learn are more successful than those who are not aware of all these processes (Eggen & Kauchak, 1992).

For this literature review, I analyzed research studies on how metacognition can improve reading comprehension for students with LD in inclusive settings. I believe metacognitive knowledge is of great value in an inclusive classroom since individuals with strong metacognitive awareness may use this knowledge to compensate for domain-specific knowledge, lack of ability, or relevant prior knowledge (Schraw, 1998).

Literature Search Procedures

To conduct a valid review of the literature, it is critical to provide clear definitions of the inclusion and exclusion criteria for all studies reviewed (Cooper, 1998). In this section, I will present the criteria I used to search, evaluate, and select the studies to be included in the review. First, I conducted a computerized search of the literature on reading comprehension instruction for students with LD by using ERIC and PsycINFO. Descriptors for the database search included the following combinations: reading comprehension, learning disabilities, inclusion, inclusive education, metacognition, metacognitive strategies, metacognitive scaffolding, reading disabilities, struggling readers, strategy instruction, self-regulation, self-monitoring, and self-

questioning. Second, I established the following criteria to evaluate, and select studies for this review:

1. The study was published between 2003 and 2013 in a peer-reviewed journal.
2. The study had to focus on evaluating metacognitive strategies to enhance reading comprehension (I excluded studies on basic reading skills or reading fluency skills).
3. The study involved participants in K-12 grades (I excluded meta-analyses, literature reviews, and synthesis of research).
4. Instruction took place in an inclusive general education classroom (studies conducted in resource rooms or self-contained special education classrooms were not included for analysis).
5. Study participants included students with learning disabilities (students described as struggling readers, reading disabled or dyslexic were considered synonymous with LD for this purpose).
6. Instruction was in English.

Results

Surprisingly, only two studies that met all of the selection criteria were located within the last 10 years. I conducted multiple searches on the ERIC and PsycINFO databases, and reviewed bibliography and references from related scholarly articles. Most studies I found were not carried out in inclusive settings. I located 10 studies on the use of metacognitive strategies to enhance reading comprehension in which all participants were identified as having LD. This body of research can certainly shed light on how to improve reading skills of students with LD in highly

specialized interventions. For example, this research can support instruction during Tier 3 in a Response to Intervention (RTI) framework. According to this framework, all students receive high-quality instruction in an inclusive general education classroom during Tier 1. Students who continue to struggle with the curriculum are referred to Tiers 2 and 3 for more intensive and individualized interventions along with eligibility for special education services (McLeskey, et al., 2013).

I excluded studies that isolated students with LD because the purpose of this paper was to analyze the impact of interventions in an inclusive classroom. On the one hand, I want to evaluate how the context of inclusion modifies the intervention and on the other hand, I want to study how the intervention affects students that are not identified as having LD. Table 1 summarizes the purpose, research design, number and type of participants, and findings of the two studies selected for this further reviews: R.

Table 1: Summary of empirical studies

| Study | Purpose | Research design | Participants | Findings |
|---|--|--|---|--|
| Faggella-Luby, Schumaker, and Deshler, (2007) | Compared the effect of using Embedded Story-Structure (ESS) and Comprehension Skills Instruction (CSI) in an inclusive ninth-grade literature class. | Control-group design with random assignment of members of matched pairs of students to two groups (ESS and CSI) to determine the effects of the ESS Routine. | N = 79 ninth graders (including 14 students with LD) Groups of 12 to 14 students were randomly assigned to one of two treatments over a nine day period. | Statistically significant differences were found between groups in favor of the ESS Routine. Results indicated equivalent gains for ESS students regardless of disability status. |
| Berkeley, Marshak, | Investigated the effectiveness of a self-questioning strategy for | Randomized experimental design. | N = 57 seventh grade students with a range of abilities | Students in the self-questioning strategy group performed better |

| | | | | |
|----------------------------------|--|---|---|--|
| Mastropieri, and Scruggs, (2011) | improving student reading comprehension of 7 grade-level social studies text material. | Students were stratified and randomly assigned to a self-questioning strategy group or a comparison typical practice group. | (including 13 English language learners, 5 students with LD and 2 students with other disabilities). Instruction lasted for three days. | on both multiple-choice and open-ended comprehension tests of the social studies content read. |
|----------------------------------|--|---|---|--|


Faggella-Luby, Schumaker, and Deshler (2007) investigated the Embedded Story-Structure (ESS) routine, which comprises three strategies: “(a) self-questioning (used during pre-reading), (b) story structure analysis (used during reading), and (c) summary writing (used after reading)” (p. 135). In figure 1, the ESS organizer is presented. This graphic device was designed by the researchers to facilitate the integration of the three strategies and the interactive construction of knowledge between students and teacher.

Figure 1. An example of graphic organizer

| Name _____ Title _____ Date _____ | | | | | | | |
|--|--|------------|---|--|--|--|--|
| Who are the main characters? | | | | | | | |
| <input type="radio"/> Protagonist <input type="radio"/> Antagonist <input type="radio"/> Other | <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 50%; text-align: center; padding: 5px;">Characters</th> <th style="width: 50%; text-align: center; padding: 5px;">Clues/Description</th> </tr> <tr> <td style="border-bottom: 1px solid black; height: 20px;"></td> <td style="border-bottom: 1px solid black; height: 20px;"></td> </tr> <tr> <td style="border-bottom: 1px solid black; height: 20px;"></td> <td style="border-bottom: 1px solid black; height: 20px;"></td> </tr> </table> | Characters | Clues/Description | | | | |
| Characters | Clues/Description | | | | | | |
| | | | | | | | |
| | | | | | | | |
| <input checked="" type="checkbox"/> What is the Central Conflict? | | | | | | | |
| <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 70%;"></td> <td style="width: 30%; padding-left: 10px;"> Person vs. Person Person vs. Nature Person vs. Ideal Person vs. Self </td> </tr> </table> | | | Person vs. Person Person vs. Nature Person vs. Ideal Person vs. Self | | | | |
| | Person vs. Person Person vs. Nature Person vs. Ideal Person vs. Self | | | | | | |
| <input checked="" type="checkbox"/> How does the central conflict begin? (Initiating Event) | | | | | | | |
| <input type="radio"/> When does the story take place? (Time) | | | | | | | |
| <input checked="" type="checkbox"/> Where does the story take place? (Place and Background info) | | | | | | | |
| <input checked="" type="checkbox"/> Which decision or event is the climax (or turning point)? (Climax) | | | | | | | |
| <input checked="" type="checkbox"/> How does the central conflict end/resolve? (Resolution) | | | | | | | |

④ Why does the author tell us the story in this way? (Theme)

Story Structure Picture:



Summary:

Taken from: Faggella-Luby, Schumaker, and Deshler (2007)

The ESS organizer can be considered a *metacognitive scaffold* that provides “guidance in how to think during learning” (Hannafin, Land, & Oliver, 1999, p. 132). Metacognitive scaffolding helps students to reflect on the learning goals to achieve them (Hannafin, Land, & Oliver, 1999). The ESS organizer guided the student through the implementation of self-questioning, story structure analysis and summary.

Faggella-Luby, Schumaker, and Deshler (2007) used the self-questioning strategy for students to ask and answer a series of questions that are critical components of story structure (main character, conflict, initiating event, time, place, background, climax/turning point, resolution, and theme). When implementing this strategy, students used WH question words (who, what, when, where, which, how, and why) as a mnemonic device to remember the information. For the story structure analysis, students were provided with picture cues and a

diagram to label specific events and infer the story structure. Finally, students were encouraged to provide a written summary of the story.

Faggella-Luby, Schumaker, and Deshler (2007) also compared the ESS routine to the Comprehension Skill Instruction (CSI). This second approach comprises three research-based strategies for instruction: “(a) the LINCIS vocabulary strategy (used during pre-reading); (b) question-answer relationships (QAR) (used during reading); and (c) semantic summary mapping (used after reading)” (p. 136). The CSI strategies were chosen because they had previously been studied as mechanisms that could improve student reading comprehension (Ellis, 2000; Englert, Mariage, Garmon, & Tarrant, 1998; Raphael, 1986). To parallel the ESS routine, the group of students that worked with CSI instruction also received a graphic device to facilitate the interactive construction of knowledge.

The LINCIS Vocabulary Strategy involves the use of a set of mnemonic strategies, including a key word strategy, a visual imagery strategy, and a story strategy to link known information to new vocabulary words and their definitions (Ellis, 2000). For the QAR strategy, students answered text-based and knowledge-based questions to develop story understanding. (e.g., "what is Johnny's father's job?", "what are some of the challenges facing the kidnappers?") (p.137). For the semantic summary mapping strategy, students used a semantic or concept map to visually identify and communicate critical components of the story.

Faggella-Luby, Schumaker, and Deshler (2007) found statistically significant differences in favor of the ESS routine on measures of strategy use, story structure knowledge, and unit reading comprehension. Results also indicated equivalent gains for ESS students regardless of whether or not students had a disability diagnosis. This study supports the belief that instruction

in the ESS routine may bolster educational outcomes for individuals with and without disabilities in inclusive classrooms.

Berkeley, Marshak, Mastropieri, and Scruggs (2011) investigated the effectiveness of a self-questioning strategy for improving student reading comprehension on social studies text material. These researchers created strategy sheets containing strategy steps, examples of each step, and suggestions for additional things to try if questions could not be answered. Strategy steps included: “(a) turning headings and subheadings into questions, (b) reading the section, (c) stopping, and (d) trying to answer your questions” (p. 108). Additional compensation strategies included: “(a) re-reading that section (in case you missed something important), (b) checking your understanding of vocabulary, (c) looking for other text structures (maps, graphs, pictures) that can help you, and (d) writing down questions to ask your teacher.” (p. 108).

Students that were randomly assigned to a comparison typical practice group received instruction in a separate classroom. These students only received a textbook with headings and subheadings, pictures, and questions at the end of the chapter. Teachers had students read a specific number of sections from the textbook and try to remember as much information as they could. This procedure was simulating a typical practice in a general education social studies classroom.

Berkeley, Marshak, Mastropieri, and Scruggs (2011) used three measures to validate their results: multiple-choice content test, open-ended content test and strategy awareness survey. Researchers found that students who received strategy instruction outperformed the typical instruction. Although all students appeared to benefit from strategic instruction, no specific

statistical analyses were conducted for students with LD or English language learners due to the insufficient numbers of students with those characteristics.

Limitations

Results of this review should be viewed in the light of several limitations. First, our search yielded only two studies and included high school students only. Studies with elementary school students could not be obtained. Age and grade level should be critical factors in terms of strategy instruction, reading development, and metacognitive knowledge. Second, the number of participants was fairly small in both studies, which limits the external validity and generalizability of the results (N= 79 for Faggella-Luby, Schumaker, & Deshler and N= 57 for Berkeley, Marshak, Mastropieri, & Scruggs). Third, it is necessary to take into account the broad spectrum of disabilities and types of students in an inclusive general education classroom. The studies reviewed included students with LD and a very small number of students with other disabilities such as hearing impairment and other health impairments. There were also a few linguistically diverse students. Results and implications can be strengthened by analyzing more heterogeneous inclusive settings. Last, interventions were implemented for a relatively short time (3 and 9 days). There were no follow-up measures to determine if students maintained the learned strategy knowledge over time or if they were able to transfer the strategies to different contexts.

Conclusions and Further Research

Although federal laws such as IDEA 2004 continue to advocate the need to educate individuals with disabilities in the least restrictive environment, most of the recent research still focuses on instruction of students with disabilities in resource rooms or self-contained special

education classrooms (e.g. Antoniou, & Souvignier, 2007; Boulware-Gooden, Carreker, Thornhill, & Joshi, 2007; Camahalan, 2006; Crabtree, Alber-Morgan, & Konrad, 2010; Higgins, & Raskind, 2005; Hollenbeck, 2011; Nelson, & Manset-Williamson, 2006). Despite the importance of reading instruction for academic success through K-12, there has been little research on instructional strategies in inclusive settings in the last 10 years (e.g. Berkeley, et al., 2011; Faggella-Luby, et al., 2007).

Besides, research has suggested that inclusion appears to make no difference in the reading achievement of non-disabled students (Gandhi, 2007). This evidence addresses and alleviates the concern of those who think that there could be a negative impact on the reading achievement or other variables associated with non-disabled students in general education classrooms that include students with disabilities (Bear & Proctor, 1990; Hollowood, 1995; Sharpe, York, & Knight, 1994; Tapasak & Walther-Thomas, 1999). Another area of concern is how teachers are approaching reading instruction (Klingner, Urbach, Golos, Brownell, & Menon, 2010). Most special education teachers seemed unsure of how to teach reading comprehension to third through fifth grade students (Klingner et al., 2010). Klingner and her colleagues (2010) conducted 124 observations of 41 special education teachers and found that comprehension strategies were not being taught explicitly. Teachers would use predicting as a reading strategy but they would rarely use more complex strategies, such as finding the main idea or summarizing (Klingner et al., 2010).

This paper presented a synthesized review of the literature on inclusive education, learning disabilities, and critical factors in reading comprehension for students with LD. In addition, empirical studies were reviewed to guide toan understanding of how explicit instruction of metacognitive strategies can bolster reading comprehension for all students in an inclusive

classroom. Given the limited number of empirical studies, it is evident that there is a need for further research across multiple classes in inclusive settings and over longer periods of time.

More systematic research will provide new insights into the role of metacognitive scaffolding in inclusive settings and how to best help students build metacognitive skills. Schraw (1998) proposed four general ways to increase metacognition in general education classrooms: “promoting general awareness of the importance of metacognition, improving knowledge of cognition, improving regulation of cognition, and fostering environments that promote metacognitive awareness” (p. 118). Future research could focus on inclusive settings and study the effect of self-regulation techniques and other interventions in a diverse group of learners.

Faggella-Luby, Schumaker, and Deshler (2007) identified four phases for strategy instruction in an inclusive classroom: “(a) teacher demonstration and modeling of the targeted strategies, including think-aloud problem solving, (b) student-teacher collaboration and co-construction of knowledge and strategy use, (c) student peer collaboration and teacher guided practice, and (d) independent student practice” (p. 139). Further research can investigate and validate more principles for explicit strategy instruction in inclusive classrooms. Instruction in the area of reading comprehension needs to be highly structured, directed response/questioning, explicit, systematic, modeled, and scaffolded (Williams, Hall, Lauer, Stafford, DeSisto, & deCani, 2005).

It is also important to acknowledge the importance of differentiating instruction because two groups of students certainly do not learn in the same way. In addition, students with LD are a very heterogeneous group of individuals (Mercer & Pullen, 2009). In order for a strategy to be effective, the teacher needs to identify students’ specific needs. Students have different levels of

struggle in terms of decoding, reading fluency, working memory, retention, prior knowledge, motivation, metacognition, vocabulary, text coherence or text structure among many other difficulties (Watson, et al., 2012; Wong, 1987).

One framework that seeks to make instruction more accessible is Universal Design for Learning (UDL). This approach to curriculum design aims at creating instructional goals, methods, materials, and assessments that work for everyone (CAST, 2011). UDL consists of a series of flexible approaches that can be customized and adjusted for individual needs. Students should be provided multiples means of representation, expression and engagement in order to minimize barriers to learning (CAST, 2011). There are indications that UDL may enhance the delivery of evidence-based practices, particularly during Tier-1 instruction in a Response to Intervention model (Basham, Israel, Graden, Poth, & Winston, 2010; Edyburn, 2009).

High schools students with and without disabilities have shown high levels of satisfaction, engagement and participation in learning environments that incorporated UDL principles (Abell, Jung, & Taylor, 2011; Dore, Dion, Wagner, & Brunet, 2002; Kortering, McClannon, & Braziel, 2008). One effective intervention was the use of digital backpacks to support diverse learners in a project-based learning environment (Basham, Meyer, & Perry, 2010). Another good example of redesigning the high-school curriculum was provided by Dymond and her colleagues (2006), who used a participatory action research approach to create a universally designed inclusive science course. Participants included one general education teacher, and two special education teachers in an inclusive high school in the Midwest in the USA. This study indicated that collaborative research among researchers and practitioners was possible and could yield meaningful results (Dymond, et al., 2006).

In conclusion, reading comprehension is an important factor for academic success in K-12 schools and further research on explicit strategy instruction and other meaningful interventions is required. The number of students with disabilities who are educated in general education classrooms has increased significantly in the last few years as a result of more public awareness and extensive national and international legislative acts that promote equal access to education (McLeskey, Henry, & Hodges, 1998). Also, when an inclusion program is well designed, students with and without disabilities benefit socially and academically (Carter & Hughes, 2006; Dore, Dion, Wagner, & Brunet, 2002). Metacognitive strategies have shown to improve the reading comprehension for students with LD and other types of students in inclusive classrooms, but implications and effects need to be further documented in the literature. Finally, an educational approach that has gained popularity in the last few years is UDL since it allows for differentiated instruction and increased accessibility to the general education curriculum.

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