



Teaching Use of Context Clues to Infer Word Meanings to Students Who Struggle with Reading Comprehension

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Article Information	ABSTRACT
<i>Received:</i> 13.02.2020	<p>This study investigated the effects of instruction in the use of context clues to infer the word meanings from context on the reading comprehension of four fourth-grade elementary school students who had difficulty constructing meaning from what they read (<50% comprehension average). Before the intervention, a reading vocabulary test instrument was used to assess whether participants had the ability to infer word meanings from context. Afterward, wrong analysis inventory was used to screen study participants' initial levels of reading comprehension. Following the intervention, social validity data were obtained to assess the social validity of intervention outcomes via a social validity survey that included in-person interviews with all participants. Baseline data showed that all participants had poor reading comprehension scores on the dependent measures, which included short answer response items. The intervention results indicated that after the instruction, from the baseline to the independent performance phase probes each participant increased their reading comprehension scores significantly. Data from social validity demonstrated that all four participants were highly very satisfied with all items, indicating positive reactions to the instructional intervention. Participants believed that this type of instruction provided themselves with important experiences in which they learned how to read the words in texts, and understand unknown word meanings they encountered during reading. This study suggests that an instruction task based on the process of learning word meanings from context for students with poor reading comprehension appears to be a practical, and powerful model for improvement of their achievement in reading comprehension.</p> <p>Keywords: Reading comprehension, context clues, infer word meanings, strategy instruction, students with reading comprehension difficulties</p>
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1. INTRODUCTION

One of the most practical ways to help students develop deep content knowledge with the text is to aid them to improve their reading comprehension skills. Rather than recalling the exact information in the text, it is more important that students should have the ability to make inferences from text to identify important information in order to monitor their comprehension, and discover new meanings of words (Cain, Oakhill & Elbro, 2003; RAND Reading Study Group 2002). According to the researchers, one of the most effective reading comprehension skills for students to develop their autonomy in the reading process is to improve their ability to decode newly encountered words by paying attention (Edwards, Font, Baumann, & Boland, 2004; McKeown, 2019; Smagorinsky, 2001). All students must use context information to unlock the meanings of unknown words in order to effectively use reading comprehension skills. This is due to the fact that contextual information allows students to deduce and make sense of unfamiliar words in the text (Beck, McKeown, & Kucan, 2002; Göçer, 2015). One of the most important components of cognitive reading skills for all students' optimal successful reading is the ability to make inferences in decoding word meanings using contextual information. The reason for this is that students must develop background knowledge that allows them to use contextual information to infer the meanings of unknown words when reading texts (Fukink & de Glopper, 1998; Kendeou, Bohn-Gettler, White, & Broek, 2008; Walter, 2006). It will be difficult for students to make inferences from context if they do not have a sufficient level of contextual information and are unable to infer the meanings of words that they encounter in the text for the first time (Tomensen, & Aarnoutse, 1998). When reading and learning new content, students must strategically use context clues to infer or derive the meanings of new words.

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The use of context clues is a comprehension aspect that can help students improve their word identification proficiency in texts about word-reading accuracy and speed in context. The ability to use contextual information to determine the meaning of written content is a strategic skill in word identification, fluency, and comprehension that is required of all students as they progress to upper-grade levels (Carnine, Silbert, Kame'enui & Tarver, 2004; Graves, 2006; Jenkins et al., 2003). As a result, learning to use context clues to identify word meanings and recognize patterns in the text is critical for all students in order to successfully comprehend the text (Kruse, Spencer, Olszewski & Goldsteinc, 2015; Vacca, Vacca, & Mraz, 2011). According to recent research, students who struggle with making inferences from the text are less likely to engage in reading and complete tasks (Hagaman, Casey & Reid, 2016; Ilter, 2018; U.S. Department of Education, 2011). When the complexity of the text exceeds the students' ability to figure out ideas encountered while reading, the student's comprehension level drops dramatically. A lack of such comprehension skills may result in a critical deficit in students' reading comprehension success. Even if students read the text fluently, a lack of ability to infer word meanings is associated with reading comprehension difficulties (Cain et al., 2003; Vacca et al., 2011).

1.1. Students Struggle with Reading Comprehension

Although reading comprehension is an important skill for academic achievement and lifelong learning (Hagaman, Casey & Reid, 2012; Kuruoğlu & Nilay, 2018; Oakhill & Cain, 2012), one of the major challenges that students face in school is their inability to learn from context and synthesize information. Students with reading comprehension difficulties, as is well known, problems in the understanding text, have poorer inference making skills, draw conclusions, struggle to infer the meanings of unknown words using context while reading (Cain & Oakhill, 1999; Clemens et al., 2017; Stanovich, 2000; Treptow, Burns & McComas, 2007). Such readers have poor inference-making skills than their peers (Blachowicz & Fisher, 2014; Cain, Oakhill, & Elbro, 2003; Cain, Oakhill, & Lemmon, 2004; Oakhill & Cain, 2016). Therefore, students with poor reading comprehension may fail to improve their vocabulary at the same rate as better comprehending peers. This is because they lack the means to learn new words through independent reading (Cain, & Oakhill, 2011). Having poorer inference-making skills causes confusion while reading. Thus, the reader becomes passive in the act of reading. Because of their limited vocabulary and poor comprehension skills, these readers either skip over difficult words or ignore them when they encounter them in grade-level texts (Cain et al., 2003; Pressley, 2006). Readers' confusion grows gradually as the number of these words increases. Reading attempts may be accompanied by symptoms such as finger-pointing, repeating words, turning back, frowning, writhing, facial tics, and other inappropriate habits and behaviors. This case causes the reader to experience tension symptoms, and the reader becomes dissatisfied with the reading act. This type of experience contributes to negative attitudes toward reading (Halladay, 2012; Hiebert & Kamil, 2005; Leslie & Caldwell, 2012; Roe & Burns, 2011). As a result, one of the key factors underlying the school failure of students who struggle with reading comprehension is the lack of ability to use context clues to learn the meanings of unknown words. This has the potential to reduce students' motivation to read (Biemiller, 2004). Research in the literature has shown that students who have difficulty understanding what they read stop reading when they come across difficult and unfamiliar words while reading the texts because they have difficulty inferring the meanings of those words (Mason, Meadan, Hedin & Taft, 2013). These shortcomings in the application of reading comprehension strategies have a negative impact on students' reading comprehension performance. As a result, students perform poorly and are becoming anxious while reading (Cataldo & Cornoldi, 1998; Roe & Burns, 2011; Yıldız, 2013). Students who lack comprehension skills must therefore learn cognitive skills aimed at improving reading and comprehension in accordance with their needs (Edmonds et al., 2009; Gajria, Jitendra, Sood, & Sacks, 2007; Hagaman & Reid 2008). Researchers stated that students had difficulty in understanding how to analyze the text they read in order to build meaning from it (Minskoff, 2005). According to Sharp et al. (2016), students who struggle with reading comprehension can learn effective comprehension skills through strategy instruction until they reach a higher level of reading comprehension performance. Strategy instruction refers to a promising teaching activity that teachers should carry out in a clear and understandable manner in order to boost their students' self-efficacy by developing a variety of reading and learning skills. Teaching effective reading comprehension skills is an effective way to improve the reading comprehension of students who are at risk in reading comprehension (Guthrie, Wigfield & You, 2012; Sung, Chang & Huang, 2008). The basic rationale behind this teaching activity is that one's level of reading comprehension can be improved by learning reading comprehension skills to be used when faced with reading difficulties. The goal of strategy instruction is to engage readers in the process of understanding what they read, as well as to teach them how to think while reading and how to comprehend what they read (Gersten, Fuchs, Williams & Baker, 2001).

1.2. The Current Study

Theoretical and empirical backgrounds in the literature indicate that the ability to use context to learn the meanings of unknown words is a prerequisite for all students to improve their reading comprehension (Carnine et al., 2004; Graves, 2006). For students, a lack of such a skill can be a critical factor underlying reading comprehension and school failure. In this regard, the current study sought to examine the efficacy of instruction based on using context clues to infer word meanings from context on reading comprehension of elementary school students who struggled to understand what they read. There are two main objectives of the study: The first step is to replicate previous research and expand (Ahmed et al., 2016; Begeny, 2019; Denton et al., 2017; Goerss, Beck, & McKeown, 1999; Hall et al., 2019; Kuhn & Stahl, 1998; McGee & Johnson, 2003; Oakhill & Cain, 2012) its findings by investigating the effect of instruction using context clues to infer word meaning from context on reading comprehension. Although the existing literature emphasizes that teaching students to learn word meanings from context contributes significantly to students' vocabulary and reading comprehension, in Turkey, little is known of teaching the use of

context clues to infer the meanings of unknown words from context to struggling readers. To fill a research gap in the literature, this study was designed to investigate the effect of instruction in inferring word meanings from context on students' reading comprehension. Second, rather than waiting for students with reading comprehension difficulties to emerge, the study aimed to enhance these students' reading comprehension of the text by improving their ability to build meaning from the text. As researchers point out that intervention programmes should be designed for students who are experiencing reading difficulties in order to improve students' reading comprehension (Rasinski, 2012; Van De Walle, Karp & Bay-Williams, 2013) the current study aimed to overcome comprehension difficulties of students that have poor reading comprehension who needed to pay close attention. Reading comprehension difficulties cause students to fall behind their peers in the development of literacy skills, and individual and social potential may not be realized (Gersten et al., 2008; McKeown, 2019). As a result, it is believed that early identification and elimination of reading difficulties in students who experienced difficulty with comprehension will be critical to their future academic and other needs. The current study aims to make significant contributions to the improvement in reading achievement of this type of students by identifying problems with reading comprehension in the early stages rather than waiting for problems with reading comprehension to arise (Caccamise & Snyder, 2005; Edmonds et al., 2009; Gajria et al., 2007).

2. METHODOLOGY

2.1. Participants

Participants included four fourth-grade elementary students with poor reading comprehension from a Turkish elementary school. The study sample was chosen based on the following criteria: First, the author interviewed students' teachers to determine whether any students had difficulty in constructing meaning out of what they read in their classrooms. This criterion was met by ten students, as identified by three teachers. Following the collection of this data, the researcher (as the author) created a reading vocabulary test (RVT) instrument based on the Turkish Language test for fourth-graders. The RVT consisted of 25 multiple-choice questions designed to assess the ability to infer and derive word meanings from context. Each item included short passages containing important words from supportive context. The RVT instrument used in this study was tested for validity and reliability on 92 fourth-grade students who were not included in the study. Internal consistency reliability for the RVT instrument was found as .85. The author administered the RVT assessment to assess whether these ten students could have the ability to unlock the meanings of unknown words in the RVT. In the classroom setting, students were asked to answer questions in the RVT independently. The number of correct items on the test was equal to the number of correct items on the test. The RVT item scores revealed that seven out of ten students identified by teachers struggled with inferring word meanings from context. This is due to the fact that their test scores were less than 50% (range 36% to 48%). Third, the author utilized the "Wrong analysis inventory-WAI" as an informal reading assessment (Ekwall & Shanker, 1988, cited in Akyol, 2014) to estimate the comprehension levels of 7 students. The WAI included grade-level expository passage, including 279-words selected from students' fourth-grade content area textbooks (i.e., social studies). The WAI included four literal questions and four inferential questions with open-ended answers. The author asked each student to read the entire passage silently and answer eight open-ended comprehension questions in the WAI. Students were not permitted to reread the passage while answering the questions. Responses of the students to all open-ended questions in WAI assessment were scored dichotomously (0= incorrect, 1= correct). The author divided the number of correct answers by 8 and multiplied by 100 to calculate the percentage of reading comprehension level. In the WAI for determining reading comprehension level, 90% or more of the questions correctly represent independent-level comprehension, 51%-89% of the questions correctly represent instructional-level comprehension, and less than 50% of the questions correctly represent frustration-level comprehension (Akyol, 2014). The WAI results revealed that 3 out of 7 students had comprehension levels higher than 50%, so they were excluded from the current study. The remaining four students' comprehension levels ranged from 36% to 48%. According to the WAI results, each of the four students was proficient in oral reading but struggled with reading comprehension. To keep their privacy, all four participants were given pseudonyms: P1, P2, P3, and P4. The teachers stated that their students did not have any learning disabilities. The first participant, P1, was a 9-year-old boy in fourth grade who scored 48% on the WAI assessment for reading comprehension. The teacher confirmed that P1 successfully read orally books but lacked cognitive skills such as making inferences about what happens or is likely to happen in a text while understanding the big picture of texts. The second participant, P2 was a 9-year-old boy and his comprehension level was 45%. According to his teacher, P2 struggled with comprehension skills such as drawing inferences and determining the meanings of difficult words from context. The third participant, P3, was also a 9-year-old boy, and his reading comprehension level was 40% on the WAI assessment. His teacher stated that P3 struggled with finding the main ideas, interpreting the visuals in text material, and making textual inferences. Finally, the fourth participant was P4, a 9-year-old girl. On the WAI assessment, she scored with 36% for comprehension. Her teacher stated that P4 struggled with identifying key ideas, analyzing information, recalling information about text elements, and unlocking the meanings of unknown words in context.

2.2. Research Design

The current study employed a multiple baseline design across participants with multiple probes (Gast, Lloyd, & Ledford, 2014). The instructor (as the author) instructed four participants, P1, P2, P3, and P4, on how to use context clues to infer word meanings from context flexibly. These targeted students were not provided with other possible contributors to their growth in reading comprehension through the intervention, such as additional assistance, reading activities, individualized and group

instruction intervention, or parent involvement in their home or by their teachers. The experimental phases were as follows: baseline, teaching sessions, independent-performance phase probes, and maintenance probes. Dependent reading measures including short-answer response items, were used in all probe conditions to identify changes in all participants' reading comprehension.

2.3. Instructional Intervention

The current study was carried out in an elementary school in a Turkish city in the 2018-2019 school year. The instructional program included five lessons adopted based on vocabulary instruction procedures developed by Graves, Juel, Graves and Dewitz (2011). Each participant received individualized reading instruction that relied on context clues to infer word meanings in texts. Each of them progressed through these lessons until they can employ a four-step strategy called inferring word meanings from context (Graves, 2006). Each lesson was introduced by using direct instruction components which included specifying the lesson objectives, strategy modeling, guided and independent practices, and strategy review. Figure 1 summaries an overview of the instructional intervention program.

Lesson 1	Lesson 2	Lesson 3	Lesson 4	Lesson 5
A digital text activity which is the one in which meaning is figured out from the video context.	Introduction and modeling the four-step strategy to learn inferring word meanings from context	Guided practice to learn how to use the four-step strategy, as well as exercises, feedback, and corrections	Independent practice with the four-step strategy in various texts	Evaluation activities including verbal repetitions, word games based on inferring word meanings and reading comprehension

Figure 1. Overview of the instructional program

Lessons for Teaching Student Infer Word Meanings

A summary of the five lessons taught to four students is presented below.

Lesson 1: Digital Text Activity for Motivation

Since learning to infer word meanings from context was a demanding and challenging task, the instructor introduced the unit with an activity for the first participant, P1. The instructor selected a content-area text titled "Waste of Electricity" and modified it as a digital text video (Ministry of Turkish National Education, 2019). The reason for choosing this type of text is that it seemed suitable for making inferences using contextual information and it is qualified to attract students' attention because it is related to daily life. In the study, digital text was used because it is flexible, draws students' attention to important information, and is an effective alternative for students with learning needs. The instructor distributed the clue chart shown in Figure 2 just before showing the video, and told the student that he would use it as he watched the video. The instructor played the video and gave the student a few minutes to complete the clue chart. In addition, the instructor asked the student which clues suggested the "Waste of Electricity" video was about, as well as where the video took place, in order to figure out the unknown words. After the student figured out all of the important clues in the video, the instructor finished the introductory lesson.

Target Words	Context Clues	Figure Out the Meaning of Word	Creating a Visual Context

Figure 2. Clue chart

Lesson 2: Four-Step Strategy Introduction and Modeling

The instructor reviewed the main points made in the first lesson and then introduced the strategy for learning words from context. A strategy entailed four steps (see Figure 3) is called inferring word meanings from the context: (1) reading carefully and stopping when there was an unknown word, (2) reading slowly from that point forward and looking for the clues in relation to the word's meaning, (3) going back and rereading the sentences preceding the term if necessary, and (4) selecting a word or phrase that appears to capture the meaning of the term, and substituting it for the unknown word to see whether it worked. After explaining the four-step strategy (Figure 1), the instructor modeled it, clarified when and where P1 was likely to use it, and let the student practice with some expository text passages containing difficult words, particularly those with informational context clues. The instructor scaffolded the student's efforts as he worked with the strategy, providing additional clues as needed, letting the student work and answering any questions he posed.

<p>Play and Question</p> <ul style="list-style-type: none"> • Read carefully. • Frequently ask yourself, "Does this make sense?" <p>Slow Advance</p> <ul style="list-style-type: none"> • Notice when you don't know the meaning of a word and slow down. • Read that sentence at least once more, looking for clues. • Ask yourself, "What is this paragraph about?" <p>Stop and Rewind or Fast Forward</p> <ul style="list-style-type: none"> • If necessary, go back and reread, looking for clues that help you figure out what the word might mean. • Read ahead to look for clues. <p>Play and Question</p> <ul style="list-style-type: none"> • When you figure out what the word might mean, substitute your guess for the difficult word and see if the sentence makes sense. • If it does, keep reading. • If it doesn't stop, rewind, and try again.

Figure 3. Description of the four-step strategy lessons (Graves, 2006, p.99)

Guided Practices, Independent Practices, and Evaluation (Lessons 3-5)

Using the interactive whiteboard, the instructor provided P1 with more detailed instructions on the four-step strategy over the next three lessons. The instructor took breaks from hard work to play games that used the strategy, created visual context activity, engaged the student in guided practices in both narrative and expository text passages, and allowed the student to use the strategy with a variety of expository text passages. In addition to the guided practice depicted in the instructor-student dialogue, each lesson beginning with the second lesson of instruction included independent practices. The instructor gave the student a short passage containing unknown words, asked him to read it, and identify words that he did know by using the four-step strategy. Not only did the student take more responsibility for the strategy and achieve better outcomes, but he also gradually self-monitored and self-regulated his use of the strategy. Each lesson concluded with a review and a question and answer session. By asking the student to recap what he had learned that day, the instructor reviewed what he had learned that day. The instructor was always available to assist the student's efforts, providing scaffolding, encouragement, and feedback as needed.

2.4. Procedure

2.4.1. Baseline

To establish baseline data, all participants were simultaneously given a dependent reading measure to evaluate their initial reading comprehension performance. Participants stayed at the baseline level until a stable baseline level was achieved. At least three coherent data points with no upward trend were found to have a stable baseline level (Richards, Taylor, Ramasamy, & Richards, 1999), which justified a phase change (Hayes, Barlow, & Nelson-Gray, 1999). Short-answer response items with four text-explicit and four text-implicit questions were used to collect baseline data. The correct answers to both text-explicit and text-implicit questions were directly related to the information read in the passage. All participants were asked to read the passage quietly. Following that, participants turned over the paper to the eight short answer response items related to the passage they had just read on before. This took between 10 and 15 minutes to complete. Participants received no assistance or additional support during the baseline phase conditions. The instructor did not announce whether or not any of the participants correctly answered the reading measures questions. When the baseline performance data appeared to be stable, the first participant, P1, began to receive strategy instruction, while P2, P3, and P4 remained at baseline (Kazdin, 2011). P2 moved into strategy instruction when his baseline data were stable after P1 completed the independent performance phase at a higher level than the baseline.

2.4.2. Intervention (Teaching Sessions)

Each participant stayed in the intervention until the criterion for independent performance was established (Hagaman et al., 2012). The criterion for this performance was achieved when a participant was able to use the four-step strategy correctly independently. The achievement of 80% accuracy in the four-step strategy demonstrated the strategy instruction criterion. Once the criterion was met, the participant moved into the independent performance phase probe, and baseline probes were provided to other participants. The same cycle was repeated until other participants completed the strategy instruction. Each student received a 30-minute session of instruction from the instructor for each lesson until the criterion was met. For all participants, the instruction intervention took more than two months.

2.4.3. Independent Performance (Second Probes)

Independent performance phase probes were administered to each of the four participants after they completed the intervention. These were the same as the baseline phase conditions. Participants did not receive any additional instruction or prompt during this phase. Independent performance information was gathered from dependent reading measures including short answer response items.

2.4.4. Maintenance Probes

Maintenance of intervention effects was examined for all participants, following two and four weeks after the completion of the study. Procedures for conducting these probes were identical to the baseline and independent performance condition procedures. Participants did not receive any instruction, prompts, or encouragement.

2.5. Dependent Measure

2.5.1. Short Answer Response Items

The author developed a set of 10 open-ended questions from the short answer response items to assess the reading comprehension levels of all participants. The short answer response items are a sensitive method of evaluating reading comprehension ability (Oakhill, Cain & Elbro, 2015). The text passages used in intervention lessons and probe conditions were all taken from fictional and nonfiction trade books at fourth grade level. The reason behind this selection was that there were a sufficient number of passages at the fourth-grade level and the participants' teachers were interested in students being able to apply ability in figuring out word meanings on content-area texts. The passages ranged from 282-486 words in length. The average readability level of all the passages used ranged from 53 to 61 using the Flesch-Kincaid readability formula developed by Ateşman (1997) for Turkish. There are two types of short-answer response items developed by the author: explicit and implicit. Implicit items were intended for making inferences from the text and identifying the main ideas. Explicit type questions aimed to assess whether students could understand and recall the information explicitly stated in the passage (Leslie & Caldwell, 2012). These questions were marked as correct or incorrect according to the acceptable answers developed by the author. Participants who answered the questions completely and correctly received two points, those who responded partially received one point, and those who did not respond correctly received zero points. On a worksheet, a participant could receive a maximum score of 20 and a minimum score of 0. To calculate the percentage of correct answers, the author divided the total number of correct answers by ten and multiplied it by 100. The percentage of correctly answered questions determined the level of reading comprehension (Akyol, 2014).

2.5.2. Social Validity

The author created a survey to assess the social validity of intervention. After the completion of the study, in-person interviews were conducted to collect social validity data from P1, P2, P3, and P4 participants. The social validity survey consisted of a rating inventory, which required participants to select a number as a response to items of the intervention's social validity (Ferguson et al., 2019), and open-ended questions. It was divided into two sections: effectiveness of strategy intervention and satisfaction with strategy intervention. On a Likert scale of 1 to 5, participants were asked to rate seven items about the effectiveness of strategy instruction (see Table 1). They were asked to rate their satisfaction with the intervention on a Likert scale of 1 to 4. They were also asked to answer two open-ended questions: "Would you recommend this strategy to your classmates?" (Do you want to say yes or no?), as well as "What did you like best about the intervention in this study?"

2.6. Inter-observer Agreement

For the current study, two types of reliability data were obtained. The inter-observer agreement was calculated using the "Agreements / Agreements + disagreements 100" formula to ensure consistent scoring of participant responses to the short answer response items. Using the answer keys developed by the author, two independent raters with PhDs in literacy education scored 30% of the participants' responses in the probe conditions. The percentage of agreement for all participants' responses to short-answer response items was 90%.

2.7. Treatment Fidelity

To ensure consistent implementation of the instructional program, teaching sessions were scripted, and a checklist for the direct instruction components in each lesson was developed. Fidelity data collected by two raters served as independent scorers in 30% of teaching sessions. The raters used scripted lessons and checklists to mark whether lesson steps were completed. They evaluated the checklist using “yes”, “no”, or “not applicable”. Treatment fidelity, the percentage of steps completed correctly by the instructor, was calculated as 90% between the raters.

Table 1.

Social Validity Survey Items and Results

Strategy Effectiveness *	P1	P2	P3	P4
1. The lessons helped me in learning the meanings of unfamiliar words from text	5	5	4	4
2. The lessons provided me with a good understanding of words and their meanings.	5	4	4	4
3. Learning to use textual information to learn the word meanings is helpful	5	4	3	3
4. The lessons improved my ability to learn words from text.	5	4	4	3
5. A four-step strategy is effective for learning the meanings of unfamiliar words while reading.	5	5	4	4
6. Learning word meanings by using text clues is an important way to understand words and text	5	5	4	4
7. The lessons help me in learning new words	4	4	4	4
Strategy Satisfaction **				
8. Did you satisfy with the teaching activities, lessons, and activities?	4	4	4	3
9. Would you recommend your experience to your classmates? (“yes” or “no”)	Yes	Yes	Yes	Yes
10. What did you like most about the intervention in this study?	Playing word games	Figuring out text elements	Creating visual contexts for the words	Learning to use clues in the texts

* Rate of 1 to 5, with 1 = strongly disagree 5 = strongly agree

** Rate of 1 to 4, 1 = Not strongly 2 = somewhat strongly, 3 = strongly, 4 = very strongly

2.8. Data Analysis

Visual inspection of the data was used in the study to examine stability, level, and trend. The visual inspection was chosen because it aids in determining participant performance and ensuring the necessary progress in the intervention process. According to researchers, the results obtained were first presented on the chart, then the trend, stability, and level of the data were analyzed visually (Gast, 2010; Kircaali-İftar & Tekin-İftar, 2012). In this study, the horizontal axis in Figure 4 represents the number of teaching sessions, while the vertical axis represents the correct response percentage of participants in the dependent reading measures. In the study, the descriptive analysis technique was used to analyze social validity data.

3. FINDINGS

Short Answer Response Items

The findings revealed that at the end of the teaching sessions, all participants demonstrated significant increases in their levels of comprehension. The total percentage of correct answers in the baseline level for P1, P2, P3, and P4 was 44.3%, 40%, 38.5%, and 38% respectively. All students demonstrated an increasing trend in their percentage of correct answers following the intervention from baseline to independent performance probe. The total percentage of correct answers for P1, P2, P3, and P4, respectively, was 75%, 72%, 70.5%, and 66%, indicating success in their level of reading comprehension. When comparing baseline and independent performance, the results showed that P1, P2, and P3 improved more than P4 in their rate of accurate answers to the short answer response items in the dependent measures. Maintenance probe performance for P1, P2, P3, and P4 were 75%, 70%, 70%, and 65%, respectively. The percentage of correct answers for each participant in the maintenance probes was slightly lower when compared to the independent performance probe scores. The results indicated that the participants showed a significant increase in their reading comprehension performance after the intervention. Figure 4 shows each of four participants' percentage of correct responses for the short-answer items.

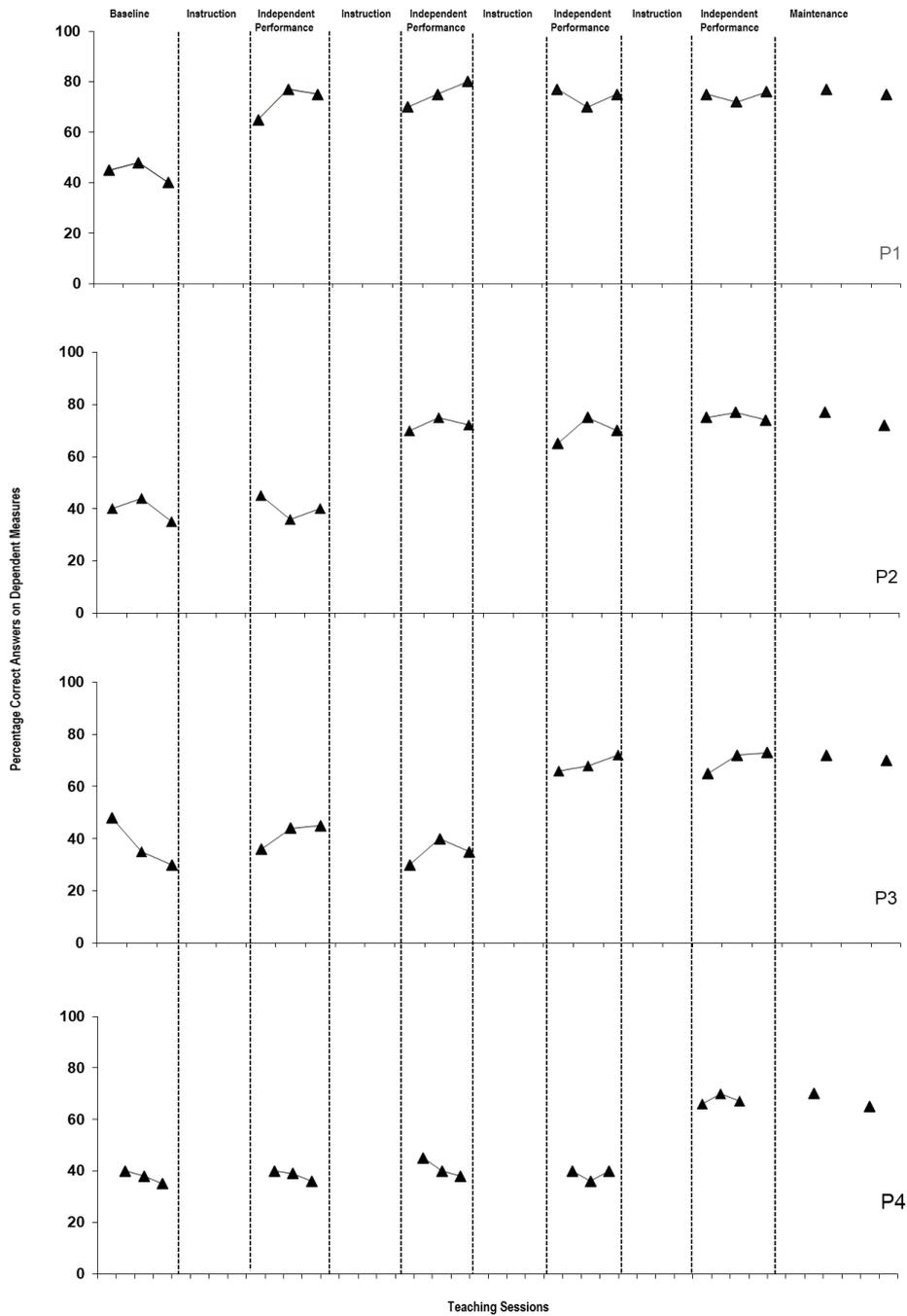


Figure 4. Percentage of correct answers for all participants in the dependent measures

Social Validity

Social validity data indicated that all of the four participants were highly satisfied with the practices and outcomes of the intervention. The rates indicating the benefits of the intervention for P1, P2, P3, and P4 were 4.75, 4.37, 3.88, and 3.62 respectively. They thought that the instructional practices were remarkably effective. The rates about the satisfaction levels with the strategy instruction for P1, P2, P3, and P4 were “Very strongly”, “Very strongly”, “very strongly” and “strongly”, respectively. According to these results, the participants rated the effectiveness of strategy instruction at a high level. This finding suggests that there was no ambivalence or negative attitude towards the intervention. When asked what they liked best about implementing such an intervention, P1 stated that he developed positive attitudes toward reading and enjoyed playing word games. P3 stated that he enjoyed figuring out text elements shown in the video. P4 responded that he would use this skill while reading and that he had successful reading experiences because he enjoyed learning unknown word meanings from context clues. P3 stated that she enjoyed reading the chosen passages, learning new words from context, and creating visual contexts for the words. She also appreciated the instructor's modeling of how context clues could be used to identify words. When asked if they would recommend the strategy for learning word meanings from text to their classmates, all of the participants said "yes."

4. DISCUSSION, CONCLUSIONS AND IMPLICATIONS

The current study sought to assess the effectiveness of instruction in the use of context clues to infer word meanings from context on the reading comprehension among students with poor comprehension performance. Following the strategy instruction, all four participants, P1, P2, P3, and P4, significantly improved their reading comprehension level. Prior to the intervention, baseline data revealed that students' initial comprehension level was poor and did not show any improvement. However, in the independent performance probes, all of these participants' correct response scores increased to 75%, 72%, 70.5%, and 66%, respectively. The increased rates indicated that P1, P2, and P3 did make remarkably more improvements in their accurate answers to the short answer response items measures. According to the findings, strategy instruction was associated with increased reading comprehension levels in participants. Following the completion of the study, it was found that all participants maintained their gains in the two and four-week follow-ups. Maintenance probes show that each of the four participants maintained the strategy learned during the lessons. In other words, the intervention effect was validated via maintenance probe scores as well. Baseline data showed that the percentage of reading comprehension of four participants was less than 50%, indicating that the participants were at frustration-level comprehension in reading (Akyol, 2014). However, the results show that all participants made significant gains in their reading comprehension, indicating that they were able to successfully apply the strategy they learned to reading word accuracy and reading comprehension. The intervention outcomes indicated that students successfully remedied their deficits in reading comprehension. Participants' feedback reported that the intervention had a positive effect on their reading outcomes. The results of social validity revealed that they benefited greatly from the intervention. Students agreed that the intervention enabled them to learn how to use context clues, comprehend a text, and infer unknown word meanings in order to improve their text comprehension. They, therefore, rated with high positive scores on the effectiveness of the instruction intervention. Findings of this study indicated that teaching students who struggled to understand what they read to use context clues to infer word meanings appears to be a worthwhile investment in improving reading proficiency (Baumann et al., 2003). Given the importance of inferring word meanings from context in reading comprehension, the findings indicate that the more students learn inferential comprehension skills, the more they contribute to their comprehension achievement (Buikema & Graves, 1993; Graves et al., 2011; Pressley, 2006). Previous research suggested that context-clues instruction could boost the level of reading comprehension for the students struggling with reading comprehension (Begeny, 2019; Bowyer-Crane & Snowling, 2005; Cain, Oakhill, & Lemmon, 2004; Edmonds et al., 2009; Ford-Connors & Paratore, 2015; Ilter, 2018; Kermani, & Seyedrezaei, 2015; Wanzek et al., 2013). In their study Cain et al. (2004) found a positive relationship between inferring meaning from context and reading comprehension. They also observed that students that have poor comprehension level were successful in learning the ability to infer meaning from context through instruction, and students used these skills effectively to cope with reading comprehension difficulties. Thus, the findings suggest that if reading comprehension strategies such as inferring word meanings using context are taught using a direct instruction method, students could increase their reading comprehension. Findings of this study suggest that an instructional intervention based on the process of using context to infer word meaning from context is a powerful model that remedied students' reading comprehension skills (Goerss, Beck & McKeown, 1999; Camine, Kameenui, & Coyle, 1984; Nippold, 2002).

The intervention effects were validated by using multiple baseline design across participants. Considering that the participants who were in the risk group for reading comprehension in this study, the results are promising. When compared to baseline data, students significantly improved their reading comprehension scores. It appears that teaching students word meanings and practice in inferring word meaning from context is a practical, economical, and efficient way to improve their reading comprehension. This study can be considered as an attempt based on the three-step "Responding to Intervention (RTI)" method to improve the reading competence of struggle readers. The goal of RTI method is to provide early interventions to students who are at risk of failing in reading comprehension. RTI enables teachers to identify whether students with poor reading comprehension need academic or behavioral interventions (Fuchs, Fuchs & Stecker, 2010; Gersten & Dimino, 2006). According to secondary-level (Tier 2) in the RTI, a limited number of children identified as having reading difficulties must receive quality reading interventions designed for Tier 2 instruction in a given classroom that will meet their academic difficulties (Fletcher & Vaughn, 2009; Sharp et al., 2016). Recent investigations reveal that there is a growing trend towards RTI intervention in reading comprehension skills, especially in dealing with the students who struggle with reading comprehension, because it provides the students with early strategy instruction and research-based reading comprehension interventions (Hagaman et al., 2016; Hall et al., 2019; Jitendra & Gajria, 2011; Johnson & Smith, 2008; Van Der Heyden & Burns, 2010; Vaughn & Fletcher, 2012). As a comprehensive early identification and prevention strategy, RTI identifies the students struggling with comprehending what they read and helps them before they fall behind their peers (Gersten et al., 2008). This study has shown that all participants achieved a remarkable improvement in their comprehension performance levels and it has laid bare the efficacy of a Tier 2 intervention for students that struggle with reading comprehension, a significant success that emphasizes the clinical significance of the strategy instruction.

As a result, there may be numerous significant implications for teachers and other educators dealing with students' reading comprehension problems. First, the results of this study showed that instruction in inferring word meanings from the context seems to be an effective method of improving the reading comprehension skills of the students identified as performing poorly on text reading comprehension. In a response to intervention setting, students with poor reading comprehension can benefit from a direct instruction in the use of context clues to infer the word meanings from context to have better reading comprehension. The scripted nature of this intervention makes its implementation easier for the teachers; they are ensured with simple instructions on how and when to model how to use context clues during teaching (Graves, 2006). The delivery of

individualized instruction intervention provides numerous opportunities for students to practice the modeled skills. Second, the current study exemplifies screening procedures that were successful in determining the students who struggle to use context clues and benefit from the strategy instruction. Furthermore, at the end of each teaching session, independent performance probes were administered, informing the instructor whether the strategy instruction was progressing too slowly or too quickly for each student. Finally, findings of the current study indicate a relatively effective method of assisting students with deficits in reading comprehension skills and assisting them to be successful in school, reading, and literacy in general (Koutsoftas, Harmon, & Gray, 2009). All these suggest that students who struggle with reading comprehension can be taught to use context clues to infer the meanings of unknown words (Kuhn & Stahl, 1998).

This study has some limitations. First, one limitation was that it was conducted out with relatively small sample size. It is obvious that a small number of participants restricts the generalization of findings, so the results may not be generalizable. Future research should help to increase the generalizability of the findings by repeating the effects of instruction in inferring word meanings from the context with different samples. Second, the participants in this study were provided with a one-on-one intervention. Future research should investigate whether strategy instruction is as effective in a small-group or a whole-class setting. Third, the dependent reading measures which included the short answer response items developed by the author were used in all probes. This could have affected participant scores on the short answer response items. Future research may address using validated dependent reading measures, such as already developed standardized reading tests. Fourth, the participants' reading comprehension skill development levels were assessed in this study. Future research should be strengthened by combining other reading measures such as vocabulary and reading fluency.

Research and Publication Ethics Statement

The paper is complied with research and publication ethics.

Contribution Rates of Authors to the Article

Contribution rates of the author to the article are 100%.

Statement of Interest

The author declare that the article has no conflicts of interest.

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