Story-based Lessons for Students with Severe Intellectual Disability: Implications for Research-To-Practice

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Abstract

All educators must use evidence-based practices to teach literacy to their students, including those who teach students with a severe disability. This may be a challenge, specifically for teachers who serve students with intensive communication needs and hearing loss. This exploratory study investigated the use of research in both severe disability and hearing loss to support two middle-school students, with a severe intellectual disability, in participating in literacy lessons aligned to grade level novels. The study used an abbreviated alternating treatment design to compare the effects of a story-based task analysis, with (SBL+) and without (SBL) embedded support for students with hearing loss, on student participation and comprehension of grade-aligned text. Results indicated increased student participation and correct responses from baseline to intervention for both the SBL+ and SBL interventions. Results were mixed regarding one treatment providing better student outcomes. Additionally, results indicated that while the teacher was able to implement the steps of the task-analysis during literacy instruction, low fidelity on prompting system and feedback during each step of the task-analysis may hinder students' opportunities to demonstrate mastery of new content. Implications for practice, with emphasis on the use of evidence-based practice and future research are discussed.

According to the No Child Left Behind Act (NCLB), academic skill development is required for all students, including those with significant disability (NCLB, 2002). Not only are academics required to be taught to all students, the population of students with significant challenges continues to surpass previous expectations and make significant growth towards grade-level standards (Browder et al., 2012). In regards to academic standards, attainment of literacy skills continues to be a driving force in the level at which students are able to access the curriculum (Browder, Mims, Spooner, Ahlgrim-Delzell, & Lee, 2009). A student's ability to access text, pictures, and new concepts may be one of the most important abilities

supported within the curriculum, due to the implications literacy has on future access to math, science and social studies, as well as "functional life skills." The purpose of this study was to further investigate methods for implementing story-based lessons for students with severe disability, including hearing loss, using both a task-analytic and a Universal Design for Learning (UDL) planning approach (Browder et al., 2009).

Research Regarding Literacy Instruction for Students with Severe Disability

For many decades the field of severe disability heavily focused on sight word instruction, with little regard to comprehension or the broader sense of the term "literacy" (Browder, Wakeman, Spooner, Ahlgrim-Delzell, & Algozinne, 2006). However, in recent years research has begun to shift focus onto reading (phonics based instruction) and early-literacy story-based (e.g., author, title, main idea, sequencing) interventions to teach students with severe disabilities (Browder, Ahlgrim-Delzell, Courtade, Gibbs,, & Flowers, 2008; Browder, Trela, & Jimenez, 2007). Through the use of systematic instruction (e.g., task-analytic instruction, time-delay, prompting systems), research has proven that students with moderate to severe intellectual disability can participate, show comprehension, and master early literacy and reading skills across the grade span (Spooner, Knight, Browder, & Smith, 2012). One example of the research conducted in recent years is a study published in 2007, in which Browder et al. taught three teachers of students with severe disability to use systematic instruction to teach students to participate in literacy lessons with grade appropriate text (e.g., *Call of the Wild* by Jack London). Using a 12-step task-analysis and a least-to-most prompting system, teachers were able to guide students through a lesson and increase student participation in early literacy skills, such as identifying the author, identifying the title, opening the book, and answering literal recall comprehension questions.

Additionally, research has begun to investigate how to promote early literacy skills with students who have intensive support needs (Browder, Mims, Spooner, Ahlgrim-Delzell, & Lee, 2009; Mims, Browder, Baker, Lee, & Spooner, 2009; Skotko, Koppenhaver, & Erickson, 2004). Specifically, Browder et al. (2009) investigated the use of shared stories using a task-analytic approach and the application of a UDL planning approach for students with limited communication and severe intellectual disability. The UDL teams discussed student participation in lessons and planned future lessons based on the three elements of UDL: representation (e.g., how they adapted the books and materials), student expression (e.g., eyegaze or laughter response to object), and student engagement (e.g., use of prompting, error correction and feedback). Results found that all three students were able to participate in the story-based lesson when the lesson itself was universally designed. The findings of Browder et al. (2009) suggest that all students, including those with the most limited communication and intensive support needs, can participate in meaningful ways with grade-appropriate literature. This emerging line of research has been important to the field of academic achievement for students with severe disability, as it has provided guidance in order for educators to respond to the call for evidence-based interventions or practices (EBP) to teach grade-aligned English-language arts standards to students with severe disability.

Evidence-Based Practices (EBPs)

To be considered an EBP, interventions must be shown to be effective by multiple research studies that meet strict criteria including research design, quality and effect on student outcomes (Horner et al., 2005; NSTTAC, 2010). In order to assist educators in finding these practices, Torres, Farley, and Cook (2012) published guidelines to help educators locate, assess, and effectively apply EBPs in their teaching. While the use of EBPs may be helpful for many

educators, it is quite possible that with populations of students with significant disability, newer research-based practices may support academic achievement even while these practices do not meet EBP standards. Recently, Hudson and Test (2012) completed a literature review of shared story reading, finding moderate evidence to support that story reading promotes literacy skill acquisition of students who have moderate to severe disability. While all of the research located found significant student growth, only six studies were located, and five of them were implemented by the same team of researchers.

An evidence-based practice is not a cure-all (Gallagher, 2004); however when chosen wisely and implemented appropriately, the evidence-base can be used as a guide to implement practices that are most likely to work for a given population when implemented with fidelity (Cook, Tankersley, Cook, & Landrum, 2008). Currently, teachers who serve students with severe disability may need to use both EBPs and research-based practices to drive current instruction. Fidelity of implementation of specific treatments may be difficult for some educators depending on the population of students on which the research has been conducted. For example, a teacher who would like to implement story-based literacy lessons (Browder et al., 2007) may review the literature and find that the students within her class have very specific needs not addressed by previous studies (e.g., multiple disabilities, limited communication, hearing loss). As the Browder et al. (2009) study addressed the UDL planning component of such interventions, it may be necessary to continue to develop strategies to support students with more intensive support needs who are not typically addressed in current research.

Research Design Related to Participants with Complex Needs

All educators, including those who serve students with complex needs, should continue to use valid research to support instruction within their classroom. However, it is also important to

continue to investigate additional supports that specific students may need to be successful within the "evidence-based practice." Primarily in the field of severe disability, most of the research has been conducted using single case research designs with small numbers of students (e.g., 3 participants). By virtue of the nature of single case research, individual students with very specific characteristics have participated in studies, providing suggested interventions for similar groups of students. With the field of severe disabilities encompassing such a vast population of students (e.g., verbal/nonverbal; mobility, behavioral, social, academic levels) one argument with research and evidence-based practice has related to the extent to which such practices are able to be generalized to another group of students with little to no change in implementation (i.e., procedural fidelity). While the intent of single-case research is just that, "single-case", implications should be investigated related to the use of such research to help guide educators' practice with their own students, with the knowledge that "one size does not fit all."

The Teaching of Literacy in Deaf Education

Specifically, within deaf education, there exist many approaches to teaching literacy to students with hearing loss. Students with hearing loss are typically delayed in the literacy areas of vocabulary knowledge and acquisition of new vocabulary when compared to hearing peers (Lederberg, 2003; Luckner & Cooke, 2010; Luckner, Slike, & Johnson, 2012). Therefore, students with hearing loss may have difficulty with the vocabulary and concept demands of many content-area discussions, lessons, and material presented in textbooks (Luckner, Slike, & Johnson, 2012). Receptive vocabulary knowledge in kindergarten is predictive of reading comprehension skills in the fourth and seventh grades (Tabors, Snow, & Dickinson, 2001), and receptive vocabulary in first grade has been shown to demonstrate a substantial relationship with

reading comprehension in the 11th grade (Cunningham & Stanovich, 1997), so teaching early literacy skills to students with hearing loss is critical, especially when so many students with hearing loss appear to struggle to become skilled readers (Karchmer & Mitchell, 2003; Traxler, 2000). For students with intellectual disability coupled with hearing loss, it may be necessary to employ evidence-based instructional supports such as those outlined by Luckner, Slike, and Johnson (2012). Specifically, Luckner et al. suggest that teachers of the deaf should provide literacy instruction through concrete activities, such as linking reading topics to students' prior experiences, modeling meanings from pictures and key words ("think alouds"), and through using direct instruction of sight words and vocabulary related to pictures and signs.

The current study is built on the story-based lesson (SBL) task-analysis used in Browder et al. (2007), and the need to plan for representation, expression, and engagement to promote student achievement. Research on early literacy development and hearing loss was used to guide the UDL planning process (SBL+). Additionally, a comparison of the SBL and SBL+ interventions was investigated to determine the need for and extent to which the hearing loss literature would provide instructional support for students with severe disability and hearing loss. Finally, in response to the need for teacher fidelity of research-based practices, this study investigated the level of fidelity through which the interventions were taught and the effect of this fidelity on student progress. This study fills the gap in existing literature on the subject of literacy and deaf education for students with severe disability by providing preliminary evidence of a UDL approach to storybased lessons. Additionally, this study provides data that can be used to support the discussion of issues within evidence-based practices and teacher fidelity of implementation.

Method

Participants and Settings

The study took place in a self-contained classroom for students with moderate to severe intellectual disability within a public middle school located in a large-urban district in the southern United States. Students in this context received the majority of their daily instruction in the self-contained classroom, and experienced lunch and recess as well as special area instruction (music, media class) with their non-disabled peers. All literacy/reading instruction took place in the self-contained classroom. The class had nine students with intellectual disability, with only one student having a significant hearing loss. The classroom had one teacher, one paraprofessional, and an additional 1:1 support paraprofessional. The teacher had 14 years experience teaching students with intellectual disability and a Bachelor of Science degree in special education.

Students. Two middle school students with severe disability participated in the study. Inclusion criteria for the study included (a) diagnosis of a severe intellectual disability, (b) participation in the North Carolina EXTEND 1 alternate assessment based on alternate achievement standards, (c) enrollment in a middle school, and (d) limited literacy skills, including limited comprehension of grade level text. Based on these criteria, the teacher was asked to select two students, one with a hearing loss and one without a hearing loss, to participate in the study. After informed consent was obtained for all students and teacher, baseline data was collected. Student characteristics are included in Table 1.

Materials

Adapted book. The classroom teacher was presented with a choice of three grade-appropriate adapted novels to use in the study, and asked to identify one she would prefer to use. The books were adapted by condensing text (e.g., chapters 1-3 became one 4-5 page unit), using

a readability level of 3rd grade or less, measured by the Lexile® Analyzer, adding picture symbols to key vocabulary in the story, and the addition of a repeated story line specific to the chapter's main idea. The children's novel *How to Eat Fried Worms* was selected by the classroom teacher for the study.

Story-based lesson task-analysis. A story-based lesson task-analysis (see Table 2) was provided to the teacher to use to instruct all lessons. Additionally, teacher support materials were developed to assist the teacher in implementation of the Story-Based Lessons (SBL) or Story-Based Lessons Plus (SBL+) interventions, see Figures 1 and 2 respectively. For example, to teach Chapters 4-6 (adapted to one unit), the teacher used the task-analysis and used the SBL supports to ask specific comprehension questions during the lesson (step 11). Then, to teach Chapters 7-9 (one unit), the teacher used the same task-analysis and use the SBL+ support to embed best-practices used to teach students with hearing loss (see Figure 2). The teacher taught each lesson a total of three times and chapters changed with each lesson, however, the target skills remained the same for the entire novel, giving students the opportunity for repeated practice and to apply literacy skills to new contexts.

Student response materials. Students were given several manipulatives and response materials that remained constant across all lessons: (1) vocabulary picture cards -_laminated piece of cardstock with pictures of the vocabulary words and text printed at bottom of card under the picture, (2) objects -_ select vocabulary words and comprehension responses were represented by objects (e.g., plastic worms, toy cars), and (3) adapted books – each student had his own *How to Eat Fried Worms* adapted book. The manipulatives were theme based and changed for each unit. For example, in a unit (Chapters 4-6) about frying worms before eating them, the manipulatives used in that lesson were plastic worms and a small frying pan to role

play the frying of the worms. All vocabulary picture cards and objects used for student response options were also used during the instruction of the lesson (e.g., teacher modeled frying a worm while reading the paragraph in which the characters fry the worm; comprehension response involved picture and objects used while reading text).

Research Design

An exploratory, single subject, alternating treatment design study was used to demonstrate the effect of the two story-based lesson treatments with concurrent replication across two participants. Once baseline data was stable for each participant, the story- based lesson treatment (SBL) and the story-based lesson plus treatment (SBL+) were introduced. The two treatments were alternated across units (chapters of the book) in a rapid succession in order to ascertain a comparative effect (Gast, 2010). The teacher repeated a unit for three lessons for at least three days before introducing the next unit which utilized the "other" treatment (i.e., Chapters 4-6: SBL; Chapters 7-9: SBL+). While it is possible students may build literacy skills (e.g., ability to open book), to control for carryover effect, each set of chapters had new vocabulary, events, and comprehension questions. Additionally, only one novel (context) was used across each treatment to control for content being "harder" or "easier" across interventions. Finally, rather than only implement one of the two treatments with the students, the researchers wanted to determine if one treatment was more beneficial than the other to both students (with and without a hearing loss).

Dependent Variables and Data Collection

Story-Based Lessons. A story-based lesson task-analysis was used by the teacher to teach each unit (set of chapters) to the students. Similar to Browder et al., (2009), a guideline for participating in specific steps of the task-analysis was created during a UDL planning session with the lead author and the classroom teacher. For each response, an observable behavior that

could count as an independent correct response was developed. All responses were based on an independent response that the student could perform independently without physical assistance. The teacher completed each of the 12-steps of the task-analysis during each lesson (see Table 2); however student data was only collected on five of the 12 steps. One of the steps of the task-analysis was the completion of a comprehension question (step 11) in which the students were given three different questions during the unit (chapters), hence data was collected on seven student responses. Data was reported by percentage of steps completed correctly.

During each step of the lesson, the teacher would complete the step herself, ask the comprehension question, or provide a natural cue (e.g., hand student a book and say "let's read," waiting for the student to open the book). The teacher would then provide both students an opportunity to complete the task providing additional prompting only as needed. Finally, praise was provided only as students independently completed the step. The teacher taught the unit three times, videotaping the third lesson of the unit. The videotapes were then loaded into a virtual folder (*Dropbox*) and data was coded by the researchers. Student data was collected on the same steps of the task-analysis for each of the two students; however different responses were expected from either student, as can be seen in Table 3. For example, to demonstrate early literacy skills of book awareness, both students were asked to open their book. Kevin was asked to activate a switch to ask someone to open his book, while Alan physically opened his novel. While only independent responses were graphed, data was collected on independent correct (I) responses, prompted correct (C) responses, or no responses (NR). Only independent correct responses were graphed for Alan, while any independent response (correct or incorrect) was graphed for Kevin. The primary dependent variable for Kevin was to make an intentional response to the stimuli to demonstrate engagement and awareness of the text.

Experimental Design Procedures

Baseline. Prior to baseline, the students had not been exposed to a story-based lesson using grade-level text. During baseline, the teacher provided the adapted book and asked students to complete their typical reading instruction using unit one (Chapters 1-3) of the book. Data was taken on the percentage of correct responses (Alan, independent correct; Kevin, independent response) because it was not possible to take data on the number of steps completed since the teacher might not embed opportunities to respond to all five steps. For example, during baseline the teacher might just read the book to the students without asking students to make a prediction.

Teacher training. Before intervention and after baseline, the special education teacher received a one hour training session in her classroom at an agreed upon time of the day while her students were at lunch or in special areas (i.e., physical education). A model-lead-test (Engelman & Becker, 1982) format was used to train the teacher to use the 12-step task-analysis to teach the adapted text. Sample SBL and SBL+ support materials were introduced to the teacher and used in the training. The training included models of least intrusive prompting and specific praise contingent on designated student behavior. Before implementing the intervention, the teacher was also shown a sample video of a story-based lesson using an adapted novel with middle school students similar to her own.

SBL. The intervention was designed to provide story-based lessons' instruction on the specific early literacy objectives outlined in Table 1. First, the teacher read the chapters from *How to Eat Fried Worms* aloud, providing opportunities for the students to perform both early literacy (e.g., open book, identify title, make predictions) and grade-aligned literacy skills (i.e., answer literal recall and inferential comprehension questions, review key vocabulary with picture

and object representations) in the context of the story. In order to control for the depth of knowledge in comprehension across units, three questions were provided to the teacher to embed for each unit (see Figure 1). Each unit included a knowledge, application, and synthesis question regarding the chapters read in the lesson. The teacher implemented each step of the task-analysis using a least intrusive prompting strategy (e.g., allow student to answer independently, then if needed provide a verbal prompt, then if needed provide a model prompt, then if needed provide a physcial prompt). If the student was correct, specific verbal praise was provided (e.g., "Great, you said the story was going to be about worms!"). Each lesson was taught a total of three times before moving to the next unit.

SBL+. The intervention was designed to provide the same SBL intervention with the addition of evidence-based practices to support text comprehension for students with hearing loss (Lederberg, 2003; Luckner & Cooke, 2010; Luckner, Slike, & Johnson, 2012). Using the same task-analysis, prompting procedures, and repetition of lessons, three specific instructional practices were embedded into the SBL task-analysis: (1) signing key vocabulary to text, (2) providing visual representations of big ideas from the text to provide context, (3) pulling out three situations/scenes per chapter to act out from the unit. Teacher supports were again provided to the teacher to use with detailed outlines on how and where to embed each of the three practices (see Figure 2). Specifically, one vocabulary word was signed five times within the story. Secondly, pictures were provided during the story to support what was happening in the story (e.g., picture of boys make a bet with money, then the boy putting ketchup on the worm, then the boy eating the worm). Finally, the teacher "acted out" specific important scenes in the chapters. For example, in a chapter about frying worms, the teacher might read a few lines of the

text, introduce the worms and the toy frying pan, then proceed to "fry the worm". Additionally, the students may also have "fried the worms".

Reliability

Implementation fidelity. The research team used the SBL task-analysis to ensure each of the steps were incorporated by the special education teacher during each story-based lesson. Due to the nature of this task-analysis, the teacher was allowed to embed steps out of order during the most natural time of the lesson (e.g., embed comprehension question after reading the second page of the chapter, rather than waiting until the end of the lesson to ask three questions in a row). Data was collected to determine that each skill was taught (e.g., identify title, ask comprehension question) and embedded using the designated prompting and feedback provided in the teaching trial (least to most prompting system, only gave praise for independent responses). Fidelity was taken during at least one of the three lessons taught within each unit (33% of instructional sessions).

Student behaviors. Inter-observer agreement (IOA) was taken by the two members of the research team on student data across baseline and intervention conditions. A point-by-point agreement was calculated for each skill assessed during the *How to Eat Fried Worms* lessons. IOA was taken during at least one of the three baseline and 33% of intervention sessions.

Social validity. Teacher interviews were conducted via personal contact, phone conversations, and email to determine the teacher's perceptions of the feasibility and effectiveness of the story-based lesson instruction on student participation, early literacy skills, and comprehension of grade-aligned text. At the conclusion of the study, the teacher was asked to share her thoughts, struggles, successes, and overall feelings about the intervention.

Results

Teacher Fidelity

During baseline, the teacher embedded a mean of 52% of the steps of the task-analysis (range of 43-64%). During the intervention phase the teacher embedded a mean of 88% of the steps of the task-analysis (range of 79-93%). Of the steps embedded, the procedural fidelity in which they were implemented with use of least-intrusive prompts and correct use of praise had a mean score of 86% accuracy (range of 69-100%). IOA was collected on 33% of baseline sessions with 92% agreement and 66% of intervention sessions with 100% agreement.

Student Data

Student performance data are displayed in Figures 3 and 4. Due to the number of steps omitted or prompted (without a chance for independent student responses) by the teacher during the intervention, a percentage based on the opportunities given to respond was used to display student data. Inter observer agreement for scoring student responding was collected on 33% of baseline sessions with 92% agreement and 66% of intervention sessions with 100% agreement for both students.

Kevin. During baseline, Kevin completed 0% of the steps of the task-analysis. During the alternating treatment phase, there was a significant response to both the SBL and the SBL+ interventions (M=45%, range from 20-60%). While there was a difference between the SBL (M=35%) and SBL+ (M=55%), the data trend did not indicate a significant difference in effect of student responding. Kevin's performance showed an immediate change in level and trend after introduction of the independent variables. IOA was collected on 33% of baseline sessions with 92% agreement and 66% of intervention sessions with 100% agreement.

Alan. During baseline, Alan completed 0% of the steps of the task-analysis. During the alternating treatment phase, there was a significant response to both the SBL and the SBL+

interventions (M=78%, range from 60-100%). There was a difference between Alan's level of correct responses during the SBL (M=90%) and SBL+ (M=66%) interventions. Alan's performance showed an immediate change in level and trend after introduction of the independent variables. IOA was collected on 33% of baseline sessions with 92% agreement and 66% of intervention sessions with 100% agreement.

Feasibility. The results of the teacher feasibility interviews indicated that the teacher found the use of story-based lessons to be beneficial to both students. She indicated that she had begun using the story-based lesson task analysis to support other students within her class to access grade-appropriate literature. She indicated that while she felt both students were benefitting academically from the interventions, they were also gaining better attention and communication skills. The teacher indicated her frustration with "knowing what she needed to do" but possibly forgetting the step or prompting procedure. Overall, she planned to continue use of the adapted books, task-analysis, and additional supports (sign language, sequencing, role play) within the lessons to provide additional comprehension support to her students.

Discussion

The purpose of this study was to compare the use of a story-based lesson intervention without and with the use of evidence-based practices (SBL vs. SBL+) to support students with hearing loss, for two students with severe intellectual disability. Additionally, in response to the call for educators to employ evidence-based practices with fidelity in their classrooms, this study took a close look at the level of fidelity the teacher implemented the study and its effect on student learning. Based on the visual analysis of the graphed data, both of the students increased their early literacy skills when taught using the story-based lessons or story-based lessons plus intervention packages. Results from this study indicate a functional relationship between the use

of the story-based lessons and student early literacy skill mastery. However, a clear difference between the two interventions was not made in this exploratory study for both students.

Research shows that students with intellectual disabilities learn best when taught using systematic instruction and repeated practice (Browder et al., 2012). Most recently, research on the use of story-based lessons has shown that students with severe intellectual disabilities, including students with multiple disabilities, can learn to participate and show comprehension of grade-aligned literature (Browder, Lee, & Mims 2011; Mims, Browder, Baker, Lee, & Spooner, 2009; Mims, Hudson, & Browder, 2012). Additionally, the findings of this exploratory study support those of Browder et al. (2007) and Browder et al., (2009), in that both students showed a significant increase in level of participation (Kevin) and early literacy skill attainment (Alan) after being taught using the story-based lesson task-analysis. Specifically, the UDL planning component was essential in allowing Kevin to participate in each step of the lesson. Due to Kevin's complex communication needs it was important that his teacher utilize a very personalized, intensive approach to providing him an opportunity to respond to the stories.

Based on the recommendations of Cook et al. (2008), research must continue to investigate the use of evidence-based practices to support their use with fidelity within classrooms. This study set out to determine if the SBL intervention with UDL planning, was "enough" to support students with severe intellectual disability and hearing loss, or was it necessary to bring additional research-based practices to the table to support this population (e.g., best practices from the deaf education literature). While the findings of this study were mixed on the effect of the SBL+ intervention with the two students, the teacher found the + intervention to be useful and practical to support her students. One possible thought is that the + intervention, while based in the deaf education literature, was merely a form of UDL planning under the area

of representation or engagement. For example, the teacher "role playing" a specific scene of the chapter provides the student an additional representation of the chapter, alongside the text. As teachers are faced with the challenges of finding evidence-based practices to support their students with intensive support needs (Gallagher, 2004), it may be helpful to use additional evidence-based practices (e.g., deaf education literature) when planning for UDL.

Limitations and Recommendations for Future Research

Several limitations should be noted for this study. First of all, the study employed an alternating treatment single-subject design to compare the effects of a story-based lesson (SBL) or story-based lesson with embedded practices from the deaf education literature (SBL+) on student achievement. Only four data points were collected during the intervention phase, with only two data points using each of the two interventions. The exploratory nature of this study should only be used to guide discussion surrounding the use of the SBL as previously prescribed (Browder et al., 2007). However, through visual analysis of the study as an AB design replicated with two participants, it is clear that the story-based lesson intervention (with or without the additional features) did promote student participation and comprehension for these two students. As noted in the findings of Hudson and Test (2011), additional research is needed to support the use of task-analytic instruction to guide grade-aligned literacy instruction for this population of students.

A second limitation of this study was the fidelity in which the teacher was able to implement the steps of the task-analysis with accuracy in prompting and feedback. Cook et al. (2009) specifically address the need to determine the level at which a student can make progress with an intervention and the fidelity in which the intervention must be implemented. This study illustrated the need to support teachers in basic evidence-based practices, such as systematic

instruction, in order to allow educators to take content specific research (e.g., story-based lessons) and implement them with fidelity. The results of this study found that if students are taught skills in a systematic way, and given a mode and opportunity to respond, they are able to participate in grade-aligned text. However, this study also illustrated that even with individualized training on a specific research-based strategy (story-based lessons), if the teacher doesn't provide an opportunity to respond the student has no way to show what they know.

Finally, one last limitation of this study is that it was conducted in a self-contained special education classroom. The school district in which this study was implemented primarily served students with severe disability, in segregated settings. While this may not be the most ideal setting, it was important to use this study to support the teachers and students within this district. In response to the need for more inclusive research, more studies are needed in the area of Universal Design for Learning to support inclusive education of students with severe disability. This study found that prior to UDL planning, students did not have a mode to participate with or respond to text. Additionally, once students gained access to the text via UDL planning, they began to participate and show comprehension in grade-aligned academics. Hence, research is needed to support the education of pre and in-service teachers to enable them to support all students, in all settings.

Research and support is needed to provide teachers not only the ability to find and employ new evidence-based practices (e.g., use of a story-based task analysis) but the essential evidence-based teaching methods needed to use those new practices. This exploratory study is an example of what can happen when students are given the instruction they need to support their learning. Although the teacher did not implement the steps of the task-analysis with a high level of fidelity, the movement from "nothing to something" immediately increased student

participation and learning. Furthermore, in order to support all students, including those with multiple disability, the use of UDL planning should expand and include investigation of evidence-based practices outside the field of severe intellectual disability.

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Table 1

Student Demographics

Participant	Gender/ Ethnicity	Grade / Age	Primary Diagnoses	Most Recent Cognitive Assessment/ Results	Current Literacy Skill	Primary Mode of Communication
Kevin	M, AA	8th/ 15 yrs old	Multiple Disability (MU) *ID and Hearing loss	2006. Merrill-Palmer-Revised (Cognitive Battery); 7-8 month developmental level	Recognize his name when given two choices; unable to consistently recognize any sight words/pictures	Eyegaze or AAC (button switch) *He will grasp objects if he wants them (e.g., highly motivational toys)
Alan	M, AA	7th/ 12 yrs old.	Moderate ID	Bayley Scales of Infant Development; *MDI below 50%	Recognize his name; identify some environmental sight words (e.g., McDonald's, stop).	Verbal or touch response when presented with options.

African American (AA), Intellectual Disability (ID), Mental Development Index (MDI)

Table 2. Story-based lesson task-analysis

1. Uses attention getter: Teacher presents an object, photo, word, or action that represents the story or a concept in the story, paired with ASL. The attention getter is discussed and shared with the students; it may be introduced at any point prior to reading the book.
2. Review vocabulary and new symbols: Prior to reading the book, the teacher reviews the target vocabulary paired with ASL Vocabulary should be presented in the same format that the students will be asked to identify in the story, for example, if the student uses picture symbols then the same picture symbol should be reviewed prior to the lesson; during the lesson the student should be asked to find the same symbol. No set number of vocabulary words, may be only one.
3. Asks student to make a prediction: The teacher asks "what do you think will happen next?" using picture card to indicate question (or any form of prediction question). Prediction questions can be asked before reading begins or at any time during the story.
4. Asks student to point to the title: Give student an opportunity to independently point or eye gaze to the title of the book asking question with picture card cue. The teacher may or may not model pointing to the title first. Student may point to title on teacher's book or their own copy.
5. Asks student to point to the author: Give student an opportunity to independently point or eye gaze to the author of the book asking question with picture card cue. The teacher may or may not model pointing to the author first. Student may point to author on teacher's book or their own copy.
6. Gives student opportunity to open book: Give student an opportunity to open or assist with opening the book. Teacher directions should include something like: how do we get our story started" as opposed to "Can you open the book?"
7. Gives student opportunity to turn the page: Give student an opportunity to turn or assist with turning the page of the book. Teacher directions should include something like: how do we keep our story going" as opposed to "Can you turn the page?" using picture cue. Can be done at any time throughout the book. Can be done once or a number of times. OK if teacher models turning pages first and then asks student to turn on later pages (w/o modeling).
8. Gives student an opportunity to anticipate the repeated story line: Each book should have a repeated story line. The first time the line occurs the teacher should read the line his/herself. On any or all of the following occurrences the teachers should begin the line and then pause for the student to complete the line. The student may complete it vocally or using a voice output device.
9. Gives student an opportunity to identify key vocabulary words: Teacher asks student to locate one of the vocabulary words that were reviewed at beginning of lesson. Words may be in the text, or a symbol that has the word on it. Teacher should give student an opportunity to find the word independently. OK if the teachers models pointing to the word(s) when they come up at earlier points in the story.
10. Gives student opportunity to point to each word as read (with picture symbols) : At any point in the story, asks student to follow the words as the teacher reads along. Student may follow along by pointing, touching, or eye gazing. Teacher may model sentences prior to asking the student to point to words, teacher may also show the student where to start.

11.Asks three comprehension questions: At any point during or at the end of the story, the teacher asks a comprehension question. Comprehension questions include literal recall, a summary question at the end, and inferential questions.
12.Provides phonemic awareness or phonics opportunity: At any point in the lesson, the teacher asks the student to a. blend sounds into words (teacher vocally stretches out a word and asks a student to find the word that she said) b. segment words (teachers asks a student to break a word into it's individual sounds, t-a-p or into its syllables to-day. Student may clap, tap, point….anything that they can physically do c. identify target sounds (show me /aaaaa/) d. identify letters, when shown or heard

Based on Browder, Trela, & Jimenez (2007)

Table 3. UDL planning for each student, expected responses for selected steps of the task-analysis.

Step of SBL TA	Kevin	Alan
1 Attention Getter	Look at, grab towards, make intentional vocalization when presented with materials/pictures	Reach/grab/ interact with materials/pictures presented at beginning of chapter/story
3 Prediction	Indicates choice from 2 objects, through eyegaze or touches switch "what happens next "	Makes a response from a choice of 3 pictures
6 Opening the book	Activates switch to ask for help to - opens book to start to "read"	Physically opens book to start to "read"
8 Anticipate repeated story line	Activates switch to "read" story line with the teacher at appropriate point of the text.	Points to the repeated story line to "read" with the teacher at appropriate point of the text.
11 (3x) Comprehension	Eyegaze towards or reach towards object or picture from a choice of 2.	Point/ touch/ grab object/picture from a choice of 3.

Figure 1. Sample teacher support for Story Based Lesson (SBL) intervention.

Chapter 4-6

Follow the basic story-based lesson task-analysis

STEP of the TA	SBL Intervention			
11	Comprehension Question 1	Knowledge	*What was too big for Billy to eat?*	*Worms, Bike, Dog*
11	Comprehension Question 2	Application	How did Billy feel when we had to eat a worm?	Happy, Yucky, sleepy
11	Comprehension Question 3	Synthesis	What is this chapter about?	Eating worms, Playing in the yard, Going to the Doctor

Figure 2. Sample teacher support for Story Based Lesson (SBL+) intervention.

Chapters 7-9

Follow the basic story-based lesson task-analysis

STEP of the TA	PLUS + Intervention			
2,8,9	SIGN Key Vocabulary	Minimum of 3x	*FRY (sign "cook")*	
8	Sequence & Acting Out	***Repeated Story Line:*** *Frying the Worm will make it taste better.* "What did _____ do when _____ happened? Use the manipulatives or role play what happened."	"What happened first? What happened next? (teacher modeled)	Page 22: (picture of frying pan and worm; picture of thinking about fish)
			Fry the worm in the frying pan.	P 22 – with repeated story line.
11	Comprehension Question 1	Knowledge	What did Tom tell Billy he would do with the worm before Billy eats it?	*Fry it, Step on it, dance with it*
11	Comprehension Question 2	Application	Why did they set the frying pan in front of Billy?	Eat the worm, throw it away, talk to it
11	Comprehension Question 3	Synthesis	What was this chapter about?	Fishing in a pond; frying the worms; school

Figure 3. Kevin's percentage of intentional responses during story-based lesson interventions.

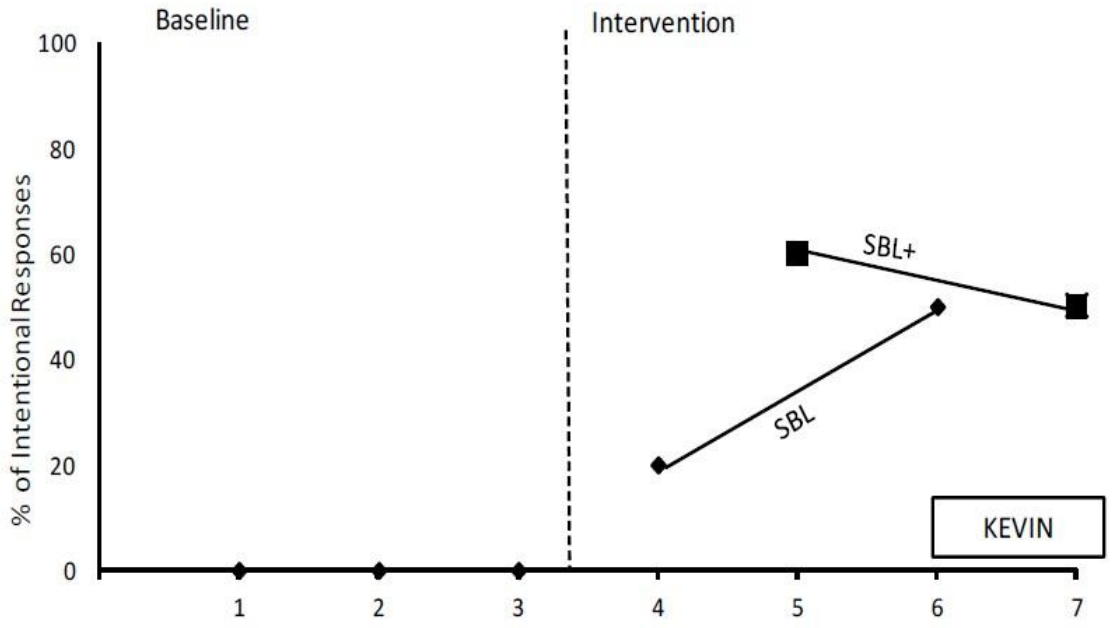
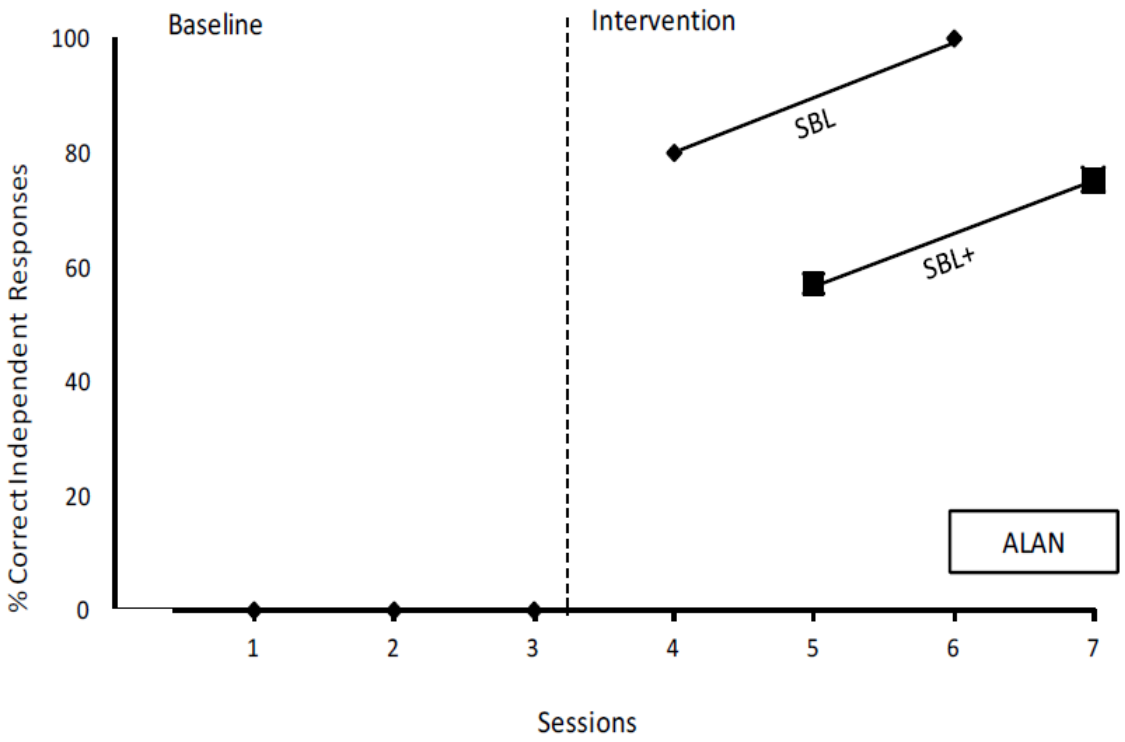


Figure 4. Alan's percentage of independent correct responses during story-based lesson interventions.



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