The Effects of a Multicomponent Storytelling Intervention on the Vocabulary Recognition of Struggling English as a Foreign Language Learners With Learning Disabilities

Anne Barwasser
Turid Knaak
Matthias Grünke

Department of Special Education, University of Cologne, Germany

In a globalized world, the ability to speak English has become increasingly significant. A large number of students who are learning English as foreign language face obstacles in acquiring and storing vocabulary. Children with learning disabilities are especially at risk because of a limited power of retention and motivational struggles. Having an adequate number of words stored in the mental lexicon facilitates the process of language learning and is essential to develop literacy in English as a foreign language. The purpose of this single-case study was to evaluate the effectiveness of a storytelling intervention combined with flashcards and a rewarding procedure in four secondary students with learning disabilities. All of them showed tremendous increases in their performance upon the onset of the training. Visual analysis, effect sizes, and a piecewise regression analysis indicated that the treatment was successful. In addition, a follow-up measurement spoke to the assumption that treatment gains do not immediately drop as soon as the intervention is terminated.

Keywords: Storytelling, Motivation, Vocabulary Recognition, English as a Foreign Language, Learning Disabilities

INTRODUCTION

English as a foreign language (EFL) is an important element of general education and overall success in almost all non-English-speaking countries. There are virtually no school curricula in which EFL does not play a substantial role (Ivancevic-Otanjac, 2016). However, sufficient English skills are not only vital for academic success—being able to read, comprehend, and speak this tongue at least on a basic level is also important for many other aspects of everyday life: It is the language of the media industry and the Internet, it can help to meet new people, and it often makes travel easier. Acquiring at least some elementary English is an important prerequisite for full participation in social and economic life (Reddy, 2016).

Unfortunately, not everyone meets the minimum standards in this re-
spect that are necessary to have a chance to be fully included in one’s community. Di Fino and Lomardino (2004) highlighted three major problem areas concerning the acquisition of a second language (such as EFL), which may result in failure: (a) poor memorization skills, (b) high level of anxiety, and (c) lexical grammar confusion. The gap between performance in EFL literacy and in the literacy of one’s mother tongue is much wider within individuals who are seriously affected by these challenges than within their normally achieving counterparts (Fraser, 2007).

Having a large vocabulary in EFL is certainly one of the very basic requirements for being able to use English in whatever context necessitates it. Even though it is often possible to unlock the meaning of an unknown word from the context of the sentence in which it appears, such a strategy is prone to error and places a heavy burden on one’s working memory (Grabe, 2004). Thus, vocabulary knowledge is one of the central concerns when learning a new language. Without a rich word pool, which can be automatically and quickly retrieved, learners cannot convey meaning and thus, communicative actions are restricted (Morra & Camba, 2009).

Individuals with learning disabilities (LDs) usually experience especially severe working memory and information processing problems, which affects vocabulary storage (Garcia & Tyler, 2010). Furthermore, they frequently demonstrate a lack of self-monitoring ability and procedural knowledge about effective learning strategies (Shippen et al., 2005). However, even though they usually struggle greatly when trying to acquire EFL skills (i.e., Abu-Rabia & Bluevetin-Danon, 2012; Koda, 2005; Sparks et al., 2008; Sparks, 2012), they should not be given up on. Instead, they should be provided with EFL instruction that is tailored to their specific needs (Sparks, 2009). Among the approaches that are appropriate in this respect are mnemonic devices, small group instruction, explicit teaching, high-intense practice, and many more (Wight, 2015).

Despite concerns regarding overburdening the cognitive capabilities of students with LDs when trying to teach them EFL, most of these learners are essentially competent to acquire a new language (Lazda-Cazers & Thorson; 2008; Wydeell & Kondo, 2003). The use of instructional approaches that give careful consideration to the special needs of these individuals is necessary (Sparks et al., 2008). In particular, the fact that these learners demonstrate difficulties in memorization and information processing needs to be taken into account. The way a new language is introduced is enormously important—it is all about modification of a language learning classroom (Lazda-Cazers & Thorson, 2008).

One model that seems to be particularly suitable for deriving effective practices for teaching EFL vocabulary to students with LDs is the dual coding theory by Paivio (1986). Paivio assumed that there are two core ways in which
someone improves in learned material: verbal associations and visual imagery. In his theory, he differentiated between nonverbal and verbal mental systems in the context of processing imagery and linguistic information. If a person has stored a stimulus concept for a certain word as a verbal and nonverbal concept, he or she is able to retrieve both types of information for recalling, increasing the probability of remembering a certain item. According to this model, word concreteness and images should be emphasized in cognitive tasks related to meaning (Clark & Paivio, 1991). Thus, providing students with verbal and nonverbal stimuli seems to be beneficial, and second language learning is more effective when nonverbal and verbal modalities are combined (Ginns, 2005; Mayer, 2009; Peker et al., 2018).

In the context of vocabulary learning, it is assumed that new words can be better learned when they are combined with images (i.e., Mirhassani & Eghtesadei, 2007; O’Malley & Chamot, 1990). Students with LDs especially benefit from multimodal instruction. They need more time to process language components and deeper exposure to the language and the usage of visual tools to support their learning than their nonlabeled peers do (Brady et al., 2015; Skinner & Smith, 2011). Furthermore, multimodal instruction with individuals with LDs leads to a relatively fast incorporation of new facts and words into the long-term as well as the short-term memory (Regalla & Peker, 2018).

To support vocabulary acquisition, unfamiliar words should be embedded into a context (Nation, 2015; Webb, 2008). Students (particularly those with LDs) are more likely to remember them if they are integrated into stories of everyday life and commonplace experiences (Oxford & Scarcella, 1994; Van, 2009). Atay and Ozbulgan (2007) demonstrated that approaches that emphasize learning through context lead to an improvement of vocabulary knowledge. Moreover, there is a need for interesting topics situated in a meaningful framework to trigger students’ motivation (Grimm et al., 2015). When unknown vocabulary is embedded into an interesting narrative, being able to verbally utter the vocabulary and explain its meaning is easier. Additionally, an improvement in word knowledge can be observed through word meaning explanation and repeated reading (Webb, 2007). Studies show an improvement in gaining word meaning while using single reading and word meaning explanation (average of 15% gain; Senechal, 1997; Senechal & Cornell, 1993), repeated readings without word meaning explanation (average of 9% gain; Brabham & Lynch-Brown, 2002; Elley, 1989), and repeated reading and word meaning explanation (average of 26%; Hargarve & Senechal, 2000; Penno et al., 2002).

Bearing in mind the main problems learners with LDs face while acquiring a new language, it stands to reason to develop interventions that combine the components of retention, the importance of context, and the relevance
of multimodal instruction through nonverbal and verbal modalities. Storytell-
ing is a powerful tool to activate and motivate learners, as well as to improve dif-
ferent kinds of skills while involving teachers and students in a communicative
circle (Cameron, 2001; Ellis & Brewster, 2002; Roney, 1996). This method can
be defined as a process in which a teller, using mental imagery, vocalization, and
a narrative structure, conveys certain content to the audience through a story
frame (Roney, 1996). Through this approach, interaction takes place; children
adopt the teacher’s pronunciation and thus improve their sensitivity to rhythm,
intonation, and pronunciation (Ellis & Brewster, 2002).

There has not yet been research on the effects of storytelling on the
vocabulary recognition of EFL learners. Furthermore, no studies have been con-
ducted with a focus on the effects of storytelling in the context of LDs. Existing
research has been limited to testing options to improve general language skills
and reading comprehension (Al-Manosour & Al-Shorman, 2011; Hemmati et
al., 2015; Huang, 2006; Kim, 2010).

A comparatively general approach that can potentially boost the effec-
tiveness of many educational methods geared toward solidifying factual knowl-
edge is the direct instruction flashcards technique. It is characterized by drill and
practice (Tan & Nicholson, 1997), as well as by strategic incremental rehearsal
(Kupzyk et al., 2011). When using it to teach second language vocabulary, words
that are unknown by the student are written on cards. A teacher presents them
successively and asks the student to read them and to state their meaning. The
cards are grouped into a set ratio of mastered and unmastered ones. If an error
occurs, the teacher provides immediate corrective feedback (Fraher et al., 2019).

The benefits of direct instruction flashcards have been documented in
the context of students with and without LDs (Brasch et al., 2008; Fraher et
al., 2019; Standish et al., 2012). They have proven useful in fostering reading
fluency (Kaufman et al., 2011) and sight word acquisition (Crowley et al.,
2013; Erbey et al., 2011; Rich et al., 2016; Ruwe et al., 2011; Seines et al.,
2015), including sight words in a foreign language (Abbasian & Ghorbanpout,
2016). Through the application of a flashcards procedure, automatization can
be achieved, and students who struggle with memorization and recall of certain
information benefit (Seine et al., 2015).

Because struggling learners fear facing repeated failure when acquiring
a foreign language (Csizér et al., 2010), motivation is essential, and adding mo-
tivational components to an intervention seems to be beneficial (Garcia & de
Caso, 2004; Lepola et al., 2004). One realization of motivation is called “in-
terdependent group contingencies”, which are implemented in classrooms to
improve learning outcomes and behaviors. This can be defined as a contingency
in which getting a reward is dependent on the behavior of each group member
(Cooper et al., 2007). Students collect points for meeting certain criteria, which
together count for the whole team. Interventions that additionally introduced group contingencies showed especially great effects (Cooper et al., 2007; Little et al., 2015; Popkin & Skinner, 2003). Furthermore, researchers have found a positive impact on academic achievement (Bowman-Perrot et al., 2013; Pappas et al., 2010; Rohrbeck et al., 2003) and social behavior (Ginsburg-Block et al., 2006; Wills et al., 2016).

An additional tool that can be implemented to improve motivation is a self-graphing procedure, which is the visual recording of one’s own progress. Self-graphing to make personal progress transparent has positive effects on “on-task behavior” (Amato-Zech et al., 2006; Legge et al., 2010) and enhances academic success (i.e., Gunter et al., 2003).

Vocabulary acquisition in EFL requires context embedding as well as an adequate amount of repetition and direct instruction of words with respect to the long-term retention of these words. Furthermore, adding motivational components and using verbal and nonverbal modalities is enormously important, especially for learners with LDs. Having in mind these facts, we implemented a multicomponent intervention in this study uniting storytelling, direct instruction flashcards as a verbal and nonverbal instrument, self-graphing, and group rewarding to foster vocabulary acquisition of secondary school students with LDs in EFL.

**Methods**

**Participants and Setting**

The participants of this study were four female seventh graders from an inclusive secondary school in North Rhine-Westphalia, Germany: Jutta (15 years, 2 months old), Lena (14 years, 9 months old), Pia (15 years, 1 month old), and Mia (14 years, 3 month old). We changed their names to ensure their privacy and confidentiality. They were part of a larger intervention group of 24 students from four seventh-grade classrooms, who were chosen to receive storytelling vocabulary instruction based on three pretests, each consisting of 40 common words in English to capture their knowledge base in EFL vocabulary. We selected the words from a list of the 1,000 most frequently used words in the English language (Education First, 2019) and from the suggestions of the teacher based on English schoolbooks and already taught vocabulary. If the students fell below a certain benchmark in all three of the tests, they were considered eligible for the treatment.

Six of the participants had been diagnosed with an LD by a multiprofessional team. This study was intended to focus on this small group because we designed it to test the effects of the treatment on students with this kind of challenge. However, two out of the six participants missed seven treatment sessions or more and were not further considered in this study. All four remaining
participants were born in Germany and did not have an immigrant background. In each case, German was their first and English was their second language.

**Materials**

From the vocabulary pretests, we identified 30 English words that were unfamiliar to the participants at the time. Three graduate university students of special education served as interventionists (see below). Each of them created 12 short stories in English of about 150 words each. Every narrative contained 10 of the 30 unfamiliar words. The interventionists made sure that each of these 30 words occurred just as often as any other one in the texts. They tried to keep the texts equal with respect to word difficulty, sentence structure, and length. Stories were related to popular TV series in which the participants were all interested. We used binders and put them on bookshelves in the classrooms to make the stories easily accessible to the students (e.g., during free activity or self-study sessions). Besides, we prepared direct instruction flashcards, each consisting of one of the 30 chosen words. In addition, we printed matching pictures on 8.3 x 11.7-inch sheets. Finally, as a motivational component, we created self-graphing score cards to enable participants to document their own learning progress. The cards displayed 12 successive rows, each with empty boxes for the 30 training words.

**Design**

We applied a single-case multiple baseline design across subjects (AB; Ledford & Gast, 2018) to estimate the effects of the intervention processually and individually for each participant. In this experiment, a total number of 16 probes were defined for phases A and B. Right after the last measurement in the intervention phase, the students went on school vacation for 2 weeks. Upon their return, they were tested once more to provide an indication of how much they remembered over time. The probes in the A and B phase spread evenly over a period of 6 weeks. Data was collected directly after baseline activity or intervention. We randomly assigned 18 out of the 24 aforementioned students to six groups consisting of four children each. The six participants with LDs were evenly allocated across the clusters (meaning each group included one of the students with LDs). We randomly allocated all six groups to the possible starts of intervention to increase internal validity (Dugard et al., 2012). The A phase had to consist of at least four and the B phase of at least 10 probes. Thus, the treatment could have started after the fourth, fifth, or sixth measurement point. A random drawing of the three possible options resulted in an arrangement whereby Jutta’s group began with the training after the fourth baseline probe, Lena’s and Pia’s group after the fifth, and Mia’s group after the sixth. Intervention took place three times a week at the same time. We took the different groups out of regular class into separate rooms to reduce possible distractions.
Instrument

We asked the participants to undertake a vocabulary test consisting of the 30 words that were taught in the storytelling intervention. The time limit was set to 5 minutes. Students were supposed to translate the English words on the left-hand side of the test sheet into German on the right-hand side. The number of correct responses functioned as the dependent variable. We did not take spelling into account.

Procedures

During baseline conditions, all participants occupied themselves with worksheets unrelated to EFL vocabulary instruction for 35 minutes. The respective tasks dealt with math and German exercises. Subsequently, the students undertook the vocabulary test (see above). During the intervention phase, three graduate university students, who each instructed two groups, implemented the storytelling training. The first author had extensively briefed them on how to implement the treatment during three preparatory 45-minute sessions prior to the beginning of the experiment. The training was realized in a two-stage model, consisting of a first pre-listening stage in which the 10 words from the last story were repeated and the 10 new words were introduced with the help of flashcards and matching pictures to each word. Participants trained on the words by thinking of the meaning and the correct pronunciation for 10 minutes.

In the second stage, the storytelling procedure started and had a duration of 25 minutes. The narratives were always visible to the students, and the words to be trained were marked in green and appeared twice in each story. Any time a green word appeared while reading, the interventionist stopped the story, took the correct flashcards, and repeated the word together with all participants. At any time of intervention, both stages were realized successively to ensure that the training words were conveyed through instruction by using flashcards and in a motivational and contextual frame through the storytelling itself.

The first three intervention sessions were dedicated to introducing all 30 words, 10 words at each meeting. All remaining lessons focused on automatization, because all words randomly recurred after being introduced the first time. The procedure of only dealing with 10 words in an intervention session was maintained with the aim to prevent excessive demand. Thus, the participants were exposed to the training words step by step. All participants were confronted with the 30 target words at least six times during the entire intervention. After each session, feedback about the performance from last time was given, and all participants were measured, as in the baseline condition, with the 30-word vocabulary test, but the order of the target words was random. These last steps took about 10 minutes.

As motivational components, after any measurement, the students were asked to fill out their own progress-monitoring sheet. Each storytelling group
collected points to obtain a reward at the end. The amount of points resulted from the self-graphing paper. Students got one point for keeping the same vocabulary retention score as last time and two points for getting better. Each participant threw these points into a receptacle visible to all group members. The goal was to hit a prior defined total number of words to get a group reward.

**Treatment Fidelity**

We gave the interventionists a field manual to make sure that they implemented the training as planned and delivered each component to all four participants in the same way. Moreover, graduate students of special education who were not involved in the treatment monitored one third of the sessions. They sat in the back of the room and used a checklist to record if the lessons complied with the field manual. This checklist included 15 criteria (e.g., “Was the content of the last lesson recapitulated before the new session started?” “Were the flashcards used to teach key words while relating a respective story?” “Did the participants record their scores on the graph?”). In addition to the observers appraising the rigor of the training, each interventionist got his or her own treatment fidelity checklist. We asked them to go through the checklist to reflect on how well they followed the standards and to fill it out after each session. According to the respective outside evaluation and self-assessment scores, each interventionist considered all criteria on the checklist at all times. The first author stayed in constant contact (i.e., daily during the first 2 weeks and weekly during the time until the end of the experiment) with the three master’s students via e-mail to provide moral support, to answer questions, and to inquire about whether everything was proceeding as originally designed and intended.

**Results**

**Visual Analysis**

We created the graphs with the SCAN package for R by Wilbert (2020). As can be seen in Figure 1, all participants increased their vocabulary knowledge in the treatment phase. There was no baseline trend for all four participants. They all improved their scores visibly after the intervention was implemented. Pia and Lena showed a direct level effect with the beginning of intervention, whereas the other two had a slower increase of known words. Regarding the follow-up data, only a minimal decrease of known words took place.
Figure 1. Amount of words known correctly for each participant in baseline, treatment condition and follow-up measurement.
Quantitative Analysis

Descriptive statistics for number of correctly recognized words for each group are presented in Table 1. All participants showed great improvement from the A phase to the B phase, and two of them reached the highest possible score.

Table 1. Descriptive Data for each Participant in A and B Phase

<table>
<thead>
<tr>
<th></th>
<th>N Phase A</th>
<th>N Phase B</th>
<th>M (SD) Phase A</th>
<th>M (SD) Phase B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jutta</td>
<td>4</td>
<td>12</td>
<td>0.50 (1.00)</td>
<td>17.17 (9.54)</td>
</tr>
<tr>
<td>Lena</td>
<td>5</td>
<td>11</td>
<td>2.67 (0.58)</td>
<td>22.43 (7.18)</td>
</tr>
<tr>
<td>Pia</td>
<td>5</td>
<td>11</td>
<td>0.40 (0.55)</td>
<td>14.29 (6.24)</td>
</tr>
<tr>
<td>Mia</td>
<td>6</td>
<td>10</td>
<td>2.50 (0.84)</td>
<td>9.22 (4.29)</td>
</tr>
</tbody>
</table>

We applied the mean baseline difference (O’Brien & Repp, 1990), which showed an average increase of about 2,400% in the intervention phase compared to the baseline phase. Pia benefited the most, while Mia benefitted the least. Even though official mean baseline difference value cutoffs do not exist, a 2,400% performance increase can be seen as outstanding.

Additionally, we calculated nonoverlap effect sizes, again using the SCAN package by Wilbert (2020): nonoverlap of all pairs, percentage exceeding the median, percentage of nonoverlapping data, and the improve rate difference (Parker et al., 2011). All indices document that the treatment was effective. Jutta showed the least improvement but still with considerable increase. The majority reached the maximum value of 100%, and nonoverlap of all pairs results indicate significant differences between the A and B phases for all students.

Table 2. Overlap Indices for Number of Correct Recognized Words

<table>
<thead>
<tr>
<th>Name</th>
<th>NAP</th>
<th>PEM</th>
<th>PND</th>
<th>MBD</th>
<th>IRD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jutta</td>
<td>97.92*</td>
<td>100</td>
<td>100</td>
<td>3646%</td>
<td>91.67</td>
</tr>
<tr>
<td>Lena</td>
<td>100*</td>
<td>100</td>
<td>100</td>
<td>730%</td>
<td>100</td>
</tr>
<tr>
<td>Pia</td>
<td>100*</td>
<td>100</td>
<td>100</td>
<td>5225%</td>
<td>100</td>
</tr>
<tr>
<td>Mia</td>
<td>100**</td>
<td>100</td>
<td>100</td>
<td>269%</td>
<td>100</td>
</tr>
</tbody>
</table>

Note. PND=percentage of non-overlapping data; PEM = Percentage exceeding the median; IRD=improved rate difference; MBD=mean baseline difference; NAP=non-overlap of all pairs. *significant at the .01 level ** significant at the .001 level
In accordance with the standards for single-case experimental designs by Tate et al. (2016), we supplemented visual inspection and interpretation of overlap indices with piecewise regression analyses on Level 1 (each student) and Level 2 (across all students). We did not find baseline trends for any participants, but due to the short baseline phase, trend information has to be interpreted carefully. Mia, Pia, and Jutta showed a significant slope effect with an average of 1.5 scale points gained with each intervention point. For Lena, we found a significant level effect. These results support a successive improvement of known words over time, with the exception of Lena.

**Table 3. Regression Model for Number of Correctly Recognized Words (Level 1 Analysis)**

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jutta</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>-1.000</td>
<td>2.096</td>
<td>-0.477</td>
<td>0.642</td>
</tr>
<tr>
<td>Trend</td>
<td>0.600</td>
<td>0.765</td>
<td>0.784</td>
<td>0.448</td>
</tr>
<tr>
<td>Level</td>
<td>-1.142</td>
<td>1.778</td>
<td>-0.643</td>
<td>0.533</td>
</tr>
<tr>
<td>Slope</td>
<td>2.001</td>
<td>0.779</td>
<td>2.570</td>
<td>0.025*</td>
</tr>
<tr>
<td>Lena</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>2.667</td>
<td>3.543</td>
<td>0.753</td>
<td>0.480</td>
</tr>
<tr>
<td>Trend</td>
<td>0.000</td>
<td>1.037</td>
<td>0.000</td>
<td>1.000</td>
</tr>
<tr>
<td>Level</td>
<td>10.742</td>
<td>3.333</td>
<td>3.223</td>
<td>0.018*</td>
</tr>
<tr>
<td>Slope</td>
<td>1.662</td>
<td>1.081</td>
<td>1.538</td>
<td>0.175</td>
</tr>
<tr>
<td>Pia</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>-0.500</td>
<td>1.485</td>
<td>-0.337</td>
<td>0.745</td>
</tr>
<tr>
<td>Trend</td>
<td>0.300</td>
<td>0.448</td>
<td>0.670</td>
<td>0.522</td>
</tr>
<tr>
<td>Level</td>
<td>2.463</td>
<td>1.603</td>
<td>1.537</td>
<td>0.163</td>
</tr>
<tr>
<td>Slope</td>
<td>1.422</td>
<td>0.477</td>
<td>2.978</td>
<td>0.018*</td>
</tr>
<tr>
<td>Mia</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>1.400</td>
<td>1.433</td>
<td>0.977</td>
<td>0.350</td>
</tr>
<tr>
<td>Trend</td>
<td>0.314</td>
<td>0.368</td>
<td>0.854</td>
<td>0.411</td>
</tr>
<tr>
<td>Level</td>
<td>-1.230</td>
<td>1.578</td>
<td>-0.779</td>
<td>0.452</td>
</tr>
<tr>
<td>Slope</td>
<td>1.119</td>
<td>0.418</td>
<td>2.676</td>
<td>0.022*</td>
</tr>
</tbody>
</table>

*Note. *significant at the .05 level.*
Level 2 analysis shows a significant slope effect across all participants at the .001 level, implying that all participants improved in the amount of known English vocabulary with the amount of sessions, supporting the results of the Level 1 analysis.

Table 4. Piecewise Regression Model for Number of Correctly Recognized Words (Level 2 Analysis)

<table>
<thead>
<tr>
<th></th>
<th>B</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>2.315</td>
<td>2.239</td>
<td>1.034</td>
<td>0.307</td>
</tr>
<tr>
<td>Trend</td>
<td>-0.048</td>
<td>0.468</td>
<td>-0.102</td>
<td>0.920</td>
</tr>
<tr>
<td>Level</td>
<td>1.830</td>
<td>1.613</td>
<td>1.135</td>
<td>0.262</td>
</tr>
<tr>
<td>Slope</td>
<td>2.078</td>
<td>0.491</td>
<td>4.233</td>
<td>&lt;.001***</td>
</tr>
</tbody>
</table>

Note. *** significant at the .001 level

Discussion

Main Findings

The purpose of this study was to evaluate the effects of a multicomponent intervention consisting of storytelling, direct instruction flashcards, group rewarding, and self-graphing on the vocabulary acquisition of four EFL students with LDs. Our findings indicate high benefits for each of the participants regarding word recognition. Visual analysis suggests a continuous improvement in performance during the B phase. The students enhanced their ability to correctly recall the meaning of English words that had previously been unfamiliar to them. Different overlap indices speak to the argument that the treatment was very effective.

Due to introducing new vocabulary consecutively during the intervention, we anticipated that students would show a gradual slope effect rather than instant improvements. The piecewise linear regression of each case and a hierarchical piecewise linear regression of all cases combined confirm this assumption. Mia, Pia, and Jutta all showed remarkable enhancements in performance after a couple of sessions, and Lena was able to increase her scores immediately after the beginning of the B phase. Therefore, her results show a significant level effect in addition to a slope effect. In fact, she was able to recall almost all of the 10 trained vocabulary words from the first session.

At the end of the entire intervention, Jutta and Lena achieved almost the highest possible test score of 30. The follow-up data, which we collected after a 2-week break, indicate that most of the new information was stored in the long-term memory. Therefore, the treatment seemed to benefit students with
Insights into Learning Disabilities 17(1), 35-53, 2020

LDs in the acquisition of previously unknown English vocabulary in a remarkable and sustainable way.

**Limitations**

Despite its promising results, this study is subject to certain limitations. First, it would be dubious to formulate confident statements about how to teach students with LDs to improve their vocabulary knowledge based on this small-scale study. The experiment involved only four participants and does not allow for generalization. Furthermore, we only tested if students would remember the meaning of certain words. We did not test if they were also able to read them fluently, spell them correctly, or integrate them in their active language.

Additionally, the four cases belonged to a particular age group and showed similar learning challenges. We defined LD in this study as a phenomenon in which individuals demonstrate an academic skill level above that of people with intellectual disabilities but still fail starkly in core academic areas (Grünke & Morrison Cavendish, 2016). This is the common definition in Germany and a number of other countries. Furthermore, we chose our participants based on an informal English vocabulary test. Hence, the common methodological standard for single-case research of making the selection process of the subjects as replicable as possible (see, e.g., Mulcahy et al., 2016) is certainly compromised here, because we used no standard.

Moreover, we did not measure social validity. Even though the effects seem impressive, nothing is known about the acceptability of and the satisfaction with intervention procedures from the standpoint of the participants. However, social validity is an important consideration when evaluating educational interventions (Worthen & Luiselli, 2017). An approach can only be successful in the long run if it is accepted by those for whom it was designed.

Another limitation pertains to the fact that a considerable number of the data points were missing due to illness. Whereas for Jutta, all 17 measurements were available, Mia participated only in 16 vocabulary tests, Lena only in 11, and Pia only in 13. Although there is an ongoing debate in the scientific community as to the tolerable percentage of missing values in single-subject experiments (Peng & Chen, 2018), 6 out of 17 (35.29%) in the case of Lena, the number of unavailable data points is certainly more than questionable.

Finally, it is impossible to discern which element of the multicomponent intervention contributed to the results to what extent. We can only assume that the combination of all of the treatment elements accounted for the success of the training. However, no one can tell whether the endeavors would have been less effective had one of the components been left out.

**Conclusion**

Despite its limitations, this research provides valuable information on how to help German EFL students with LDs remember the meaning of basic
English vocabulary. Every study has its strengths and weaknesses, and it can always only contribute a small strand to the overall fabric. It goes without saying that more experiments are needed about the benefits of an approach such as storytelling that has not yet been investigated very deeply. Prospective studies should include a larger number of students, should examine to what extent memorizing vocabulary words affects reading skills or the active production of language, and should test the intervention with various age groups. In addition, researchers should include participants with different kinds of LDs. In this study, we used a rather broad definition for this condition. However, the concept is sometimes limited to a strictly neurological disorder (Ali & Rafi, 2016). Furthermore, future researchers should test how effective a storytelling intervention would be without a multicomponent motivational system. Last, prospective studies should not exhibit the same methodological weaknesses as this one (vague sample selection process, many missing values, and no social validity data).

However, it cannot be emphasized enough that the improvements of the participants in this experiment are of striking magnitude. It would be negligent not to make use of the insights gained through this single-case analysis. Even though more research about storytelling is certainly warranted, there is no good reason educators should not apply this approach with students who struggle with EFL acquisition. The literature offers a wide variety of options on how to support these learners. In fact, an electronic database search in Academic Search Complete, ERIC, PsycINFO, and TOC Premier with the terms “intervention or treatment or therapy or program or strategy” AND “foreign language learning or second language learning or second language acquisition” AND “learning disab*” yielded 1,494 references in scholarly journals (as of March 2020). The choices seem endless. One convincing reason that speaks for applying an approach as described in this paper is how easy it can be implemented. No special materials are needed. A list with unfamiliar words, some stories that contain those words, and flashcards are all it takes. The costs are low, and the preparation for the interventionists takes only little time and effort. We hope that storytelling will receive more attention in future research than it has in the past. Acquiring basic EFL vocabulary is important for people with and without LDs alike. They should get all the support they need to ensure that this happens.

REFERENCES


**Authors’ Note**

Correspondence concerning this article should be addressed to Anne Barwasser, Department of Special Education & Rehabilitation, University of Cologne, Klosterstr. 79b, Cologne, Northrhine-Westfalia, 50931, Germany, Email: anne.barwasser@uni-koeln.de