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Executive Summary

Students with significant cognitive disabilities may participate in states' alternate assessments based on alternate achievement standards (AA-AAS). A growing number of students with significant cognitive disabilities are also English learners (ELs) whose family may use another language in the home. They may only be exposed to English in a school setting. To fully and meaningfully participate in an AA-AAS, ELs with significant cognitive disabilities need to be offered meaningful access to the grade-level curriculum prior to taking the assessment. The purpose of this article is to identify an evidence base on best practices in English language arts instruction for these students. Based upon the limited research available, the article provides recommendations for important first steps to ensure that ELs with significant cognitive disabilities have access to grade-level curriculum and instruction.

Instructing and Assessing English Learners with Significant Cognitive Disabilities

Federal education legislation requires that states implement grade-level standards-based assessments to measure students' academic achievement. For a small group of students, those with "significant cognitive disabilities," an alternate assessment based on alternate achievement standards (AA-AAS) is allowed. These students may be assessed on grade-level content with different achievement standards to define proficiency. With the enactment of the Every Student Succeeds Act (ESSA), there is a state-level cap of 1% of all tested students in a subject area who may participate in the AA-AAS.

Legislation does not clearly define who students with significant cognitive disabilities are. Rather, each state has its own criteria for AA-AAS participation, and future ESSA regulations may ask states to specify these criteria (Council of Chief State School Officers, 2016). Broad criteria include that students have one or more disabilities represented by IDEA disability categories, and that their cognitive impairments are a barrier to attaining grade-level achievement standards (U.S. Department of Education, 2005, p. 23). Students participating in one AA-AAS developed by a consortium of states were largely those with intellectual disabilities, autism, or multiple disabilities (Thurlow, Wu, Quenemoen, & Towles, 2016). The majority of these students were reported to: use symbolic expressive communication, have receptive communication skills, communicate without the aid of assistive technology, have vision and hearing within normal limits, and have no significant motor difficulties (Thurlow et al., 2016). Baseline data indicated that a range of less than 1% to 13% of AA-AAS participants across 18 participating states came from homes where a language other than English was spoken (Towles-Reeves, Kearns, Flowers, Hart, Kerbel, Kleinert, Quenemoen, & Thurlow, 2012). Even though English learners (ELs) comprise a small proportion of the total AA-AAS participants,

their numbers are growing and their needs must be considered when designing both the test and the instruction the precedes it. This work is just beginning. According to Thurlow, Christensen, and Shyyan (2016), ELs with significant cognitive disabilities have largely been invisible to educators and policymakers for many years.

Providing accessible instruction on the content that will be tested is a cornerstone of the standards-based assessment and accountability movement (Cortiella, 2006; Elmore & Rothman, 1999; McDonnell, McLaughlin, & Morison, 2007). One consortia of states collaboratively built an AA-AAS accompanied by a system of curriculum and instructional materials. Members made a decision to design the assessment and instruction together in order to ensure that students with significant cognitive disabilities were offered meaningful instructional opportunities using a challenging, grade-level curriculum before they were assessed. As part of this work, the partner states created curriculum and instruction resources to improve educators' ability to deliver instruction aligned to the standards on which the AA-AAS is based. Early on, resources were developed for the general population of students with significant cognitive disabilities and were not specific to those students with significant cognitive disabilities who were learning English. Now this consortium plans to create additional curriculum and resources for ELs with significant cognitive disabilities who take the same assessment but who need different instructional support to address academic needs related to both their disability and their limited English skills.

Designing meaningful educational opportunities for students with significant cognitive disabilities who are acquiring English in addition to their home language (L1) can be challenging. In an effort to understand current practices for instructing ELs with significant cognitive disabilities, we examined the available literature on instruction for these students. From

this review of literature we draw implications for creating curriculum and instruction materials to support the learning of those ELs who participate in an AA-AAS.

Literature Search Process

The authors used a variety of search methods to identify as wide a range of articles as possible, pulling from both health and education. First, we used Google Scholar to identify a broad list of books and articles relating to ELs or bilingual students with significant cognitive disabilities. Search terms included: “bilingual,” “English language learner,” “Spanish” + “significant cognitive disability/ies,” “significant disability,” “severe disability,” “intellectual disability,” “autism,” “mental retardation,” “Down syndrome,” “assistive technology,” and “literacy”. Because the focus was on the literature on instructional practices, we did not include “assessment” as a possible term. Search results included dissertations and, when possible, we reviewed the reference list for those dissertations to locate additional studies. As part of this search we also used the “Cited by” function in Google Scholar to search for the names of other articles citing the most relevant documents located in the search. We limited the search to English language publications and stayed mainly within the 2000-2015 time period. Some publications prior to 2000 were included if the topic was relevant. However, for the most part, these older articles and books were difficult to obtain and often did not relate to academic instruction for students with significant cognitive disabilities.

Second, additional searches were conducted in (a) MNCat Discovery, a University-affiliated search engine including the library catalog, academic journals, government documents, magazines and newspaper articles; (b) Academic Search Premier, a multidisciplinary database of academic articles; (c) OVID Medline, a search engine for articles in health sciences; (d) The Education Resources Information Center (ERIC). We identified and reviewed abstracts for any articles not previously located in the Google Scholar search.

Third, we checked all issues of five key journals to locate articles on ELs with significant cognitive disabilities. These journals were: (a) *Research and Practice for Persons with Severe Disabilities*; (b) *Journal of Policy and Practice in Intellectual Disabilities;* (c) *Multiple Voices for Ethnically Diverse Exceptional Learners;* (d) *Focus on Autism and Other Developmental Disabilities; (e) Education and Training in Autism and Developmental Disabilities*.

After conducting the searches, we compiled a list of relevant document citations. When the population of students addressed by articles was unclear, we reviewed abstracts or full articles for applicability to students with significant cognitive disabilities. Two article authors read each of the relevant articles, identified key information on research methodology and instructional methods, and discussed the results of the independent reviews. Final article selection was based on whether the articles presented research findings that had direct relevance for English Language Arts or language instruction and assessment of ELs with significant cognitive disabilities.

Literature

Only a handful of studies used empirical research to investigate an instructional strategy in English Language Arts for potential ELs with moderate-severe disabilities. These eight studies were:

- Ainsworth (2013)
- Kemper (2012)
- Lang, Rispoli, Sigafoos, Lancioni, Andres, and Ortega (2011)
- Rivera (2011)
- Rivera, Spooner and Hicks (2013)
- Rivera, Wood and Spooner (2012)

- Rohena, Jitendra, and Browder (2002)
- Spooner, Rivera, Browder, Baker, and Salas (2009)

These studies will be described according to four emergent themes relating to the provision of instruction to ELs with significant cognitive disabilities: (a) How students were identified as ELs; (b) linguistic support provided for language learners; (c) intervention strategies investigated; (d) and study results. For detailed information on the focus of the studies, the language of the intervention and of instruction, and student characteristics, see Table 1.

How Students were Identified as ELs

In the majority of studies, the students were considered ELs for research purposes because the family used a language other than English at home. Student participants may not have gone through a formal intake and assessment process to be officially identified as an EL who was eligible for English development services. Information about the students' proficiency in the L1 and in English, based on test scores or other forms of data, were generally unavailable from the school at the time studies began. Researchers typically collected information on L1 and English skills, or on which language was dominant for the student, using a variety of methods. These methods included interviews (Rivera et al., 2012), a parent language survey (Rohena et al., 2002), observations in class or at home (Rohena et al, 2002), and standardized tests such as the *Preschool Language Scales* (e.g., Zimmerman, Steiner, & Pond, 2011) in English and Spanish, the *Expressive Vocabulary Test* (e.g., Williams, 2007), the *Peabody Picture Vocabulary Test* (e.g., Dunn & Dunn, 2007), and the *Test de Vocabulario en Imagenes Peabody* (Dunn, Lugo, Padilla, & Dunn, n.d.). Notably, the formal measures used in the studies tended to assess vocabulary knowledge and, with the exception of the *Preschool Language Scales,* not more global language proficiency. In addition, most of the standardized tests that were administered

were those typically used for special education assessments and were not measures designed for determining second language acquisition. A lack of detailed information on students' L1 and English proficiency was a limitation that affected study results in some cases (Lang et al., 2011; Rivera et al., 2012).

Linguistic Support Provided for ELs

Seven of the eight studies reviewed (Kemper, 2012; Lang, 2011; Rivera, 2011; Rivera et al., 2013; Rivera et al., 2012; Rohena et al., 2002; Spooner et al., 2009) investigated the incorporation of the students' L1, Spanish, into an individualized teaching strategy or intervention commonly used in special education settings. The final study (Ainsworth, 2013) included students with a variety of non-English language backgrounds in the research, but did not incorporate use of the students' L1 or other second language acquisition supports during instruction. Incorporating the use of the L1 as a linguistic support strategy occurred in most of the studies despite the fact that only two of them (Kemper 2002, Lang et al., 2011) included students who had received some instruction in the L1. The exact nature and extent of the L1 instruction was not described in sufficient detail.

Intervention Strategies Investigated

Our review identified articles that investigated five strategies taken from either Applied Behavior Analysis techniques or Direct or Explicit Instruction to the instruction of ELs with moderate to severe disabilities. We provide a description of each strategy, as it was conceptualized in the research.

Constant Time Delay (CTD). Four studies (Ainsworth, 2013; Kemper, 2012; Rivera et al., 2013; Rohena et al., 2002) featured the use of a constant time delay strategy in instruction. A constant time delay is a fixed amount of time provided between instruction and a teacher prompt. A reinforcement such as praise, food, or access to toys is given when the student correctly

responds with a targeted skill or behavior to increase the likelihood that the student will demonstrate that skill or behavior again. Typically, over time, the use of teacher prompting would gradually be eliminated, but these studies were limited in scope and often ended before prompting was eliminated. In the four studies that included CTD, three of them (Kemper, 2012; Rivera et al., 2013; Rohena et al., 2002) incorporated instruction in both the student's L1 and English and compared the effectiveness of a constant time delay strategy in the two languages. The time delays in these three studies lasted from 4 seconds to 10 seconds. The fourth study (Ainsworth, 2013) did not include any L1 support.

Kemper (2012) examined the effectiveness of a bilingual listening reading comprehension package with English and Spanish used for instruction on alternating days. Ten age-appropriate English children's books were modified to add visual symbols for key vocabulary. The same symbols were reproduced on the students' communication boards or in hard copy to support student responses to comprehension questions. In addition, a one to two line summary was added at the end of the book. After the teacher read each book twice in English, the student answered comprehension questions in the language of the intervention (English or Spanish). The teacher waited up to 10 seconds for students to respond by pointing or using a communication board. If the student gave an incorrect answer or did not respond within 10 seconds, the teacher repeated the question and provided the answer.

Rivera et al. (2013) conducted a similar study examining the effectiveness of a multimedia shared story intervention in English and Spanish to support English vocabulary learning. Instead of using children's books, the researcher created three multimedia books, in English and in Spanish, that used English vocabulary students had not known on a pretest. Sound effects and visuals accompanied new vocabulary. As a first step, the researcher presented

PowerPoint slides containing the new words in the story along with a picture of the object. The pictures were identified in both English and Spanish. Second, students were asked to predict what the story would be about. Third, the researcher read the story and when a new vocabulary word appeared, the researcher presented a slide with the target vocabulary word and a picture. At this stage the teacher presented the new word with a zero second delay prompt ("This word is rain. Say it with me, rain. Say it with me again, rain."). At the end of the first reading, students were asked to name the word that went with each picture. They had a four second time delay before the teacher prompted by saying the word as a model. After the prompt, the teacher again presented the new word twice with a zero second delay as a form of error correction. The students were again shown the pictures of each vocabulary word and were asked to name them. Verbal and physical praise (e.g., a high five) were provided for correct answers.

Rohena et al. (2002) used a four second time delay with an instructional package focused on teaching English sight words. The researchers compared the number of correct responses students provided in English and Spanish instruction on the English words. The researchers identified a list of 30 sight words used for classroom instruction and wrote them on cards. These words were taken from signs in department stores where students' families shopped. From the list of 30 words, 15 unfamiliar words were selected and grouped into three sets of five words each. Every day the student had three instructional trials of approximately two to three minutes per trial. The sessions started with a probe. During the probe the teacher showed the sight word cards and provided a cue in the language of the intervention ("Look at the word, read the word" or "Mira la palabra, lee la palabra"). The student had four seconds to respond. After the probe, the teacher began instruction by providing a brief set of directions, presenting, and then modeling each sight word using no delay. After three consecutive sessions of words being presented and

modeled with no delay, the words were again presented with a four second delay to allow the student to read the word. If the student made an error, the teacher gave a prompt. Correct words were followed by praise from the teacher, as well as pennies students could spend at the end of the intervention. Sessions continued until the student reached the criterion of 100% correct for one of the instructional conditions (i.e., English or Spanish).

Discrete Trial Training (DTT). Lang et al. (2011) studied the outcomes of discrete trial training, or DTT, conducted in both a student's L1 and in English to determine whether the language of instruction influenced the student's correct responses to oral commands (i.e., receptive language skills). The teacher had a stack of index cards with a task demand written on each one. Tasks included pointing to a body part, identifying a common object (e.g., a spoon, your head), and imitating the teacher's actions. During a 15 minute session conducted in either English or Spanish, commands were presented in one language at a time at a speed of roughly two cards per minute. If needed, the teacher provided a prompt to help the student respond correctly. Reinforcements, such as food, access to toys, and praise were provided for correct responses, but were removed for the next command. The teacher conducted two to three DTT sessions a day, with a break and play time between them.

Forward Chaining of Skills (Task Analysis). Spooner et al. (2010) examined the effectiveness of teaching a bilingual paraprofessional to use a story-based task analysis and forward chaining to develop emergent literacy skills in elementary school ELs with intellectual disabilities. The researchers developed a total list of 14 sequential reading skills that were subdivided into three sets, with the earliest skills to develop contained in the first skill set. The task analysis listed steps for the paraprofessional to complete with the student. It included items such as "Provides an anticipatory set" or "Asks prediction question and provides the student with

two choices." After being trained on the task analysis steps, the paraprofessional then chose three culturally relevant children's books for use with the Spanish speaking student. The first book was written in Spanish, the second book contained both Spanish and English, and the third book was written in English. Modifications were made to make the books easier to read. For example, the title and author name were enlarged for easier reading, pages were laminated, and a repeated story line was added to the bottom of every other page.

The language of instruction was chosen to reflect the paraprofessional's typical pattern of interacting with students in two languages even though the teacher may only have used English in the classroom. She taught the first skill set in the student's L1 as she read the first book in that language. This was done to ensure that the student understood the procedures being followed. When the student mastered that skill set, a new book was used that was written in both the L1 and English. Along with the new book, a new skill set was introduced using both languages. The third book was written in English with some Spanish words, and the paraprofessional introduced the third skill set in English. The student was required to continue using the skills from the first skill set while learning subsequent skill sets. The paraprofessional monitored her own progress by checking off steps as she completed them. She waited five seconds for the student to respond to story comprehension questions before verbally prompting for an answer. For each skill set the student used a binder that contained removable cards with possible answer choices for the teachers' questions or prompts. By the end of the instructional sessions the student was responding to all of the items in the task analysis.

Model-Lead-Test. Rivera et al. (2012) examined the comparative effect of an instructional procedure, in English compared to Spanish, which used "systematic explicit instruction" and technology within a model-lead-test approach ("I do, we do, you do"). The

researchers examined the effect of this model-lead-test approach on students' oral English vocabulary learning. Fifty unfamiliar nouns in each language were selected from a published curriculum (*Espanol to English* by Engelmann & Osborn, 2001) and from teacher-provided lists of words students might encounter at home and school. The list of 50 words was divided into 10 sets of five nouns each. Instruction occurred three days a week for roughly 12 minutes a session over a period of 10 weeks. For each instructional session, the teacher made a brief introduction in the language of the intervention, either English or Spanish, and explained "First I will say the word, then you will say it with me, and then you will say it by yourself" (p. 48). Pictures of items associated with vocabulary words were presented individually via PowerPoint slides. The teacher reviewed the name of each picture in Spanish first, to offset students' limited English skills. Then for each word the model-lead test approach was used in the language of the intervention to introduce the vocabulary in English. After completion of the five slides, the teacher showed the student each slide again and gave the student four seconds to provide the correct vocabulary word. If the student could not provide the correct response in four seconds, the teacher gave the correct answer and continued to the next slide. At the end of the instructional session, a slide with the same five words in random order was presented and students were asked to identify the words that they knew. After three teaching sessions, students were tested on the total pool of vocabulary words in both English and Spanish before additional instruction occurred.

Shared Stories. A few of the studies (Kemper, 2012; Spooner et al., 2009; Rivera et al., 2013) incorporated shared story reading activities that were either directly based on the work of Browder, Trela, and Jimenez (2007) or had some similar characteristics. Browder et al. (2007) advocated for adapting age-appropriate texts in ways that would support the learning of students with moderate-severe disabilities. In their study of non-ELs they modified texts to add pictures

for key vocabulary words, and a repeated story line that summarized each chapter. They also laminated book pages for easy handling. Studies that adapted age-appropriate texts, or created them, for ELs with moderate-severe disabilities took a similar approach, but used stories from the student's home culture. Kemper (2012) and Rivera et al. (2013) added pictures or symbols to highlight new vocabulary. Rivera et al. (2012) accompanied those pictures with a sound. Spooner et al. (2009) added a repeated story line that occurred frequently. The same authors also enlarged the book title and author name. Kemper (2012) provided a summary at the end of the story. In all three studies (Kemper, 2012; Rivera et al., 2013; Spooner et al., 2009) the adapted texts were read in the student's L1. One study (Rivera et al., 2013) incorporated technology to present the texts digitally. Researchers studying shared stories delivered through technology believed the use of technology was beneficial. According to Rivera et al. (2013), a multimedia approach to instruction captured the students' interest and allowed information to be presented verbally and in picture format. In addition, Kemper (2012) found that technology could be used to deliver instructional content in the student's L1 when the teacher lacks proficiency in that language.

Study Results

The intent of most of the eight studies reviewed was to determine whether the use of English or Spanish produced better results during a language or literacy intervention for Spanish-speaking ELs with a moderate-severe disability. Thus, the overall effectiveness of the instructional strategy was not generally the focus of investigation and no definite conclusions can be drawn about recommended strategies for teaching or assessing ELs with significant cognitive disabilities. The researchers used commonly recommended strategies for students with moderate-severe disabilities who were not ELs and typically made adjustments to embed the L1 and culture into those interventions. Adjustments included using bilingual teaching staff, choosing

L1 or bilingual books that reflected the student's culture, using the student's L1 during instruction, and choosing sight words or vocabulary words from the student's community (e.g., words found in shopping malls frequented by the family). These adjustments were made even though most of the students in the studies appeared to receive instruction primarily in English.

Table 2 contains a summary of study findings, the authors' stated limitations and study implications for educators. Across studies, there was no clear pattern of greater effectiveness when students were taught in Spanish versus English. Researchers generally indicated that Spanish instruction produced better results for some students in some cases, but not for others. Related factors brought up by authors included whether students had a formal communication system that they were used to using at home prior to the intervention, their proficiency in both languages, the teacher or researcher's proficiency in the L1, the school's access to L1 resources like books or vocabulary cards, and the student's reading skills in both languages.

Researchers recommended close collaboration between the school and the parents when choosing the language of instruction so that a teacher knows how the student typically communicates with family, and the type of language to which the student is exposed (Rivera, 2011; Rivera et al., 2013; Spooner et al., 2009). Rivera et al. (2013) argued that no single decision about L1 or English use during instruction will fit the needs of every student (Rivera et al., 2013).

Discussion and Implications

This review of the research literature on effective instruction for ELs who have significant cognitive disabilities found very few relevant studies on either topic. Nevertheless, the few studies available provide a set of initial findings that may be of value to educators

working with these students. More detailed recommendations on implementing specific instructional strategies from individual research studies can be found in Table 2.

The eight studies reviewed highlighted the urgent need for more empirical research on effective instruction for ELs with significant cognitive disabilities. Educators need a body of best practices to draw from, but at the present time that knowledge base does not exist. In fact, some research (Crockett, 2006; Mueller, Singer, & Carranza, 2006; Mueller, Singer, & Grace, 0024; Pickl, 2011) has shown that many special educators charged with instructing ELs with significant cognitive disabilities lack the specialized resources, knowledge and skills, as well as the administrator support, needed to teach these students in linguistically and culturally sensitive ways that incorporate high expectations.

The studies reviewed in this paper tended to examine the benefits of incorporating students' L1 (and sometimes culture) into instructional strategies typically used for students with moderate-severe disabilities who are not ELs. The typical viewpoint of researchers was that the largely nonverbal students could use their L1 to continue learning while they were developing more communication skills in English. Findings on the effectiveness of L1 use varied across students and studies. Researchers largely did not account for the fact that most participants used their L1 at home and English at school. Thus, the type and topic of communication that students typically experienced in each setting, and each language, may have varied, potentially confounding results of academic interventions delivered in both languages. To maintain and increase the range of students' L1 skills in the classroom, ELs need continued instruction in the L1 to do academic tasks in that language (Chumak-Horbatsch, 2012; Cummins, 2001; Garcia, 2005). However, the ELs with significant cognitive disabilities in the studies reviewed appeared to receive academic instruction that was restricted in scope and rigor compared to the grade-level

instruction their peers without significant cognitive disabilities most likely received. Most studies described interventions aimed at developing students' basic literacy skills (Ainsworth, 2013), comprehension of simple commands (Lang et al., 2011), or production of vocabulary and sight words (Rivera, 2011; Rivera et al., 2012; Rivera, 2013; Rohena, 2002). Only two of the studies (Kemper, 2012; Spooner et al., 2010) asked students to engage in more complex, grade-appropriate tasks such as answering comprehension questions about a piece of literature. Thus, the types of language skills required for interventions in each study were not comparable. To understand a text read aloud and answer questions about it in the L1 requires language skills that some ELs with significant cognitive disabilities may not have had the opportunity to develop at home and on which they would need instruction. However, to learn a list of vocabulary words such as those needed for a shopping trip (Rohena et al., 2012) may require a set of L1 skills similar to those used in the home.

Despite the lack of research, this review of the literature suggests that there are some critical first steps educators can take to ensure that ELs with significant cognitive disabilities have access to the grade-level standards-based instruction on which an AA-AAS will be based. These steps include:

- Going beyond existing labels when deciding which students need English language supports. Federal guidance (U.S. Department of Justice and U.S. Department of Education, 2015) requires that all eligible ELs, including ELs with disabilities, receive services. Yet anecdotal information from teachers (Liu, Goldstone, Thurlow, Ward, Hatten, & Christensen, 2013) suggests that some students with significant cognitive disabilities and limited communication skills may not be identified as ELs through the traditional identification processes (e.g., home language questionnaire, assessment) or

may not be retained in English language development services. Students who use another language at home and do not receive English language development services may not have the same degree of access to instruction offered in English at school as their native English speaking peers do.

- Collecting information on students' typical communication patterns at home, and their proficiency in both the formal communication systems of the L1 and English, as well as any other communication system that may have a linguistic or cultural basis (e.g., sign language, gestures).
- Developing procedures for identifying the content knowledge and skills students already have in their L1 and may not yet be able to demonstrate in English. In doing so, educators should consider whether these procedures are designed to capture the full extent of what ELs know and can do.
- Involving parents of ELs with significant cognitive disabilities in their child's education at the earliest stages. This is, of course, important for all students with significant cognitive disabilities, but perhaps more important for those who are suspected to be ELs. Parents have a critical role to play in the education of ELs with significant cognitive disabilities. They can help prevent misidentification of their student as having a significant cognitive disabilities, or when identification is appropriate, can assist the school in identifying what their student can and cannot do that the school may not see because of the language difference. They can also provide insight on links between the content and students' L1 and culture.
- Developing grade-appropriate curricular materials for students with significant cognitive disabilities (e.g., see Browder, Flowers, Wakeman, Lee, Quenemoen, & Thurlow, 2015)

so that students are exposed to content that requires them to develop more complex language skills.

- Involving English development and cultural experts in integrating linguistic supports that are appropriate for a given EL with a cognitive disability during the design and delivery of content instruction. These linguistic supports need to include more than the use of a student's L1 during instruction, particularly when the linguistic demands of either L1 or English content instruction may, in some cases, be greater than what the student has had the opportunity to learn at home.

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Table 1.

Instruction and Intervention Study Details and Student Demographics

Study	Literacy Focus	Number of Participants	L1	Disability	Verbal Skills	Age	Language of Intervention	Language of Instruction
Ainsworth (2013)	Basic literacy skills in English	8	Spanish (3) English (3) Bengali (1) Amharic (1)	Cerebral Palsy Rhett Syndrome Down Syndrome Intellectual Disability	Functionally non-verbal	11-16	English	No information
Kemper (2012)	Reading comprehension skill development in L1 and L2 through listening	4	Spanish	Autism + Severe Intellectual Disability (3) Fragile X Syndrome + Speech delay + Seizure Disorder + Severe Intellectual Disability (1)	Nonverbal	5-8	English Spanish	2 English only 2 English & Spanish
Lang et al. (2011)	Receptive language skills in English	1	Spanish	Severe Autism	Little spontaneous speech Minimal use of one syllable words in L1 and L2 if prompted	4	English Spanish	English & Spanish

Rivera (2011)	Oral English vocabulary acquisition	2	Spanish	Moderate Intellectual Disability	Clear verbal speech + limited vocabulary knowledge	9	English Spanish	English
Rivera et al. (2013)	Oral English vocabulary acquisition	2	Spanish	Moderate Intellectual Disability	Clear verbal speech + limited vocabulary knowledge	9	English Spanish	English
Rivera et al. (2012)	Oral English vocabulary acquisition	3	Spanish	Moderate Intellectual Disability	Communicates in both L1 and L2	8-10	English Spanish	No information
Rohena et al. (2002)	English sight word acquisition	4	Spanish	Moderate Intellectual Disability	Communicates and followed directions in L1 and L2	12-15	English Spanish	English
Spooner et al. (2009)	Emergent literacy skills	1	Spanish	Moderate Intellectual Disability	Limited vocalization Mostly non-symbolic	6	English Spanish	"Most" in English

Note. L1= Home language; L2= Second language (English)

Table 2.

Instruction Study Results, Limitations, and Implications for Educators

Study	Findings	Limitations	Implications for Educators
Ainsworth (2013)	Statistically significant relationship between use of the ALL curriculum and student progress on letter-sound correspondence and sight word recognition No performance differences by disability types, ways of responding, ages, IQ scores, or L1	Short intervention time length (10 weeks including holidays and days students were absent) Small number of students Teacher did not conduct intervention	Do not exclude students from literacy instruction based on IQ scores, primary disability category, age or behavioral issues. Offer shorter sessions to accommodate physical effort of responding Ensure students are comfortable Minimize students' behavioral challenges by attending to the environment
Kemper (2012)	All students demonstrated increases in the total number of responses to comprehension questions and in the number of communication attempts for both the English and bilingual interventions There were slightly larger increases for the Spanish intervention compared to English The accuracy of student responses was lower than the established 80% criterion in both L1 and L2	Lack of bilingual interventionist (poor Spanish pronunciation) Multiple student absences during intervention Engagement definition (i.e., eye contact) did not work well for students with autism Some students lacked prerequisite skills for answering comprehension questions	Collect information on home communication patterns, family literacy skills and activities Design instruction to build from students' existing communication skills, which may be in L1 Use the same symbols in the adapted text and on the student's communication board Model physically matching the symbols to the new vocabulary words while reading the text Define student engagement in ways that are relevant for specific students

Study	Findings	Limitations	Implications for Educators
Lang et al. (2011)	More correct student responses and fewer challenging behaviors (i.e., tongue clicking) occurred with Spanish instruction compared to English	Student's expressive and receptive language skills may not have been well measured by standardized test.	Use language proficiency assessment data to guide decisions about the language of instruction even for students who lack expressive language skills
Rivera (2011)	Teachers thought multimedia shared stories were practical and useful teaching tools Gains in English vocabulary learning were possible regardless of language of instruction Students showed mixed results on outcomes of English versus Spanish interventions	Limited generalizability; small number of students Students lacked ability to apply words to variety of photos or objects All instruction in one setting and situation No established mastery criterion for students Hispanic interventionist may have influenced student responses Classroom teacher did not conduct intervention	Select language of instruction based on individual student need Understand systematic instruction and applied behavior analysis Adapt techniques for group instruction of ELs using SMART Boards and Universal Design for Learning principles
Rivera et al.(2013)	Both students made gains in English vocabulary learning, but each one made larger gains in a different language Language of instruction did not meaningfully affect generalization and maintenance of vocabulary over time Teachers thought multimedia shared stories were practical and useful	Cannot generalize results to larger populations of students with intellectual disabilities Students not trained to apply vocabulary to a variety of pictures or objects Lack of student mastery criterion Hispanic interventionist may have influenced student responses Classroom teacher did not conduct intervention	Multimedia shared stories and systematic instruction can provide effective vocabulary instruction Select language of instruction based on individual student need Understand systematic instruction and applied behavior analysis Be familiar with computers Adapt techniques for group instruction of ELs using SMART Boards and Universal Design for Learning principles

Study	Findings	Limitations	Implications for Educators
Rivera et al. (2012)	All students learned new English vocabulary words in both language conditions Two of the three students learned more quickly with Spanish instruction compared to English One student made similar progress under both conditions Generalization scores were lower than expected	No maintenance data collected and generalization data only collected after intervention Instruction with only one visual example (e.g., picture) may have limited students' ability to generalize vocabulary to new examples Classroom teacher did not conduct the intervention and may have inadvertently provided instruction on some words Small number of students (n=3) influenced results	Use PowerPoint to set up and deliver supplemental vocabulary instruction in short increments (10-15 minutes), using basic instructional language in the student's L1 Incorporate whiteboard technology to promote student engagement Know students' needs and use culturally responsive instruction methods Use a variety of visual examples of a single word
Rohena et al. (2002)	Language of instruction may not greatly affect English word learning For three of four students, both Spanish and English time delay conditions were effective and efficient for promoting English sight word reading compared to no time delay Spanish time delay was more effective and efficient than English for the fourth student All four students could apply the shopping sight words learned in class to stores in the community and learned most of the incidental information about words (e.g., definitions, descriptions)	Small number of students limits applicability of findings Scheduling problems prevented collection of generalization data for one student Generalization sessions held in stores were unstructured because of the nature of activities	Select words that are functional Use repetition, modeling, and verbal and visual cues during instruction Match the language required for activities to the student's L2 proficiency Provide culturally relevant activities
Spooner et al. (2009)	The student increased correct responses from baseline (no culturally relevant book, no Spanish instruction, no forward chaining) to intervention in skill sets 1, 2 and 3	The student may not have maintained performance in the English-only condition over the long term Limited time for the intervention required moving the student to the second phase of	Provide L1 support during academic instruction to help ELs with an intellectual disability transition to the L2 and develop optimal literacy skills

	The student also made improvements when returning to baseline conditions. To some degree, the intervention improved the student's book awareness, vocabulary knowledge, and listening comprehension	the intervention prior to meeting mastery criteria Only one student participated, limiting generalizability of the results to other groups Mixing the language of instruction may have confounded study results	

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