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Effects of a writing instructional package for students with moderate intellectual disability.

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EFFECTS OF A WRITING INSTRUCTIONAL PACKAGE FOR STUDENTS WITH
MODERATE INTELLECTUAL DISABILITY

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A Dissertation Approved on

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ABSTRACT

EFFECTS OF A WRITING INSTRUCTIONAL PACKAGE FOR STUDENTS WITH

MODERATE INTELLECTUAL DISABILITY

Beth Newberry Gurney

August 8, 2019

The development of writing skills is one of the most complex competencies that

students are expected to master (Saddler, 2013). Limited research has been conducted on

the acquisition of writing skills for students with moderate and severe intellectual

disability. Even fewer studies have examined the acquisition of sentence construction

skills. The current study examines the effects of a writing instructional package using

peer tutoring, response prompting, and sentence frames to teach students with moderate

intellectual disability to construct sentences related to adapted grade-level social studies

content. Four seventh grade students without disabilities were trained to implement the

writing instructional package with three students with moderate intellectual disability.

Maintenance over time, generalization to the general education classroom, and social

validity were examined. Results indicate that all three students with moderate intellectual

disability increased the number of sentences written correctly and independently about a

historical artifact. Additionally, the three students increased the number of

comprehension questions answered correctly about the artifact. All students maintained

the results during the maintenance period and generalized the results to their general

education social studies classes. Finally, the staff and students reported high levels of

satisfaction with the instructional package.

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CHAPTER 1

INTRODUCTION

Writing is a flexible tool that serves multiple purposes and meets a range of goals (Graham & Perin, 2007a). It is a system of graphic marks that denote the components of a specific language and is a part of almost every human activity (Schmandt-Besserant & Erard, 2008). Writing is crucial for communication and learning for all students (Saddler, 2013). It is learned and produced in social situations, establishes social relationships, and creates shared meaning (Bazerman, 2016). Over the years, most children learn to master writing in order to communicate with others and to acquire and integrate knowledge (Connelly & Dockrell, 2016).

Producing accurate and effective written text is challenging and, unfortunately, a significant number of children struggle with the writing process (Graham & Harris, 2009). The ability to express thoughts in writing is among the most complex academic competencies that students are expected to master (Saddler, 2013). In 2011, the National Assessment of Educational Progress (NAEP) was used to measure the writing skills of more than 52,000 middle and high school students in the United States. Only 27% of students scored at the proficient or advanced level. For 8th graders, 54% of students were found to be at the basic level and 20% were found to be below the basic level. For 12th graders, 52% of students were found to be at the basic level and 21% were found to be below the basic level. In sum, 74% of 8th graders and 73% of 12th graders did not meet

NAEP writing proficiency goals. Students who do not learn to write well are at a long-term considerable disadvantage in school, at work, and in their community (Graham & Perin, 2007b).

Writing instruction is a crucial, and often neglected, part of a comprehensive literacy program (Mason, Davidson, Hammer, Miller, & Glitting, 2013). Although reading and writing are complementary skills, they do not necessarily go hand in hand (Wengelin & Arfé, 2018). While readers form a mental representation of thoughts written by someone else, writers must formulate their own thoughts, organize them, and create a written record of them using the conventions of spelling and grammar (Gillespie, Graham, & Kiuhara, 2014). Reading and writing are vital aspects of literacy and each requires its own dedicated instruction (Graham & Perin, 2007a). Reading and writing are reciprocal processes (Staples & Edmister, 2012) and the overall literacy skills of all students are enhanced when teachers provide high-quality instruction in both areas (Copeland & Keefe, 2016).

Academic Instruction for Middle School Students with MSID

In 1975, *Education for All Handicapped Children Act*, now known as the *Individuals with Disabilities Education Improvement Act* (IDEA), was passed (Public Law 94-142). This law guaranteed education for all children with disabilities and marked the first time that students with moderate and severe intellectual disability (MSID) were guaranteed access to public schools (Wehmeyer & Smith, 2017). The landscape of education for students with MSID has changed rapidly in the past four decades. Following the passage of Public Law 94-142, students with MSID were often grouped together in special schools or self-contained special education classrooms. The

educational focus was placed on skills deemed "functional" and not on teaching academic content (Kurth, Morningstar, & Kozleski, 2014). The 1997 and 2004 amendments to IDEA emphasized aligning each student's educational program and specially designed instruction to the general education curriculum while continuing to address the student's unique learning needs instead of concentrating solely on functional skills (Wehmeyer & Smith, 2017). In addition, the No Child Left Behind Act (NCLB) of 2001 required annual performance assessments for all students, including those students with MSID, in reading, mathematics, and science (Browder, Wakeman, & Flowers, 2006; Wehmeyer & Smith, 2017).

Most research on academics for students with MSID conducted prior to the mid-2000s focused exclusively on functional skills (e.g., using money, daily living tasks; Browder & Spooner, 2014). Research in the area of literacy focused on functional sight word instruction (Browder, Wakeman, Spooner, Ahlgrim-Delzell, & Algozzine, 2006), in mathematics on money and time instruction (Browder, Spooner, Ahlgrim-Delzell, Harris, & Wakeman, 2008), and in science on daily living tasks (Spooner, Knight, Browder, Jimenez, & DiBiase, 2011). As the research in the area of content-focused academic instruction for students with MSID has increased over the previous two decades, much of the research has been conducted with elementary-aged students (Williams-Diehm & Palmer, 2017). Only 19 recent (2005-2019) studies focusing on academic instruction for middle school students with MSID were located. Of those studies, six centered on literacy instruction, five on science instruction, four on mathematics instruction, one on mathematics and science instruction, one on social studies instruction, and two on

multiple content areas (i.e., food science class, earth science class, teen living class, visual arts class, health class).

Writing Instruction for Students with MSID

For over 100 years, researchers have studied the effectiveness of practices for teaching students to write (Bazerman, 2016). However, the study of instructional practices for writing has been much less extensive and deep when compared to instructional practices for reading (Graham, Harris, & Chambers, 2016). This is compounded when examining research that includes students with disabilities. Writing Next, an important study published by the Carnegie Commission, used meta-analysis to examine two areas: learning-to-writing and writing-to-learn. Of the 142 studies included in the meta-analysis, only 41 involved students considered low-achieving writers (Graham & Perin, 2007b). Copeland and Keefe (2016) reported a scant amount of research on writing with students with intellectual disability. The low academic expectations for students with MSID have likely influenced the amount and type of instruction that was provided (Sturm, 2012). Only 15 recent (2005-2019) writing studies were located including four studies on spelling, four studies on sentence writing, three studies on story writing, two study on paragraph writing, and two studies on functional writing.

Social Studies Instruction for Students with MSID

Social studies instruction is important for all students to promote civic competence, the knowledge and skills students need to be active and engaged in public life (National Council for the Social Studies, 2010). While the emphasis on social studies instruction has diminished over the previous two decades for all students (Fitchett,

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Heafner, & Lambert, 2014), the lack of social studies instruction is more pronounced

when considering students with MSID (Browder, Spooner, Courtade, Wood, in press).

The National Council for the Social Studies (2017) explicitly includes an emphasis on

inclusion of all students in social studies classrooms in its publications. It is important

that all students are taught the skills to recognize societal problems and learn the steps

they can take to make meaningful change. Only four recent (2005-2019) studies focusing

on social studies instruction for students with MSID were located.

Peer Tutoring Interventions for Students with MSID

Targeted student peer tutoring is one type of peer-mediated intervention that

involves pairing a student who is higher achieving with a student who needs support

learning concepts and skills (Chan et al., 2009). Targeted student peer tutoring

interventions are practical in school settings and can decrease the reliance on direct adult

support (Feldman, Carter, Asmus, & Brock, 2016). These interventions can take place in

the special education or general education setting. Targeted student peer tutoring have an

added benefit of increasing social interactions with the peer implementing the

intervention and other peers in the classroom possibly leading to deeper levels of

inclusion (Ganz et al., 2012). Eight recent (2005-2019) studies focusing on targeted

student peer tutoring were located.

Purpose of the Study

This study aims to add to the existing research body of effective interventions that

can be used to teach middle school students with MSID to write sentences related to

social studies content. The purpose of this study was to evaluate the effectiveness of an

instructional package using targeted student peer tutoring, response prompting (constant

time delay, system of least prompts), and sentence frames on the construction of sentences about a historical artifact by middle school students with moderate intellectual disability (MID). Furthermore, the comprehension of grade-level social studies content of the student with MID was evaluated. Social validity of the intervention was also examined.

The independent variable in the study was a writing instructional package based on Pennington, Flick, and Smith-Wehr (2018), Pennington, Foreman, and Gurney (2018), and Pennington and Rockhold (2017). It included targeted student peer tutoring, sentence frames, written models, constant time delay, and system of least prompts. The peers were selected from the two general education social studies classes that the students with MID were enrolled and were trained using behavioral skills training (BST) to implement the writing instructional package by the researcher (Miltenberger, 2016). Instructional sessions occurred in the special education classroom. Probe sessions occurred in the two general education social studies classrooms.

Sentences constructed independently and correctly relating to an artifact served as the primary dependent variable in the study. Specifically, the primary dependent variable was the number of sentences written independently and correctly by the students with MID during each session. A secondary dependent variable was the comprehension of the grade-level social studies content of the students with MID. Specifically, the secondary dependent variable was the number of comprehension questions answered correctly by the students with MID about the social studies content.

Significance of the Study

There is a lack of research in the area of academic instruction for middle school students with MSID. Students and teachers deserve well-researched, practical, evidence-based practices for teaching all content areas. It is important for students with MSID to have the same educational opportunities to receive high-quality instruction in a variety of content areas as their peers without disabilities. This study adds to the research demonstrating the use of a writing instructional package with targeted student peer tutoring, response prompting (constant time delay, system of least prompts), and sentence frames to write sentences about grade-level social studies content for middle school students with MID.

The research to date on teaching writing skills to students with MSID is limited. Currently 15 recent studies exist in this area. Practitioners are in need of effective interventions. The current literature suggests that students with MSID can gain meaningful writing skills (i.e., writing sentences, writing text messages) when given consistent, authentic opportunities to write. All 15 studies were conducted exclusively in special education settings. Additional research is needed to investigate interventions that are effective and practical in general education settings. Additionally, none of the studies examined writing-to-learn, using writing to assist comprehension of new subject matter in content areas such as science, mathematics, and social studies (Klein & Meichi Yu, 2013). It is important to identify interventions that can be used to increase the understanding of content from these areas for students with MSID. This investigation adds to the research of providing multiple, authentic opportunities to write and writing-to-learn in the special education and general education settings for students with MID.

To date, a limited number of studies have been conducted on the acquisition of social studies content for students with MSID. With only four recent studies, this area is in need of additional research. The current literature suggests that students with MSID can learn vocabulary definitions, answer comprehension questions, and generate questions related to social studies content. With just two of the studies conducted partially in the general education setting, more research investigating interventions that are practical and effective in general education settings is needed. This investigation adds to the research of teaching grade-level social studies content to students with MID in special education and general education settings.

With only eight recent studies, the area of targeted student peer tutoring interventions is in need of additional investigation. The existing literature does suggest that with training, peers are capable of effectively implementing systematic instructional procedures for students with MSID. This investigation adds to the research of using targeted student peer tutoring to teach academic content for students with MID in special education and general education settings.

Research Questions

The purpose of the study was to support and extend the current research by examining the following research questions:

1. What is the effect of a writing instructional package (targeted student peer tutoring, response prompting, and sentence frames) on the construction of sentences related to an artifact written by students with MID?

2. What is the effect of a writing instructional package (targeted student peer tutoring, response prompting, and sentence frames) on the comprehension of grade-level social studies content for the students with MID?

3. How do the special education teacher, general education teachers, and paraprofessionals view the goals, procedures, and effects of the writing instructional package (targeted student peer tutoring, response prompting, and sentence frames) for the students with MID and the students without disabilities?

4. What are the views of the students with MID and the students without disabilities toward working with one another and the writing instructional package (targeted student peer tutoring, response prompting, and sentence frames)?

Delimitations

The study was conducted in a small school district in one middle school in a rural area. Generalization of the results to larger school districts as well as suburban and urban school districts should be made with caution.

Three students with MID, four peers without disabilities, two paraprofessionals, two general education teachers, and one special education teacher participated in the study. All students and staff were located in the same middle school. The small number of participants and their relative homogeneity may have an effect on generalization of the results to other student and staff populations.

The participants with MID in this study were students with some word recognition skills. All students included in this study were able to read some content specific words prior to intervention phase. Additional supports during the intervention may be needed for students who do not read text independently.

The two general education social studies teachers that participated in the study were required by the school administration to incorporate writing into their instruction. In other social studies classrooms, some students may be asked to write more or less than the students in these classrooms. This may have an effect on generalization of the results to other general education classrooms.

Conclusion

The writing instructional package was initiated to address the lack of writing instruction and sentence construction skills for students with MSID. Additionally, an intended goal of the research study was to add to the body of literature of writing instruction and interventions for students with MSID in order to develop additional interventions that are practical for implementation in a variety of school settings.

This chapter provided a brief overview of the literature and rationale for using a writing instructional package to teach sentence writing for students with MID. Chapter 2 presents a detailed review of the literature supporting the intervention for middle school students with MID. Chapter 3 includes details of the research design and methodology of the study. The procedures for baseline, intervention, and maintenance conditions, as well as general education probe sessions, are described. A detailed analysis of the data is presented in Chapter 4. Chapter 5 provides interpretation and explanation of the results of the study including how the findings contribute to the existing literature, educational implications, and ideas for future research. References and appendices are included.

CHAPTER 2

REVIEW OF LITERATURE

Graham and colleagues (2016) identified six evidence-based practices for

teaching writing to all students in kindergarten through high school. First, teachers should

ensure students write for a variety of purposes and are given ample opportunities to write.

Second, teachers should create supportive writing environments by setting clear and

specific goals with each student. Third, teachers should explicitly teach writing skills and

strategies. This includes teaching students to construct sentences through modeling and

guided practice. Fourth, frequent feedback should be provided to students by teachers,

peers, or technology. Fifth, students should be taught to use word processors. Finally,

students should be given opportunities to write in a variety of content areas to support

learning.

Learning to construct sentences effectively is one of the most important skills a

writer must develop. Teaching a developing student to write sentences is a complex task

that requires the use of direct, systematic instruction (Saddler, 2013). In order to construct

sentences, a writer must have an understanding of syntax (i.e., how to organize words

within a sentence structure; Graham & Harris, 2009). Most children initially learn syntax

through verbal communication with others. Oral language is transformed to written

language during the early school years (Saddler, 2013). Catts, Fey, Zhang, and Tomblin

(1999) found that students with higher syntactic abilities and larger vocabularies were

able to write more words quickly than students with less advanced syntactic abilities and smaller vocabularies. Therefore, because of language difficulties, students with MSID will likely need more intensive instruction to learn to effectively construct sentences.

One strategy that has been used to teach students with MSID to construct sentences is sentence frames, a scripted portion of a sentence that can be completed to produce a targeted written or spoken response (Pennington, Flick, & Smith-Wehr, 2018). With frames, an instructor teaches a student to complete a common frame across multiple stimuli (Betz, Higbee, Kelley, Sellers, & Pollard, 2011). Kame'enui and Simmons (1990) identified sentence completion as a critical task in writing instruction. Sentence frames, and more generally predictable writing routines, reduce the complexity of the writing task and support students who have a limited understanding of syntax and is a strategy recommended for students with high incidence disabilities (Graham & Harris, 2007a). Additional research is needed to refine the use of sentence frames for students with MSID.

Writing-to-learn is an educational practice of using writing to assist in understanding subject matter in content areas such as mathematics, social studies, and science (Klein & Meichi Yu, 2013). Writing can help students better understand concepts and theories of a subject as well as commit facts to memory (Bangert-Drowns, Hurley, & Wilkinson, 2004). Graham and Hebert (2011) found that when compared to nonwriting activities, writing summaries contributed significantly to learning. Writing tasks that were less than 10 minutes in length were found to be more effective than longer ones (Bangert-Drowns et al., 2004). The practice of writing about historical sources has seen increased interest in the last 30 years (De La Paz & Felton, 2010). Explicit instruction in writing in

social studies was found to be effective in increasing history knowledge and historical reasoning for students who were above average, average, and struggling writers (De La Paz, 2005; De La Paz & Graham, 2002) as well as those with learning disabilities (Ferretti, MacArthur, & Okolo, 2001). Additional research is needed to explore the practice of writing-to-learn for students with MSID.

To examine the literature related to the writing instructional package in a middle school setting, four areas of research were explored. These included: middle school academic instruction, writing instruction, social studies instruction, and targeted student peer tutoring interventions for students with MSID. Electronic searches were conducted using EBSCO Academic Search Complete, ERIC, PsychINFO, ProQuest, and Google Scholar. Additionally, ancestral searches were conducted to identify other relevant studies. The studies were limited to those published between 2005 and 2019. The purpose of this chapter is to examine the prior research in order to establish a basis for the study.

Middle School Academic Instruction

In the previous 15 years, research in the area of instruction for students with MSID has shifted from being almost exclusively focused on functional skills to an increased focus on grade-level academic content (Wehmeyer & Smith, 2017). However, much of the research evaluating academic interventions for students with MSID was conducted at the elementary school level. Nineteen recent studies were located that focus on academic interventions in the middle school setting for students with MSID.

To examine the literature on teaching academic content to middle school students with MSID, the following search terms were used in various combinations: middle school, moderate disability, severe disability, autism, autism spectrum disorder,

developmental disability, intellectual disability, writing, reading, literacy, social studies, history, mathematics, science. Criteria for inclusion included: (a) published in a peer-reviewed journal between January 2005 and April 2019; (b) setting of a middle or specialized school (grades 6-8); (c) participants included at least one student with MSID (IQ below 55); and (d) included at least one academic outcome measure. Nineteen studies were located. See Table 1 for a summary of the studies.

Table 1

Studies of Academic Instruction for Middle School Students with MSID

Authors	Participants	Setting	Design	Intervention	Implementer	DVs	Findings
Browder, Trela, & Jimenez, 2007	3 special education teachers, 4 students with MID (12 year old male, 13 year old male, 13 year old female, 14 year old female), 2 students with SID (12 year old male, 13 year old female)	Small group instruction in a special education classroom in a public middle school	Concurrent multiple probe across participants design	Trained teachers to follow a task analysis to teach story-based literacy lessons using adapted, grade-level literature	3 special education teachers	Number of lesson plan steps followed; correct, independent student responses; correct, overall student responses	All teachers increased the number of steps followed during intervention; all students increased their independence in book awareness, listening comprehension, and other early literacy skills
Mims, Hudson, & Browder, 2012	4 students with MID (12 year old male, 13 year old male, 14 year old male, 14 year old female)	Individual instruction in a special education classroom in a public middle school	Concurrent multiple probe across participants design	Read-alouds of adapted grade-level biographies, modified system of least prompts with a rule for answering WH questions and an opportunity to hear sections of the text again	Researcher	Text-dependent comprehension questions	All students increased listening comprehension question responses after intervention and maintained high levels of correct responding over time; 3 students generalized responding to untrained biographies

Authors	Participants	Setting	Design	Intervention	Implementer	DVs	Findings
Mims, Lee, Browder, Zakas, & Flynn, 2012	13 students with MID, 2 students with mild ID	Small group instruction in special education classrooms in public middle schools	One-group, nonrandomized pre-posttest design	4-part comprehensive literacy package using systematic and direct instruction	5 special education teachers	Pretest- and posttest measures based on the scripted lessons and target grade-level ELA skills	Significant gains were noted for vocabulary and comprehension of familiar text; moderate gains were noted for comprehension of unfamiliar text, poetry, research, and writing
Ruwe, McLaughlin, Derby, & Johnson, 2011	1 student with MID (14 year old male), 2 students with mild ID (13 year old male, 14 year old male)	Individual instruction in a special education classroom in a public middle school	Combination multiple baseline across sets design and ABAB	Direct Instruction flashcard instructional procedures	Researcher	Sight word reading from a list, passage reading	All 3 participants increased accuracy for all 3 word lists following intervention, the increase was not noted in the passage reading probes
Ahlgrim-Delzell et al., 2016	31 total students (K-8th grade, IQs of 40-88), 10 students with MID in the treatment group, 6 middle school students in the treatment group	Individual instruction in special education classrooms in 16 public elementary and middle schools	Randomized control trial design	Early Reading Skills Builder using iPad®-based technological speech supports and systematic instruction (time delay, shaping/fading of model prompts)	22 special education teachers	106-item curriculum based measure	A significance difference was found between the treatment and control group for phoneme identification and decoding words; a non-significance difference was found between the treatment and control group for blending sounds

Authors	Participants	Setting	Design	Intervention	Implementer	DVs	Findings
Pennington, Foreman, & Gurney, 2018	2 students with MID (12 year old male, 13 year old male), 1 student with mild ID (12 year old male)	Individual instruction in a special education classroom in a public middle school	Concurrent multiple probe design across sentence types	Constant time delay, sentence frames, written models	1 special education teacher	Construction of correct sentences	Participants met criterion for all three sentence types following the introduction of the instruction package; participants produced variable levels of responding during maintenance and generalization to an untrained context (journal writing)
Jimenez, Browder, & Courtade, 2009	3 students with MID (11 year old male, 12 year old female, 13 year old female)	Individual instruction in a special education classroom and a general education science classroom in a public middle school	Concurrent multiple probe across science units design	A multi-component package (multiple exemplar training, time delay, and a self-directed learning prompt), 15-step task analysis that focused on the use of a self-directed KWHL chart	Researcher	Steps of the task analysis completed correctly and independently	All three students acquired the use of a task analysis across science concepts and generalized the concepts across different materials; students were also able to surmise a new untaught concept; all students were able to generalize the use of the chart to the general education science class

Authors	Participants	Setting	Design	Intervention	Implementer	DVs	Findings
Courtade, Browder, Spooner, & DiBiase, 2010	4 special education teachers; 6 students with MID (12 year old male, 12 year old female, 13 year old male, 13 year old female, 14 year old male, 15 year old female); 2 students with SID (11 year old male, 13 year old female)	Small group instruction in 3 special education classrooms in public middle schools and 1 separate school	Concurrent multiple probe across participants design	A multi-component training package (videotape, manual, application, role play, in vivo feedback); a teacher task analysis, system of least prompts	4 special education teachers	The teachers use of inquiry-based science instruction, effects on student participation in an inquiry lesson, total number of new science words used by students	All teachers increased their ability to follow the task analysis to deliver the inquiry-based science lessons and generalized across science content areas; all students increased the number of responses to participate in an inquiry lesson, 1 student used a science term outside the lesson, other students initiated use of science terms during the lessons
Pennington & Koehler, 2017	3 students with MID (12 year old male, 12 year old male, 13 year old male)	Individual instruction in a special education classroom in a public middle school	Concurrent multiple probe across participants design	Story video models, story templates, system of least prompts, self-graphing	1 special education teacher	Story construction responses with 5 elements	All participants acquired story construction responses and met criterion; all students demonstration partial maintenance of targeted skills

Authors	Participants	Setting	Design	Intervention	Implementer	DVs	Findings
Jimenez, Browder, Spooner, & DiBiase, 2012	4 students with MID (11 year old male, 11 year old male, 13 year old male, 14 year old female); 1 student with SID (11 year old female); 6 students without disabilities (all 11 years old, 5 females, 1 male)	Individual instruction in a general education classroom in a public middle school	Concurrent multiple probe design across science units	Targeted student peer tutoring using embedded, constant time delay	6 middle school peers	Number of correct student science responses (identifying sight words, picture symbols, and concept statements)	All participants increased their science vocabulary and concept knowledge following the introduction of the intervention and maintained the skills after meeting criteria for each science unit
Knight, Spooner, Browder, Smith, & Wood, 2013	3 students with MID (13 year old male, 14 year old male, 14 year old female)	Individual instruction in a special education setting in a public middle school	Concurrent multiple probe across students design	Instructional package including graphic organizers and systematic instruction (i.e., constant time delay, multiple exemplars), task analysis	Researcher	Independent, correct steps of a 16-step task analysis	All students increased the number of steps completed on the task analysis to demonstrate the science concept (i.e., convection); all students were able to generalize skills to untrained graphic organizers
Knight, Wood, Spooner, Browder, & O'Brien, 2015	2 students with MID (11 year old male, 11 year old female), 2 students with mild ID (12 year old male, 14 year old male)	Individual instruction in a special education classroom in a public middle school	Concurrent multiple probe across students design with an embedded ABCD design	Book Builder; Book Builder combined with examples/non-examples and Model-Lead-Test; Book Builder combined with examples/non-examples, Model-Lead-Test, and referral to definition	Researcher	Number of correct responses on science probes	Book Builder alone was not effective; Book Builder combined with explicit instruction was effective for all 4 students; the interventions were found to be feasible by the teacher and students

Authors	Participants	Setting	Design	Intervention	Implementer	DVs	Findings
Browder, Jimenez, & Trela, 2012	3 students with MID (11 year old male, 13 year old female, 13 year old male); 1 student with SID (13 year old male)	Small group instruction in a special education classroom in a public middle school	Concurrent multiple probe across math units design	Mathematics word problem stories based on familiar activities, graphic organizers and manipulatives for the mathematics concepts, step-by-step training in the task analysis to identify and organize key facts and solve the problem stated in the written story	Special education teacher	Number of correct math responses	All students had higher mean math responses during intervention, showed generalization to untrained story problems, and maintained most steps of the task analysis over time
Ayers, Langone, Boon, & Norman, 2006	3 students with MID (all 14 years old; 2 males, 1 female); 1 student with SID (14 year old male)	Individual and small group instruction in a special education classroom in a public middle school and a grocery store in the community	Concurrent multiple probe across participants design	Computer-based instruction, system of least prompts, community-based instruction	1 special education teacher, researcher	Accuracy of purchasing exchange at a community grocery store	For 2 students with MID and 1 student with SID, the intervention was effective at teaching the dollar plus purchasing strategy both in the classroom and community setting; the intervention was not effective for 1 student with MID
Fletcher, Boon, & Cihak, 2010	3 students with MID (13 year old female, 13 year old male, 14 year old male)	Small group instruction in a special education classroom in a public middle school	Alternating treatments design	The use of the TOUCHMATH program using "touch points" and the number line strategy; model-lead-test procedure	1 special education teacher, 1 paraprofessional	Percentage of single-digit addition problems performed correctly	The TOUCHMATH strategy was more effective and efficient compared to the use of a number line for all 3 students

Authors	Participants	Setting	Design	Intervention	Implementer	DVs	Findings
Root, Saunders, Spooner, & Brosh, 2017	3 students with MID (all 14 year old males)	Individual instruction in a special education classroom in a public middle school	Concurrent multiple probe across participants	Modified schema-based instruction, student self-instruction sheet, model-test procedure, system of least prompts	Researcher	Personal finance problem solving (correct, independent steps of a task analysis)	All participants were able to learn to solve 2-digit real-world word problems with the use of a calculator and generalize the skills to an iPad®; 2 students demonstrated maintenance of the skills over time
Schenning, Knight, & Spooner, 2013	2 students with MID (11 year old female, 11 year old male), 1 student with SID (13 year old female)	Small group instruction in a special education classroom in a public middle school	Concurrent multiple probe design across participants	Structured inquiry process with a script and task analysis; a graphic organizer, model-lead-test	1 special education teacher, 1 paraprofessional	Comprehension of adapted middle school social studies lessons	All participants increased their scores when the intervention was introduced, all students generalized the skills to real-world problems, and maintained high levels of responding after intervention concluded
Jameson, McDonnell, Johnson, Riesen, & Polychronis, 2007	2 students with MID (15 year old male, 15 year old male), 2 students with mild ID (13 year old male, 15 year old female)	Individual instruction in a special education classroom and general education classrooms in a public middle school	Alternating treatments design	Embedded instruction using constant time delay; massed practice instruction using constant time delay	1 special education teacher, 1 paraprofessional	Definitions of content-specific vocabulary	Embedded instruction was found to be more effective for 1 student, massed practice instruction was found to be more effective for 2 students, embedded instruction and massed practice instruction were equally efficient for 1 student

Authors	Participants	Setting	Design	Intervention	Implementer	DVs	Findings
Jameson, McDonnell, Polychronis, & Riesen, 2008	3 students with MID (13 year old male, 13 year old female, 15 year old female); 3 students without disabilities (14 year old male, 14 year old female, 15 year old female)	Individual instruction in 3 general education classrooms in a public middle school	Concurrent multiple probe across participants design; a combined multiple probe across participants design and alternating treatments design	Targeted student peer tutoring using embedded, constant time delay	3 middle school peers	Percentage of correct responses of the grade level content by the students with MID; procedural fidelity of the peers without disabilities	Students with MID increased the percentage of responses following intervention and maintained the same level of responding during maintenance probes; peers demonstrated the ability to be quickly and efficiently trained to implement embedded, constant time delay with high levels of procedural fidelity
Browder, Trela, et al., 2012	37 middle and high school students with MSID	Small group instruction in special education classrooms in public middle and high schools	Quasi-experimental, randomized trials design	Mathematics: word problem stories based on familiar activities, graphic organizers, manipulatives, task analysis; Science: use of an inquiry-based lesson, additional vocabulary instruction, and hands-on experiments	10 special education teachers	Percentage of change from pretest to posttest for both mathematics and science	Students who were taught the mathematics intervention increased their performance on the mathematics posttest; students were taught the science intervention increased their performance on the science posttest
Mims, Stanger, Pennington, White, Sears, & Stricker, 2017	2 students with MID (10 year old female, 14 year old male), 1 middle school student with SID (14 year old male)	Individual instruction in a special education classroom in a public middle school	Concurrent multiple probe across participants design	iPad® app, picture supports, system of least prompts, response options, graphic organizers, error correction procedures	Researcher	Correct steps performed during opinion writing tasks	All participants increased the number of correct steps performed and maintained performance at levels greater than baseline over time

Of the 21 studies that focus on academic instruction for middle school students with MSID, eight focused on literacy, five focused on science, four focused on mathematics, one focused on both science and mathematics, one focused on social studies, and two focused on multiple content areas (i.e., food science class, earth science class, teen living class, visual arts class, health class). Of the eight studies centered on literacy, all were exclusively set in special education settings. Four of the studies were aligned to grade-level standards. First, Browder, Trela, and Jimenez (2007) evaluated the effectiveness of training teachers to follow a task analysis to teach a story-based literacy lesson to six middle school students with MSID. Results indicated a functional relation between teacher training and both the number of steps followed on the task analysis by the teachers and an increase in overall and independent correct responses by the students. Additionally, Mims, Hudson, and Browder (2012) evaluated the use of a modified system of least prompts and adapted grade-level biographies on listening comprehension of four middle school students with MID during read-alouds. Students improved the number of listening comprehension questions answered correctly after the intervention was implemented and were able to generalize the skills to new biographies. In the third study, Mims, Lee, Browder, Zakas, and Flynn (2012) evaluated the effectiveness of an intervention package that included systematic and direct instruction on the acquisition of skills aligned with grade-level language arts standards for 13 middle school students with MID and two students with mild intellectual disability (ID) using a nonrandomized pre-posttest design. Statistically significant gains were made in vocabulary and comprehension of familiar text with moderate, nonsignificant gains made in the comprehension of unfamiliar text. In the fourth study, Mims and colleagues (2017)

evaluated the effectiveness of an iPad® application, GoBook, with picture supports, system of least prompts, reinforcement, response options, graphic organizers, and error correction procedures to teach three middle school students with MSID (two students with MID and one student with SID) to write opinion paragraphs related to adapted grade-level text in a special education setting. A multiple probe across participants design was used. All students improved their performance after the intervention was introduced A multiple probe across participants design was used.

The remaining four studies were not focused on grade-level standards. First, Ruwe, McLaughlin, Derby, and Johnson (2011) evaluated the effectiveness of the Direct Instruction flashcard procedure in improving sight word knowledge of one middle school student with MID and two students with mild ID. They found increases in sight word accuracy from baseline to intervention by all participants, however, an increase was not noted on passage reading probes. In another study, Ahlgrim-Delzell and colleagues (2016) developed and evaluated a comprehensive reading curriculum using systematic instruction for middle school students with MID. A randomized control trial design with repeated-measures ANOVA was used to examine interaction effects and statistically significant effects were found in the area of phoneme identification, decoding for picture-word matching, and total score. In a third study, Pennington, Foreman, and Gurney (2018) evaluated the use of an instructional package (response prompting, sentence frames) to teach sentence writing for two middle school students with MID and one middle school student with mild ID. They found that all students learned to generate the three sentence structures during intervention and were able to maintain the increased skills over time. In the fourth study, Pennington and Kohler (2017) evaluated the use of

an instructional package consisting of story video models, story templates, system of least prompts, and self-graphing to teach three middle school students with MID to write narratives. A multiple probe across participants design was used. All three students increased the number of story elements included in their narratives after the intervention was introduced.

Five studies were found that focused exclusively on teaching science content to students with MSID. All five of these studies were aligned to grade-level standards. Additionally, three of the studies took place exclusively in special education settings, one exclusively in a general education setting, and one in both special education and general education settings. First, Jimenez, Browder, and Courtade (2009) investigated the effect of an intervention package (time delay, multiple exemplar training, KWHL chart) on the acquisition and generalization of a science task analysis for three middle school students with MID. All of the participants acquired and were able to use the science task analysis across two science concepts in the self-contained special education setting and were able to generalize the use of the KWHL chart to the general education science class. In another study, Courtade, Browder, Spooner, and DiBiase (2010) evaluated the effects of a multicomponent training for teachers on the ability to follow the steps of an inquiry-based science task analysis by the teachers and participation during the lessons by the students. All four teachers were able to increase their ability to follow the task analysis and provide inquiry-based science instruction for students with MSID. All eight students with MSID increased the number of responses during the science lessons.

Additionally, Jimenez, Browder, Spooner, and DiBiase (2012) used peer-mediated embedded instruction in a general education science class to teach five middle

school students with MSID science vocabulary and concept statements. They found the intervention had a positive effect on students' science vocabulary acquisition and concept knowledge. In another study, Knight, Spooner, Browder, Smith, and Wood (2013) evaluated the use of an intervention package (time delay, model-lead-test, graphic organizer) on teaching science concepts and vocabulary to three middle school students with MID in a self-contained special education setting. Results indicate the intervention increased the number of correct steps completed on a task analysis to demonstrate science concepts by all three students. In the final science study, Knight, Wood, Spooner, Browder, and O'Brien (2015) evaluated the feasibility and effects of using supported electronic text on science vocabulary and comprehension acquisition of two middle school students with MID and two students with mild ID. They found that the supported electronic text was deemed feasible by teachers but was not effective for vocabulary and comprehension acquisition until explicit instruction was added.

Four of the 21 studies focused exclusively on mathematics interventions with one aligned to grade-level standards. All four studies were conducted in special education settings. First, Browder, Jimenez, and Trela (2012) evaluated a story-based mathematics intervention with a task analysis for four middle school students with MSID and found that it increased learning on each of the problem-solving skills related to grade-level standards. Three studies focusing on functional mathematics outcomes were located. Ayers, Langone, Boon, and Norman (2006) evaluated the use of computer-based instruction, system of least prompts, and community-based instruction to teach the dollar plus purchasing strategy. Multiple probe across participants design was used. Two students with MID and one student with SID increased their accuracy of responses

following the introduction of intervention learning to use the strategy in the simulated classroom environment and at a grocery store in the community. The intervention was not successful for one student with MID. Fletcher, Boon, and Cihak (2010) compared the use of a number line and the TOUCHMATH program to teach three students with MID to solve single-digit addition problems. They found that all of the participants showed more improvements when using the TOUCHMATH program over the number line intervention. Root, Saunders, Spooner, and Brosh (2017) evaluated the use of a modified schema-based instructional package that included a student self-instruction sheet, model-test procedure, and system of least prompts to teach 2-digit real-world word problems. All three students with MSID increased their independent, correct responding and were able to generalize the skills to an iPad®. Two students demonstrated maintenance of the skills over time.

Browder, Trela, and colleagues (2012) examined intervention packages to teach mathematics or science content to 37 students with MSID. Ten special education teachers were randomly assigned and trained to teach either the mathematics or science instructional package. For mathematics, students were taught to solve word problem stories based on familiar activities using graphic organizers, manipulatives, and step-by-step training in the task analysis to identify and organize key facts and solve the problem stated in the written stories over four units. For science, the intervention included the use of an inquiry-based lesson, additional vocabulary instruction, and hands-on experiments over four units. Results indicate that students receiving the mathematics intervention scored higher on the mathematics posttest than student receiving the science intervention. Likewise, students receiving the science intervention scored higher on the science

posttest than students receiving the mathematics intervention. Specifically, the inquiry-based science intervention increased the acquisition of grade-level science vocabulary while the story-based mathematics intervention increased students' ability to solve grade-level mathematics problems.

Three additional studies conducted with middle school students with MSID were located. In the only study focusing on social studies instruction for middle school students with MSID, Schenning, Knight, and Spooner (2013) evaluated a structured inquiry process to teach the students to identify historical problems and solutions and place the answer on a graphic organizer. All three students improved their comprehension, were able to generalize their problem-solving skills to real-world situations, and were able to maintain the skills over time. Two studies focused on embedded instruction in multiple general education classrooms. First, Jameson, McDonnell, Johnson, Riesen, and Polychronis (2007) compared the use of embedded instruction in general education classrooms (food science class, earth science class, teen living class) and massed practice instruction in the special education classroom to teach grade-level vocabulary. They found that massed practice instruction to be more efficient for two students, embedded instruction for one student, and no difference for the fourth student. Finally, Jameson, McDonnell, Polychronis, and Riesen (2008) evaluated the effects of a training package on the use of embedded, constant time delay procedures implemented by peers to teach grade-level curriculum in general education settings (visual arts class, health class). They found that peers can be quickly and efficiently trained to implement constant time delay and embedded instruction techniques with high

levels of fidelity and the intervention was effective for promoting the acquisition of the targeted skills by the students with MID.

The research focusing on academic interventions for students with MSID at the middle school level is encouraging. However, with only 21 studies for all academic content areas, it is quite sparse overall. Research in all content areas is needed, nonetheless, with a single study in the areas of both social studies and writing, there is clearly a pressing need for additional research in those areas for middle school students with MSID. Additionally, research conducted in general education classrooms and aligned to grade-level standards is warranted.

Writing Instruction

The ability to use written expression is essential for student success in academic settings as well as many other aspects of life (Lee & Laspe, 2003). Many students struggle with writing but characteristics often associated with students with MSID (i.e., rehearsing, planning, monitoring, and organizing challenges) can make learning written communication skills particularly challenging (Dockrell, Ricketts, Charman, & Lindsay, 2014). These skills may be enhanced by increased interaction with written language (Kaderavek & Rabidoux, 2004), however, students with MSID have typically received fewer opportunities to practice written expression at school and at home in contrast to their peers without disabilities (Joseph & Konrad, 2009). Low expectations have likely influenced the type and amount of writing instruction provided to students with MSID but recent research has shown several practices to be effective (Sturm, 2012). Like all students, those with MSID deserve to receive instruction in the area of written expression (Pennington & Delano, 2014).

To examine the literature on teaching writing to students with MSID, the following search terms were used in various combinations: elementary school, middle school, high school, moderate disability, severe disability, autism, autism spectrum disorder, developmental disability, intellectual disability, writing, narrative writing, sentence construction, sentence frames, predictable routines, systematic instruction, constant time delay, and system of least prompts. Criteria for inclusion included: (a) published in a peer-reviewed journal between January 2005 and April 2019; (b) setting of an elementary, middle, high, or specialized school (K-12); (c) participants included at least one student with MSID (IQ below 55); (d) intervention focused on writing. Fifteen studies were located. See Table 2 for a summary of the studies.

Table 2

Studies of Writing for Students with MSID

Authors	Participants	Setting	Design	Intervention	Implementer	DVs	Findings
Erbas, Turan, Ozen, & Halle, 2006	2 students with MID (7 year old male, 8 year old female)	Small group instruction in a special school	Concurrent multiple probe across three word sets design	Adapted "cover-write" procedure	1 special education teacher	Word naming; word spelling	Both students increased performance in word naming and word spelling when intervention began; the students generalized the skills to other settings; the students maintained the skills after intervention ended
Vedora & Stromer, 2006	2 students with MID (14 year old male, 17 year old female)	Individual instruction in a special school	Concurrent multiple probe across three word sets design	Computer-assisted instruction using Boardmaker® and PowerPoint	Researcher	Word naming; word spelling	Participants increased performance in spelling the target words, naming the target words, and were able to generalize skills as demonstrated by writing a list of items and collecting the items from around the room
Purrazzella & Mechling, 2013	3 students with MID (18 year old female, 20 year old female, 20 year old male)	Small group instruction in a high school transition program	Concurrent multiple probe across three word sets design	Computer-assisted instruction using PowerPoint, written models, a tablet with a digital pen, and forward chaining	Researcher	Word naming; word spelling	Participants increased performance in spelling the target words, naming the target words, and were able to generalize skills as demonstrated by writing the target words with pencil and paper

Authors	Participants	Setting	Design	Intervention	Implementer	DVs	Findings
Tanji, Takahashi, & Noro, 2013	3 students with MID (9 year old male, 9 year old female, 11 year old male)	Individual instruction in a special school	Non-concurrent multiple probe across six word sets design	Computer-assisted, constructed-response matching-to sample procedure	Researcher	Matching picture to printed word; constructing printed word to match spoken word; constructing printed word to match picture	Participants met criteria on matching picture to printed word, constructing printed word to match spoken word, and constructing printed word to match picture on targeted word sets; two participants generalized the spelling skills to untrained words
Mims, Lee, Browder, Zakas, & Flynn, 2012	13 students with MID, 2 students with mild ID	Small group instruction in a special education classroom in a public middle school	One-group, nonrandomized, pre-posttest design	4-part literacy package; the writing component used system of least prompts, a prewritten sentence, and response options	5 special education teachers	Writing component—creating an opinion statement and backing up with two facts	Participants made moderate, statistically non-significant gains on the writing component
Pennington, Flick, & Smith-Wehr, 2018	3 students with MID (7 year old female, 8 year old male, 12 year old male)	Individual instruction in a special education classroom in a public elementary school	Concurrent multiple probe across sentence types design	System of least prompts, constant time delay, sentence frames, written models	1 special education teacher	Construction of complete sentences	Participants learned to construct all three sentence types during intervention, maintained the skills after meeting criteria for each sentence type, and generalized skills to untrained stimuli

Authors	Participants	Setting	Design	Intervention	Implementer	DVs	Findings
Pennington & Rockhold, 2017	3 students with MID (6 year old male, 8 year old male, 9 year old male, 9 year old male)	Individual instruction in a special education classroom in a public elementary school	Concurrent multiple probe across participants design	Constant time delay, sentence frames, written models	1 special education teacher	Construction of correct sentences	Participants met criterion for all three sentence types following the introduction of the instruction package; the participants produced variable levels of responding during maintenance and generalization to untrained stimuli
Pennington, Foreman, & Gurney, 2018	2 students with MID (12 year old male, 13 year old male), 1 middle school student with mild ID (12 year old male)	Individual instruction in a special education classroom in a public middle school	Concurrent multiple probe across sentence types design	Constant time delay, sentence frames, written models	1 special education teacher	Construction of correct sentences	Participants met criterion for all three sentence types following the introduction of the instruction package; participants produced variable levels of responding during maintenance and generalization to an untrained context (journal writing)
Pennington, Ault, Schuster, & Sanders, 2010	2 students with MID (7 year old male, 10 year old male), 1 student with mild ID (8 year old male)	Individual instruction in a special education classroom in a public elementary school	Concurrent multiple probe across participants design	Computer-assisted instruction, simultaneous prompting	2 special education teachers	Computer-based story construction responses	All participants demonstrated gains in story construction responses; the two students with MID met criterion and demonstrated variable levels of maintenance and generalization to a novel story template and to different response topographies (handwriting, vocal response)

Authors	Participants	Setting	Design	Intervention	Implementer	DVs	Findings
Pennington, Collins, Stenhoff, Turner, & Gunselman, 2014	3 students with MID (7 year old male, 7 year old male, 10 year old male), 2 students with mild ID (7 year old male, 10 year old male)	Individual instruction in a special education classroom in a public elementary school	Concurrent multiple probe across story templates design	Computer-assisted instruction, simultaneous prompting	1 special education teacher, 1 paraprofessional	Computer-based story construction responses with 5 elements	All participants acquired story construction responses and met criterion; all participants generalized responses at least partially to new story topics and different response topographies (handwriting, vocal response); all participants demonstrated variable levels of maintenance
Pennington & Koehler, 2017	3 students with MID (12 year old male, 12 year old male, 13 year old male)	Individual instruction in a special education classroom in a public middle school	Concurrent multiple probe across participants design	Story video models, story templates, system of least prompts, self-graphing	1 special education teacher	Story construction responses with 5 elements	All participants acquired story construction responses and met criterion; all students demonstration partial maintenance of targeted skills
Mims, Stanger, Pennington, White, Sears, & Stricker, 2017	2 students with MID (10 year old female, 14 year old male), 1 middle school student with SID (14 year old male)	Individual instruction in a special education classroom in a public middle school	Concurrent multiple probe across participants design	iPad® app, picture supports, system of least prompts, response options, graphic organizers, error correction procedures	Researcher	Correct steps performed during opinion writing tasks	All participants increased the number of correct steps performed and maintained performance at levels greater than baseline over time

Authors	Participants	Setting	Design	Intervention	Implementer	DVs	Findings
Konrad, Trela, & Test, 2006	4 students with MID (15 year old male, 16 year old male, 17 year old male, 18 year old male)	Individual instruction in a special education classroom in a public high school	Concurrent multiple baseline across participants design	Self-regulated writing strategy	Researcher	Writing quality and content of IEP goal paragraphs	All participants improved their performance in writing paragraphs related to potential IEP goals, were able to generalize the skills to other types of paragraphs, and maintained responding over time
Pennington, Delano, & Scott, 2014	2 students with MID (20 year old male, 20 year old male), 1 student with mild ID (19 year old male)	Individual instruction in a transition program	Concurrent multiple probe across participants design	Modeling, self-monitoring, system of least prompts, feedback	1 special education teacher	6 targeted handwritten cover letter components	All participants learned to include all components and maintained performance over time
Pennington, Saadatzi, Welch, & Scott, 2014	2 students with MID (19 year old female, 21 year old female), 1 student with mild ID (21 year old male)	Individual instruction in a transition program	Concurrent multiple baseline across participants design	Robot-assisted instructional package, simultaneous prompting, self-graphing	1 special education teacher	3 targeted text message components	All participants increased the use of targeted components during intervention and generalized the skills to different communicative partners; 2 of the participants demonstrated maintenance of the skills over time

Spelling. Historically, most of the research related to writing instruction for students with MSID focused on spelling skills (Varuzza, De Rose, Vicari, & Menghini, 2015). Four recent studies focusing on spelling skills were located. Erbas, Turan, Ozen, and Halle (2006) used an adapted "cover write" method to teach word identification and spelling to two elementary school students with MID in a small group instructional arrangement in a special education setting. The adapted "cover write" method involved: (a) the student looking at a flash card and saying the word; (b) the student writing the word three times while viewing the flash card; (c) the student writing the word three times while the flash card was removed from view; (d) the teacher correcting the spelling with a red pencil if an error was made and the student writing the word an additional time looking at the correction; and (e) the teacher providing verbal praise and a preferred edible item for reinforcement. Multiple probe across word sets design was used. Both students met criteria on all word sets and maintained the skills after intervention had concluded. Additionally, students were able to generalize the response to a different setting (art class).

Vedora and Stromer (2006) taught two high school students with MID to spell functional sight words using computer-assisted instruction in an individual instructional arrangement in a special education setting in two experiments. The first experiment used Boardmaker® software program while the second used PowerPoint. In both experiments using multiple probe across word sets design, the researchers taught the students to construct words corresponding to auditory stimuli and pictures on the computer. Students then wrote the words on index cards and used them to retrieve objects around the room. The computer presented digital feedback immediately following responses. Data

indicated that the participants learned to spell the target words, read the words, and collect the items from the lists.

Purrazzella and Mechling (2013) taught three high school students with MID to spell functional words using computer-based instruction, written models, and forward chaining procedure in a small group instructional arrangement in a special education setting. The instructional package used PowerPoint, a tablet with digital pen, and large screen projection. Multiple probe across word sets design was used. All three students learned to spell their three targeted word lists. Additionally, data indicated that the students learned the words from the other students' word lists to some degree.

Tanji, Takahashi, and Noro (2013) taught three elementary school students with MID to construct words to match printed words, spoken words, and pictures using a computer-assisted, constructed-response matching-to-sample procedure in an individual instructional arrangement in a special education setting. A touchscreen computer with auditory stimuli was used to teach six overlapping-syllable word sets. A multiple probe across word sets design was used. The three students met criteria on the targeted word sets. Additionally, two students generalized the spelling skills to untrained words.

The four studies focusing on spelling included a total of 10 students with MID (five elementary school students, five high school students). The studies did not include students with SID. All used multiple probe across word sets designs to evaluate the intervention. Two of the studies used an individual instructional format while two used a small group instructional arrangement. Three studies were conducted in special education settings with one study conducted in both general and special education settings. The data for the four studies show that all participants made progress with learning to spell the

words of multiple word lists. None of the studies focused on grade-level standards. Spelling, while important, is only a small aspect of written expression.

Sentence writing. Four recent studies have focused on sentence writing for students with MSID. As one part of a four-part literacy package, Mims, Lee, and colleagues (2012) taught 13 middle school students with MID and two students with mild ID to write a sentence stating their opinion of an adapted chapter of grade-level literature. The students were taught the definition of opinion and given a writing journal. The journal contained a prewritten sentence (e.g., "I like _____ in the story.") and response options (e.g., Stanley, judge, great grandfather). Students completed the sentence by writing, circling, or touching one of the response options. System of least prompts was used and the teacher read the sentence aloud when the student was finished. A pre-posttest design was used and moderate, statistically nonsignificant gains were made.

Pennington, Flick, and Smith-Wehr (2018) used system of least prompts, constant time delay, and sentence frames to teach three elementary school students with MID to construct three sentence types (I want ____, I see ____, The ____ is ____). Two students used a selection-based software while one student used manual handwriting. A multiple probe across sentence types design to evaluate the instructional package and posttest probes were used to assess generalization to untrained sentences. The three participants learned to construct all three sentence types during intervention, maintained their performance after meeting criteria for each sentence type, and generalized responding to untrained stimuli.

In two similar studies, Pennington and Rockhold (2017) and Pennington, Foreman, and Gurney (2018) used constant time delay, written models, and sentence

frames to teach students to construct sentences related to a picture of a familiar animal. In Pennington and Rockhold (2017), all four elementary school students with MID met criterion following the introduction of the instructional package and three students produced variable levels of responding during maintenance and generalization probes. Tau-U indicated a medium effect across the four participants (0.89). In Pennington, Foreman, and Gurney (2018), the two middle school students with MID and one middle school student with mild ID met criterion for all sentence types and maintained performance during maintenance sessions. Tau-U indicated a strong effect across the three participants (0.94). In Pennington, Foreman, and Gurney (2018), all students used manual handwriting while in Pennington and Rockhold (2017), all students used an iPad® with a selection-based application to write sentences. Pennington, Foreman, and Gurney (2018) utilized a multiple probe across sentence types design and Pennington and Rockhold (2017) used a multiple probe across participants design.

In two of the sentence writing studies (Pennington, Foreman, & Gurney, 2018; Pennington, Flick, & Smith-Wehr, 2018), implementers taught the students to construct one sentence type until the participant met criterion before moving on to the next sentence type, which may have limited the participants' ability to switch from one sentence type to another during probe sessions. To attempt to address that limitation, Pennington and Rockhold (2017) taught all three sentence types during each session, however, they continued to find minimal variation in the sentence types constructed by the students and listed a possible bias by the teacher to present a single sentence type during intervention as a possible reason for this finding.

The four studies that focus on sentence construction included a total of 22 students with MID (seven elementary school students, 15 middle school students). The studies did not include any students with SID. Two studies used multiple probe across sentence types designs, one study used multiple probe across participants design, and one study used pre-posttest design. All four studies used an individual instructional arrangement in a special education setting. The data for the four studies shows that participants made progress with constructing simple sentences. One of the studies (Mims, Lee et al., 2012) focused on grade-level standards.

Story writing. Three recent studies have focused on teaching students with MSID to write stories. In two similar studies, Pennington, Ault, Schuster, and Sanders (2010) and Pennington, Collins, Stenhoff, Turner, and Gunselman (2014) used simultaneous prompting and computer-assisted instruction to teach five elementary school students with MID and three elementary school students with mild ID to construct stories. In Pennington and colleagues (2010), a multiple probe across participants design was used to evaluate the intervention. In Pennington et al. (2014), a multiple probe across story templates design was used. In both studies, a pre-posttest measure was used to assess generalization of the acquired skills to new story topics and different response topographies (i.e., handwriting, vocal response). A laptop with selection-based software and story template with picture support were used. All participants with MID reached criterion during intervention and demonstrated some levels of maintenance and generalization. Additionally, Pennington and colleagues (2014) found that all participants increased the identification of non-targeted sight words used during instruction.

Pennington et al. (2010) found varying degrees of maintenance and generalization to a novel story template for the two students with MID.

In the third study, Pennington and Koehler (2017) taught three middle school students with MID to write narratives that included five story elements using story video models, story templates, system of least prompts, and self-graphing. All students used manual handwriting. A multiple probe across participants design was used. All three students increased the number of story elements included in their narratives during intervention and demonstrated higher levels of performance during maintenance sessions compared to baseline sessions. Tau-U indicated an overall medium effect of the intervention across the three participants.

The three studies that focused on story writing included eight students with MID (six elementary school students, three middle school students). The studies did not include any students with SID. Two of the studies used a multiple probe across participants design while the third used multiple probe across behaviors design. All studies were conducted in an individual instructional format in a special education setting. None of the studies focused on grade-level standards.

Paragraph writing. Two studies focused on writing paragraphs. In the first, Konrad, Trela, and Test (2006) taught four high school students with MID to use a self-regulated writing strategy to compose six-sentence paragraphs related to possible IEP goals in an individual instructional format in a special education setting. Specifically, the students were taught to include a possible goal, four possible objectives, and a timeline for meeting them. A multiple baseline across participants design was used, however, data were not collected during intervention as is typical. Data were only collected during

baseline condition and following the completion of intervention condition. All of the students improved the quality and content of the paragraphs, were able to generalize the skills to other types of paragraphs, and maintained responding over time.

In the second, Mims and colleagues (2017) taught three middle school students with MSID (one student with SID and two students with MID) to write opinion paragraphs related to chapters of an adapted grade-level text. The researchers used an iPad® application, GoBook, with picture supports, system of least prompts, reinforcement, response options, graphic organizers, and error correction procedures. All students improved their performance during intervention and maintained their performance at levels greater than baseline over time. A multiple probe across participants design was used. Sessions were conducted in an individual instructional format in a special education setting.

The two studies that focused on writing paragraphs included six students with MID (two middle school students, four high school students) and one middle school student with SID. One multiple baseline across participants and one multiple probe across participants designs were used. Both studies were conducted in individual instructional formats in special education settings. One of the studies focused on grade-level standards.

Functional writing. Two studies focused on functional writing tasks related to real life skills. In the first, Pennington, Delano, and Scott (2014) used modeling, self-monitoring, system of least prompts, checklists, response prompting, and feedback to teach cover-letter writing skills to three high school students (two with MID, one with mild ID). The students were taught to handwrite cover letters including: (a) salutation; (b) statement of the job interest; (c) statement of their relevant skills; (d) statement of

gratitude; (e) closing; and (f) signature. A multiple probe across participants design was used. The students learned to include all six components and maintained improved performance over time. However, data of the two students with MID does indicate some latency in response to the intervention suggesting a possible limitation.

In the second, Pennington, Saadatzi, Welch, and Scott (2014) used a robot-assisted instructional package consisting of simultaneous prompting and self-graphing to teach high school students to improve the quality of their text messages. Two students with MID and one student with mild ID participated in the study. The students were taught to include three components in each text message (greeting, statement about an activity or event, closing). A multiple baseline across participants design was used. All three students increased the use of targeted components during intervention and generalized the skills to different communicative partners. Two of the participants (one with MID) demonstrated maintenance after the conclusion of the intervention.

The two studies that focused on functional writing included four high school students with MID. The studies did not include any students with SID. One of the studies used a multiple baseline across participants design while one used a multiple probe across participants design. Both studies were conducted in an individual instructional format in a special education setting. Neither of the studies were focused on grade-level standards.

Additional research in the area of written expression is needed as expectations are changing for students with MSID. Thirteen of the recent studies that addressed writing were conducted in an individual instructional format while two were conducted in a small group format. Fourteen of the studies were set exclusively in special education settings while one was set in special education and general education settings. It is important to

identify interventions that are effective and practical in inclusive general education classrooms. Additionally, only two studies focused on grade-level standards. Studies are needed to identify writing interventions that focus on grade-level standards.

Social Studies Instruction

The National Council for the Social Studies (2010) defines social studies as:

…the integrated study of the social sciences and humanities to promote civic competence. Within the school program, social studies provides coordinated, systematic study drawing upon such disciplines such as anthropology, archaeology, economics, geography, history, law, philosophy, political science, psychology, religion, and sociology, as well as appropriate content from the humanities, mathematics, and natural sciences.

Social studies instruction is essential for all students because it is where students learn to view and interpret the world around them (Parker, 2015). Browder and Spooner (2011) assert that it is important to teach social studies to students with MSID so they can learn about their history, government, and world; to allow them to learn about their cultural background and gain appreciation for the culture of others; and to allow them to gain skills for participating in the government process.

To examine the literature on teaching social studies to students with MSID, the following search terms were used in various combinations: elementary school, middle school, high school, moderate disability, severe disability, autism, autism spectrum disorder, developmental disability, intellectual disability, social studies, history, object-based learning, authentic learning. Criteria for inclusion included: (a) published in a peer-reviewed journal between January 2005 and April 2019; (b) setting of an elementary,

middle, high, or specialized school (K-12); (c) included at least one student with MSID (IQ below 55); and (d) intervention included social studies content. Four studies were located. See Table 3 for a summary of the studies.

Table 3

Studies of Social Studies for Students with MSID

Authors	Participants	Setting	Design	Intervention	Implementer	DVs	Findings
McDonnell et al., 2006	3 students with MID (13 year old male, 14 year old female, 15 year old male), 1 student with mild ID (13 year old male)	Individual instruction in general education classroom in a public middle school; small group instruction in a special education classroom in a public middle school	Alternating treatments design	Constant time delay, differential reinforcement, error correction procedures	3 paraprofessionals	Vocabulary word definitions (1 student was taught content related to a history class)	All 4 participants met criteria; embedded instruction in the general education classroom and small group instruction in the special education classroom were found to be equally effective in promoting acquisition
Schenning, Knight, & Spooner, 2013	2 students with MID (11 year old female, 11 year old male), 1 student with SID (13 year old female)	Small group instruction in a special education classroom in a public middle school	Concurrent multiple probe across participants design	Structured inquiry process with a script and task analysis; a graphic organizer, model-lead-test	1 special education teacher, 1 paraprofessional	Comprehension of adapted middle school social studies lessons	All participants increased their scores when the intervention was introduced, all students generalized the skills to real-world problems, and maintained high levels of responding after intervention concluded

Authors	Participants	Setting	Design	Intervention	Implementer	DVs	Findings
Wood, Browder, & Flynn, 2015	3 students with MID (10 year old female, 11 year old male, 11 year old male)	Individual instruction in a special education classroom small group instruction in a general education classroom in a public middle school	Concurrent multiple probe across participants design	Modified system of least prompts, WH question word graphic organizer, adapted grade-level social studies text	2 special education teachers, 1 general education teacher	Generate questions and answer questions related to adapted text	All participants increased their scores when the intervention was introduced and generalized skills to the general education classroom
Courtade, Gurney, & Carden, 2017	3 students with MID (10 year old male, 10 year old female, 12 year old male)	Individual instruction in a special education classroom in a public elementary school	Concurrent multiple probe across participants design	Modified system of least prompts, WH question word graphic organizer, adapted grade-level social studies text	Researcher	Correct and independent responses to comprehension questions related to adapted social studies text	All participants increased the number of comprehension questions answered correctly after intervention was introduced; all participants responded at levels above baseline during maintenance probes

The research on teaching social studies to students with MSID remains slim. Four research teams have examined teaching social studies content to students with MSID. In the first, McDonnell and colleagues (2006) used alternating treatment design to compare the effectiveness of embedded instruction in a general education setting and small group instruction in a special education setting on the acquisition of vocabulary word definitions for four middle schoolers with disabilities (three with MID, one with mild ID). Paraprofessionals implemented both interventions. One student was taught content vocabulary word definitions related to a history class (citizen, election, economy, civil rights, government) while the other three were taught words related to science or health class. All four students met criteria and the two interventions, embedded instruction and small group instruction, were found to be equally effective in promoting acquisition.

In the second study, Schenning and colleagues (2013) taught three middle school students with MSID (two with MID, one with SID) to comprehend grade-level social studies content using structured inquiry and explicit instruction (i.e., model-lead-test). Investigators used adapted grade-level social studies text with picture supports and a graphic organizer for the seven-step inquiry procedure. Students were also taught to generalize the skills by applying the solutions from the history lessons to real-world problems. A multiple probe across participants design was used. Data indicates that the instructional package was effective at teaching students to comprehend grade-level social studies content and generalize the skills to real-world problems. Additionally, all three students maintained high levels of responding after intervention concluded.

In two similar studies, Wood, Browder, and Flynn (2015) and Courtade, Gurney, and Carden (2017) used a modified system of least prompts and a WH question word

graphic organizer during read-alouds of adapted grade-level social studies text to teach

six elementary school students with MID to comprehend social studies content in special

education settings. Wood and colleagues (2015) also taught students to identify if the

answer to the question was in the book or not in the book and to generate questions

related to the text. In both studies, students were taught to answer literal comprehension

questions that could be answered from the book. While all intervention sessions for both

studies occurred in the special education setting, Wood and colleagues (2015) collected a

generalization measure in the general education social studies classroom. Both studies

used a multiple probe across participants design. Data from both studies indicate a

functional relation between using a modified system of least prompts and a graphic

organizer during read-alouds of grade-level social studies text and the number of text-

dependent comprehension questions answered correctly. Additionally, Wood and

colleagues (2015) found an improvement in the number of questions generated between

baseline and intervention conditions and that students improved their question generating

and answering skills during lessons taught in the general education classroom.

The four studies that focused on social studies instruction included 11 students

with MSID (five middle school students with MID, six elementary school students with

MID, one middle school student with SID). Three of the studies used multiple probe

across participants design while the fourth used alternating treatments design. All

intervention sessions were conducted in an individual instructional format. Two of the

studies were conducted partially in the general education setting while two of the studies

were conducted completely in the special education setting. All four studies were focused

on grade-level standards. Social studies remains the only content area that does not have

any identified evidence-based practices (Courtade et al., 2017). More research into this content area is needed.

Peer Tutoring Interventions

Individually assigned paraprofessionals is the dominant approach for supporting the general education involvement of students with MSID with more than 400,000 working with students with disabilities in the public school system in the United States (Carter, Sisco, Brown, Brickham, & Al-Khabbaz, 2008; Fisher & Pleasants, 2012). Although well intentioned, the close and constant presence of school staff may have unintended consequences and has not been shown to be an effective practice (Carter, Asmus, & Moss, 2013; Asmus et al., 2016). Shukla, Kennedy, and Cushing (1999) found that individually-assigned paraprofessionals were associated with lower levels of social related interactions with peers and less involvement of the certified general education teacher for students with MSID in general education classrooms. Additionally, reliance on paraprofessionals has been shown to hinder student achievement (Gerber, Finn, Achilles, & Boyd-Zaharias, 2001), have a mixed impact on academic engagement (Werts, Zigmond, & Leeper, 2001), and stigmatize students (Broer, Doyle, & Giangreco, 2005). Researchers and practitioners are calling on alternatives that enable students with disabilities full access to the general education environment (Carter & Kennedy, 2006).

One alternative to individual paraprofessional support that has gained wide acceptance is the use of peers to support students with MSID in inclusive classrooms (Giangreco, 2010). Although there may be times that it is necessary for school staff to provide direct support to students with MSID, there are many instances when it may be more beneficial to use peers (Bond & Castagnera, 2006).

Peer-mediated instruction has long been used to improve the social interactions and learning outcomes for students with and without disabilities (Carter & Kennedy, 2006). Peer-mediated instruction refers to an alternative teaching arrangement in which peers serve as instructional agents for their classmates (Maheady, Harper, & Sacca, 1988). Students are taught to present information systematically, elicit and monitor the accuracy of responses, and provide immediate feedback (Delquadri, Greenwood, Whorton, Carta, & Hall, 1986). Peer-mediated instruction was initially developed by the Juniper Gardens Children's Project at the University of Kansas from a collaboration between educational researchers and a general education teacher who was trying to successfully include students with learning disabilities into her classroom (Delquadri, Greenwood, Stretton, & Hall, 1983). Stenhoff and Lignugaris/Kraft (2007) reviewed 20 research studies and found peer tutoring in secondary settings with students with mild disabilities to be effective across settings (general education classroom, special education classroom), used to teach a variety of basic academic and social skills, resulted in overall improved academic outcomes, and is an evidence-based practice for students with mild disabilities. They found support for training for the peers prior to participating in peer tutoring and ongoing monitoring of the peers during sessions. Okilwa and Shelby (2010) reviewed 12 research studies on the effects of peer tutoring with secondary students and found positive outcomes across settings and disability types on teaching basic skills in a variety of academic content areas (language arts, mathematics, social studies, science). In another literature review, Wexler, Reed, Pyle, Mitchell, and Barton (2015) synthesized 13 studies on secondary students with academic difficulties and mild disabilities and found a moderate to high effect for peer tutoring. Additionally, they concluded students and

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teachers believed that peer tutoring interventions were beneficial for learning, that they enjoyed participating in peer tutoring interventions, and that they believed participation in peer tutoring interventions decreased behavior problems and increased student engagement. In a meta-analysis focusing on peer tutoring for both students with mild disabilities and without disabilities, Bowman-Perrott and colleagues (2013) calculated Tau-U across 26 single-case research studies and found a moderate to large effect size for students in Grades 1-12, indicating that students participating in peer tutoring arrangements made greater than expected academic gains. Also, social validity data indicated that teachers found peer tutoring to be easy to implement within ongoing classroom routines. A series of systematic reviews found that peer tutoring has a medium effect size when used with students with emotional and behavioral disabilities (Ryan, Reid, Epstein, 2004; Dunn, Shelnutt, Ryan, & Katsiyannis, 2017). They found that peer tutoring interventions are effective regardless of the role the student was assigned (i.e., tutor, tutee, alternating between tutor and tutee) and that consistent academic gains were observed across academic subject areas (i.e., mathematics, reading, spelling, social studies).

The research on peer tutoring can be separated into classwide peer tutoring and targeted student peer tutoring. Classwide peer tutoring involves all students in a class working together as partners in class activities (Maheady et al., 1988). Typically, students are grouped heterogeneously with higher performing students paired with lower performing students (McMaster, Fuchs, & Fuchs, 2006). This tutoring model has over 35 years of research associated with a host of positive outcomes for students with and

without disabilities (Allsopp, 1997; Kourea, Cartledge, & Musti-Rao, 2007; Maheady, Harper, & Sacca, 1988; Mastropieri, Scruggs, & Berkeley, 2007).

While the majority of the peer tutoring research has focused on classwide peer tutoring, most of the studies involving students with MSID used targeted student peer tutoring. Targeted student peer tutoring, also called peer tutoring dyads or unidirectional peer tutoring, involves students who are higher achieving in a particular area serving as tutors for students who need assistance learning concepts, applications, and skills (Ryan et al., 2004). Although the research is limited, a few earlier studies have investigated the effects of targeted student peer tutoring on academic outcomes (Collins, Branson, & Hall, 1995; Collins, Branson, Hall, & Rankin, 2001; Kamps, Locke, Delquadri, & Hall, 1989; Koury & Browder, 1986; Miracle, Collins, Schuster, & Grisham-Brown, 2001; Tekin & Kircaali-Iftar, 2002; Werts, Caldwell, & Wolery, 1996) and social outcomes (Kohl, Moses, & Stettner-Eaton, 1983; Shukla, Kennedy, & Cushing, 1998, 1999) for students with MSID.

To examine the literature on using targeted student peer tutoring with students with MSID, the following search terms were used in various combinations: elementary school, middle school, high school, moderate disability, severe disability, autism, autism spectrum disorder, developmental disability, intellectual disability, embedded instruction, peer-mediated interventions, peer-implemented interventions, peer supports, peer tutoring, unidirectional peer tutoring, targeted student peer tutoring, peer tutoring dyads, systematic instruction, constant time delay, and system of least prompts. Criteria for inclusion included: (a) published in a peer-reviewed journal between January 2005 and April 2019; (b) setting of an elementary, middle, high, or specialized school (K-12); (c)

participants included at least one student with MSID (IQ below 55); (d) included at least

one academic measure and (e) intervention utilized peers to implement some or all of the

intervention. Eight studies were located. See Table 4 for a summary of the studies.

Table 4

Studies of Targeted Student Peer Tutoring Interventions for Students with MSID

Authors	Participants	Setting	Design	Intervention	Implementer	DVs	Findings
Carter, Sisco, Melekoglu, & Kurkowski, 2007	2 students with MID (15 year old female, 16 year old female); 2 students with SID (15 year old male, 18 year old female); 4 students without disabilities (15 year old female, 15 year old male, 16 year old female, 17 year old female)	Individual and group instruction in general education classrooms (biology, art) in a public high school	Delayed multiple baseline across participants	Peers were trained to (a) support their partner's social-related IEP goals, (b) support participation in ongoing class activities, (c) provide frequent, positive feedback to their partner, (d) promote communication between their partner and other classmates	4 high school peers	Social interactions, academic engagement	Results indicate all participants with MSID increased social interactions during intervention and three students with MSID had small increases academic engagement
Carter, Moss, Hoffman, Chung, & Sisco, 2011	3 students with MID (16 year old male, 16 year old female, 18 year old male); 6 students without disabilities (15 year old male, 15 year old female, 17 year old female, 17 year old female, 18 year old female, 19 year old female)	Individual and group instruction in general education classrooms (ceramics, culinary arts) in a public high school	Concurrent multiple baseline across participants	Peers were trained to use strategies from a menu of support options that could be drawn upon at appropriate times	6 high school peers	Social interactions, academic engagement	Students with MID increased levels of social interactions following intervention; academic engagement was unchanged from baseline (working with paraprofessionals)

Authors	Participants	Setting	Design	Intervention	Implementer	DVs	Findings
Carter, Cushing, Clark, & Kennedy, 2005	3 students with MID (12 year old male, 13 year old female, 17 year old male); 6 students without disabilities (11 year old male, 11 year old male, 13 year old female, 14 year old female; 17 year old female, 17 year old female)	Individual and group instruction in 2 general education science classrooms in a public middle school; individual and group instruction in a general education English classroom in a public high school	Reversal design	Peers were trained to (a) adapt class activities, (b) provide instruction related to IEP goals, (c) implement relevant behavior intervention plans, (d) provide frequent feedback to the students, (e) promote communication between the student with disabilities and the other students in the class	4 middle school peers, 2 high school peers	Consistency with the general curriculum, contact with the general curriculum, social interaction	Students with MID had high levels of all dependent variables during intervention; results indicate that 2 students providing tutoring increases contact with the general curriculum and social interactions with the partners
Jameson, McDonnell, Polychronis, & Riesen, 2008	3 students with MID (13 year old male, 13 year old female, 15 year old female); 3 students without disabilities (14 year old male, 14 year old female, 15 year old female)	Individual instruction in 3 general education classrooms in a public middle school	Concurrent multiple probe across participants; combined concurrent multiple probe across participants design and alternating treatments design	Targeted student peer tutoring using embedded, constant time delay	3 middle school peers	Percentage of correct responses of the grade level content by the students with MID; procedural fidelity of the peers without disabilities	Students with MID increased the percentage of responses following intervention and maintained the same level of responding during maintenance probes; peers demonstrated the ability to be quickly and efficiently trained to implement embedded, constant time delay with high levels of procedural fidelity

Authors	Participants	Setting	Design	Intervention	Implementer	DVs	Findings
Jimenez, Browder, Spooner, & DiBiase, 2012	4 students with MID (11 year old male, 11 year old male, 13 year old male, 14 year old female); 1 student with SID (11 year old female); 6 students without disabilities (all 11 years old, 5 female, 1 male)	Individual instruction in a general education science classroom in a public middle school	Concurrent multiple probe across science units design	Targeted student peer tutoring using embedded, constant time delay	6 middle school peers	Number of correct student science responses (identifying sight words, identifying picture symbols, matching words to picture symbols, and identifying concept statements)	All participants increased their science vocabulary and concept knowledge following the introduction of the intervention and maintained the skills after meeting criteria for each science unit
Godsey, Schuster, Lingo, Collins, Kleinert, 2008	4 students with MID (15 year old male, 16 year old male, 17 year old male, 20 year old male); 11 students without disabilities (2 males, 9 females; ages 16-19)	Individual instructional in a special education classroom in a public high school	Multiple probe across participants design	Targeted student peer tutoring using constant time delay	11 high school peers	Steps completed correctly and independently on the chained food preparation tasks	Results indicate that students increased independent and correct steps following intervention; peers were able to implement the procedure following training
Hudson, Browder, & Jimenez, 2014	3 students with MID (2 female, 1 male, all 4th graders); 2 students without disabilities (10 year old male, 10 year old female)	Individual instruction in a 4th grade general education classroom in a public elementary school	Concurrent multiple probe across participants design	Targeted student peer tutoring using system of least prompts and adapted science read-alouds	2 elementary school peers	Correct listening comprehension question responses	All participants increased their accuracy of comprehension question responses but skills did not generalize to untrained science lessons

Authors	Participants	Setting	Design	Intervention	Implementer	DVs	Findings
Hudson & Browder, 2014	3 students with MID (9 year old male, 10 year old female, 11 year old male); 3 students without disabilities (10 year old male, 10 year old female, 11 year old female)	Individual instruction in a 5th grade general education classroom in a public elementary school	Concurrent multiple probe across participants design	Targeted student peer tutoring using system of least prompts and an adapted grade-level novel	3 elementary school peers	Number of correct, independent listening comprehension responses; number of correct, prompted listening comprehension responses	All participants increased the correct, prompted listening comprehension responses during intervention; 1 student increased the correct, independent listening responses during intervention

Two targeted student peer tutoring studies used embedded instruction. In the first, Jameson and colleagues (2008) utilized targeted student peer tutoring using embedded instruction to examine the effects of a training package on three peers' without disabilities implementation of the procedures and the effects of the instructional package on the acquisition of grade-level content of three students with MID. One student participated in a core academic class (science) while the other two participated in a related arts class (visual arts). The investigators used a multiple probe across participants design to evaluate the effectiveness of the training package on the learning outcomes. The instructional package consisted of embedded, constant time delay. Additionally, they used a combined multiple probe across participants design and an alternating treatments design to assess the peers' acquisition of the instructional procedures and generalization to untrained stimuli. The instructional package consisted of a written manual, individual training sessions, and ongoing verbal feedback. Results indicated that peers can be quickly and efficiently trained to implement constant time delay and embedded instruction techniques with high levels of procedural fidelity. The acquisition data of the students with MID clearly demonstrated that peer-delivered embedded instruction was effective in promoting the acquisition of the targeted skills by all three participants and the students maintained the targeted behaviors at high rates over time. The special and general education teachers identified benefits for both students with MID and peers without disabilities and noted that the strategy increased access and participation in the general education curriculum for students with MID.

In a second study focusing on targeted student peer tutoring using embedded instruction, Jimenez and colleagues (2012) investigated the use of embedded instruction

in an inclusive science class with five middle school students with MSID (four students with MID, one student with SID) and six general education peer partners. The peer partners participated in a short training session and learned to embed constant time delay. A multiple probe across three science units design was used. The researchers found an overall functional relation between the peer-implemented embedded time-delay instruction and the number of correct science responses by students with MID. Data from all five students with MSID indicated that the intervention had a positive effect on students' science vocabulary acquisition and concept knowledge. Peer partners indicated that they would like to continue the intervention, benefitted academically and socially, and enjoyed the process. In fact, all six peers' average science grade either maintained or increase during the intervention. Both teachers indicated that the intervention was successful, feasible, and socially important.

Carter, Sisco, Melekoglu, and Kurkowski (2007) compared the effects of targeted student peer tutoring to individually assigned paraprofessionals for four high school students with MSID (two with MID, two with SID) in general education science and art classrooms. Before intervention began, four high school students without disabilities were trained to use strategies to support their partner's social-related IEP goals, support their partner's participation in ongoing class activities, provide frequent feedback to their partner, and encourage communication between their partner and other classmates. Following the introduction of the intervention, all four students engaged in substantially more peer interactions than during baseline condition. Interestingly, the researchers found the interactions to be fairly reciprocal and balanced for three of the students and their peers with the student with disabilities contributing to about half of the conversational

turns indicating that they were not socially passive within these arrangements. Interactions between the students with disabilities and their peers covered both academic activities and social-related topics suggesting that core academic classes provide sufficient, and often untapped, opportunities for supporting peer interaction. Additionally, adult-related interactions decreased considerably when peer support arrangements were introduced occurring during an average of 22% of the intervals during baseline and 12% of the intervals during intervention. Also, large improvements in academic engagement were noted for two of the students without disabilities. The other two students without disabilities maintained comparable engagement levels across conditions.

In a study of three high school students with MID, Carter, Moss, Hoffman, Chung, and Sisco (2011) evaluated the use of targeted student peer tutoring in two elective classes (culinary arts and ceramics classes). Prior to the implementation of the intervention, paraprofessionals provided almost all academic and social supports with a near absence of peer interactions observed even though the students had been attending the classes for many weeks. Before intervention began, six high school students without disabilities were trained to use strategies from a menu of academic and social support options that could be drawn upon at appropriate times. When peer support strategies were introduced, all three students experienced immediate and substantial increases in social interaction with other students. The peer interactions addressed a range of academic and social topics and extended to other classmates. However, the levels of academic engagement remained largely unchanged as a result of the peer supports.

Carter, Cushing, Clark, and Kennedy (2005) studied the effects of varying the number of peers tutors on social interactions and academic engagement of two middle

school students and one high school student with MID in general education language arts and science classes. They found an increase in the time the students were actively involved in instruction activities aligned to the general curriculum and in frequencies of social interactions when students were working with two peers in comparison to one peer. Regardless of number of peer support students, the alignment of students' activities with the general curriculum remained high and stable indicating that peers can be taught to modify instruction activities effectively. This may help to eliminate the disconnect that can exist between the instruction received by the student with MID and their classmates in general education classrooms.

Godsey, Schuster, Lingo, Collins, and Kleinert (2008) trained 11 peer tutors to implement a constant time delay procedure to teach four high school students with MID to complete chained food preparation tasks. A multiple probe across participants design was used. All four students with MID increased the number of steps they completed correctly and independently and maintained high levels of responding over time.

Hudson, Browder, and Jimenez (2014) investigated the effects of peer-delivered instructional package to teach comprehension question responses to three students with MID. Following training, two peer tutors delivered adapted science read-alouds and used system of least prompts to locate answers to comprehension questions in a 4th grade general education classroom in a one-on-one format during a transition period. A multiple probe across participants design was used. Results show that all three students increased their accuracy of comprehension question responses but skills did not generalize to untrained lessons. Students with MID were successfully taught to request help from their peers and monitor their correct responses. Peers indicated that they

enjoyed being a participating in the targeted student peer tutoring intervention and would like to do it again. Teachers indicated that the students with MID and the students without disabilities benefitted from the peer-delivered instruction.

Additionally, Hudson and Browder (2014) examined targeted student peer tutoring using system of least prompts and adapted read-alouds of a grade-level novel on correct comprehension question responses for three elementary school students with MID. All intervention sessions occurred in the general education literacy class. A multiple probe across participants design was used. Data indicated a functional relation between the peer tutoring intervention and prompted correct responses on the comprehension questions. Procedural reliability data showed that the three peer tutors implemented the intervention with high fidelity. Social validity results reveal that the general education teacher and special education teacher had positive feelings about the intervention. Additionally, all students in the class were given a social attitude survey before and after intervention. It indicated that the students without disabilities were more willing to interact with the students with disabilities at a deeper level (e.g., eating lunch, playing at recess) and liked having students with disabilities in the class more following intervention.

The eight studies that focused on targeted student peer tutoring in an academic area included 26 students with MSID (six elementary school students with MID, seven middle school students with MID, one middle school student with SID, 10 high school students with MID, two high school students with SID). Multiple probe across participants design, multiple baseline across participants design, multiple probe across science units design, reversal design, and alternating treatments design were used. Seven

of the studies were conducted in general education classrooms while one was conducted in a special education classroom. Three of the studies used both individual and small group instruction while five used only individual instruction. Targeted student peer tutoring interventions are a promising way to address social and academic outcomes in special education or general education settings. More research is needed.

Conclusion

The literature highlighted in this chapter demonstrates the overall lack of research dedicated to academic instruction for middle school students with MSID. Of the 21 studies focusing on academic content instruction for students with MSID, 13 of the studies focused on grade-level skills. Additionally, 16 of the 21 studies were set exclusively in special education classrooms.

The literature presented in this chapter also demonstrates that lack of research focusing on writing instruction for students with MSID. All of the 15 studies reviewed were conducted in a special education setting with 13 using an individual instructional arrangement. Only two studies were aligned to grade-level standards.

Additionally, the literature presented in this chapter demonstrates the lack of research on social studies instruction with students with MSID. Of the four studies located, only two were set partially in the general education setting. On a positive note, all four focused on grade-level standards.

Finally, the literature presented in this chapter demonstrates the lack of research focusing on the use of targeted student peer tutoring interventions for students with MSID. Encouragingly, seven of the eight studies located were set in the general

education setting. Additionally, seven of the eight studies focused on grade-level standards.

This study aims to add to the research on teaching grade-level academic standards to middle school students with MSID. Additionally, this study may be the first to investigate writing-to-learn in an academic content area for students with MSID. This study also aims to add to the small amount of recent literature surrounding social studies instruction for students with MSID. Finally, this study aims to add to the literature on targeted student peer tutoring interventions for students with MSID.

CHAPTER 3

METHOD

The literature reviewed in Chapter 2 demonstrated that response prompting combined with the use of sentence frames appears to be an effective method to teach students with MSID to construct sentences. However, the area of writing instruction for students with MSID is generally understudied. Furthermore, there are no studies that examine writing sentences as a component of instruction for other academic content areas (e.g., social studies, science, mathematics) for students with MSID. Additional research on general writing instruction and in relation to academic content areas for students with MSID is needed. Additionally, the literature reviewed in Chapter 2 suggests that students with MSID can learn social studies content when systematic instruction is used and that targeted student peer tutoring seems to be a viable alternative to direct adult support, however, more research in both areas is needed.

The purpose of this study was to evaluate the effectiveness of a writing instructional package using targeted student peer tutoring, response prompting (i.e., constant time delay, system of least prompts), and sentence frames on the construction of sentences about a historical artifact by students with MID. Additionally, the comprehension of grade-level social studies content of the student with MID was evaluated. Social validity was examined by giving a questionnaire to the special education teacher, general education teacher, and paraprofessionals about the feasibility,

acceptability, and effects of the intervention (see Appendix M). Additionally, students without disabilities were interviewed to assess their attitudes toward the intervention and working with the student with MID (see Appendix N). Lastly, students with disabilities were interviewed to examine their attitudes toward the intervention and working with their partners (see Appendix O).

The study addressed the following research questions:

1. What is the effect of a writing instructional package (targeted student peer tutoring, response prompting, and sentence frames) on the construction of sentences related to an artifact written by students with MID?

2. What is the effect of a writing instructional package (targeted student peer tutoring, response prompting, and sentence frames) on the comprehension of grade-level social studies content for the students with MID?

3. How do the special education teacher, general education teachers, and paraprofessionals view the goals, procedures, and effects of the writing instructional package (targeted student peer tutoring, response prompting, and sentence frames) for the students with MID and the students without disabilities?

4. What are the views of the students with MID and the students without disabilities toward working with one another and the writing instructional package (targeted student peer tutoring, response prompting, and sentence frames)?

This chapter details the method that was used to investigate the research questions. Specifically, this chapter will provide descriptions of the participants, research design, independent variables, dependent variables, and data collection.

Setting

The study took place in a public middle school located in a rural area in the Southeastern United States. The school district enrolled nearly 7,000 students. The middle school had approximately 450 6th and 7th grade students with 60% qualifying for free and reduced lunch. The racial makeup of the school was 69% White, 19% Hispanic, 7% Black, 1% Asian, and 4% two or more races. About 13% of the student population received special education services at the time of the study. The average student-teacher ratio was 25:1.

The participants with MID received the majority of their instruction in a self-contained classroom for students with MSID. They were included in general education settings for a portion of the school day including one core academic class (i.e., mathematics, social studies), one related arts class (e.g., art, physical education, music, technology), lunch, and a wellness period. Baseline, intervention, and maintenance sessions took place in the special education classroom during a school-wide advisory period. A small room adjacent to the special education classroom used for small-group instruction by various school staff was used for these sessions. The two students in each dyad sat side-by-side at a table with two chairs. Probe sessions occurred in the general education classrooms during two social studies classes approximately once per week for each dyad. For these sessions, the dyad chose a table in the general education classroom and sat side-by-side. Approximately 30 students were enrolled in the general education classes. Probe sessions occurred at the beginning of the social studies classes during a class-wide 10-minute writing session that occurred approximately once per week. During this time, all students were tasked with writing sentences about an artifact (i.e., spinning

wheel, printing press) while the image was displayed on the projector. The students could choose to write independently or with a partner. Because students were involved in collaborative learning throughout the class, the writing instructional package using targeted student peer tutoring, response prompting, and sentence frames was not a distraction within the learning of the classroom.

Participants

      Students with disabilities. Six students with MID were recruited to participate in this investigation. After reviewing the study overview with the researcher, the special education teacher was asked to nominate participants who met the following inclusion criteria: (a) receiving special education services under the category of MSID (Functional Mental Disability [FMD] in Kentucky), (b) an intelligent quotient (IQ) of 40 to 55, (c) able to answer questions verbally or point to words/pictures to answer questions, (d) enrolled in middle school, (e) consistent attendance (i.e., no more than two absences a month), (f) eligible for the state's alternate assessment, and (g) enrolled in a general education social studies class. Parents/guardians of the six nominated students received study recruitment letters along with parental consent forms (see Appendix A). Parental consent was obtained for four participants prior to the beginning of the study. Additionally, the researcher and special education teacher met with the four students individually to explain the purpose of the study, read aloud the student assent letter, and obtain participant assent (see Appendix B).

      Ultimately, three students with MID participated in the study. A fourth student was enrolled in the study and completed five baseline sessions but was withdrawn due to an extended absence before intervention began. Logan, Blake, and Ethan (pseudonyms)

were all male, in Grade 7, and had an educational label of FMD. Logan spoke in

sentences while Blake and Ethan spoke in short phrases. All three students required

comprehensions questions to be presented in multiple choice format with answer choices

with symbol support for all academic content areas. Relevant characteristics of the

students with MID are listed in Table 5. Information is provided on the age,

race/ethnicity, IQ, medical diagnoses, and related services received for each of the three

participants with MID.

Table 5

Characteristics of Students with MID

Student	Age	Race/Ethnicity	IQ	Medical Diagnoses	Related services
Logan	12	Hispanic	48 (verbal)[1]	Traumatic brain injury	Speech Therapy
Blake	13	African American	43 (nonverbal)[1]	Cerebral palsy, Cortical Vision Impairment	Speech Therapy, Physical Therapy, Occupational Therapy
Ethan	14	Caucasian	44 (nonverbal)[1]	Down syndrome, Hashimoto's disease	Speech Therapy, Occupational Therapy

[1]Stanford-Binet Intelligence Scales, Fifth Edition

Students without disabilities. Additionally, six students without disabilities were

recruited to participate in the study. After reviewing the study overview with the

researcher, the general education teachers and the paraprofessionals were asked to

nominate participants who met the following inclusion criteria: (a) a middle school

student enrolled in a general education social studies class with a student with MSID, (b)

an average score of a 3 (i.e., approaching mastery) or 4 (i.e., mastery) on the school

district's standards-based grading system in the social studies class, and (c) consistent

attendance (i.e., no more than two absences a month). The teachers and paraprofessionals were asked to select peers who had (a) been observed interacting positively with the student, (b) extend an open invitation to the class for interested peers, or (c) ask the student with disabilities for suggestions (Brock, Biggs, Carter, Cattey, & Raley, 2016). A combination of all three selection methods were used and eight peers were nominated. Parents/guardians of the nominated students received study recruitment letters along with parental consent forms (see Appendix C). Parental consent was obtained for four participants prior to the beginning of the study. Additionally, the researcher and special education teacher met with the students individually to explain the purpose of the study, read aloud the student assent letter, and obtain participant assent (see Appendix D).

Hannah, Landon, Charlotte, and Lillian (pseudonyms) were all in Grade 7. Hannah, Landon, and Charlotte were matched with peers with MID that were enrolled in the same general education social studies class. After the fourth student with MID was withdrawn from the study, Lillian served as a substitute during sessions if the assigned peer was absent or unavailable. Relevant characteristics of the participants without disabilities are listed in Table 6. Information is provided on the age and assigned peer of the participants.

Table 6

Characteristics of Students without Disabilities

Student	Age	Gender	Race/Ethnicity	Peer
Hannah	13	Female	Caucasian	Logan
Landon	13	Male	Caucasian	Blake
Charlotte	12	Female	Hispanic	Ethan
Lillian	13	Female	Caucasian	Substitute

Teachers and Paraprofessionals. Two general education social studies teachers were recruited to participate in the study. The teachers who participated met the following inclusion criteria: (a) middle school social studies teacher, and (b) willing to help facilitate inclusive education for students with MSID. One special education teacher was recruited to participate in the study. She was selected based on the following criteria: (a) special education teacher of middle school students with MSID, (b) familiar with systematic instruction, and (c) willing to help facilitate inclusive education for students with MSID. Two paraprofessionals were recruited to participate in the study. The paraprofessionals were selected based on the following criteria: (a) primarily served middle school students with MSID and (b) willing to help facilitate inclusive education for students with MSID. All five adult participants completed informed consent forms prior to the beginning of the study (see Appendix E). Approval by the Institutional Review Board (IRB) at the University of Louisville (UofL) was obtained following approval of the study proposal by the dissertation committee. The researcher obtained informed consents and student assents using the format approved by the IRB at the UofL.

Experimenter and Data Collectors

The researcher, a doctoral candidate in Curriculum and Instruction in the College of Education and Human Development at the University of Louisville, provided the training for the peer partners and served as the primary data collector in all conditions. The researcher had eight years of experience as a special education teacher of students with MSID in an elementary setting. A grant-supported special education consultant from the College of Education and Human Development served as a secondary data collector. The consultant had six years of experience as a special education teacher of students with learning and behavioral disabilities in a high school setting.
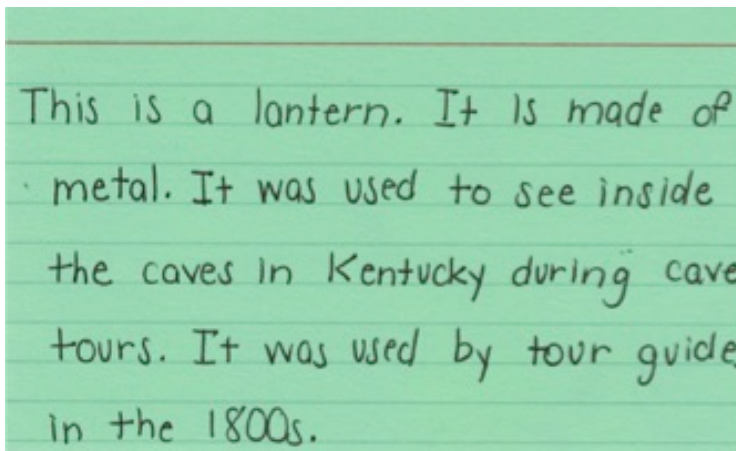
Materials

This study utilized an iPad mini 3®, an iPad application (Clicker Sentences™), Boardmaker Online®, and four index cards for each instructional session. The general education social studies teachers met and shared the instructional plans for writing instruction for the upcoming units with the researcher. The researcher used the 12 historic artifacts that the general education teachers had selected for their instruction as the focus for the general education probe sessions. The researcher selected 49 additional artifacts for the baseline, intervention, and maintenance sessions conducted in the special education classroom.

For each instructional session, the researcher selected an artifact that was similar to the artifacts chosen by the general education teachers and met the middle school Kentucky Academic Standards for Social Studies. These artifacts included a drum used by soldiers during the Civil War, a curling iron used by wigmakers in the 1700s, and a corn planter used by farmers in the 1800s. Websites such as the Smithsonian's History

Explorer (https://historyexplorer.si.edu/) and the Historic Jamestowne

(https://historicjamestowne.org/) were used.

Next, the researcher wrote a four sentence summary to provide background

information about the artifact and recorded it on a 3 x 5 inch index card (see Figure 1).

The summary presented the name of the artifact, the main material it was made of, the

location where it was used, the person or group of people that used it, and the time period

when it was used. The summary was read aloud by the peer to the student with MID at

the beginning of the instructional session.

Figure 1. Example of background information on an index card.

The researcher then created a model sentence for each of the three sentence

frames (i.e., The (artifact) is made of _____; It was used to _____; It was used by

_____.) Each sentence was recorded on a 3 x 5 inch index card (see Figure 2). The

model sentences were programmed into Clicker Sentences™ to create word banks (see

Figure 3). The word banks consisted of a grid of 5-7 words. The word banks included the

words needed to construct each sentence. The application randomly organized the

placement of the words in order to reduce the potential influence of word order during

tasks. Clicker Sentences™ provided audio feedback as each word was selected and when

a sentence was complete.

Figure 2. Example of model sentences on index cards.
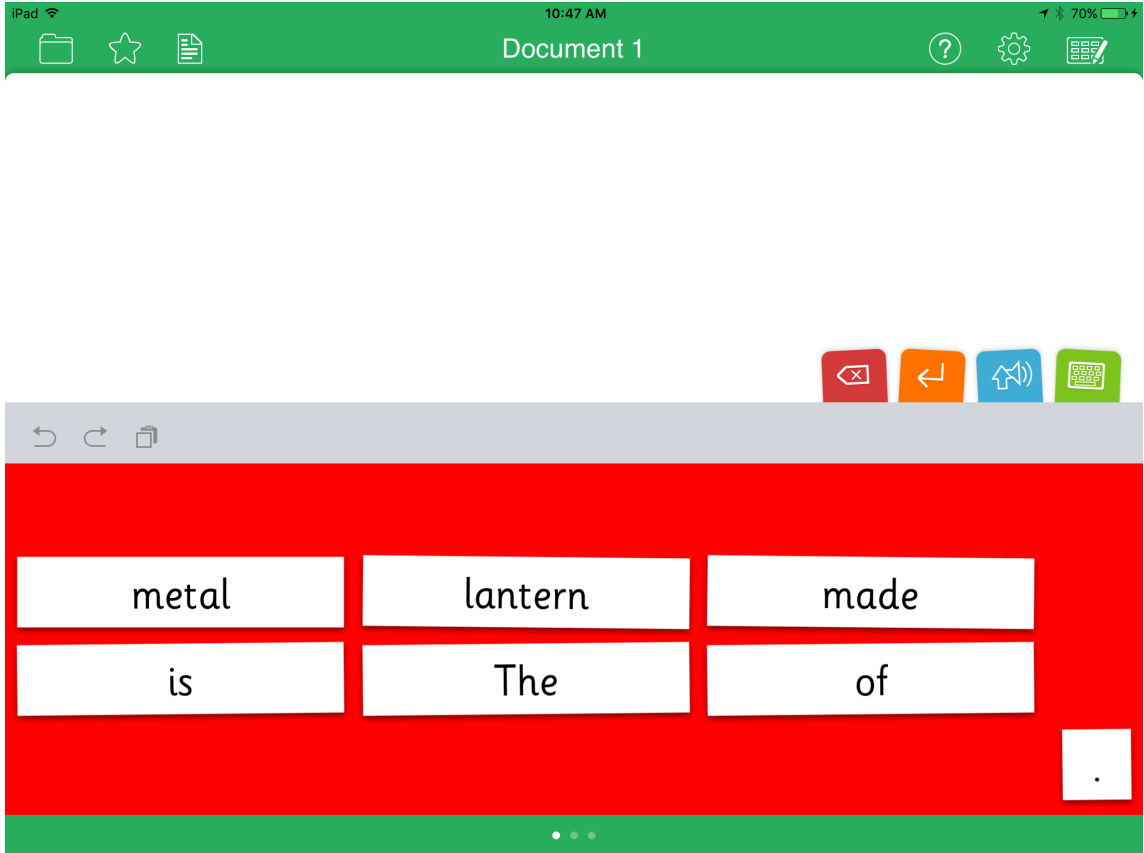
Figure 3. Example of Clicker Sentences™ display.

Last, the researcher designed three comprehension questions. Boardmaker

Online® was used to create the materials for the comprehension portion of the

instructional package (see Figure 4). Three answer choices (Green, 2001) with symbol

support was provided for each of the three comprehension questions presented in each

session. The peer read the question and the three answer choices aloud.

Question 1: What is the lantern made of?

plastic

sugar

metal
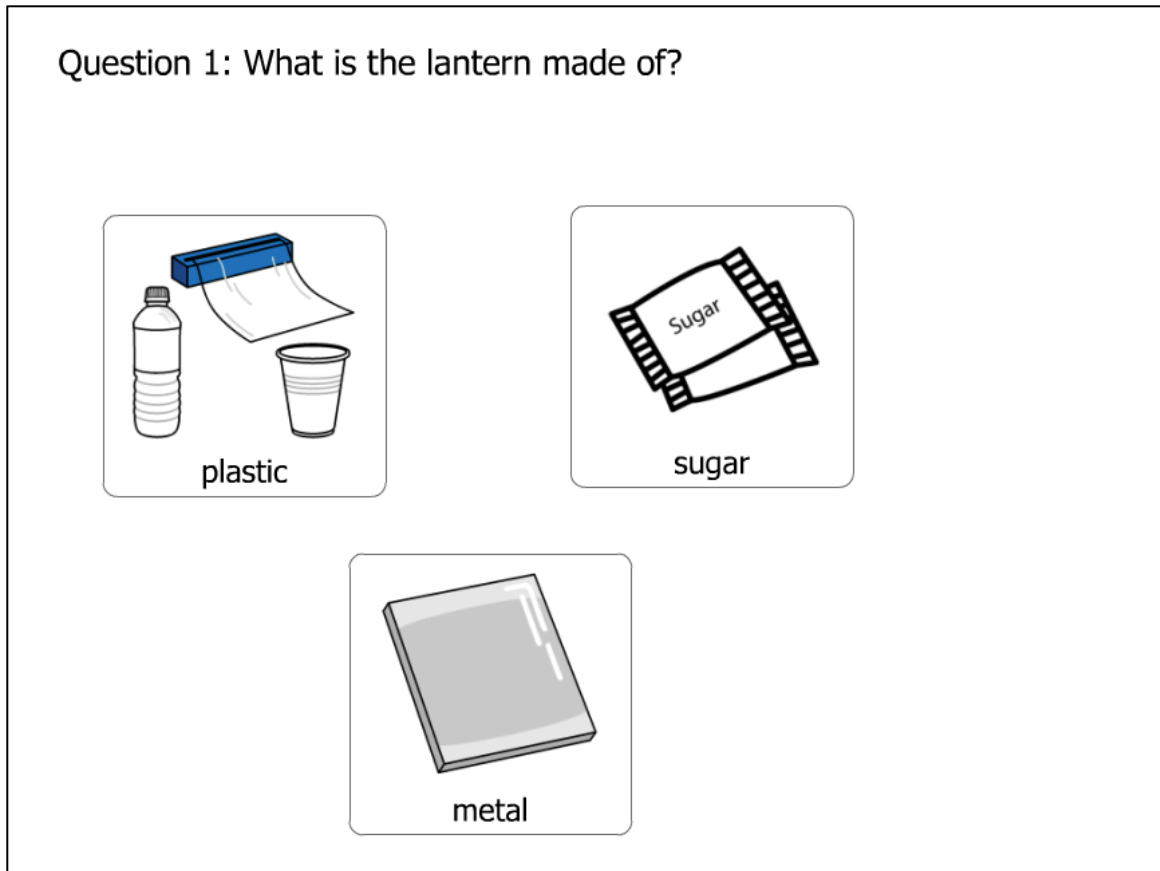
Figure 4. Example of Boardmaker Online® printout.

Response Definitions and Measurement Procedures

Two dependent variables were measured during baseline, intervention, and maintenance conditions. All sessions were approximately 10 minutes in length and took place in the special education classroom Monday through Friday and in the general education classroom approximately once per week.

Sentences constructed independently and correctly relating to an artifact served as the primary dependent variable. Specifically, the primary dependent variable was the number of sentences written independently and correctly by the students with MID during each session. A correct sentence was defined as (a) corresponding to the presented artifact, (b) including a subject and a verb, (c) syntactically correct, and (d) ending with a

period. The three sentence frames used during each session were: (a) The (artifact) is made of _____; (b) It was used to _____; and (c) It was used by _____. This dependent variable was measured with trial-by-trial recording. Each trial was recorded as a correct independent response (+) if the student did not require the use of the model prompt and the sentence met the set criteria or incorrect (−) if the student required the model prompt, did not respond, or the sentence did not meet the set criteria. For each session, the total number of correct responses were added together.

The secondary dependent variable was the comprehension of the grade-level social studies content of the students with MID. Specifically, the secondary dependent variable was the number of comprehension questions answered correctly by the students with MID. The three comprehension questions asked during each session were: (a) What is the (artifact) made of? (b) Who used the (artifact)? and (c) How was the (artifact) used? Three answer choices (one correct answer and two distractors) were presented for each of the three questions. This dependent variable was measured with trial-by-trial recording. Each trial was recorded as a correct independent response (+) if the student touched or verbally stated the correct answer within 10 s or incorrect (−) if the student touched or verbally stated the incorrect answer or did not respond. For each session, the total number of correct responses were added together.

Observer Training

The secondary observer was a grant-supported special education consultant from the College of Education and Human Development at the University of Louisville. All observer training sessions occurred at the University of Louisville. The secondary observer was trained using BST by the primary researcher (Miltenberger, 2016). BST

includes instruction, modeling, rehearsal, and feedback. First, the secondary observer was

informed of the purpose of the study and was given an overview of the study procedures.

Operational definitions of the dependent variables were presented. The Protocol for Probe

Sessions (Appendix F) was provided. Next, a video of the researcher implementing a

probe session was viewed while the researcher modeled how to complete the Protocol for

Probe Sessions and the Dependent Variable Data Collection Form (Appendix I). The

researcher stopped the video to discuss the justifications for each decision and then

provided an opportunity to ask questions. Next, a second video of the researcher

implementing a probe session was viewed while the researcher and secondary observer

completed the forms independently. The number of intervals with agreements was

divided by the total number of intervals and multiplied by 100 to obtain a percentage of

total intervals with agreements for the Protocol for Probe Sessions. Similarly, the number

of agreements was divided by the total number of items and multiplied by 100 to obtain a

percentage of total items with agreements for the Dependent Variable Data Collection

Form. The researcher then gave the secondary observer feedback on her performance.

Viewing of the videos, scoring, and feedback was repeated until the researcher and

secondary observer reached 100% agreement on both the Protocol for Probe Sessions and

the Dependent Variable Data Collection Form. These procedures were repeated for the

Protocol for Intervention: Phase 1 Condition (Appendix G) and Protocol for Intervention:

Phase 2 Condition (Appendix H).

Interobserver Agreement and Procedural Reliability

To address dependent variable reliability, the researcher and secondary observer

collected data during at least 30% of baseline, intervention, maintenance, and probe

sessions. In single-case research design, reliability of the measure is established via interobserver agreement, which examines the consistency with which the variables can be measured using the instrument (Cooper, Heron, & Heward, 2007). Interobserver agreement data were taken by having both the researcher and secondary observer complete the Dependent Variable Data Collection Form (Appendix I) during the session. It was calculated for both dependent variables using point-by-point procedures and then taking the number of agreements divided by the number of agreements plus disagreements and multiplying by 100 (Kazdin, 1978). If interobserver agreement fell below 80%, additional training was provided for the observer.

Procedural reliability, the degree to which the procedures of an experimental condition are implemented as written (Billingsley, White, & Munson, 1980), of the peer implementing the writing instructional package was measured using direct observation techniques by having the researcher and secondary observer collect data on the peer's implementation of the instructional procedures during at least 30% of baseline, intervention, maintenance, and general education probe sessions. During baseline and general education probe sessions, the researcher and secondary observer completed the Protocol for Probe Sessions (Appendix F). During Intervention: Phase 1 sessions, the researcher and secondary observer completed the Protocol for Intervention: Phase 1 Condition (Appendix G). During Intervention: Phase 2 sessions, the researcher and secondary observer completed the Protocol for Intervention: Phase 2 Condition (Appendix H). The number of observed behaviors was divided by the number of planned behaviors (i.e., 25 for baseline/general education probe condition, 28 for Intervention:

Phase 1 condition, and 31 for Intervention: Phase 2 condition) and multiplied by 100. If procedural reliability fell below 80%, the peer was provided with additional training.

To examine procedural reliability of the researcher implementing the training for peers, Training Checklist for Probe Session Procedures (Appendix J), Training Checklist for Intervention: Phase 1 Condition Procedures (Appendix K), and Training Checklist for Intervention: Phase 2 Condition Procedures (Appendix L) were used. Data were collected on the researcher's ability to provide consistent training as planned over the course of the training sessions. The secondary observer observed all training sessions.

Experimental Design

A single-case research design, multiple-probe-across-participants, was used to evaluate the effectiveness of the writing instructional package. Single-case research designs generally involve repeated, systematic measurement of a dependent variable before, during, and after the introduction of a research-manipulated independent variable (Kratochwill et al., 2010). Single-case research focuses on change within the individual rather than change within the group as a whole (Borckardt et al., 2008). Multiple-probe-across-participants design is a variation of a multiple baseline design that allows for intermittent measurement of the dependent variable after the initial consecutive baseline sessions and staggered introduction of the independent variable across participants (Gast, Lloyd, & Ledford, 2014). This design was chosen because it is practical in applied settings and it is fitting for irreversible behaviors such as sentence writing. Additionally, multiple probe design was selected over multiple baseline design because prolonged and continuous measurement during baseline condition without instruction for Dyad 2 and Dyad 3 was unnecessary and may have proven aversive for the students (Horner & Baer,

1978). In order for experimental control to be established using multiple-probe-across-participants design, researchers must ensure that participants are functionally independent and functionally similar (Gast et al., 2014).

All three student dyads began the study in baseline condition. The order in which dyads began intervention condition was based on the stability of the trend and level of the data. That is, the student demonstrating the most stability during baseline condition began intervention condition first. Internal validity in single-case research designs is established though repeated demonstrations of a functional relation between the independent and dependent variables (Gast, 2014). This study had three demonstrations of experimental effect.

External validity is a concern with single-case research. In order to address this concern, Horner and colleagues (2005) recommends having a sufficient number of participants (at least three) for each study and a sufficient number of studies that show replication of the independent variable (five or more studies) and participants. The demonstration of some external validity occurred through the replication of experimental effects across the three dyads.

Procedure

The three students with MID were assessed prior to beginning baseline condition and following the completion of maintenance condition on their knowledge of the words used in the word banks during all sessions. The pre-assessment and post-assessment were conducted individually by the researcher and secondary observer. One student, Logan, was assessed using an expressive format. The words were presented individually and he was asked to verbally state the written word. Two students, Blake and Ethan, were

assessed using a receptive format. The written words were presented as a field of three, the target word was read aloud by the researcher, and the student was asked to point to the word. Each word was recorded as a correct response (+) if the student responded correctly within 5 s or as an incorrect response (−) if the student responded incorrectly or did not respond within 5 s.

Prior to the implementation of baseline sessions, each of the four peers were trained to implement the procedures of the Protocol for Probe Sessions (see Appendix F) using BST by the researcher. The training occurred at the study site during the advisory period. Following introductions, the rationale for the writing instructional package, relevant background about the students with disabilities, and goals for the writing instructional package were shared. The researcher discussed the importance of confidentiality and using respectful language. A brief overview of the writing instructional package was shared. The peers received a copy of the Protocol for Probe Sessions. The researcher explained of each of the 25 steps. The peers watched a video of the researcher modeling each step. The peer was asked to practice each of the steps and the researcher and secondary observer recorded the data on correct and incorrect implementation on the Protocol for Probe Sessions. Lastly, feedback was given for correct and incorrect responses. Modeling, rehearsal, and feedback was repeated until the peer was able to implement the 25 steps of the Protocol for Probe Sessions with 100% accuracy.

Following the completion of baseline sessions for each dyad, the peer partner was trained to implement the Protocol for Intervention: Phase 1 (see Appendix G) using BST by the researcher and secondary observer (Miltenberger, 2016). The training occurred

individually at the study site during the advisory period. The participant received a copy of the Protocol for Intervention: Phase 1. The researcher explained of each of the 28 steps. Next, a video of the researcher implementing the steps of Intervention: Phase 1 was shown. The peer partner was then asked to practice the steps and the researcher recorded data on correct and incorrect implementation on the Protocol for Intervention: Phase 1. Lastly, feedback was given for correct and incorrect responses. Modeling, rehearsal, and feedback were repeated until the peer was able to implement the 28 steps of Intervention: Phase 1 of the instructional writing package with 100% accuracy.

Prior to the introduction of Intervention: Phase 2, the peer partners were trained to implement the Protocol for Intervention: Phase 2 (see Appendix H) using BST by the researcher and secondary observer (Miltenberger, 2016). The training occurred individually at the study site during the advisory period. The participant received a copy of the Protocol for Intervention: Phase 2 (Appendix H). The researcher explained of each of the 31 steps. Next, a video of the researcher implementing the steps of Intervention: Phase 2 was shown. The peer was then asked to practice the steps and the researcher and secondary observer recorded data on correct and incorrect implementation on the Protocol for Intervention: Phase 2. Lastly, feedback was given for correct and incorrect responses. Modeling, rehearsal, and feedback were repeated until the peer was able to implement the 31 steps of Intervention: Phase 2 of the writing instructional package with 100% accuracy.

Baseline procedures. The baseline condition sessions occurred in the special education classroom during the school-wide advisory period five days a week. The peer followed the Protocol for Probe Sessions (Appendix F). The peer gained the student's

attention, pointed to the artifact, gave a directive to look at the artifact, and read a five-sentence explanation of the artifact. The peer presented the iPad® with Clicker Sentences™ open to the student. The peer asked the student to "Write a sentence telling what the artifact is made of." The peer waited 10 s for the student to begin writing. If the student began writing, the peer waited for the student to stop writing. If the student did not select a word within 10 s, the peer gave the student non-specific feedback. Then, the peer swiped right on Clicker Sentences™ to obtain the word bank corresponding to the second sentence. The second and third sentence frames repeated the procedures and used the requests, "Write a sentence telling how the artifact was used" and "Write a sentence telling who used the artifact" respectively.

Next, the peer placed the Boardmaker Online® printed page labeled Question 1. The peer read Question 1 to the student, read and pointed to the answer choices, and waited 10 s for the student to make a selection. The peer provided non-specific feedback. The procedures were repeated for Question 2 and Question 3.

Intervention: Phase 1 procedures. Like baseline, Intervention: Phase 1 condition sessions occurred in the special education classroom during the school-wide advisory period. Zero second delay procedures were implemented for three consecutive sessions at the beginning of intervention phase for each dyad. The peer followed the Protocol for Intervention: Phase 1 (Appendix G). The peer gained student attention, pointed to the artifact, gave a directive to look at the artifact, and read a four-sentence explanation of the artifact. The peer presented the iPad® with Clicker Sentences™ open to the student. The peer asked the student to "Write a sentence telling what the artifact is made of." The peer immediately presented a written model corresponding to the first

sentence frame and said, "You can use this to help you." The peer read the model sentence aloud. Upon completion of the sentence, the sentence was read aloud and verbal praise was delivered. The peer swiped right on the application to obtain the words corresponding to the second sentence. The second and third sentence frames repeated the procedures and used the requests, "Write a sentence telling how the artifact was used" and "Write a sentence telling who used the artifact" respectively.

Intervention: Phase 2 procedures. Like baseline and Intervention: Phase 1 conditions, Intervention: Phase 2 condition occurred place in the special education classroom during the school-wide advisory period five days a week. During the fourth session of intervention phase, 10 second delay trials began. The peer followed the Protocol for Intervention: Phase 2 (Appendix H). The peer gained the student's attention, pointed to the artifact, gave a directive to look at the artifact, and read a five-sentence explanation of the artifact. The peer presented the iPad® with Clicker Sentences™ open to the student. The peer asked the student to "Write a sentence telling what the artifact is made of." The peer waited 10 s for the student to begin writing. If the student did not select a word within 10 s or made an error, the peer prompted the student to delete the error and provided a written model. If the student selected the correct initial word within 10 s, the peer waited for the student to select the second word. If the student did not select the second word within 10 s or made an error, the peer prompted the student to delete the error and provided the written model. If the student wrote the sentence independently or with the model, the peer read the sentence aloud and delivered praise. The steps repeated for the second and third sentence frames using the requests, "Write a sentence telling how the artifact was used" and "Write a sentence telling who used the artifact" respectively.

After the second and third sentences were complete, the peer placed the Boardmaker Online® printed page labeled Question 1. The peer read Question 1 to the student, read and pointed to the answer choices, and waited 10 s for the student to make a selection. The peer provided praise for a correct answer. If the student did not respond or responds incorrectly, the peer pointed to and read the correct answer choice. The procedures were repeated for Question 2 and Question 3.

Intervention concluded for each dyad independently when the student reached criterion for the primary dependent variable. Criterion was set as three sentences written correctly for three consecutive sessions.

Maintenance procedures. Following each student reaching criterion, maintenance probes were conducted one time per week in the special education classroom on both dependent variables for at least five sessions. The peer followed the Protocol for Probe Sessions (Appendix F).

General education probe procedures. Probe sessions were conducted in the general education social studies classroom at least one time per week during baseline, intervention, and maintenance conditions. These sessions occurred when the general education social studies teachers were focusing on writing during the first portion of the class. The peer followed the Protocol for Probe Sessions (Appendix F).

Social Validity

The practical significance of an educational intervention is another important consideration. Specifically, Wolf (1978) recommends the social significance of the goals, social appropriateness of the procedures, and social importance of the effects be examined. In order to control for this threat, social validity was measured by asking the

special education teacher, the general education teachers, and the paraprofessionals to complete a questionnaire about the goals, procedures, and effects of the intervention after implementation. The questionnaire contained 10 statements using a 5-point Likert-type scale (i.e., very difficult, difficult, neutral, easy, very easy) and two open ended questions.

Additionally, individual interviews were conducted following the conclusion of the intervention to assess the attitudes of the peers toward the writing instructional package and providing support to students with disabilities. The interviews consisted of 10 open ended questions (see Appendix N) and lasted approximately 15 minutes. Lastly, individual interviews were conducted following the conclusion of the intervention to assess the attitudes of the students with disabilities toward the writing instructional package and working with the students without disabilities. The interviews consisted of seven open ended questions (see Appendix O) and lasted approximately 10 minutes. The interviews were conducted during the school-wide advisory period in the special education classroom.

Data Analysis Procedures

Visual inspection of data is the hallmark for evaluating studies utilizing single-case research designs (Lane & Gast, 2014) and was the primary method used to evaluate the effects of this study. Both dependent variables were plotted on a line graph and analyzed separately to determine if there was a functional relation between the independent variable (the writing instructional package) and the dependent variables (the number of sentences written correctly, the comprehension questions answered correctly). Specifically, six key features were used to examine the data patterns within and between

phases: level, trend direction, trend stability, immediacy of the effect, overlap, and consistency of data patterns across similar phases (Kratochwill et al., 2010). These six features were evaluated separately and collectively to determine if the results from the study demonstrate a causal relation.

Additionally, an evaluation of intervention effects using the Tau-U statistical measure was used. Tau-U combines Kendall's Tau and Mann-Whitney U to analyze both trend and nonoverlapping data (Parker, Vannest, Davis, & Sauber, 2011). Nonoverlap has been used with visual analysis since at least the 1960s (Cooper, Heron, & Heward, 1987) and has been measured statistically since the 1980s (Scruggs, Matropieri, & Casto, 1987). Nonoverlap methods do not require a normal distribution and are robust to outlier scores (Armitage, Berry, & Matthews, 2002), both frequent concerns with single-case research. Tau-U can be conceptualized as the percentage of nonoverlapping data points between phases (Rekap, 2015; Parker et al., 2011; Rispoli et al., 2013). For multiple baseline designs, Tau-U is first calculated for each phase contrast and then the scores are averaged together to calculate the overall effect size (Rakap, 2015). The calculation of Tau-U requires the use of statistical packages; the web-based calculator at www.singlecaseresearch.org/calculators/tau-u was used in this study (Vannest, Parker, Gonen, & Adiguzel, 2016). Tau-U scores range from 0.00 to 1.00 and can be interpreted as: 0.65 or lower—weak or small effect; between 0.65 and 0.92—moderate effect; and 0.93 or higher—large or strong effect (Rakap, 2015).

CHAPTER 4

RESULTS

The purpose of this chapter is to present the results of the writing instructional

package on the writing performance of the students with MID. First, results related to the

primary dependent variable, constructing sentences correctly and independently by the

students with MID, are reported. Next, results related to the secondary dependent

variable, answering comprehension questions related to the social studies content by the

students with MID, are presented. Included are the results of the interobserver agreement

and procedural reliability measures across all baseline, intervention, and maintenance

conditions, as well as general education probes. Additionally, procedural reliability data

for the training sessions are reported. Finally, the social validity measures given to the

school staff, the students without disabilities, and the students with MID are presented.

Primary Dependent Variable

The primary dependent variable for this study was the number of sentences

written correctly and independently by the students with MID. This dependent variable

was measured with trial-by-trial recording. Three trials were presented during each

session. Each trial was recorded as a correct independent response (+) if the student wrote

the sentence meeting the set criteria and without the use of the model prompt or incorrect

(−) if the student required the model prompt, did not respond, or the sentence did not

meet the set criteria. In this section, the results for the primary dependent variable will be

presented for each dyad, including (a) visual analysis results, such as level, trend, and

stability; (b) means and ranges in each condition; and (c) Tau-U results. See Figure 5 for

the graph of the results across all three dyads.

Figure 5. Graph of the number of sentences written correctly and independently.

Dyad 1: Logan and Hannah. During the five baseline sessions, Logan did not write any sentences correctly. Data indicated a low and stable level with a zero-celerating trend across all baseline sessions. Following the introduction of the writing instructional package, data showed an immediate effect with a level and trend change. During the intervention sessions, data indicated a high and variable level with an accelerating trend. Logan averaged 2.47 sentences written correctly and independently during intervention (range = 2-3) per session. He met criterion within 17 sessions. Calculation of Tau-U comparing baseline and intervention conditions indicated a strong effect (Tau-U = 1.0). During the seven maintenance sessions, Logan maintained his performance writing 3 sentences independently and correctly each session.

Nine general education probe sessions were conducted during baseline, intervention, and maintenance conditions. Logan did not write any sentences correctly during the one general education probe conducted during baseline condition. He wrote all three sentences correctly during the three general education probes conducted during intervention condition. Logan wrote all three sentences correctly during the five general education probes conducted during maintenance condition.

Dyad 2: Blake and Landon. During the six baseline sessions, Blake did not write any sentences correctly. Data indicated a low and stable level with a zero-celerating trend across all baseline sessions. Following the introduction of intervention, data showed a delayed level and trend change. During intervention condition, data indicated a variable level with an accelerating trend. Blake wrote an average of 2.14 sentences correctly and independently during intervention (range = 0-3) per session. He met criterion within 29 sessions. Calculation of Tau-U comparing baseline and intervention conditions indicated

a strong effect (Tau-U = .93). He maintained his performance during maintenance phase writing an average of 2.83 sentences independently and correctly (range = 2-3).

Eight general education probe sessions were conducted during baseline and intervention conditions. Blake did not write any sentences correctly during the one general education probe conducted during baseline condition. He averaged 2.57 sentences written correctly during the seven general education probes conducted during intervention condition (range = 2-3).

Dyad 3: Ethan and Charlotte. During seven baseline sessions, Ethan did not write any sentences correctly. Data indicated a low and stable rate of responding across all baseline sessions. Following the introduction of intervention, data showed a delayed level and trend change. During intervention condition, data indicated a variable level with an accelerating trend. Ethan wrote an average of 1.50 sentences correctly and independently (range = 0-3) per session. He met criterion within 30 sessions. Calculation of Tau-U comparing baseline and intervention condition indicated a moderate effect (Tau-U = .90). He maintained his performance during maintenance phase writing an average of 2.80 sentences correctly and independently (range = 2-3).

Nine general education probe sessions were conducted during baseline and intervention conditions. Ethan did not write any sentences correctly during the two general education probes conducted during baseline condition. He averaged two sentences written correctly during the seven general education probes conducted during intervention condition (range = 0-3).

For the primary dependent variable, the weighted average comparing baseline and intervention condition for the three participants indicated a strong effect (Tau-U = .94).

Secondary Dependent Variable

The secondary dependent variable was the number of comprehension questions answered correctly by the students with MID. This dependent variable was measured with trial-by-trial recording. Three trials were presented each session. Each trial was recorded as a correct independent response (+) if the student answered the question correctly within 10 s or incorrect (−) if the student answered incorrectly or did not respond. In this section, the results for the secondary dependent variable will be presented for each dyad, including (a) visual analysis results, such as level, trend, and stability; (b) means and ranges in each condition; and (c) Tau-U results. See Figure 6 for the graph of the results across all three dyads.
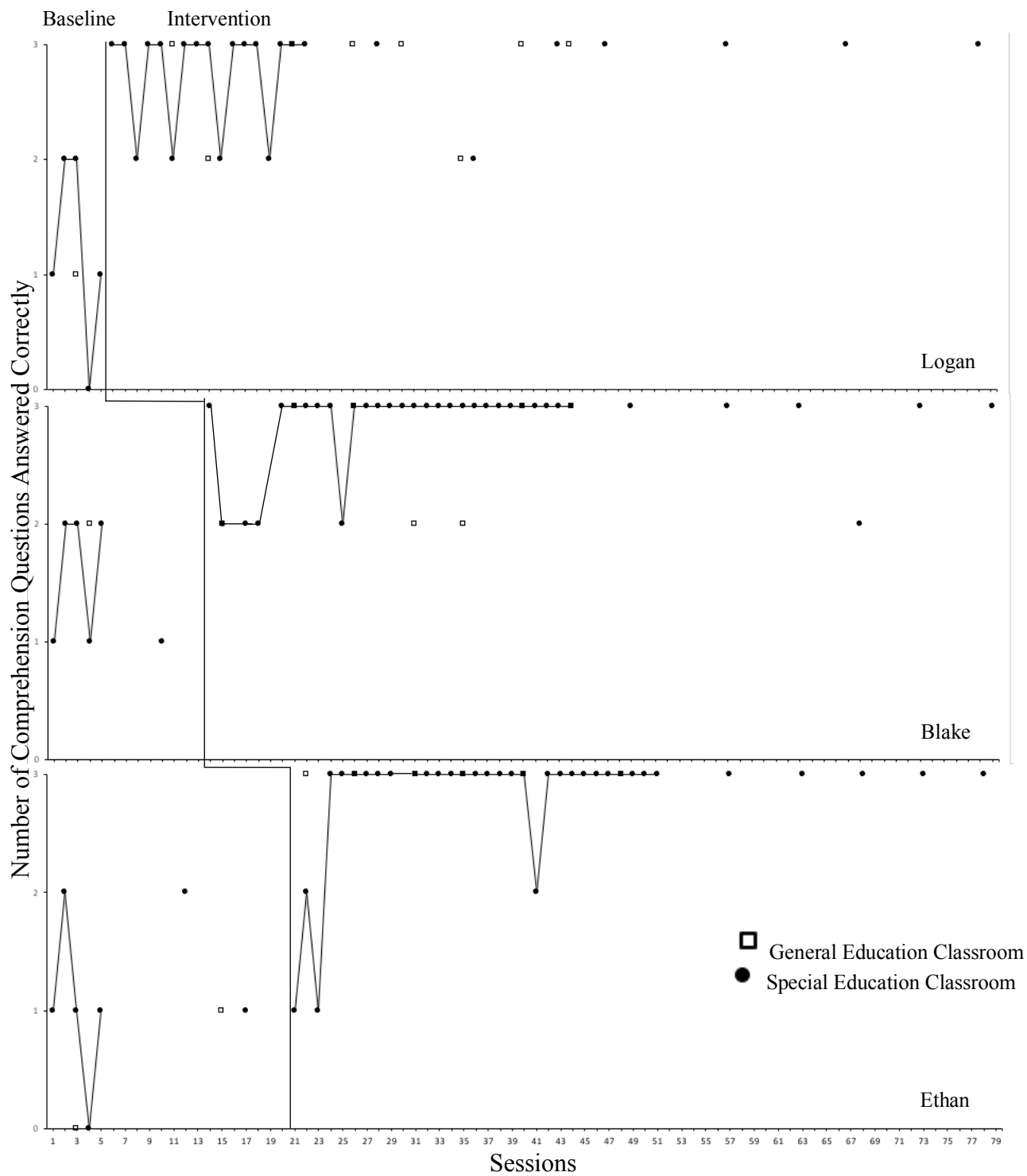
Figure 6. Graph of the number of comprehension questions answered correctly.

Dyad 1: Logan and Hannah. During the five baseline sessions, Logan answered an average of 1.2 comprehension questions correctly (range = 0-2). Data indicated a variable level with a zero-celerating trend across all baseline sessions. Following the introduction of intervention, data showed an immediate change in level and trend. During intervention, he answered an average of 2.76 comprehension questions correctly (range = 2-3). Data indicated a high level with an accelerating trend. Calculation of Tau-U comparing baseline and intervention conditions indicated a moderate effect (Tau-U = .91). During maintenance phase, Logan maintained his performance answering an average of 2.86 comprehension questions correctly (range = 2-3).

Nine general education probe sessions were conducted during baseline, intervention, and maintenance conditions. Logan answered one comprehension question correctly during the one general education probe conducted during baseline condition. He averaged 2.67 comprehension questions answered correctly during the three general education probes conducted during intervention condition (range = 2-3). Logan averaged 2.80 comprehension questions answered correctly during the five general education probes conducted during maintenance condition (range = 2-3).

Dyad 2: Blake and Landon. During the six baseline sessions, Blake answered an average of 1.50 comprehension questions correctly (range = 0-2). Data indicated a variable level with a zero-celerating trend across all baseline sessions. Following the introduction of intervention, data showed an immediate change in level and trend. During intervention, he answered an average of 2.86 comprehension questions correctly (range = 2-3). Data indicated a high level with an accelerating trend. Calculation of Tau-U comparing baseline and intervention conditions indicated a strong effect (Tau-U = .93).

During maintenance phase, Blake maintained his performance answering an average of 2.83 comprehension questions correctly (range = 2-3).

Eight general education probe sessions were conducted during baseline and intervention conditions. Blake answered two questions correctly during the one general education probe conducted during baseline condition. He averaged 2.70 comprehension questions answered correctly during the seven general education probes conducted during intervention condition (range = 2-3).

Dyad 3: Ethan and Charlotte. During the seven baseline sessions, Ethan answered an average of 1.14 comprehension questions correctly (range = 1-2). Data indicated a variable level with a zero-celerating trend. Following the introduction of intervention, data showed a delayed change in trend and level. During intervention, he answered an average of 2.80 comprehension questions correctly (range = 1-3). Data indicated high level and an accelerating trend. Calculation of Tau-U comparing baseline and intervention conditions indicated a moderate effect (Tau-U = .90). During maintenance phase, Ethan maintained his performance answering three questions correctly writing each session.

Nine general education probe sessions were conducted during baseline and intervention conditions. Ethan answered .50 comprehension questions answered correctly during the two general education probes conducted during baseline condition (range = 0-1). He answered all three comprehension questions correctly during the seven general education probes conducted during intervention condition.

For the secondary dependent variable, the weighted average comparing baseline and intervention condition for the three participants indicated a moderate effect (Tau-U = .91).

Word Knowledge Assessment

The three students with MID were assessed on their word knowledge before baseline condition began and following the completion of maintenance condition. Logan identified 70% of the words correctly before baseline condition and 76% of the words correctly following maintenance condition. Blake identified 44% of the words correctly before baseline condition and 79% of the words correctly following maintenance condition. Ethan identified 53% of the words correctly before baseline condition and 91% of the words correctly following maintenance condition.

Procedural Reliability

To verify the degree to which the intervention package was implemented as designed, the researcher and secondary observer collected procedural reliability data for a minimum of 30% of all sessions for each condition for each participant. Procedural reliability of the instructional package was calculated for all three session types using point-by-point procedures and then taking the number of observed behaviors divided by the number of planned behaviors and multiplying by 100 (Kazdin, 1978). Data indicated the mean procedural reliability across all participants was 96% (range = 88-100) during baseline, 95% (range = 93-100) during Intervention: Phase 1, 97% (range = 94-100) during Intervention: Phase 2, 98% (range = 96-100) during maintenance sessions, and 97% (range = 94-100) during general education probe sessions. Mean procedural reliability across all participants and conditions was 97% (range = 88-100).

Additionally, the secondary observer collected procedural reliability data for 100% of the peer training sessions. Procedural reliability for all three training session types was calculated using point-by-point procedures and then taking the number of observed behaviors divided by the number of planned behaviors and multiplying by 100 (Kazdin, 1978).

Dyad 1: Logan and Hannah. For Hannah, the researcher and secondary observer collected procedural reliability data during 60% (3 out of 5 sessions) of baseline sessions, 66% (2 out of 3 sessions) of Intervention: Phase 1 sessions, 53% (8 out of 15 sessions) of Intervention: Phase 2 sessions, 43% (3 out of 7 sessions) of maintenance sessions, and 33% (3 out of 9 sessions) of general education probe sessions. Mean procedural reliability in baseline condition was 97% (range = 92-100). Mean procedural reliability in Intervention: Phase 1 sessions was 96% (range = 93-100). Mean procedural reliability in Intervention: Phase 2 sessions was 98% (range = 94-100). Mean procedural reliability in maintenance sessions was 99% (range = 96-100). Mean procedural reliability in general education probe sessions was 99% (range = 96-100).

Dyad 2: Blake and Landon. For Landon, the researcher and secondary observer collected procedural reliability data during 40% (2 out of 5 sessions) of baseline sessions, 33% (1 out of 3 sessions) of Intervention: Phase 1 sessions, 32% (9 out of 28 sessions) of Intervention: Phase 2 sessions, 33% (2 out of 6 sessions) of maintenance sessions, and 38% (3 out of 9 sessions) of general education probe sessions. Mean procedural reliability in baseline condition was 92% (range = 88-100). Procedural reliability in the Intervention: Phase 1 session was 93% (range = 93-100). Mean procedural reliability in Intervention: Phase 2 sessions was 97% (range = 90-100). Mean procedural reliability in

maintenance sessions was 96% (range = 96-100). Mean procedural reliability in general education probe sessions was 96% (range = 92-100).

Dyad 3: Ethan and Charlotte. For Charlotte, the researcher and secondary observer collected procedural reliability data during 43% (3 out of 6 sessions) of baseline sessions, 50% (1 out of 2 sessions) of Intervention: Phase 1 sessions, 30% (7 out of 21 sessions) of Intervention: Phase 2 sessions, 50% (1 out of 2 sessions) of maintenance sessions, and 33% (3 out of 9 sessions) of general education probe sessions. Mean procedural reliability in baseline condition was 97% (range = 96-100). Procedural reliability in the Intervention: Phase 1 session was 96% (range = 93-100). Mean procedural reliability in Intervention: Phase 2 sessions was 97% (range = 94-100). Mean procedural reliability in maintenance sessions was 98% (range = 96-100). Mean procedural reliability in general education probe sessions was 96% (range = 92-100).

Substitute Peer: Lillian. For Lillian, the researcher and secondary observer collected procedural reliability data during 50% (1 out of 2 sessions) of baseline sessions, 100% (1 out of 1 session) of Intervention: Phase 1 sessions, 42% (5 out of 12 sessions) of Intervention: Phase 2 sessions, and 33% (1 out of 3 sessions) of maintenance sessions. Lillian did not implement general education probe sessions. Procedural reliability in the baseline session was 96%. Procedural reliability in the Intervention: Phase 1 session was 93%. Mean procedural reliability in Intervention: Phase 2 sessions was 96% (range = 94-100). Procedural reliability in the maintenance session was 96%.

Training Sessions

To verify the degree to which the training packages were implemented as designed, the secondary observer collected procedural reliability data during all 12 training sessions. Procedural reliability was 100% for all three training session types.

Interobserver Agreement

To assess dependent variability reliability, the researcher and secondary observer collected data for both dependent variables simultaneously but independently. IOA data was collected for a minimum of 30% of all sessions for each condition for each participant. IOA was calculated for both dependent variables using point-by-point procedures and then taking the number of agreements divided by the number of agreements plus disagreements and multiplying by 100 (Kazdin, 1978). Data indicated the mean IOA across all participants was 100% during baseline, 99% (range = 83-100) during intervention, 100% during maintenance, and 98% (range = 93-100) during general education probe sessions.

Dyad 1: Logan and Hannah. For Logan, the secondary observer collected IOA data during 60% (3 out of 5 sessions) of baseline sessions, 59% (10 out of 17 sessions) of intervention sessions, 43% (3 out of 7 sessions) of maintenance sessions, and 33% (3 out of 9 sessions) of general education probe sessions. IOA data indicated 100% agreement across all conditions for Logan.

Dyad 2: Blake and Landon. For Blake, the secondary observer collected IOA data during 50% (3 out of 6 sessions) of baseline sessions, 35% (10 out of 29 sessions) of intervention sessions, 33% (2 out of 6 sessions) of maintenance sessions, and 38% (3 out of 8 sessions) of general education probe sessions. IOA data indicated 100% agreement

during baseline, 99% (range = 83-100) agreement during intervention, 100% agreement during maintenance, and 100% agreement during general education probe sessions for Blake.

Dyad 3: Ethan and Charlotte. For Ethan, the secondary observer collected IOA data during 57% (4 out of 7 sessions) of baseline sessions, 30% (9 out of 30 sessions) of intervention sessions, 40% (2 out of 5 sessions) of maintenance sessions, and 33% (3 out of 9 sessions) of general education probe sessions. IOA data indicated 100% agreement during baseline, 100% agreement during intervention, 100% agreement during maintenance, and 94% (range = 83-100) agreement during general education probe sessions for Ethan.

Social Validity

Following the completion of the intervention, teacher and student perceptions of the writing instructional package were examined using social validity questionnaires and interviews. One general education teacher, the special education teacher, and two paraprofessionals completed the staff questionnaire. The questionnaire consisted of 10 questions using a Likert-type scale and two open ended questions. Table 7 shows the results of the questionnaires of the four staff members.

Table 7

Staff Social Validity Questionnaire Results

Survey Item	Mean	Range
1. Students with moderate and severe disability can learn adapted academic content in the general education classroom.	4.3	4-5
2. How effective was the writing instructional package?	4.7	4-5
3. How difficult was it to implement the writing instructional package?	3.5	3-4
4. How likely are you to implement the writing instructional package in the future?	3.8	3-4
5. How likely would you be to recommend the use of the writing instructional package to others?	4	4
6. How would you describe the effectiveness of the peer-implemented intervention for your students?	4.3	4-5
7. How difficult do you think it would be to implement the peer-implemented intervention in the future?	3.5	3-4
8. How likely are you to use peer-implemented interventions in the future?	4	4
9. How likely would you be to recommend the use of peer-implemented interventions in the future?	4	4
10. Overall, this intervention was beneficial for the students.	4.24	4-5

Overall, staff members viewed the writing instructional package positively. The staff members agreed or strongly agreed that students with MSD can learn academic content in the general education classroom. The staff members found the instructional package to be somewhat or completely effective and agreed or strongly agreed that it was beneficial for the students. They all reported that they are likely to use and recommend peer-implemented interventions in the future.

In addition to the item ratings, staff members provided written responses to two open-ended questions. The staff members wrote positively about the intervention helping to show what the students know about the social studies content and teaching them to construct sentences. Staff members also commented that supporting the students to interact with the peers without disabilities was a positive. Staff members reported that preparing the materials daily for the instructional package might prove to be challenging.

The three students with MID and the four students without disabilities were interviewed. Overall, the students reported feeling positively about the writing instructional package. The students with MID all reported that they would rather work with peers than adults in the future. Blake said that he liked working with Landon because he liked "to talk to him". When Logan was asked how he felt about working with Hannah he said, "I felt happy. Hannah is nice." Blake reported that the word bank helped him construct sentences.

The students without disabilities all reported feeling positively about the writing instructional package. When asked if she enjoyed working with Logan, Hannah said, "Yes, very much. We've been becoming close where we see each other in the hallway and be like, 'Hey, what's up? How are you doing?'" Landon was asked to describe how it was to work with Blake and replied, "It was fun. It was actually pretty fun. At first, I thought it was going to be boring but as I started doing it, it started to get better and I started liking it more." Landon reported starting to eat breakfast and lunch with Blake in the cafeteria and inviting him to his upcoming birthday party. All responded that they would like to continue to work with their partners during social studies class.

CHAPTER 5

DISCUSSION

The purpose of this study was to examine the effects of a writing instructional package on the independence and accuracy of sentences written about a historical artifact by students with MID. Further objectives of this study were to investigate if the writing instructional package led to increases in the accuracy of comprehension questions about the historical artifact answered by students with MID and to examine the social validity of the intervention and its effects. A multiple probe across dyads design was used to determine the effect of the impact of the independent variable (i.e., writing instructional package using targeted student peer tutoring, response prompting, sentence frames) on the dependent variables (i.e., sentences written, comprehension questions answered). The following research questions guided the investigation:

1. What is the effect of a writing instructional package (targeted student peer tutoring, response prompting, and sentence frames) on the construction of sentences related to an artifact written by students with MID?

2. What is the effect of a writing instructional package (targeted student peer tutoring, response prompting, and sentence frames) on the comprehension of grade-level social studies content for the students with MID?

3. How do the special education teacher, general education teachers, and paraprofessionals view the goals, procedures, and effects of the writing

instructional package (targeted student peer tutoring, response prompting, and

sentence frames) for the students with MID and the students without disabilities?

4. What are the views of the students with MID and the students without disabilities

toward working with one another and the writing instructional package (targeted

student peer tutoring, response prompting, and sentence frames)?

The findings of this study demonstrated a functional relation between the writing

instructional package and the number of sentences written correctly and independently by

the students with MID. Additionally, the results of this study indicated a functional

relation between the writing instructional package and the number of comprehension

questions answered correctly by the students with MID. Results also indicate the results

generalized to the general education social studies classes and maintained over time.

Finally, social validity measures indicated a high degree of satisfaction with the writing

instructional package and the outcomes by the teachers, paraprofessionals, students with

MID, and students without disabilities.

In general, these findings are consistent with previous studies on sentence

construction interventions showing that students with MID can learn to construct

sentences (Pennington, Flick, and Smith-Wehr, 2018; Pennington, Foreman, and Gurney,

2018; and Pennington and Rockhold, 2017). Findings are also consistent with previous

studies on targeted student peer tutoring demonstrating that this can be an effective and

practical alternative to adult support (Jimenez et al., 2012; Hudson et al., 2014; Hudson &

Browder, 2014). A discussion of more specific findings is presented below and is

organized by research question. A discussion of the limitations of the study, suggestions

for further research, and implications for practice follows.

Question 1

What is the effect of a writing instructional package (targeted student peer tutoring, response prompting, and sentence frames) on the construction of sentences related to an artifact written by students with MID?

Findings indicate a functional relation between the writing instructional package using targeted student peer tutoring, response prompting, and sentence frames and the number of sentences written correctly and independently by students with MID. All three students showed increases on the number of sentences written correctly and independently from baseline to intervention. Tau-U for Logan was 1.00 indicating a strong effect. Tau-U for Blake was 0.93 indicating a strong effect. Tau-U for Ethan was 0.90 indicating a strong effect. The weighted average for all three participants was 0.94 indicating a strong effect.

These findings are consistent with those of the writing interventions conducted by Pennington, Flick, and Smith-Wehr (2018); Pennington, Foreman, and Gurney (2018); and Pennington and Rockhold (2017). In these studies, teachers implemented an instructional package using response prompting and sentence frames to teach elementary and middle school students with MID to construct simple sentences (Pennington, Flick, & Smith-Wehr, 2018; Pennington, Foreman, & Gurney, 2018; Pennington and Rockhold, 2017). Similarly, the current study used an instructional package with response prompting and sentence frames to teach middle school students with MID to construct simple sentences. However, in the current study, same-age peers implemented the intervention. Similar to Pennington, Flick, and Smith-Wehr (2018) and Pennington and Rockhold (2017) students used an iPad® with selection-based software rather than

manual handwriting. In Pennington, Foreman, and Gurney (2018) and Pennington and Rockhold (2017), students were asked to write a sentence about a picture of a familiar animal. In Pennington, Flick, and Smith-Wehr (2018) students were taught to write three sentence formats: I want ____, I see ____, and The ___ is ___. This study extends the literature by teaching students to write about grade-level social studies content; thus, demonstrating that the intervention is an effective strategy to teach students to write sentences related to academic content.

Pennington, Flick, and Smith-Wehr (2018) and Pennington, Foreman, and Gurney (2018) used multiple probe across sentence type designs. The five students with MID met criterion across all three sentence types in an average of 22.6 sessions (range = 19-26) while the student with mild ID met criterion across all three sentence types in 14 sessions. Pennington and Rockhold (2017) used a multiple probe across participants design and the three students met criterion on the three sentence types in an average of 32.3 sessions (range = 9-67). In the current study, students met criterion in an average of 25 sessions (range = 17-30). This is similar to the five students with MID in Pennington, Flick, and Smith-Wehr (2018) and Pennington, Foreman, and Gurney (2018). This is also consistent with two of the students in Pennington and Rockhold (2017) who met criterion in 9 and 21 sessions. This suggests that teaching one sentence type to criterion as in Pennington, Flick, and Smith-Wehr (2018) and Pennington, Foreman, and Gurney (2018) is similarly efficient as teaching three sentence types simultaneously as in Pennington and Rockhold (2017) and the current study. This study extends previous research by demonstrating that peer implementers and teacher implementers are similarly efficient in delivering the intervention.

Question 2

What is the effect of a writing instructional package (targeted student peer tutoring, response prompting, and sentence frames) on the comprehension of grade-level social studies content for the students with MID?

Findings indicate a functional relation between the writing instructional package using targeted student peer tutoring, response prompting, and sentence frames and the number of comprehension questions answered correctly by students with MID. All three students showed increases on the number of questions answered correctly from baseline to intervention. Tau-U for Logan was 0.91 indicating a moderate effect. Tau-U for Blake was 0.93 indicating a strong effect. Tau-U for Ethan was 0.90 indicating a moderate effect. The weighted average for all three participants was 0.91 indicating a moderate effect.

Similar to Browder et al., (2007), Courtade et al. (2017), Hudson et al. (2014), Hudson and Browder (2014), Knight et al. (2015), Mims, Hudson, and Browder (2012), Mims, Lee et al. (2012), Schenning et al. (2013), and Wood et al. (2015), students in the current study were able to demonstrate understanding of grade-level content by independently answering text-dependent comprehension questions. The interventions in Courtade et al. (2017), Knight et al. (2015), and Mims, Hudson, and Browder (2012), were researcher-implemented; the interventions in Browder, Trela, and Jimenez (2009), Mims, Lee et al. (2012), and Wood et al. (2015) were teacher-implemented; and the intervention in Schenning et al. (2013) was implemented by a special education teacher and a paraprofessional. The interventions in Hudson et al. (2014), Hudson and Browder (2014), and the current study were implemented by same-age peers. These studies

utilized evidence-based systematic prompting procedures including system of least

prompts and constant time delay. Together, these studies demonstrate the ability of

students with MSID to learn to answer text-dependent comprehension questions related

to grade-level academic content with an array of implementers. The current study extends

this research by demonstrating that students with MID are able to increase their

comprehension of grade-level academic content after participating in a writing exercise.

This is the first study examining writing-to-learn with students with MID.

Question 3

How do the special education teacher, general education teachers, and paraprofessionals

view the goals, procedures, and effects of the writing instructional package (targeted

student peer tutoring, response prompting, and sentence frames) for the students with

MID and the students without disabilities?

Assessing the social validity of an intervention is necessary to determine if the

outcomes of a research study are of practical significance to key stakeholders (Wolf,

1978). In order for a researched intervention to become an evidence based practice, the

social validity of the intervention must be evaluated (Horner et al., 2005). It is important

to determine if the intervention is viewed to be useful and practical by parents, teachers,

and other stakeholders. As recommended by Wolf (1978), the social significance of the

goals, social appropriateness of the procedures, and the social importance of the

outcomes were evaluated. One general education social studies teacher, one special

education teacher, and two paraprofessionals completed a questionnaire following the

completion of maintenance phase.

Like in Carter et al. (2011), Hudson et al. (2014), Hudson and Browder (2014), and Jimenez et al. (2012), social validity measures indicate that school staff generally view interventions using targeted student peer tutoring positively. Questionnaires were used to measure staff social validity in Hudson et al. (2014), Hudson and Browder (2014), Jimenez et al. (2012), and the current study while individual interviews were used in Carter et al. (2011). All school staff in the previous studies (Carter et al. 2011; Hudson et al. 2014; Hudson and Browder, 2014; Jimenez et al. 2012) and the current study agreed that the interventions using targeted student peer tutoring were socially important, successful, and feasible in school settings. Importantly, Carter et al. (2011), Hudson et al. (2014), and the current study included the views of paraprofessionals in addition to the general education teachers and special education teachers. The current study extends the research related to social validity by replicating the views found in the studies using targeted student peer tutoring (Carter et al., 2011; Hudson et al., 2014; Hudson & Browder, 2014; Jimenez et al., 2012). None of the sentence writing instructional package interventions (Pennington, Flick, and Smith-Wehr, 2018; Pennington, Foreman, and Gurney, 2018; and Pennington and Rockhold, 2017) included social validity measures. The current study extends the research related to social validity by assessing the views of the writing instructional package for the first time.

Question 4

What are the views of the students with MID and the students without disabilities toward working with one another and the writing instructional package (targeted student peer tutoring, response prompting, and sentence frames)?

The views of the student participants were also assessed. Three students with MSID and four students without disabilities participated in individual interviews following the completion of maintenance phase.

Like in Carter et al. (2011), Hudson et al. (2014), Hudson and Browder (2014), and Jimenez et al. (2012), social validity measures indicate that students without disabilities and students with disabilities generally view interventions using targeted student peer tutoring positively. Questionnaires were used in Hudson et al. (2014), and Hudson and Browder (2014), Jimenez et al. (2012) while individual interviews were used in Carter et al. (2011) and the current study. Additionally, students without disabilities participated in a focus group in Jimenez et al. (2012). Generally, students without disabilities indicated that they liked being a peer tutor, they would like to be a peer tutor again, and they would recommend it to their friends. Importantly, Carter et al. (2011), Jimenez et al. (2012), and the current study included the views of the students with disabilities. Overall, students with disabilities indicated that they liked participating in targeted student peer tutoring and would like to do it again.

Limitations and Suggestions for Future Research

Several limitations and suggestions for future research should be considered when analyzing the results of the study. First, the small number of participants and the lack of three consecutive baseline sessions for all students prior to the introduction of the intervention limits the generalizability of the findings. While a small number of participants is a common limitation of research involving students with MSID, the established criteria for this study and the need for students to return the study consent forms exacerbated this issue. Six students with MSID that met the set criteria and the

teachers felt would benefit from the intervention were identified. However, of the six students identified, only four returned consent forms. Then, one student experienced a lengthy absence during baseline and intervention conditions. The small number of participants, while meeting the established minimum for a multiple probe across participants design, limits the generalizability of the results. Additionally, all participants with MSID were male. Horner et al. (2005) recommends that the criteria for evidence-based interventions include a minimum of five studies, with at least 22 participants in a minimum of three different geographical locations. Using this set of criteria, this investigation contributes one study with three participants in one geographical location. Also, the omission of three consecutive baseline data points prior to the introduction of the intervention for Blake and Ethan leads to questions of internal validity. Future research should replicate this intervention and include additional participants in different geographical locations and female students with MSID. Additionally, future research should examine this intervention for other students who are struggling with writing including students with high-incidence disabilities and students who are English learners. Also, future research using a multiple probe across participants design should ensure three consecutive sessions of baseline are conducted prior to the introduction of the intervention for all participants.

Second, a member of the research team (i.e., the researcher, the secondary observer) recorded participant response data during all sessions. Given the peer tutors' age, the complexity of the intervention, and the importance of recording accurate data, it was decided that the researcher and/or secondary observer would record participant responses during all sessions. Peer tutors were trained to make instructional decisions

quickly based on participant responses (e.g., which prompt level to deliver, when to deliver verbal praise). The procedural reliability data indicates that the peer tutors' implemented the intervention with high fidelity ($M = 98\%$, range = 88-100%) but because of the researcher and/or secondary observer's constant presence, the fidelity with which the peers would implement the session without the outside adult supervision is unknown and remains an area for future research to evaluate. Future research should examine if peers implement the intervention with high fidelity without the direct observation of a member of a research team.

A third limitation of this study is that this study was not fully conducted in the general education setting. Inclusion of students with MSID has benefits for students with MSID and students without disabilities (Brock et al., 2016; Carter et al., 2005; Carter et al., 2008; Carter et al., 2011). General education probes were conducted in two general education social studies classes when the general education teachers' plans indicated that all students were going to be participating in a writing activity during that class session. Ultimately, nine general education probes were conducted during baseline, intervention, and maintenance conditions for Logan, eight general education probes were conducted during baseline and intervention conditions for Blake, and nine general education probes were conducted during baseline and intervention conditions for Ethan. Data indicates that the students were able to demonstrate the same increase in skills in the general education classrooms as they were in the special education classroom. While these results are promising, future research should be conducted fully in the general education setting to ensure that the implementation of the writing instructional package is feasible and that the same results are achieved.

A fourth limitation is that that the researcher developed the materials for the study. While the researcher collaborated with the general education teachers and the special education teacher, ultimately the researcher adapted materials of the artifacts chosen for instruction in the general education setting and created the materials of the artifacts for the intervention sessions in the special education setting. The development of the materials for each session took a substantial amount of time. This is a concern with the feasibility of the intervention in a school setting given the limited amount of time the general education teachers and special education teacher have for planning. A potential solution to decrease the time burden on the teachers may be to have students without disabilities in the general education classes create the materials, which might have the added benefit of increasing their comprehension of the social studies content. Another possible solution to decrease the time burden might be to use one artifact and the related materials for more than one intervention session. Future research should examine the practicality and sustainability of the school staff adapting and developing the materials within the natural middle school environment.

The final limitation is that the peers without disabilities were trained by the researcher and not a school staff member. Because this is an intervention designed to be conducted in the school setting, it is important that all aspects of the intervention are feasible for members of the school staff to implement with fidelity. Future research should examine the feasibility and effectiveness of school staff implementing the training for the peers without disabilities.

Implications for Practice

Practitioners are in need of practical and effective strategies to teach writing and social studies content to students with MSID. The results of the current study offer several implications for practice. This study demonstrates that students with MID can learn to construct simple sentences related to social studies content. First, students with MSID are expected to participate and demonstrate progress on end-of-year assessments in writing (NCLB, 2011). Second, while federal legislation does not require students with MSID be assessed in the area of social studies, about half of the states voluntarily assess social studies content (Thurlow, Albus, & Lazarus, 2017). This study demonstrates that students with MID can learn to write sentences related to adapted grade-level social studies content.

Second, this study demonstrates that same-age peers without disabilities can be trained to deliver systematic instructional procedures for students with MSID. Since peers are abundant in public school settings, this can be a practical way to lessen direct adult support. Both students with MID and students without disabilities enjoyed participating in the intervention. Targeted student peer tutoring can be an effective strategy for students with MID in the special education or general education setting.

Third, this study suggests that students with MID can use writing-to-learn academic content. Students were able to answer comprehension questions about the artifacts with more accuracy during intervention condition than during baseline condition. This is an important finding because writing-to-learn is frequently used in secondary academic content classes for students without disabilities and students with mild

disabilities. It is important that students with MSID are given the support to participate in general education classroom activities as fully as possible.

Finally, practitioners are in need of interventions to teach a wide range of writing competencies to students with MSID. This study suggests that a writing instructional package using targeted student peer tutoring, response prompting, and sentence frames can effectively teach students with MID to construct simple sentences related to middle school social studies content. It is important that strategies are available to support students with MSID to write for a variety of purposes and acquire various writing competencies. It is also important that essential that effective strategies are taught to pre-service and in-service special education and general education teachers.

Conclusion

The current research relating to teaching writing to students with MSID is slim. Current mandates (IDEA, 2004; NCLB, 2011) call for assessment and progress in the general curriculum for all students. In order for students with MSID to be provided access to the general curriculum, practitioners need practical and effective strategies to provide instruction for students with MSID in all content areas. Although the research on teaching academic content to students with MSID is increasing, the research on teaching academic content to middle school students with MSID, teaching social studies content to students with MSID, teaching sentence construction to students with MSID, and using targeted student peer tutoring with students with MSID is not sufficient.

Future research should focus on including participants from different geographical locations and female students with MSID to ensure generalizability of the intervention. Additionally, future research should be conducted fully in the general

education setting to more fully examine the practicality and effectiveness of the intervention in an inclusive setting. Future research should examine if the fidelity of the implementation of the writing instructional package of the peer remains high if a member of the research team is not directly observing each session. It is also important that in future research studies, school staff develop the instructional materials and train the peers to more fully examine the practicality of the intervention in a school setting.

The purpose of this study was to determine the effects of a writing instructional package using targeted student peer tutoring, response prompting, and sentence frames on the construction of sentences and the answering of comprehension questions related to grade-level social studies content of students with MID. Findings indicate that the intervention was successful for the middle school students with MID in this investigation. Replications of this intervention may lead to the development of an evidence-based practice that practitioners can use to teach writing in academic content areas to students with MSID.

REFERENCES

Ahlgrim-Delzell, L., Browder, D. M., Wood, L., Stanger, C., Preston, A. I., & Kemp-
     Inman, M. M. (2016). Systematic instruction of phonics skills using an iPad for
     students with developmental disabilities who are AAC users. *Journal of Special*
     Education, 50(2), 86-97.

Allsopp, D. H. (1997). Using classwide peer tutoring to teach beginning algebra problem-
     solving skills in heterogeneous classrooms. *Remedial and Special Education,*
     18(6), 367-379.

Armitage, P., Berry, G., & Matthrews, J. N. (2002). *Statistical Methods in Medical*
     Research, 4th ed. Oxford: Blackwell Science.

Asmus, J. M., Carter, E. W., Moss, C. K., Born, T. L., Vincent, L. B., Lloyd, B. P., &
     Chung, Y.-C. (2016). Social outcomes and acceptability of two peer-mediated
     interventions for high school students with severe disabilities: A pilot study.
     Inclusion, 4(4), 195-214.

Ayers, K. M., Langone, J., Boon, R. T., & Norman, A. (2006). Computer-based
     instruction for purchasing skills. *Education and Training in Developmental*
     Disabilities, 41(3), 253-263.

Bangert-Drowns, R. L., Hurley, M. M., & Wilkinson, B. (2004). The effects of school-
     based writing-to-learn interventions on academic achievement: A meta-analysis.
     Review of Educational Research, 74(1), 29-58.

Bazerman, C. (2016). What do sociocultural studies of writing tell us about learning to

    write? In C. A. MacArthur, S. Graham, & J. Fitzgerald (Eds.) *Handbook of*

    writing research, 2nd ed. (pp. 11-23). New York, NY: The Guilford Press.

Betz, A. M., Higbee, T. S., Kelley, K. N., Sellers, T. P., & Pollard, J. S. (2011).

    Increasing response variability of mand frames with script training and extinction.

    Journal of Applied Behavior Analysis, 44(2), 357-362.

Billingsley, F., White, O. R., & Munson, R. (1980). Procedural reliability: A rationale

    and an example. *Behavioral Assessment, 2*(2), 229-241.

Bond, R., & Castagnera, E. (2006). Peer supports and inclusive education: An

    underutilized resource. *Theory into Practice, 45*(3), 224-229.

Borckardt, J. J., Nash, M. R., Murphy, M. D., Moore, M., Shaw, D., & O'Neill, P.

    (2008). Clinical practice as natural laboratory for psychotherapy research: A

    guide to case-based time-series analysis. *American psychologist, 63*(2), 77-95.

Bowman-Perrott, L., Davis, H., Vannest, K., Williams, L., Greenwood, C., & Parker, R.

    (2013). Academic benefits of peer tutoring: A meta-analytic review of single-case

    research. *School Pyschology Review, 42*(1), 39-55.

Brock, M. E., Biggs, E. E., Carter, E. W., Cattey, G. N., & Raley, K. S. (2016).

    Implementation and generalization of peer support arrangements for students with

    severe disabilities in inclusive classrooms. *The Journal of Special Education,*

    49(4), 221-232.

Broer, S. M., Doyle, M. B., & Giangreco, M. F. (2005). Perspectives of students with

    intellectual disabilities about their experiences with paraprofessional support.

    Exceptional Children, 71(4), 415-430.

Browder, D. M., Jimenez, B. A., & Trela, K. (2012). Grade-aligned math instruction for secondary students with moderate intellectual disability. *Education and Training in Autism and Developmental Disabilities, 47*(3), 373-388.

Browder, D. M., & Spooner, F. (2014). *More language arts, math, and science for students with severe disabilities.* New York, NY: Brooks.

Browder, D. M., & Spooner, F. (2011). *Teaching students with moderate and severe disabilities*. New York, NY: Guilford Press.

Browder, D. M., Spooner, F., Ahlgrim-Delzell, L., Harris, A. A., & Wakeman, S. Y. (2008). A comprehensive review of research on teaching math to students with significant cognitive disabilities. *Exceptional Children, 74*(4), 407-432.

Browder, D., Spooner, F., Courtade, G., & Wood, L. (in press). Social studies. In D. M. Browder, F. Spooner, & G. C. Courtade (Eds.), *Teaching students with moderate and severe disabilities* (2nd ed.). Baltimore, MD: Paul H. Brookes Publishing Co.

Browder, D. M., Trela, K., Courtade, G. R., Jimenez, B. A., Knight, V., & Flowers, C. (2012). Teaching mathematics and science standards to students with moderate and severe developmental disabilities. *Journal of Special Education, 46*(1), 26-35.

Browder, D. M., Trela, K., & Jimenez, B. (2007). Training teachers to follow a task analysis to engage middle school students with moderate and severe developmental disabilities in grade-appropriate literature. *Focus on Autism and Other Developmental Disabilities, 22*(4), 206-219.

Browder, D. M., Wakeman, S., & Flowers, C. P. (2006). Assessment of progress in the general curriculum for students with disabilities. *Theory into Practice, 45*(3), 249-259.

Browder, D. M., Wakeman, S. Y., Spooner, F., Ahlgrim-Delzell, L., & Algozzine, B. (2006). Research on reading instruction for individuals with significant cognitive disabilities. *Exceptional Children, 72*(4), 392-408.

Carter, E. W., Asmus, J., & Moss, C. K. (2013). Fostering friendships: Supporting relationships among youth with and without developmental disabilities. *The Prevention Researcher, 20*(2), 14-18.

Carter, E. W., Cushing, L. S., Clark, N. M., & Kennedy, C. H. (2005). Effects of peer support interventions on students' access to the general curriculum and social interactions. *Research and Practice for Persons with Severe Disabilities, 30*(1), 15-25.

Carter, E. W., Cushing, L. S., & Kennedy, C. H. (2009). *Peer support strategies for improving all students' social lives and learning.* Baltimore, MD: Brookes.

Carter, E. W., & Kennedy, C. H. (2006). Promoting access to the general curriculum using peer support strategies. *Research and Practice for Persons with Severe Disabilities, 31*(4), 284-292.

Carter, E. W., Moss, C. K., Hoffman, A., Chung, Y.-C., & Sisco, L. (2011). Efficacy and social validity of peer support arrangements for adolescents with disabilities. *Exceptional Children, 78*(1), 107-125.

Carter, E. W., Sisco, L. G., Brown, L., Brickham, D., & Al-Khabbaz, Z. A. (2008). Peer interactions and academic engagement of youth with developmental disabilities in inclusive middle and high school classrooms. *American Journal on Mental Retardation, 113*(6), 479-494.

Carter, E. W., Sisco, L. G., Melekoglu, M. A., & Kurkowski, C. (2007). Peer supports as an alternative to individually assigned paraprofessionals in inclusive high school classrooms. *Research and Practice for Persons with Severe Disabilities, 32*(4), 213-227.

Catts, H. W., Fey, M. E., Zhang, X., & Tomblin, J. B. (1999). Language basis of reading and reading disabilities: Evidence from a longitudinal investigation. *Scientific Studies of Reading, 3*, 331-361.

Chan, J. M., Lang, R., Rispoli, M., O'Reilly, M., Sigafoos, J. & Cole, H. (2009). Use of peer-mediated interventions in the treatment of autism spectrum disorders: A systematic review. *Research in Autism Spectrum Disorders, 3*, 876-889.

Collins, B. C., Branson, T. A., Hall, M. (1995). Training generalized reading of cooking product labels to adolescents with mental disabilities through the use of key words taught by per tutors. *Education and Training in Mental Retardation and Developmental Disabilities, 30*(1), 65-75.

Collins, B. C., Branson, T. A., Hall, M., & Rankin, S. W. (2001). Teaching secondary students with moderate disabilities in an inclusive academic classroom setting. *Journal of Development and Physical Disabilities, 13*, 41-59.

Connelly, V., & Dockrell, J. (2016). Writing development and instruction for students with learning disabilities: Using diagnostic categories to study writing difficulties. In C. A. MacArthur, S. Graham, & J. Fitzgerald (Eds.), *Handbook of writing research, 2nd ed.* (pp. 349-363). New York, NY: The Guilford Press.

Cooper, H., Heron, T. & Heward, (1987). Applied behavior analysis. Columbus, OH: Prentice-Hall.

Cooper, J. O., Heron, T. E. & Heward, W. L. (2007). *Applied behavior analysis* (2ⁿᵈ ed.) Upper Saddle River, NJ: Pearson.

Copeland, S. R., & Keefe, E.B. (2016). Teaching reading and literacy skills to students with intellectual disability. In M. L. Wehmeyer and K. A. Shogren (Eds.) *Handbook of research-based practices for educating students with intellectual disability* (pp. 320-342). New York, NY: Routledge.

Courtade, G. R., Browder, D. M., Spooner, F., & DiBiase, W. (2010). Training teachers to use an inquiry-based task analysis to teach science to students with moderate and severe disabilities. *Education and Training in Autism and Developmental Disabilities, 45*(3), 378-399.

Courtade, G. R., Gurney, B. N., & Carden, R. (2017). Using read-alouds of grade-level social studies text and systematic prompting to promote comprehension for students with severe disabilities. *Journal of Social Studies Research, 41*, 291-301.

De La Paz, S. (2005). Effects of historical reasoning instruction and writing strategy mastery in culturally and academically diverse middle school classrooms. *Journal of Educational Psychology, 97*(2), 139-156.

De La Paz, S., & Felton, M. K. (2010). Reading and writing from multiple source documents in history: Effects of strategy instruction with low to average high school writers. *Contemporary Educational Psychology, 35*(3), 174-192.

De La Paz, S., & Graham, S. (2002). Explicitly teaching strategies, skills, and knowledge: Writing instruction in middle school classrooms. *Journal of Educational Psychology, 94*, 687-698.

Delquadri, J. C., Greenwood, C. R., Stretton, K., & Hall, R. V. (1983). The peer tutoring

    spelling game: A classroom procedure for increasing opportunity to respond and

    spelling performance. *Education and Treatment of Children, 6*(3), 225-239.

Delquadri, J. C., Greenwood, C. R., Whorton, D., Carta, J. J., & Hall, R. V. (1986).

    Classwide peer tutoring. *Exceptional Children, 52*(6), 535-542.

Dockrell, J. E., Ricketts, J., Charman, T., & Lindsay, G. (2014). Exploring writing

    products in students with language impairments and autism spectrum disorders.

    Learning and Instruction, 32, 81-90.

Dunn, M. E., Shelnut, J., Ryan, J. B., & Katsiyannis, A. (2017). A systematic review of

    peer-mediated interventions on the academic achievement of students with

    emotional/behavioral disorders. *Education and Treatment of Children, 40*(4), 497-

    524.

Erbas, D., Turan, Y., Ozen, A., & Halle, J. W. (2006). Effect of an adapted "cover write"

    method to word-naming and spelling to students with developmental disabilities

    in Turkey. *Education and Training in Developmental Disabilities, 41*(4), 357-364.

Feldman, R., Carter, E. W., Asmus, J., & Brock, M. E. (2016). Presence, proximity, and

    peer interactions of adolescents with severe disabilities in general education

    classrooms. *Exceptional Children, 82*(2), 192-208.

Ferretti, R. P., MacArthur, C. A., & Okolo, C. M. (2001). Teaching for historical

    understanding in inclusive classrooms. *Learning Disability Quarterly, 24*, 59-71.

Fisher, M., & Pleasants, S. L. (2012). Roles, responsibilities, and concerns of

    paraeducators: Findings from a statewide survey. *Remedial and Special

    Education, 33*(5), 287-297.

Fitchett, P. G., Heafner, T. L., & Lambert, R. G. (2014). Examining elementary social

  studies marginalization: A multilevel model. *Educational Policy, 28*(1), 40-68.

Fletcher, D., Boon, R. T., & Cihak, D. F. (2010). Effects of the TOUCHMATH program

  compared to a number line strategy to teach addition facts to middle school

  students with moderate intellectual disabilities. *Education and Training in Autism*

  and Developmental Disabilities, 45(3), 449-458.

Ganz, J. B., Heath, A. K., Lund, E. M., Carmargo, S. P. H., Rispoli, M. J., Boles, M., &

  Plaisance, L. (2012). Effects of peer-mediated implementation of visual scripts in

  middle school. *Behavior Modification, 36*(3), 378-398.

Gast, D. L. (2014). General factors in measurement and evaluation. In D. L. Gast & J. R.

  Ledford (Eds.), *Single case research methodology: Applications in special*

  education and behavioral sciences (pp. 85-104). New York, NY: Routledge.

Gast, D. L., Lloyd, B. P. & Ledford, J. R. (2014). Multiple baseline and multiple probe

  designs. In D. L. Gast & J. R. Ledford (Eds.), *Single case research methodology:*

  Applications in special education and behavioral sciences (pp. 251-296). New

  York, NY: Routledge.

Gerber, S. B., Finn, J. D., Achilles, C. M., & Boyd-Zaharias, J. (2001). Teacher aides and

  students' academic achievement. *Educational Evaluation and Policy Analysis,*

  23(2), 123-143.

Giangreco, M. F. (2010). One-to-one paraprofessionals for students with disabilities in

  inclusive classrooms: Is conventional wisdom wrong? *Intellectual and*

  Developmental Disabilities, 48(1), 1-13.

Gillespie, A., Graham, S., & Kiuhara, S. (2014). High school teachers use of writing to
support students' learning: A national survey. *Reading and Writing, 27*, 1043-
1072.

Godsey, J. R., Schuster, J. W., Lingo, A. S., Collins, B. C., & Kleinert, H. L. (2008).
Peer-implemented time delay procedures on the acquisition of chained tasks by
students with moderate and severe disabilities. *Education and Training in
Developmental Disabilities, 43*(1), 111-122.

Graham, S. & Harris, K. R. (2009). Almost 30 years of writing research: Making sense of
it all with The Wrath of Khan. *Learning Disabilities Research & Practice, 24*(2),
58-68.

Graham, S., Harris, K. R., & Chambers, A. B. (2016). Evidence-based practice and
writing instruction: A review of reviews. In C. A. MacArthur, S. Graham, & J.
Fitzgerald (Eds.), *Handbook of writing research, 2nd ed.* (pp. 211-226). New
York, NY: The Guilford Press.

Graham, S. & Hebert, M. (2011). Writing to read: A meta-analysis of the impact of
writing and writing instruction on reading. *Harvard Educational Review, 81*(4),
710-744.

Graham, S. & Perin, D. (2007a). A meta-analysis of writing instruction for adolescent
students. *Journal of Educational Psychology, 99*(3), 445-476.

Graham, S. & Perin, D. (2007b). *Writing next: Effective strategies to improve writing of
adolescents in middle and high school.* Washington, DC: Alliance for Excellence
in Education.

Green, G. (2001). Behavior analytic instruction for learners with autism: Advances in

stimulus control technology. *Focus on Autism and Other Developmental*

Disabilities, 16(2), 72-85.

Horner, R. D., & Baer, D. M. (1978). Multiple-probe technique: A variation of the

multiple baseline. *Journal of Applied Behavior Analysis, 11*(1), 189-196.

Horner, R. H., Carr, E. G., Halle, J., McGee, G., Odom, S., & Wolery, M. (2005). The

use of single-subject research to identify evidence-based practice in special

education. *Exceptional Children, 71*(2), 165-179.

Hudson, M. E., & Browder, D. M. (2014). Improving listening comprehension responses

for students with moderate intellectual disability during literacy class. *Research*

and Practice for Persons with Severe Disabilities, 39(1), 11-29.

Hudson, M. E., Browder, D. M., Jimenez, B. A. (2014). Effects of a peer-delivered

system of least prompts intervention and adapted science read-alouds on listening

comprehension for participants with moderate intellectual disability. *Education*

and Training in Autism and Developmental Disabilities, 49(1), 60-77.

Individuals with Disabilities Education Act, 20 U.S.C. § 1400 (2004).

Jameson, J. M., McDonnell, J., Johnson, J. W., Riesen, T., & Polychronis, S. (2007). A

comparison of one-to-one embedded instruction in the general education

classroom and one-to-one massed practice instruction in the special education

classroom. *Education and Treatment of Children, 30*(1), 23-44.

Jameson, J. M., McDonnell, J., Polychronis, S., & Riesen, T. (2008). Embedded, constant

time delay instruction by peers without disabilities in general education

classrooms. *Intellectual and Developmental Disabilities, 46*(5), 346-363.

Jimenez, B. A., Browder, D. M., & Courtade, G. R. (2009). An exploratory study of self-directed science concept learning by students with moderate intellectual disabilities. *Research and Practice for Persons with Severe Disabilities, 34*(2), 33-46.

Jimenez, B. A., Browder, D. M., Spooner, F., & DiBiase, W. (2012). Inclusive inquiry science using peer-mediated embedded instruction for students with moderate intellectual disability. *Exceptional Children, 78*(3), 301-317.

Joseph, L. M., & Konrad, M. (2009). Teaching students with intellectual or developmental disabilities to write: A review of the literature. *Research in Developmental Disabilities, 30*, 1-19.

Kaderavek, J. N., & Rabidoux, P. (2004). Interactive to independent literacy: A model for designing literacy goals for children with atypical communication. *Reading and Writing Quarterly, 20*(3), 237-260.

Kame'enui, E. J. & Simmons, D. C. (1990). Designing instructional strategies: The prevention of academic learning problems. Columbus, OH: Merrill.

Kamps, D., Locke, P., Delquadri, J., Hall, R. V. (1989). Increasing academic skills of students with autism using fifth grade peers as tutors. *Education and Treatment of Children, 12*(1), 38-51.

Kazdin, A. E. (1978) Methodological and interpretive problems of single-case experimental designs. *Journal of Consulting and Clinical Psychology, 46,* 629-642.

Klein, P. D., & Meichi Yu, A. (2013). Best practices in writing to learn. In S. Graham, C. A. MacArthur, & J. Fitzgerald (Eds.), *Best practices in writing instruction, 2nd ed.* (pp. 166-192). New York, NY: The Guilford Press.

Knight, V. F., Spooner, F., Browder, D. M., Smith, B. R., & Wood, C. L. (2013). Using systematic instruction and graphic organizers to teach science concepts to students with autism spectrum disorders and intellectual disabilities. *Focus on Autism and Other Developmental Disabilities, 28*(2), 115-126.

Knight, V. F., Wood, C. L., Spooner, F., Browder, D. M., & O'Brien, C. P. (2015). An exploratory study using science eTexts with students with autism spectrum disorder. *Focus on Autism and Other Developmental Disabilities, 30*(2), 86-99.

Kohl, F. L., Moses, L. G., & Stettner-Eaton, B. A. (1983). The results of teaching fifth and sixth graders to be instructional trainers with students who are severely handicapped. *The Journal of the Association for Persons with Severe Handicaps, 8,* 33-40.

Konrad, M., Trela, K., & Test, D. W. (2006). Using IEP goals and objectives to teach paragraph writing to high school students with physical and cognitive disabilities. *Education and Training in Developmental Disabilities, 41*(2), 111-124.

Kourea, L., Cartledge, G., & Musti-Rao, S. (2007). Improving the reading skills of urban elementary students through total class peer tutoring. *Remedial and Special Education, 28*(2), 95-107.

Koury, M., & Browder, D. M. (1986). The use of delay to teach sight words by peer tutors classified as moderately mentally retarded. *Education and Training of the Mentally Retarded, 21*(4), 252-258.

Kratochwill, T. R., Hitchcock, J. H., Horner, R. H., Levin, J. R., Odom, S. L., Rindskopf, D. M., & Shadish, W. R. (2010). Single-case designs technical documentation. What Works Clearinghouse.

Kurth, J. A., Morningstar, M. E., & Kozleski, E. B. (2014). The persistence of highly restrictive special education placements for students with low-incidence disabilities. *Research and Practice for Persons with Severe Disabilities, 39*(3), 227-239.

Lane, J. D., & Gast, D. L. (2014). Visual analysis in single case experimental design studies: Brief review and guidelines. *Neuropsychological rehabilitation*, *24*(3-4), 445-463.

Lee, D. L., & Laspe, A. K. (2003). Using high-probability request sequences to increase journal writing. *Journal of Behavioral Education, 12*(4), 261-273.

Maheady, L., Sacca, M. K., & Harper, G. F. (1988). Classwide peer tutoring with mildly handicapped high school students. *Exceptional Children, 55*(1), 52-59.

Mason, L. H., Davidson, M. D., Hammer, C. S., Miller, C. A., & Glitting, J. J. (2013). Knowledge, writing, and language outcomes for a reading comprehension and writing intervention. *Reading and Writing, 26*(7), 1133-1158.

Mastropieri, M. A., Scruggs, T. E., & Berkeley, S. (2007). Peers helping peers. *Educational Leadership, 64*(5), 54-58.

McDonnell, J., Johnson, J. W., Polychronis, S., Riesen, T., Jameson, M., & Kercher, K. (2006). Comparison of one-to-one embedded instruction in general education classes with small group instruction in special education classes. *Education and Training in Developmental Disabilities, 41*(2), 125.

McMaster, K. L., Fuchs, D., & Fuchs, L. S. (2006). Research on peer-assisted learning strategies: The promise and limitations of peer-mediated instruction. *Reading & Writing Quarterly, 22*(1), 5-25.

Miltenberger, R. (2016). *Behavior modification: Principles and procedures* (6th ed.). Belmont, CA: Wadsworth Publishing.

Mims, P. J., Hudson, M. E., & Browder, D. M. (2012). Using read-alouds of grade-level biographies and systematic prompting to promote comprehension for students with moderate and severe developmental disabilities. *Focus on Autism and Other Developmental Disabilities, 27*(2), 67-80.

Mims, P. J., Lee, A., Browder, D. M., Zakas, T. L., Flynn, S. (2012). Effects of a treatment package to facilitate English/language arts learning for middle school students with moderate to severe disabilities. *Education and Training in Autism and Developmental Disabilities, 47*(4), 414-425.

Mims, P. J., Stanger, C., Pennington, R., White, W., Sears, J., Stricker, N. (2017). Opinion paragraph writing intervention for students with significant disability. *Assistive Technology Outcomes and Benefits, 11*, 29-46.

Miracle, S. A., Collins, B. C., Schuster, J. W., & Grisham-Brown, J. (2001). Peer- versus teacher-delivered instruction: Effects on acquisition and maintenance. *Education and Training in Mental Retardation and Developmental Disabilities, 36*(4), 373-385.

National Council for the Social Studies. (2010). *National curriculum standards for social studies: A framework for teaching, learning, and assessment.* Silver Springs, MD: National Council for the Social Studies.

National Council for the Social Studies. (2017). Powerful, purposeful pedagogy in

    elementary school social studies. Retrieved from

    https://www.socialstudies.org/positions/powerfulandpurposeful

No Child Left Behind Act of 2001, P.L. 107-110, 20 U.S.C. § 6319 (2011).

Okilwa, N. S., & Shelby, L. (2010). The effects of peer tutoring on academic

    performance of students with disabilities in grades 6 through 12: A synthesis of

    the literature. *Remedial and Special Education, 31*(6), 450-463.

Parker, R I., Vannest, K. J., Davis, J. L., & Sauber, S. B. (2011). Combining nonoverlap

    and trend for single-case research: Tau-*U. Behavior Therapy, 42*, 284-299.

Parker, W. C. (2015). Social studies education at eC21. In W. C. Parker (Ed.), *Social*

    studies today: Research and practice (pp. 3-14). New York, NY: Routledge.

Pennington, R. C., Ault, M. J., Schuster, J. W., & Sanders, A. (2010). Using simultaneous

    prompting and computer-assisted instruction to teach story writing to students

    with autism. *Assistive Technology Outcomes and Benefits, 7*(1), 24-38.

Pennington, R. C., Collins, B. C., Stenhoff, D. M., Turner, K., & Gunselman, K. (2014).

    Using simultaneous prompting and computer-assisted instruction to teach

    narrative writing skills to students with autism. *Education and Training in Autism*

    and Developmental Disabilities, 49(3), 396-414.

Pennington, R. C., & Delano, M. (2014). Teaching written expression to students with

    moderate and severe disabilities. In D. M. Browder & F. Spooner (Eds.), *More*

    Language Arts, Math, and Science for Students with Severe Disabilities (pp. __-

    __). Baltimore, MD: Paul H. Brookes Publishing Co.

Pennington, R. C., Delano, M., & Scott, R. (2014). Improving cover-letter writing skills of individuals with intellectual disabilities. *Journal of Applied Behavior Analysis, 47*, 204-208.

Pennington, R. C., Flick, A., & Smith-Wehr, K. (2018). The use of response prompting and frames for teaching sentence writing to students with moderate intellectual disabilities. *Focus on Autism and Other Developmental Disabilities, 33*(3), 142-149.

Pennington, R. C., Foreman, L. H., & Gurney, B. N. (2018). An evaluation of procedures for teaching students with moderate and severe disabilities to write sentences. *Remedial and Special Education, 39*(1), 27-38.

Pennington, R. C. & Koehler, M. (2017). Effects of modeling, story templates, and self-graphing in the use of story elements by students with moderate intellectual disability. *Education and Training in Autism and Developmental Disabilities, 52*(3), 280-290.

Pennington, R. C., & Rockhold, J. (2017). Brief report: An evaluation of an instructional package for teaching sentence construction to students with ASD. *Journal of Autism and Developmental Disorders, 48*(1), 301-306.

Pennington, R. C., Saadatzi, M., Welch, K. C., & Scott, R. (2014). An investigation of robot delivered instruction to teach texting to students with intellectual disabilities. *Journal of Special Education Technology, 29*, 49-58.

Purrazzella, K. & Mechling, L. C. (2013). Evaluation of manual spelling, observational and incidental learning using computer-based instruction with a tablet PC, large

screen projector, and a forward chaining procedure. *Education and Training in Autism and Developmental Disabilities, 48*(2), 218-235.

Rakap, S. (2015). Effect sizes as result interpretation aids in single-subject experimental research: description and application of four nonoverlap methods. *British Journal of Special Education, 42*(1), 11-33.

Rispoli, M., Lang, R., Neely, L., Hutchins, N., Camargo, S., Davenport, K., & Goodwyn, F. (2013). A comparison of within- and across-activity choices for reducing challenging behavior in children with autism spectrum disorders. *Journal of Behavioral Education, 22*, 66-83.

Root, J., Saunders, A., Spooner, F., & Brosh, C. (2017). Teaching personal finance mathematical problem solving to individuals with moderate intellectual disability. *Career Development and Transition for Exceptional Individuals, 40*(1), 5-14.

Ruwe, K., McLaughlin, T. F., Derby, M. K., & Johnson, J. (2011). The multiple effects of direct instruction flashcards on sight word acquisition, passage reading, and errors for three middle school students with intellectual disabilities. *Journal of Developmental and Physical Disabilities, 23*(3), 241-255.

Ryan, J. B., Reid, R., & Epstein, M. (2004). Peer-mediated intervention studies on academic achievement for students with EBD. *Remedial and Special Education, 25*(6), 330-341.

Saddler, B. (2013). Best practices in sentence construction skills. In S. Graham, C. A. MacArthur, & J. Fitzgerald (Eds.), *Best practices in writing instruction, 2nd ed.* (pp. 238-256). New York, NY: The Guilford Press.

Schenning, H, Knight, V., & Spooner, F. (2013). Effects of structured inquiry and

    graphic organizers on social studies comprehension by students with autism

    spectrum disorders. *Research in Autism Spectrum Disorders, 7*, 526-540.

Schmandt-Besserat, D., & Erard, M. (2008). Origins and forms of writing. In C.

    Bazerman (Ed.), *Handbook of research on writing: History, society, school,*

    individual, text (pp. 7-22). New York, NY: Taylor & Francis.

Scruggs, T. E., Mastropieri, M. A., & Casto, G. (1987). The quantitative syntheses of

    single-subject research: Methodology and validation. *Remedial and Special*

    Education, 8, 24-33.

Shukla, S., Kennedy, C. H., & Cushing, L. S. (1998). Adult influence on the participation

    of peers without disabilities in peer support programs. *Journal of Behavioral*

    Education, 8(4), 397-413.

Shukla, S., Kennedy, C. H., & Cushing, L. S. (1999). Intermediate school students with

    severe disabilities: Supporting their social participation in general education

    classrooms. *Journal of Positive Behavior Interventions, 1*(3), 130-140.

Spooner, F., Knight, V., Browder, D., Jimenez, B., & DiBiase, W. (2011). Evaluating

    evidence-based practice in teaching science content to students with severe

    developmental disabilities. *Research and Practice for Persons with Severe*

    Disabilities, 36, 62-75.

Staples, A. & Edmister, E. (2012). Evidence of two theoretical models observed in young

    children with disabilities who are beginning to learn to write. *Topics in Language*

    Disorders, 32(4), 319-334.

Stenhoff, D. M., & Lignugaris/Kraft, B. (2007). A review of the effects of peer tutoring on students with mild disabilities in secondary settings. *Exceptional Children, 74*(1), 8-30.

Sturm, J. (2012). An enriched writers' workshop for beginning writers with developmental disabilities. *Topics in Language Disorders, 32*, 335-360.

Tanji, T., Takahashi, K., & Noro, F. (2013). Teaching generalized reading and spelling in children with autism. *Research in Autism Spectrum Disorders, 7*(2), 276-287.

Tekin, E. & Kircaali-Iftar, G. (2002). Comparison of the effectiveness and efficiency of two response prompting procedures delivered by sibling tutors. *Education and Training in Mental Retardation and Developmental Disabilities, 37*(3), 283-299.

Thurlow, M. L., Albus, D. A., & Lazarus, S. S. (2017). *2014-2015 publicly reported assessment results for students with disabilities and Els with disabilities* (NCEO Report 405). Minneapolis, MN: University of Minnesota, National Center on Educational Outcomes.

Vannest, K. J., Parker, R. I., Gonen, O. & Adiguzel, T. (2016). Single case research: Web based calculators for SCR analysis. (Version 2.0) [Web-based application]. College State, TX: Texas A & M University.

Varuzza, C., De Rose, P., Vicari, S., Menghini, D. (2015). Writing abilities in intellectual disabilities: A comparison between down and Williams syndrome. *Research in Developmental Disabilities, 37*, 135-142.

Vedora, J. & Stromer, R. (2006). Computer-based spelling instruction for students with developmental disabilities. *Research in Developmental Disabilities, 28*, 489-505.

Wehmeyer, M. L., & Smith, J. D. (2017). Historical understandings of intellectual

    disability and the emergence of special education. In M. L. Wehmeyer & K. A.

    Shogren (Eds.), *Handbook of research-based practices for educating students*

    with intellectual disability (pp. 3-16). New York, NY: Routledge.

Wengelin, A. & Arfé, B. (2018). The complimentary relationship between reading and

    writing in children with and without writing difficulties. In B. Miller, P.

    McCardle, & V. Connelly (Eds.), *Writing development in struggling learners:*

    Understanding the needs of writers across the lifecourse (pp. 29-51). Boston,

    MA: Brill.

Werts, M. G., Caldwell, N. K., & Wolery, M. (1996). Peer modeling of response chains:

    Observational learning by students with disabilities. *Journal of Applied Behavior*

    Analysis, 29(1), 53-66.

Werts, M. G., Zigmond, N., & Leeper, D. C. (2001). Paraprofessional proximity and

    academic engagement: Students with disabilities in primary aged classrooms.

    Education and Training in Mental Retardation and Developmental Disabilities,

    424-440.

Wexler, J., Reed, D. K., Pyle, N., Mitchell, M., & Barton, E. E. (2015). A synthesis of

    peer-mediated academic interventions for secondary struggling learnings. *Journal*

    of Learning Disabilities, 48(5), 451-470.

Williams-Diehm, K. L., & Palmer, S. B. (2017). High-quality educational programs for

    students with intellectual disability in elementary school. In M. L. Wehmeyer &

    K. A. Shogren (Eds.), *Handbook of research-based practices for educating*

    students with intellectual disability (pp. 383-405). New York, NY: Routledge.

Wolf, M. M. (1978). Social validity: the case for subjective measurement or how applied

 behavior analysis is finding its heart. *Journal of Applied Behavior Analysis, 11*(2),

 203-214.

Wood, L., Browder, D. M., & Flynn, L. (2015). Teaching students with intellectual

 disability to use a self-questioning strategy to comprehend social studies text for

 an inclusive setting. *Research and Practice for Persons with Severe Disabilities,*

 40(4), 275-293.

LIST OF APPENDICES

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APPENDIX A

PARENT CONSENT OF STUDENTS WITH DISABILITIES

EFFECTS OF A PEER-IMPLEMENTED WRITING INSTRUCTIONAL PACKAGE FOR STUDENTS WITH MODERATE INTELLECTUAL DISABILITY

Investigator(s) name & address:
Ginevra Courtade, Ph.D.
College of Education and Human Development
University of Louisville
Louisville, KY 40292
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Beth Newberry Gurney, M.Ed.
College of Education and Human Development
University of Louisville
Louisville, KY 40292
502-852-3274
beth.gurney@louisville.edu

Site(s) where study is to be conducted:
East Middle School
600 Rocket Lane
Shelbyville KY 40065

Phone number for subjects to call for questions: 502-852-2144 or 502-852-3274

Introduction and Background Information

Your child is invited to participate in a research study. This is because he/she is enrolled in a middle school general education social studies class and has been identified as possibly benefitting from additional writing instruction. The study is being conducted by Ginevra Courtade, Ph.D., a faculty member in the College of Education and Human Development; Amy Lingo, Ed.D., a faculty member in the College of Education and Human Development; and Beth Newberry Gurney, M.Ed., a doctoral candidate in the

College of Education and Human Development. The study will take place at East Middle School in the general education social studies classroom that your child is currently enrolled and in the special education resource classroom during the school-wide advisory period. Approximately 10 students (four students with disabilities and six students without disabilities) and three staff members will be invited to participate.

Purpose

The purpose of this study is to evaluate the use of a peer-implemented writing instructional package on the acquisition of sentence writing skills for students with moderate intellectual disability in a general education middle school setting. The acquisition of social studies content for students with moderate intellectual disability will also be evaluated. Additionally, the academic engagement of the students with moderate intellectual disability and the peers without disabilities will be assessed.

Procedures

A member of the research team will talk with your child's special education teacher to obtain information about your child's disability, cognitive ability, and communication skills. Additionally, a member of the research team will talk with your child's general education teacher to obtain information about the classwide instruction and will observe your child during the social studies class. This information will help the researcher tailor instruction to your child's needs. A researcher will meet with your child to explain the purpose of the study. The writing sessions will last approximately 5-10 minutes and will take place during the first portion of the social studies class. Each session will be video recorded. The study will last approximately six weeks. Following the end of the intervention, your child will be asked seven questions about the intervention. The interview will take approximately 15-20 minutes and will be audio recorded.

Potential Risks

There are no foreseeable risks, although there may be unforeseen risks.

Benefits

The possible benefits of this study include improvement in your child's sentence writing ability and social studies content knowledge. The information collected may not benefit your child directly. The information learned in this study may be helpful to others, by providing new knowledge on how to improve writing instruction of students with disabilities in general education settings.

Payment

You will not be compensated for your time, inconvenience, or expenses while your child participates in this study.

Confidentiality

Total privacy cannot be guaranteed. We will protect your child's privacy to the extent permitted by law. If the results from this study are published, your child's name will not be made public. Once
your child's information leaves our institution, we cannot promise that others will keep it private.

Your information may be shared with the following:

- The University of Louisville Institutional Review Board, Human Subjects Protection Program Office, Privacy Office, others involved in research administration and compliance at the University, and others contracted by the University for ensuring human subjects safety or research compliance
- The local research team
- People who are responsible for research, compliance and HIPAA oversight at the institutions where the research is conducted
- Government agencies, such as:
- Office for Human Research Protections

All data collected in this study will be stored on a secured server. Only members of the research team will have access to the server.

Security

Your child's information will be kept private by ensuring that all personal information and data collected will be stored on a secured server.

Voluntary Participation

Taking part in this study is voluntary. You and your child may choose not to take part at all. If you and your child decide to be in this study, you may stop taking part at any time. If you and your child decide not to be in this study or if you stop taking part at any time, you will not lose any benefits for which you may qualify.

You will be told about any changes that may affect your decision to continue in the study.

Contact Persons

If you have any questions, concerns, or complaints about the research study, please contact Dr. Ginevra Courtade at 502-852-2144 or Beth Newberry Gurney at 502-852-3274.

Research Subject's Rights

If you have any questions about your child's rights as a research subject, you may call the Human Subjects Protection Program Office at 502-852-5188. You may discuss any questions about your child's rights as a research subject, in private, with a member of the Institutional Review Board (IRB). You may also call this number if you have other questions about the research, and you cannot reach the study investigators, or want to talk to someone else. The IRB is an independent
committee made up of people from the University community, staff of the institutions, as well as people from the community not connected with these institutions. The IRB has approved the participation of human subjects in this research study.

Concerns and Complaints

If you have concerns or complaints about the research or research staff and you do not wish to give your name, you may call the toll free number 1-877-852-1167. This is a 24 hour hot line answered by people who do not work at the University of Louisville.

Acknowledgment and Signatures

This informed consent document is not a contract. This document tells you what will happen during the study if you choose to take part. Your signature indicates that this study has been explained to you, that your questions have been answered, and that you agree to take part in the study. You are not giving up any legal rights to which you are entitled by signing this informed consent document. You will be given a copy of this consent form to keep for your records.

_____
Subject Name (Please Print)   Signature of Subject   Date Signed

_____
Printed Name of Legally   Signature of Legally   Date Signed
Authorized Representative (if applicable)   Authorized Representative

_____
Authority of Legally Authorized Representative to act on behalf of Subject

*Authority to act on behalf of another includes, but is not limited to parent, guardian, or durable power of attorney for health care.

_____
Printed Name of Investigator   Signature of Investigator   Date Signed

List of Investigators:	Phone Numbers:
Ginevra Courtade, Ph.D.	**502-852-2144**
Amy Lingo, Ed.D.	**502-852-0563**
Beth Newberry Gurney, M.Ed.	**502-852-3274**

APPENDIX B

STUDENT ASSENT OF STUDENTS WITH DISABILITIES

EFFECTS OF A PEER-IMPLEMENTED WRITING INTSTRUCTIONAL PACKAGE FOR STUDENTS WITH MODERATE INTELLECTUAL DISABILITY

I am invited to be in a research study being done by Dr. Ginevra Courtade, Dr. Amy Lingo, and Ms. Beth Newberry Gurney. When a person is in a research study, they are called a "subject". I am invited because I am in social studies class and we work on writing.

This means that a classmate will use iPad® app to help me write sentences and answer questions during social studies class and the morning advisory period. My teacher, the researcher, and the paraprofessional will also be there during social studies class if I need help. At the end of the study, the researcher will ask me questions about how I felt about working with my classmate and using the iPad® app. This interview will take about 15-20 minutes and will be audio recorded. There are minimal risks with being in this study.

This study will last about six weeks. The benefit to me for participating in this study is that I might enjoy working on writing with my classmate, my writing might improve, and my understanding of social studies content might improve.

My family, the professor, and Dr. Ginevra Courtade, Dr. Amy Lingo, Ms. Beth Newberry Gurney, my teachers, and classmates will know that I'm in the study. If anyone else is given information about me, they will not know my name. A number or initials will be used instead of my name.

I have been told about this study and know why it is being done and what I have to do. My parent(s) have agreed to let me be in the study. If I have any questions I can ask Dr. Ginevra Courtade, Dr. Amy Lingo, or Ms. Beth Newberry Gurney. They will answer my questions. If I do not want to be in this study or I want to quit after I am already in this study, I can tell one of the researchers and she will discuss this with my parents.

_____
Printed Name of Subject   Signature of Subject   Date Signed

_____
Printed Name of Parent/Guardian

_____
Printed Name of Investigator   Signature of Investigator   Date Signed

PARENT CONSENT: STUDENTS WITHOUT DISABILITIES

EFFECTS OF A PEER-IMPLEMENTED WRITING INSTRUCTIONAL PACKAGE FOR STUDENTS WITH MODERATE INTELLECTUAL DISABILITY

Investigator(s) name & address:
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Louisville, KY 40292
502-852-3274
beth.gurney@louisville.edu

Site(s) where study is to be conducted:
East Middle School
600 Rocket Lane
Shelbyville KY 40065

Phone number for subjects to call for questions: 502-852-2144 or 502-852-3274

Introduction and Background Information

Your child is invited to participate in a research study. This is because he/she is enrolled in a middle school grade general education social studies class and has been identified as a possible student to provide a peer-implemented writing instructional package for a student with disabilities. The study is being conducted by Ginevra Courtade, Ph.D., a faculty member in the College of Education and Human Development; Amy Lingo, Ed.D., a faculty member in the College of Education and Human Development; and Beth Newberry Gurney, M.Ed., a doctoral candidate in the College of Education and Human

Development. The study will take place at East Middle School in the general education social studies classroom that your child is currently enrolled and in the special education resource classroom during the school-wide advisory period.

Approximately 10 students (four students with disabilities and six students without disabilities) and three staff members will be invited to participate.

Purpose

The purpose of this study is to evaluate the use of a peer-implemented writing instructional package on the acquisition of sentence writing skills for students with moderate intellectual disability in a general education middle school setting. The acquisition of social studies content for students with moderate intellectual disability will also be evaluated. Additionally, the academic engagement of the students with moderate intellectual disability and the peers without disabilities will be assessed.

Procedures

A researcher will meet with your child to explain the purpose of the study. Your child will participate in three training sessions (approximately 30-40 minutes) during non-instructional times of the school day. The writing sessions will last approximately 5-10 minutes and will take place during the first portion of the social studies class. Each session will be video recorded. The study will last approximately six weeks. Following the end of the intervention, your child will be asked 12 questions about the intervention. The interview will take approximately 15-20 minutes and will be audio recorded.

Potential Risks

There are no foreseeable risks, although there may be unforeseen risks.

Benefits

The possible benefits of this study include improvement in your child's social studies content knowledge. The information collected may not benefit your child directly. The information learned in this study may be helpful to others, by providing new knowledge on how to improve writing instruction of students with disabilities in general education settings.

Payment

You will not be compensated for your time, inconvenience, or expenses while your child participates in this study.

Confidentiality

Total privacy cannot be guaranteed. We will protect your child's privacy to the extent permitted by law. If the results from this study are published, your child's name will not be made public. Once your child's information leaves our institution, we cannot promise that others will keep it private.

Your child's information may be shared with the following:
- The University of Louisville Institutional Review Board, Human Subjects Protection Program Office, Privacy Office, others involved in research administration and compliance at the University, and others contracted by the University for ensuring human subjects safety or research compliance
- The local research team
- People who are responsible for research, compliance and HIPAA oversight at the institutions where the research is conducted
- Government agencies, such as:
- Office for Human Research Protections

All data collected in this study will be stored on a secured server. Only members of the research team will have access to the server.

Security

Your child's information will be kept private by ensuring that all personal information and data collected will be stored on a secured server.

Voluntary Participation

Taking part in this study is voluntary. You and your child may choose not to take part at all. If you and your child decide to be in this study, you may stop taking part at any time. If you and your child decide not to be in this study or if you stop taking part at any time, you will not lose any benefits for which you may qualify.

You will be told about any changes that may affect your decision to continue in the study.

Contact Persons

If you have any questions, concerns, or complaints about the research study, please contact Dr. Ginevra Courtade at 502-852-2144 or Beth Newberry Gurney at 502-852-3274.

Research Subject's Rights

If you have any questions about your child's rights as a research subject, you may call the Human Subjects Protection Program Office at 502-852-5188. You may discuss any questions about your rights as a research subject, in private, with a member of the Institutional Review Board (IRB). You may also call this number if you have other questions about the research, and you cannot reach the study investigators, or want to talk

to someone else. The IRB is an independent committee made up of people from the University community, staff of the institutions, as well as people from the community not connected with these institutions. The IRB has approved the participation of human subjects in this research study.

Concerns and Complaints

If you have concerns or complaints about the research or research staff and you do not wish to give your name, you may call the toll free number 1-877-852-1167. This is a 24 hour hot line answered by people who do not work at the University of Louisville.

Acknowledgment and Signatures

This informed consent document is not a contract. This document tells you what will happen during the study if you choose to take part. Your signature indicates that this study has been explained to you, that your questions have been answered, and that you agree to take part in the study. You are not giving up any legal rights to which you are entitled by signing this informed consent document. You will be given a copy of this consent form to keep for your records.

_____

Subject Name (Please Print)   Signature of Subject   Date Signed

_____

Printed Name of Legally   Signature of Legally   Date Signed
Authorized Representative (if applicable)   Authorized Representative

_____

Authority of Legally Authorized Representative to act on behalf of Subject

*Authority to act on behalf of another includes, but is not limited to parent, guardian, or durable power of attorney for health care.

_____

Printed Name of Investigator   Signature of Investigator   Date Signed

_____

List of Investigators: **Phone Numbers:**

Ginevra Courtade, Ph.D.   **502-852-2144**

Amy Lingo, Ed.D.   **502-852-0563**

Beth Newberry Gurney, M.Ed.   **502-852-3274**

APPENDIX D

STUDENT ASSENT OF STUDENTS WITHOUT DISABILITIES

EFFECTS OF A PEER-IMPLEMENTED WRITING INTSTRUCTIONAL PACKAGE FOR STUDENTS WITH MODERATE INTELLECTUAL DISABILITY

I am invited to be in a research study being done by Dr. Ginevra Courtade, Dr. Amy Lingo, and Ms. Beth Newberry Gurney. When a person is in a research study, they are called a "subject". I am invited because I am in social studies class with students with disabilities and my teacher thinks that I might be a good peer to help my classmate.

This means that I will learn how to help my classmate learn to write sentences and answer comprehension questions during the writing time in our social studies class and during the morning advisory period. I will do this after short trainings with the researcher. My teacher, the researcher, and the paraprofessional will be there during social studies class if I need help. At the end of the study, the researcher will ask me some questions about how I felt working with my classmate and using the iPad® app. This interview will take about 15-20 minutes and will be audio recorded. There are minimal risks with being in this study.

This study will last about six weeks. The benefit to me for participating in this study is I might enjoy working on writing with my classmate and my comprehension of social studies content might improve.

My family, Dr. Courtade, Dr. Amy Lingo, Ms. Newberry Gurney, my teachers, and classmates will know that I'm in the study. If anyone else is given information about me, they will not know my name. A number or initials will be used instead of my name.

I have been told about this study and know why it is being done and what I have to do. My parent(s) have agreed to let me be in the study. If I have any questions I can ask Dr. Ginevra Courtade, Dr. Amy Lingo, or Ms. Beth Newberry Gurney. They will answer my questions. If I do not want to be in this study or I want to quit after I am already in this study, I can tell one of the researchers and she will discuss this with my parents.

_____

Printed Name of Subject   Signature of Subject   Date Signed

_____

Printed Name of Parent/Guardian

_____

Printed Name of Investigator   Signature of Investigator   Date Signed

STAFF CONSENT

EFFECTS OF A PEER-IMPLEMENTED WRITING INSTRUCTIONAL PACKAGE FOR STUDENTS WITH MODERATE INTELLECTUAL DISABILITY

Investigator(s) name & address:
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Amy Lingo, Ed.D.
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Beth Newberry Gurney, M.Ed.
College of Education and Human Development
University of Louisville
Louisville, KY 40292
502-852-3274
beth.gurney@louisville.edu

Site(s) where study is to be conducted:
East Middle School
600 Rocket Lane
Shelbyville KY 40065

Phone number for subjects to call for questions: 502-852-2144 or 502-852-3274

Introduction and Background Information

You are invited to participate in a research study. The study is being conducted by Ginevra Courtade, Ph.D., a faculty member in the College of Education and Human Development; Amy Lingo, Ed.D., a faculty member in the College of Education and Human Development; and Beth Newberry Gurney, M.Ed., a doctoral candidate in the College of Education and Human Development. The study will take place at East Middle School. Approximately 10 students (four students with disabilities and six students without disabilities) and three staff members will be invited to participate.

Purpose

The purpose of this study is to evaluate the use of a peer-implemented writing instructional package on the acquisition of sentence writing skills for students with moderate intellectual disability in a general education middle school setting. Additionally, the comprehension of grade-level social studies content will be evaluated for the student with disabilities. The academic engagement of students with disabilities and the student without disabilities will be measured. Social validity will be examined by giving a questionnaire to the special education teacher, general education teacher, and paraprofessional about the feasibility, acceptability, and effects of the intervention. Lastly, students with and without disabilities will be interviewed to assess attitudes toward the intervention following the completion of the intervention.

Procedures

In this study, you will be asked to complete a survey, Social Validity Survey for Staff, regarding the feasibility, acceptability, and effects of the intervention following the conclusion of the intervention. The survey should take approximately 10-15 minutes to complete. You may decline to answer any questions that may make you uncomfortable.

Potential Risks

There are no foreseeable risks, although there may be unforeseen risks.

Benefits

The possible benefits of this study include improvement in your students' social studies content knowledge. The information collected may not benefit you directly. The information learned in this study may be helpful to others, by providing new knowledge on how to improve writing instruction of students with disabilities in general education settings.

Payment

You will not be compensated for your time, inconvenience, or expenses while you participate in this study.

Confidentiality

Total privacy cannot be guaranteed. We will protect your privacy to the extent permitted by law. If the results from this study are published, your name will not be made public. Once your information leaves our institution, we cannot promise that others will keep it private.

Your information may be shared with the following:

- The University of Louisville Institutional Review Board, Human Subjects Protection Program Office, Privacy Office, others involved in research administration and compliance at the University, and others contracted by the University for ensuring human subjects safety or research compliance
- The local research team
- People who are responsible for research, compliance and HIPAA oversight at the institutions where the research is conducted
- Government agencies, such as:
- Office for Human Research Protections

All data collected in this study will be stored on a secured server. Only members of the research team will have access to the server.

Security

Your information will be kept private by ensuring that all personal information and data collected will be stored on a secured server.

Voluntary Participation

Taking part in this study is voluntary. You may choose not to take part at all. If you decide to be in this study, you may stop taking part at any time. If you decide not to be in this study or if you stop taking part at any time, you will not lose any benefits for which you may qualify.

You will be told about any changes that may affect your decision to continue in the study.

Contact Persons

If you have any questions, concerns, or complaints about the research study, please contact Dr. Ginevra Courtade at 502-852-2144 or Beth Newberry Gurney at 502-852-3274.

Research Subject's Rights

If you have any questions about your rights as a research subject, you may call the Human Subjects Protection Program Office at 502-852-5188. You may discuss any questions about your rights as a research subject, in private, with a member of the Institutional Review Board (IRB). You may also call this number if you have other questions about the research, and you cannot reach the study investigators, or want to talk to someone else. The IRB is an independent committee made up of people from the University community, staff of the institutions, as well as people from the community not connected with these institutions. The IRB has approved the participation of human subjects in this research study.

Concerns and Complaints

If you have concerns or complaints about the research or research staff and you do not wish to give your name, you may call the toll free number 1-877-852-1167. This is a 24 hour hot line answered by people who do not work at the University of Louisville.

Acknowledgment and Signatures

This informed consent document is not a contract. This document tells you what will happen during the study if you choose to take part. Your signature indicates that this study has been
explained to you, that your questions have been answered, and that you agree to take part in the study. You are not giving up any legal rights to which you are entitled by signing this informed consent document. You will be given a copy of this consent form to keep for your records.

_____
Subject Name (Please Print)   Signature of Subject   Date Signed

_____
Printed Name of Legally   Signature of Legally   Date Signed
Authorized Representative (if applicable)   Authorized Representative

_____
Authority of Legally Authorized Representative to act on behalf of Subject

*Authority to act on behalf of another includes, but is not limited to parent, guardian, or durable power of attorney for health care.

_____
Printed Name of Investigator   Signature of Investigator   Date Signed

List of Investigators: **Phone Numbers:**

Ginevra Courtade, Ph.D.   **502-852-2144**

Amy Lingo, Ed.D.   **502-852-0563**

Beth Newberry Gurney, M.Ed.   **502-852-3274**

APPENDIX F

PROTOCOL FOR PROBE SESSIONS

	Procedures
	Gain student attention.
	Gesture to the artifact and give the directive, **"Look at the artifact."**
	Read explanation of the artifact (green index card).
	Present iPad®.
	Say, "**Today, we are going to write sentences**."
	Request "**Write a sentence telling what the artifact is made of**."
	Wait 10 s for the student to start writing. If the student does not respond or indicates that they are finished, provide non-specific praise for participation. If the student does select a word, wait 10 s for the student to select the next word. If the student does not respond or indicates that they are finished, provide non-specific praise for participation. Continue until the student completes the sentences, does not respond for 10 s, or indicates that they are finished and provide non-specific praise for participation.
	Swipe right to the second sentence.
	Request, "**Write a sentence telling how the artifact was used**."
	Wait 10 s for the student to start writing. If the student does not respond or indicates that they are finished, provide non-specific praise for participation. If the student does select a word, wait 10 s for the student to select the next word. If the student does not respond or indicates that they are finished, provide non-specific praise for participation. Continue until the student completes the sentences, does not respond for 10 s, or indicates that they are finished and provide non-specific praise for participation.
	Swipe right to the third sentence.
	Request, "**Write a sentence telling who used the artifact**."
	Wait 10 s for the student to start writing. If the student does not respond or indicates that they are finished, provide non-specific praise for participation. If the student does select a word, wait 10 s for the student to select the next word. If the student does not respond or indicates that they are finished, provide non-specific praise for participation. Continue until the student completes the sentences, does not respond for 10 s, or indicates that they are finished and provide non-specific praise for participation.
	Place the Question 1 page in front of the student.
	Read Question 1.
	Read and point to the three answer choices.
	Wait 10 s for the student to choose an answer (touching or saying the answer choice). Provide non-specific praise for participation.
	Place the Question 2 page in front of student.
	Read Question 2.

	Read and point to the three answer choices.
	Wait 10 s for the student to choose an answer (touching or saying the answer choice). Provide non-specific praise for participation.
	Place the Question 3 page in front of student.
	Read Question 3.
	Read and point to the three answer choices.
	Wait 10 s for the student to choose an answer (touching or saying the answer choice). Provide non-specific praise for participation.

1 = Implemented correctly
0 = Implemented incorrectly, not implemented

APPENDIX G

PROTOCOL FOR INTERVENTION: PHASE 1 CONDITION

	Procedures
	Gain student attention.
	Gesture to the artifact and give the directive, **"Look at the artifact."**
	Read explanation of the artifact (green index card).
	Present iPad®.
	Say, **"Today, we are going to learn to write sentences."**
	Request "**Write a sentence telling what the artifact is made of.**"
	Immediately present the model sentence (pink index card). Say, "**You can use this to help you**." Read the model sentence. If the student does not write the sentence correctly, use SLP.
	When complete, read the sentence and deliver praise.
	Delete the sentence and say, "**Let's practice that sentence one more time.**"
	Request "**Write a sentence telling what the artifact is made of.**"
	Immediately present the model sentence (yellow index card). Say, "**You can use this to help you**." Read the model sentence. If the student does not write the sentence correctly, use SLP.
	When complete, read the sentence and deliver praise.
	Swipe right to second the sentence.
	Request "**Write a sentence telling how the artifact was used.**"
	Immediately present the model sentence (blue index card). Say, "**You can use this to help you**." Read the model sentence. If the student does not write the sentence correctly, use SLP.
	When complete, read the sentence and deliver praise.
	Delete the sentence and say, "**Let's practice that sentence one more time.**"
	Request "**Write a sentence telling how the artifact was used.**"
	Immediately present model. Say, "**You can use this to help you**." Read the model sentence. If the student does not write the sentence correctly, use SLP.
	When complete, read the sentence and deliver praise.
	Swipe right to the third sentence.
	Request "**Write a sentence telling who used the artifact.**"
	Immediately present model. Say, "**You can use this to help you**." Read the model sentence. If the student does not write the sentence correctly, use SLP.
	When complete, read the sentence and deliver praise.
	Delete the sentence and say, "**Let's practice that sentence one more time.**"
	Request "**Write a sentence telling who used the artifact.**"
	Immediately present model. Say, "**You can use this to help you**." Read the model sentence. If the student does not write the sentence correctly, use SLP.

	When complete, read the sentence and deliver praise.

1 = Implemented correctly
0 = Implemented incorrectly, not implemented

System of Least Prompts (SLP)
1. If student does not respond or selects an incorrect word after presenting and reading the model sentence, point and say the next word on the index card.
2. If the student does not respond or selects an incorrect word, point and say the next word on the Clicker Sentences™ word bank.
3. If the student does not respond or selects an incorrect word, use physical prompting to help them select the correct word on the Clicker Sentences™ word bank.

APPENDIX H

PROTOCOL FOR INTERVENTION: PHASE 2 CONDITION

	Procedures
	Gain student attention.
	Gesture to the artifact and give the directive, **"Look at the artifact."**
	Read explanation of the artifact (green index card).
	Present iPad®.
	Say, **"Today, we are going to learn to write sentences."**
	Request "**Write a sentence telling what the artifact is made of.**"
	Wait 10 s for student to start writing. If the student does not write the sentence correctly, present the model sentence (pink index card). Say, "**You can use this to help you**." Read the model sentence. If the student does not write the sentence correctly, use SLP.
	When complete, read the sentence and deliver praise.
	Swipe right to the second sentence.
	Request "**Write a sentence telling how the artifact was used.**"
	Wait 10 s for student to start writing. If the student does not write the sentence correctly, present the model sentence (yellow index card). Say, "**You can use this to help you**." Read the model sentence. If the student does not write the sentence correctly, use SLP.
	When complete, read the sentence and deliver praise.
	Swipe right to the third sentence.
	Request "**Write a sentence telling who used the artifact.**"
	Wait 10 s for student to start writing. If the student does not write the sentence correctly, present the model sentence (blue index card). Say, "**You can use this to help you**." Read the model sentence. If the student does not write the sentence correctly, use SLP.
	When complete, read the sentence and deliver praise.
	Place the Question 1 page in front of the student.
	Read Comprehension Question 1.
	Read and point to the three answer choices.
	Wait 10 s for student to choose an answer (touching or saying the answer choice).
	Provide praise for a correct answer. If student selects the wrong answer or does not select an answer, point to and say the correct answer.
	Place the Question 2 page in front of the student.
	Read Comprehension Question 2.
	Read and point to the three answer choices.

	Wait 10 s for student to choose an answer (touching or saying the answer choice).
	Provide praise for a correct answer. If student selects the wrong answer or does not select an answer, point to and say the correct answer.
	Place the Question 3 page in front of the student.
	Read Question 3.
	Read and point to the three answer choices.
	Wait 10 s for student to choose an answer (touching or saying the answer choice).
	Provide praise for a correct answer. If student selects the wrong answer or does not select an answer, point to and say the correct answer.

1 = Implemented correctly
0 = Implemented incorrectly, not implemented

System of Least Prompts (SLP)
1. If student does not respond or selects an incorrect word after presenting and reading the model sentence, point and say the next word on the index card.
2. If the student does not respond or selects an incorrect word, point and say the next word on the Clicker Sentences™ word bank.
3. If the student does not respond or selects an incorrect word, use physical prompting to help them select the correct word on the Clicker Sentences™ word bank.

APPENDIX I

DEPENDENT VARIABLE DATA COLLECTION FORM

Student: _____ Date:_____

Peer:_____ Observer:_____

Artifact:_____Setting:_____

		Words written independently
Sentence Type 1		
Sentence Type 2		
Sentence Type 3		
Question 1		
Question 2		
Question 3		

1 = Correct
0 = Incorrect

APPENDIX J

TRAINING CHECKLIST FOR PROBE SESSION PROCEDURES

Facilitator:_____ Date:_____

Peer:_____

1 = Implemented independently   0 = Implemented after prompting

	Introductions
	Provide rationale for writing instructional package
	Discuss background about the student with MID
	Provide goals for writing instructional package
	Discuss confidentiality and respectful language
	Provide overview of writing instructional package
	Present peer with Protocol for Probe Sessions (Appendix F)
	Provide detailed description of each step
	View video model of researcher implementing the 25 steps
	Ask peer to rehearse the 25 steps and explain that feedback will be shared
	Provide specific feedback of steps that were followed and steps that were not followed
	Ask peer to rehearse the 25 steps and explain that feedback will be shared
	Provide specific feedback of steps that were followed and steps that were not followed
	Repeat until peer is able to complete the 25 steps with 100% accuracy

APPENDIX K

TRAINING CHECKLIST FOR INTERVENTION: PHASE 1 CONDITION

PROCEDURES

Facilitator:_____   Date:_____

Peer:_____

1 = Implemented independently   0 = Implemented after prompting

	Provide overview of writing instructional package
	Present peer with Protocol for Intervention: Phase 1 Condition (Appendix G)
	Provide detailed description of each step
	View video model of researcher implementing the 28 steps
	Ask peer to rehearse the 28 steps and explain that feedback will be shared
	Provide specific feedback of steps that were followed and steps that were not followed
	Ask peer to rehearse the 28 steps and explain that feedback will be shared
	Provide specific feedback of steps that were followed and steps that were not followed
	Repeat until peer is able to complete the 28 steps with 100% accuracy

APPENDIX L

TRAINING CHECKLIST FOR INTERVENTION: PHASE 2 CONDITION

PROCEDURES

Facilitator:_____   Date:_____

Peer:_____

1 = Implemented independently   0 = Implemented after prompting

	Provide overview of writing instructional package
	Present peer with Protocol for Intervention: Phase 2 Condition (Appendix H)
	Provide detailed description of each step
	View video model of researcher implementing the 31 steps
	Ask peer to rehearse the 31 steps and explain that feedback will be shared
	Specific feedback of steps that were followed and steps that were not followed
	Ask peer to rehearse the 31 steps and explain that feedback will be shared
	Specific feedback of steps that were followed and steps that were not followed
	Repeat until peer is able to complete the 31 steps with 100% accuracy

APPENDIX M

SOCIAL VALIDITY QUESTIONNAIRE FOR STAFF

1. Students with moderate and severe disability can learn adapted academic content in the general education classroom.
   Strongly disagree   Disagree   Neither agree or disagree   Agree   Strongly agree

2. How effective was the writing instructional package?
   Completely ineffective   Somewhat ineffective   Neutral   Somewhat effective   Completely effective

3. How difficult was it to implement the writing instructional package?
   Very difficult   Difficult   Neutral   Easy   Very easy

4. How likely are you to implement the writing instructional package in the future?
   Very unlikely   Unlikely   Neutral   Likely   Very likely

5. How likely would you be to recommend the use of the writing instructional package to others?
   Extremely unlikely   Unlikely   Neutral   Likely   Extremely likely

6. How would you describe the effectiveness of the peer-implemented intervention for your students?
   Completely ineffective   Somewhat ineffective   Neutral   Somewhat effective   Completely effective

7. How difficult do you think it would be to implement the peer-implemented intervention in the future?
   Very difficult   Difficult   Neutral   Easy   Very easy

8. How likely are you to use peer-implemented interventions in the future?
   Extremely unlikely   Unlikely   Neutral   Likely   Extremely likely

9. How likely would you be to recommend the use of peer-implemented interventions in the future?
   Extremely unlikely   Unlikely   Neutral   Likely   Extremely likely

10. Overall, this intervention was beneficial for the students.
    Strongly disagree   Disagree   Neither agree or disagree   Agree   Strongly agree

11. What was the best thing about this intervention package?

12. What was the most challenging thing about this intervention package?

APPENDIX N

INTERVIEW QUESTIONS FOR STUDENTS WITHOUT DISABILITIES

1. How would you describe your experience working with your partner?

2. Did you enjoy working with your partner?

3. What did you enjoy?

4. What did you find challenging?

5. Have you benefited from working with your partner?

6. Have you noticed any changes in your partner?

7. Do you think this was beneficial for your partner?

8. Is there any additional support that you feel would have helped you?

9. Are there other things you would like to do with your partner?

10. Do you interact with your partner outside of class?

Adapted from Carter, Cushing, and Kennedy (2009).

APPENDIX O

INTERVIEW QUESTIONS FOR STUDENTS WITH DISABILITIES

1. How would you describe your experience working with your partner?

2. What did you enjoy about working with your partner?

3. What did you find challenging?

4. Have you benefited from working with your partner?

5. If you were able to choose, would you like to work with a peer partner or with an adult?

6. Are there other things you would like to do with your partner?

7. Do you interact with your partner outside of class?

Adapted from Carter, Cushing, and Kennedy (2009).

CURRICULUM VITA

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EDUCATION AND CERTIFICATIONS

Education

Ph.D., Curriculum and Instruction, University of Louisville, degree anticipated December 2019

M.Ed., Special Education, University of Louisville, May 2009
Concentration: Moderate/Severe Disabilities

B.A., Sociology, University of Louisville, May 2006

Certifications

Special Education-Moderate/Severe Disabilities-Grades K-12, Kentucky

PROFESSIONAL EXPERIENCE

Summer 2017-present	Low-Incidence Consultant, State Personnel Development Grant, University of Louisville, College of Education and Human Development, Department of Special Education
Spring 2019	Instructor, EDSP 440/611: Moderate/Severe Disabilities Curriculum and Methods II, University of Louisville, College of Education and Human Development, Department of Special Education
Spring 2019	Guest Lecture, *Strategies for Including Students with Low-Incidence Disabilities in General Education Classrooms,* Special Populations in Schools, EDSP 345

Fall 2018	Instructor, EDSP 520: Assessment of Students with Moderate/Severe Disabilities, University of Louisville, College of Education and Human Development, Department of Special Education
Fall 2018	Guest Lecture, *Strategies for Including Students with Low-Incidence Disabilities in General Education Classrooms,* Special Populations in Schools, EDSP 345
Summer 2017	Co-Instructor (with Dr. Amy Lingo), EDSP 647: Teaching Math to Students with Disabilities, University of Louisville, College of Education and Human Development, Department of Special Education
Spring 2017	Guest Lecture, *Strategies for Including Students with Low-Incidence Disabilities in General Education Classrooms,* Special Populations in Schools, EDSP 345
Fall 2016	Co-Instructor, EDSP 635: MSD Practicum, University of Louisville, College of Education and Human Development, Department of Special Education
Fall 2016	Guest Lecture, *Strategies for Including Students with Low-Incidence Disabilities in General Education Classrooms,* Special Populations in Schools, EDSP 345
Spring 2016	Co-Instructor (with Dr. Ginevra Courtade), EDSP 440: MSD Curriculum and Methods II, University of Louisville, College of Education and Human Development, Department of Special Education
Spring 2016	Guest Lecture, *Strategies for Including Students with Low-Incidence Disabilities in General Education Classrooms,* Special Populations in Schools, EDSP 345
2015-present	Doctoral Student, University of Louisville, College of Education and Human Development, Department of Special Education
2009-2012	Intervention Teacher, Shelby County Summer Reading Academy, Shelbyville, KY
2008-2015	Special Education Teacher, Clear Creek Elementary School, Shelbyville, KY
2007-2008	School-Based Team Leader, City Year, Providence, RI

PUBLICATIONS

Pennington, R. C., Foreman, L. H., & Gurney, B. N. (2018). An evaluation of procedures for teaching students with moderate to severe disabilities to write sentences. *Remedial and Special Education, 39*, 27-38.

Courtade, G. G., Gurney, B. N., Carden, R. (2017). Using read-alouds of grade-level social studies text and systematic prompting to promote comprehension for students with severe disabilities. *The Journal of Social Studies Research, 41*, 291-301.

Shultz, G. J., Havens, N., Gurney, B. N., & Burt, J. (2017). You can help every provider have a better understanding of functional behavior assessment! A review of the website: Basic FBA to BSP. *Beyond Behavior, 26*(3), 152-154.

Pennington, R. C., Courtade, G. C., & Gurney, B. N. (2016). Preparing teachers with core content expertise to support students with moderate to severe disabilities. *Kentucky Teacher Education Journal: The Journal of the Teacher Education Division of the Kentucky Council for Exceptional Children, 3*, 1-5.

PRESENTATIONS

Gurney, B. N., Courtade, G., & Lingo, A. (2018, November). *High-Leverage Practices for teachers of students with intellectual disability.* Kentucky Exceptional Children's Conference. Louisville, KY.

Gurney, B. N., & Fisher, A. (2018, November). *Examining the effects of a peer-implemented writing instructional package for students with intellectual disability.* Kentucky Exceptional Children's Conference. Louisville, KY. Kentucky Exceptional Children's Conference. Louisville, KY.

Fisher, A., & Gurney, B. N. (2018, November). *Using Google Drive to improve data collection for teachers of student with moderate and severe disabilities.* Kentucky Exceptional Children's Conference. Louisville, KY. Kentucky Exceptional Children's Conference. Louisville, KY.

Gurney, B. N. (2018, August). *Doctoral student panel discussion.* University of Louisville College of Education and Human Development Doctoral Student Orientation. Louisville, KY.

Gurney, B. N. (2018, March). *Using read-alouds of grade-level social studies text and systematic prompting to promote comprehension for students with severe disabilities.* Spring Research Conference. Louisville, KY.

Courtade, G., & Gurney, B. N. (2018, March). *Designing interventions to support low-incidence teachers through a new State Personnel Development Grant.* Annual Conference of the American Council for Rural Special Education. Salt Lake City, Utah. (refereed)

Courtade, G. C., Lingo, A., & Gurney, B. N. (2017, November). *Using EBPs to teach mathematics to students with moderate and severe disabilities.* Kentucky Council for Exceptional Children Conference, Louisville, KY. (refereed)

Gurney, B. N. (2017, August). *Doctoral student panel discussion.* University of Louisville College of Education and Human Development Doctoral Student Orientation. Louisville, KY.

Courtade, G. C., & Gurney, B. N. (2017, July). *Science training for elementary teachers of students with moderate and severe disabilities: Early Science Curriculum.* Kentucky Department of Education—SPLASH. Louisville, KY.

Gurney, B. N. (2017, March). *An evaluation of an intervention package to promote social studies content acquisition for students with severe disabilities.* University of Louisville Graduate Student Council Research Conference, Louisville, KY.

Pennington, R. C. & Gurney, B. N. (2016, March). *Quality indicators in educational programs for students with intellectual disabilities and ASD*. The Arc of Kentucky Annual Conference. Louisville, KY.

Gurney, B. N. (2016, August). *Doctoral student panel discussion.* University of Louisville College of Education and Human Development Doctoral Student Orientation. Louisville, KY.

WORKSHOPS

Gurney, B. N. (2019, July). *Writing Instruction for students with moderate and severe intellectual disability.* Workshop presented for Ohio Valley Educational Cooperative. Shelbyville, KY.

Gurney, B. N. (2019, March). *Early Numeracy Skills Builder.* Workshop presented for Morgan County Public Schools. West Liberty, KY.

Gurney, B. N. (2019, March). *Story-based lessons for students with moderate intellectual disability.* Workshop presented for Hancock County Public Schools. Hawesville, KY.

Gurney, B. N. (2019, February). *Story-based lessons for students with moderate and severe intellectual disability.* Workshop presented for Morgan County Public Schools. West Liberty, KY.

Gurney, B. N. (2019, February). *Early Language Skills Builder.* Workshop presented for Minors Lane Elementary School. Louisville, KY.

Gurney, B. N. (2019, January). *Early Language Skills Builder.* Workshop presented for Hancock County Public Schools. Hawesville, KY.

Gurney, B. N. (2019, January). *Early Language Skills Builder.* Workshop presented for Morgan County Public Schools. West Liberty, KY.

Courtade, G. C. & Gurney, B. N. (2018, September). *Literacy instruction for students with moderate intellectual disability: Increased access to literature.* Workshop presented for Ohio Valley Educational Cooperative. Shelbyville, KY.

Gurney, B. N. (2018, July). *Early Language Skills Builder.* Workshop presented for Ohio Valley Educational Cooperative. Shelbyville, KY.

Gurney, B. N. (2018, July). *Literacy for students with moderate and severe disabilities: Increased access to literature.* Workshop presented for Ohio Valley Educational Cooperative. Shelbyville, KY.

Gurney, B. N. (2017, March). *Introduction to the Autism (& Low Incidence) Classroom Observation Tool.* Workshop presented for Shelby County Public Schools. Shelbyville, KY.

Gurney, B. N. (2017, February). *Evidence based practices for teaching reading comprehension for students with moderate and severe disabilities.* Workshop presented for Shelby County Public Schools. Shelbyville, KY.

Gurney, B. N. (2015, July). *Strategies for inclusion of students with severe disabilities in general education elementary classrooms.* Workshop presented for Shelby County Public Schools. Shelbyville, KY.

SERVICE

| 2016-present | Guest Reviewer, Division on Autism and Developmental Disabilities (DADD) Online Journal |
| 2016-present | Guest Reviewer, Education and Training in Autism and Developmental Disabilities (ETADD) Journal |

2016-present	Guest Reviewer, Rural Special Education Quarterly (RSEQ)
2016-2017	University of Louisville, College of Education and Human Development, Standards and Admissions Committee
2016	Guest Reviewer, Kentucky Teacher Education Journal (KTEJ)