Bauer, T. & Tang, H.(2022). Explicit vocabulary instruction for fifth graders' vocabulary knowledge and reading comprehension: An action research study.*Journal of Educational Technology Development and Exchange*, *15*(1), 124-141

Explicit Vocabulary Instruction for Fifth Graders' Vocabulary Knowledge and Reading Comprehension: An Action Research Study

Tonia Bauer
University of South Carolina, U.S.A.
tfbauer@email.sc.edu

Hengtao Tang
University of South Carolina, U.S.A.

Abstract:*This action research aimed to evaluate the impact that explicit vocabulary instruction delivered through Schoology had on the vocabulary knowledge and reading comprehension of fifth graders at an urban elementary school in the southeastern United States. A convergent mixed-method approach was applied. The vocabulary and reading comprehension scores and the learner experience survey accounted for the quantitative data. Furthermore, qualitative data gathered from semi-structured interviews were analyzed inductively. Findings show that students' vocabulary knowledge and reading comprehension significantly increased after receiving explicit vocabulary instruction, and results marked instruction regarding Latin and Greek roots as areas needing attention. For elementary educators, the study's practical implications highlight the importance of teaching explicit vocabulary strategies, including morphology and context clues, to students.*

Keywords: reading comprehension, explicit vocabulary instruction, context clues, morphological awareness, action research

Introduction

Spencer et al. (2018) purported that only a third of rising fifth graders in the United States are competent in reading comprehension. The National Assessment of Educational Progress (NAEP) investigated the vocabulary proficiency and reading comprehension of fourth, eighth, and twelfth-graders from 2009 to 2011. The results indicated a strong relationship between vocabulary knowledge and reading comprehension (National Center for Education Statistics, 2012).

In comparison to other components of literacy instruction, vocabulary has not received as much attention (Maynard et al., 2010). Reading instruction tends to focus on explicit comprehension strategies such as finding main ideas, summarizing, analyzing text structure, and making inferences. Due to the demands on teachers to prepare students for standardized tests, less time is spent teaching vocabulary (Maynard et al., 2010). However, students must understand the words embedded in reading passages before they can apply the reading strategies on their own without support from teachers (Roskos et al., 2017). Given those time constraints, vocabulary instruction traditionally takes the form of weekly definition memorization, which provides few opportunities for students to use strategies to determine word meanings for themselves. As such, traditional methods of instruction do not foster vocabulary growth (Beck et al., 2005; Graves, 2006). Therefore, consistent explicit vocabulary instruction is needed to enhance students' reading comprehension skills.

The benefits of using technology to teach vocabulary are supported by empirical research (Reutzel & Cooter, 2013; Watts-Taffe & Gwinn, 2007). Johnson et al. (1987) found that computer-assisted instruction, which is explicit instruction using technology without direct instruction from the teacher, can also enhance students' understanding of unfamiliar words. Further research has revealed that technology is most effective when appropriate strategies and applications are incorporated into instruction (Bryant et al., 2003; Jitendra et al., 2004; Kuder, 2017). Intentionally using technology in the classroom increases self-direction among students as they take control of their learning, and teachers become facilitators of the educational experience (Bjerede & Bondi, 2012). However, regarding the current trend of digital literacy in

schools, there is a gap in the literature that this action research helps to fill by highlighting the delivery of explicit vocabulary instruction using Schoology.

This action research aimed to evaluate explicit vocabulary instruction's impact on fifth-grade vocabulary knowledge and reading comprehension when lessons were delivered through Schoology. Analysis was conducted according to the following research questions:

1. How does the explicit vocabulary instruction delivered through Schoology impact fifth-grade students' vocabulary knowledge?

2. How does the explicit vocabulary instruction delivered through Schoology impact fifth-grade students' reading comprehension?

3. What are fifth-grade students' perceptions of the explicit vocabulary instruction modules?

Literature Review

Reading Comprehension and Vocabulary Knowledge

Proponents of reading purported that reading is a skill wherein students receive and understand information; as such, the skill plays a very significant role in students' learning processes (Muhid et al., 2018). In other words, students who are successful readers can understand a wide range of concepts. For reading comprehension to occur, students must understand how learning within the context of instruction aids in their acquisition and comprehension skills (Goodwin & Cho, 2016; Kendeou et al., 2011). It is not simply decoding words (Leider et al., 2013) but being able to make connections between concepts and understand what is being read.

Vocabulary knowledge has a high correlation with reading and is the strongest predictor of successful reading comprehension (Gallagher et al., 2019; Harmon & Wood, 2018; Moody et al., 2018; Mokhtari & Nieuderhauser, 2013; National Reading Panel, 2000). As students develop their word recognition skills and widen their language capabilities, vocabulary knowledge plays a vital role in shaping reading comprehension (Foorman et al., 2018; Oslund et al., 2018). Lawrence et al. (2018) investigated the relationship between academic vocabulary knowledge and reading comprehension with 5,855 middle school students. Data was collected from each student who completed an academic vocabulary assessment, a standardized reading comprehension test, and one of four types of novel vocabulary-depth measures. The findings confirmed prior research (Dole et al., 1995; Lubliner & Smetana, 2005), showing a strong correlation between students' academic vocabulary and reading comprehension (Lawrence et al., 2018).

However, students in low-income schools, referred to as Title 1 schools, usually enter the classroom with limited vocabulary knowledge and tend to perform below average on reading comprehension tests (Nelson et al., 2015). In addition, research has shown that factors affecting the vocabulary knowledge of many students from low-income families include a lack of access to books and inexperience with language (Nelson et al., 2015). Therefore, it is vital for educators, especially in Title 1 schools, to teach vocabulary explicitly (McKeown & Beck, 2004; Tomesen & Aarnoutse, 1998).

Explicit Vocabulary Instruction

Martin-Sanchez (2019) defines explicit vocabulary instruction as the structured and systematic teaching of vocabulary words with direct instruction in word meanings and learning strategies. Using this pedagogical strategy, educators must set a purpose for learning, telling the students what to do, modeling how to do it, and providing guided practice for application (Kusumawati & Widiati, 2017).

Even though advocates of implicit vocabulary instruction encourage a wide range of reading for more vocabulary knowledge, wide reading is insufficient for increasing vocabulary retention among struggling elementary readers (Gallagher et al., 2019; Shany & Biemiller, 2009). This insufficiency highlights the importance of explicitly teaching word-learning strategies for students to recognize unknown words on their own without support from the teacher. Thus, for students to learn words incidentally, they need explicit instruction in word-learning strategies and word consciousness. For instance, explicit instruction for inferring meanings based on context clues is more effective than expecting students to search dictionaries for new definitions (Ender, 2016).

This action research concentrated on two strategies for vocabulary instruction: morphological awareness and context clues

(Graves, 2006). Morphological awareness is the ability to reflect thoughtfully on, interact with, and manipulate the smaller units of language, such as prefixes and suffixes (Apel & Thomas-Tate, 2009; Tong et al., 2011; Wolter & Pike, 2015). In addition, being knowledgeable of root words provides students with the schema necessary to apply logic to new words they encounter with similar roots, and research supports teaching strategies to analyze word-structure clues in order to infer meaning (Bauman et al., 2007; Levesque, Kieffer, & Deacon, 2017; Manyak et al., 2018; Graves, Schneider, & Ringstaff, 2017).

Using context clues is a strategy wherein students make inferences about unfamiliar words based on hints found in the surrounding text. This strategy has long been a fundamental approach to reading comprehension and vocabulary acquisition (Blachowicz et al., 2005; Dowds et al., 2016; Sáenz & Fuchs, 2002). Types of context clues include definitions of surrounding words, restatements, antonyms, synonyms, examples, or explanations (Dowds et al., 2016; Innaci & Sam, 2017). Using these clues can improve children's reading comprehension skills, which in turn helps them learn vocabulary as they engage in reading daily at their instructional reading level (Dowds et al., 2016; Forbes & Buchanan, 2018).

Methodology

This action research evaluated the effectiveness of both morphological awareness and context clues as explicit vocabulary instruction strategies. According to Burns and Richards (2009), action research is a means to bridge the gap between the most effective way of doing things and the actual ways of implementing things. In addition, action researchers collect data to make informed decisions about problems they encounter or, in this case, to answer a series of research questions. To that end, this action research used a convergent mixed-methods approach (Creswell & Plano Clark, 2017) in which quantitative and qualitative data were collected simultaneously but separately (Ogilvie & McCrudden, 2017).

Setting and Participants

This study occurred in the first author's fifth-grade classroom at an urban elementary school in the southeastern United States. It is a Title 1 school with high poverty, transience, and homelessness rates. A purposive sampling method was used to identify the participants in this study (Galvan & Galvan, 2017). In order to be considered for participation in the proposed action study, students had to 1) be enrolled at the site of the study, 2) be taking a fifth-grade English Language Arts class, and 3) have scored at a third-grade reading level or higher on the 2020 iReady Reading Assessment (Curriculum Associates, 2022). The participants in this study comprised of 25 fifth graders between the ages of 10 and 11, all from diverse backgrounds: 32% Hispanic, 44% African American, 12% multiracial, 48% female, and 52% male. Two students received help from the resource teacher, and seven were English-language learners (ELLs) who received ELL services. Additionally, two students participated in the gifted and talented program; two had Individualized Education Plans (IEP), and one received mental health services.

This school district has a one-to-one technology per student ratio, and each student has a personal MacBook to use. Therefore, upon entry into the study, all participants were familiar with Schoology as a learning management system.

Intervention

The intervention, delivered on Schoology, consisted of explicit vocabulary instruction modules focused on morphological awareness and context clues. The intervention lasted for five weeks, for 15–20 minutes each weekday. Twenty-five new vocabulary terms were presented to students via Schoology's multimedia features, which supported best practices for explicit vocabulary instruction. These practices included collaboration among peers, separating affixes from base words, activating background knowledge, and illustrating word meanings (Alamri & Rogers, 2018; Zhao & Li, 2018).

On day one of each week, students' schema of the five target words was activated with an anticipation guide titled "How Well Do I Know Each Word?" Students then clicked on each word with a corresponding picture representation and used the representations to infer meaning. For instance, when students clicked on the word "vegetation," they saw a picture representing that word which helped them generate a meaning based on the picture. (see Figure 1)

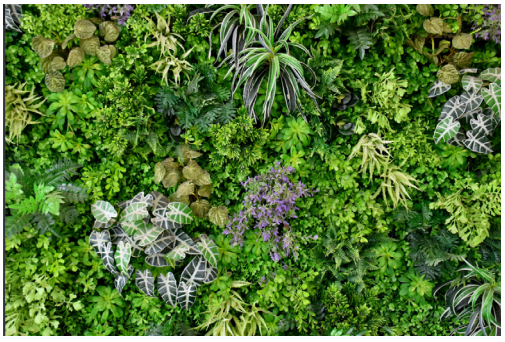

Figure 1
Picture Representation of the Word Vegetation

During day two's task, "Words, Word Parts, and Word Meanings," students would view a short video about the morphological structure of each new target word and use Schoology's microphone to pronounce each word correctly. Students then had to create a sentence for each word and complete a matching assessment, which demonstrated their understanding of the words' meanings. On Day 3, students used this knowledge to locate new words with similar prefixes, suffixes, and Latin or Greek Roots. They drew pictures to represent the words they found and then uploaded them via the files link in Schoology (see Figure 2)

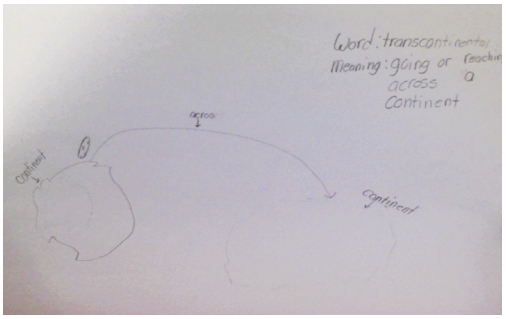

Figure 2
Illustration of Latin Root "Trans-"

On the fourth day, students listened to a mini-lesson on types of context clues and began using and identifying them in practice. Finally, on the fifth day, students had a vocabulary assessment on the five target words and all context clues taught that week.

Table 1
Outline of Weekly Vocabulary Modules in Schoology

Days	Vocabulary Strategies	Activities	Schoology Features
Day 1	Introduction of Vocabulary Terms	View picture representations	Media album Microphone Discussion
Day 2	Morphological Awareness	Learn about suffixes, prefixes, and Roots	Matching tool Inserting content tool Microphone
Day 3	Application of Morphological Awareness	Locate other examples of suffixes, prefixes, or roots Review picture representations	Link feature Media album
Day 4	Types of Context Clues	Define or restate terms Find synonyms, antonyms, examples, or explanations	Inserting content feature Highlighting tool Discussion feature
Day 5	Assessment of Vocabulary Knowledge	Complete cloze sentences Multiple Choice Matching	Highlighting tool Assessment tools

Data Collection

Quantitative

Students first took a reading comprehension and vocabulary pretest assessment from Houghton Mifflin Harcourt (2011). Cronbach's Alpha test was included to ensure internal reliability, and the values of the reading comprehension tests' coefficients were acceptable at 0.80 for the pretest and 0.78 for the posttest (Trundell et al., 2020). Likewise, the alpha values for the vocabulary pretest were acceptable at 0.78 and 0.84 for the posttest. Next, a learner experience survey, modified from the Perceived Usefulness section of the Technology Acceptance Questionnaire (Hwang et al., 2014), was used to evaluate students' perceptions regarding the effectiveness of the intervention's online vocabulary modules. This survey consisted of six items rated on a six-point Likert scale from strongly disagree to strongly agree. However, students utilized only five of the six responses, omitting the "Disagree" option, which resulted in the Likert scale being analyzed on a five-point scale. Due to these modifications, the internal consistency of the survey was tested at 0.90 using Cronbach's alpha.

Qualitative

Finally, the qualitative data originated from semi-structured interviews with 14 of the 25 participants. An interview protocol was used to understand the participants' perceptions of explicit vocabulary instruction's impact on their vocabulary knowledge. These semi-structured interviews occurred at the end of the intervention after students had completed the student perception survey. Purposive sampling was used (Galvan & Galvan, 2017) to amass a wide range of perspectives. Students who scored 80% or higher on both the vocabulary and reading comprehension posttests were considered high

performers; those who scored 70-79% were considered middle performers. Those who scored 69% and below were considered low performers.

Data Analysis

Descriptive and inferential statistics (Creswell, 2018) were used to analyze quantitative data with the JASP statistics software. The mean and standard deviation (i.e., descriptive statistics) were used to compare student averages on the vocabulary and reading comprehension pretest and posttest and to analyze student survey responses. Additionally, a paired sample t-test was conducted to investigate the differences between the mean pretest and posttest scores. In this case, Cohen's d was used to calculate the effect sizes of the pretests and posttests.

For the qualitative analysis, the recorded audio files were transcribed using the software NVivo before being read, assessed, and coded. Transcripts of the semi-structured interviews underwent inductive analysis using the software tool *Delve* to code the data by category and theme, as recommended by Creswell (2018). The inductive analysis approach generates rich thematic analyses, giving preference to participants' perceptions (Creswell, 2018). Coding patterns were identified, and similar information was grouped to form categories. Coding is vital to qualitative research because it helps make sense of the interview data. The recorded audio files were transcribed using the software *NVivo*. The researcher cleaned up the transcripts by listening to each audio to ensure correct transcription by NVivo and making necessary corrections in Microsoft Word. The researcher read and reread the transcripts four times to understand the information provided and reflect on its meaning (Creswell, 2018). The researcher then used an inductive approach to code the data, which were then used to develop categories and themes.

Results

Quantitative Findings

Regarding the quantitative findings, the mean score of the pretest (M = 44.64, SD = 20.78) was lower than the mean score of the posttest (M = 62.12, SD = 19.40). Due to outliers on the reading comprehension pretest and posttest, the standard deviations were large. The Shapiro-Wilk test, which examines whether or not data meets a normality assumption, showed no deviation. Additionally, the results of a paired samples t-test, comparing the mean scores of the reading comprehension pretests (M = 44.64, SD = 20.78) and posttests (M = 62.12, SD = 19.40), revealed a statistically significant difference, $t(24) = 5.17$, $p = 0.001$, with a large effect size (d = 1.03), as shown in Table 2.

Table 2
Inferential Statistics on Reading Comprehension Pretest and Posttest

Item	Pre-test		Post-test		*t*	*df*	*p*	Cohen's d
	M	*SD*	*M*	*SD*				
Scores	44.64	20.78	62.12	19.4	5.17	24	0.001	1.03

In terms of vocabulary knowledge, students' scores increased on the posttests. Table 3 contains descriptive statistics for the vocabulary pretest and posttest, using subscales for context clues and morphology awareness. Overall, students showed an

improvement in performance. The mean score of the context clues subscale was higher on the posttest (M = 74.64, SD = 20.12) than the pretest (M = 54.92, SD = 21.89), and the mean score of the morphological awareness subscale was higher on the posttest (M = 64.20, SD= 21.33) than the pretest (M = 49.20, SD = 23.81).

Table 3
Descriptive Statistics for Vocabulary Pretest and Posttest Subscales (n = 25)

Subscales	Pre-test		Post-test	
	M	*SD*	*M*	*SD*
Context Clues	54.92	21.89	74.64	20.12
Morphology	49.2	23.81	64.2	21.33

The Shapiro-Wilk test confirmed that the data met the normality assumption (p = 0.95). The paired samples t-test results showed that the mean difference in vocabulary knowledge scores between the pretest and posttest was statistically significant, where t(24) = 4.45, p = or < 0.001, with a large effect size of d = 0.91. Similarly, the mean difference between pretest and posttest context clue subscales was statistically significant, where t(24) = 4.65, p = 0.001, with a large effect size (d = 0.93). Likewise, the mean difference between pretest and posttest morphological awareness subscales was statistically significant, where t(24) = 3.18 and p = 0.004; however, in this case, a medium effect size (d = 0.63) was found.

Findings from the student perception survey revealed that most students (M = 4.20, SD = 1.08) agreed with the statement that the online modules were helpful to them in acquiring new vocabulary knowledge. Furthermore, the highest mean score (M = 4.32, SD = 0.94) revealed that most students prefer being taught explicitly instead of using dictionaries to find word meanings. Overall, most students agreed that the instruction provided by the online vocabulary modules made learning better and more accessible.

Qualitative Findings

Theme 1: Students perceived vocabulary modules as helpful to their learning

From the students' responses, this theme emerged to describe perceptions about how the modules expanded their understanding of unfamiliar words. Students believed the modules helped them become better readers, expanded their vocabulary, and allowed them to determine word meanings more quickly. For this reason, Theme 1 consists of three categories: 1) acquiring vocabulary knowledge, 2) design facilitating vocabulary instruction, and 3) improving reading comprehension (see Table 4).

Acquiring vocabulary knowledge. Students believed that the instruction provided on affixes, roots, and context clues led to many benefits in their acquisition of vocabulary knowledge. For instance, four out of 14 students stated that learning about affixes and roots helped increase their vocabulary knowledge. For example, John stated, "They [affixes and roots] helped me understand some of the words that I did not know, like the Latin roots and stuff and prefixes." Corroborating the idea that understanding the meanings of

smaller units of words provides students with opportunities for long-term definition retention (Sousa, 2001).

Design facilitating vocabulary instruction. According to the semi-structured interview results, students perceived the design facilitating vocabulary instruction as beneficial to expand their vocabulary knowledge. The modules were organized into weekly folders, and five days' worth of content was within each folder. Each day the students had a different vocabulary activity to complete. Two students described the organization as helpful, citing their ability to navigate the modules without difficulties. Christine said, "It also shows me which one to go and tells me which one to go to next. It was organized correctly," and Carlos said, "[I] kind of liked how you made it into weeks." In addition, being able to easily use the features presented in an online environment aided students' learning positively.

Improving reading comprehension. Confirming that explicit vocabulary instruction enhances reading comprehension skills, the interviews revealed that offering multimodal content concerning context clues and morphological awareness positively impacted students' comfort with reading comprehension tasks. In addition, concurring with Memis (2019), the affixes and roots mini-lessons positively impact students' reading comprehension.

Mary: I think it helped me a lot because it helped me become a better reader and it helped me learn more words that I didn't know the meaning of. And it helped me a lot.

Theme 2: Students identified areas of improvement for the explicit vocabulary instruction

Although research is limited, student perceptions of their vocabulary knowledge seem to encourage deeper thinking about word structure and contextual analysis (Brown & Concannon, 2016). As a result, this theme emerged from 1) the suggestions students gave for improving the modules and 2) their comments about the areas in which they experienced the most difficulties

Although teaching students to obtain word meanings is time-consuming (Bauman et al., 2003), students preferred shorter mini-lesson videos on morphology and context clues. They also desired more practice with context clues in general / overall. Some students experienced confusion using synonyms and antonyms, and as one of the most challenging sections, affixes and roots was another area of practice students recommended expanding. One participant also recommended including more writing prompts. She stated, "I might have added a little where we would have to write a small paragraph with the words. Then, we can double-check that we can use them." Learning to embed the words within sentences and paragraphs offers students opportunities to use context clues to determine the meanings of unfamiliar words.

Finally, another area needing improvement was the difficulty level of the vocabulary terms. Some students mentioned that the words were too easy. For example, Thomas stated, "Most of them [vocabulary word questions] are pretty easy," and Kamiya stated, "Well, it was a little too easy for me, and I flew through it." Terry also said, "My weakness was, well, I already knew the word and did it right off the top." This comment attests to a facet of the intervention that was too easy and did not challenge students. Additionally, when prompted to provide suggestions for improvements, Terry suggested that he would like to change the words he already knew, indicating more challenging vocabulary terms.

Table 4
Themes and Categories

Themes	Categories	Pattern Codes	First Cycle Codes
Students Perceived the Explicit Vocabulary Instruction as Helpful to their Learning	Acquiring Vocabulary Knowledge	Affixes and Roots	Prefixes and suffixes "Helped me know Latin and Greek roots"
		Context Clues	Enjoy context clues "Synonyms and antonyms" Context clues helped me learn words
		Perceived Benefits for Vocabulary	"Improve vocabulary" "Recognize words" Explain word meanings Liked typing and searching for synonyms Liked creating sentences
	Design Facilitating Vocabulary Instruction	Picture Representation	Using pictures to infer word meanings "Really liked drawing and uploading pictures"
		Organization of Content	Easy access to content Made into weeks "Know which day to go to"
		Using Schoology's Online Features	Use PowerPoint and video Use media album for pictures
		Online Assessments	Improvement in grades Weekly quizzes
	Improving Reading Comprehension	Understood Books Better	Become a better reader "Helped me describe characters in story"
		Boost Confidence	Build confidence "Stronger at word meanings" Express themselves better
Students Identified Areas of Improvement for the Explicit Vocabulary Instruction Modules	Recommend-ations for Improvement	Desired more practice with context clues	Trouble with context clues Need more passages and questions "Write small paragraph with words"
		Preference towards short videos	Challenges in focusing on long videos Cut video length
		Needed more instruction on affixes and roots	Struggles with Roots, Prefixes, and Suffixes "Needs more understanding of words"
		Preference towards more challenging words	Words were too easy More challenging words

Discussion

Research Question 1: How does explicit vocabulary instruction impact students' vocabulary knowledge in online learning modules?

Findings revealed that the explicit vocabulary instruction delivered through online learning modules positively impacted students' vocabulary knowledge. There was a statistically significant increase between the vocabulary pretest (M = 52.48, SD = 19.02) and posttest scores (M = 70, SD = 18.83). This finding is consistent with prior research highlighting the importance of explicitly teaching word-learning strategies to account for any new vocabulary students might encounter (Gallagher et al., 2019; Shany & Biemiller, 2010).

Additionally, the context clue subscales of the vocabulary pretests (M = 54.92, SD = 21.89) and posttests (M = 74.64, SD = 20.12) also showed a significant increase in students' vocabulary knowledge. Existing literature argues that contextual analysis is an important component of explicit word instruction (Bauman et al., 2007; Bauman et al., 2003; Dowds et al., 2016; İlter, 2019), and the findings of this study confirm the importance of teaching students' explicit contextual analysis strategies to infer the meanings of unfamiliar words. The qualitative findings from the semi-structured interviews revealed that many students attributed their improved vocabulary knowledge to the modules focused on context clues.

For the morphology subscales, there was also a significant statistical difference between the vocabulary pretest (M = 49.20, SD = 23.81) and posttest (M = 64.20, SD = 21.33), supporting the notion of morphological awareness as an effective strategy for improving vocabulary knowledge (citation?). As was the case for the context clues subscales, the qualitative data revealed that students also perceived prefixes, suffixes, and roots to be important contributing factors in their vocabulary knowledge.

Research Question 2: How does Explicit Vocabulary Instruction Impact Students' Reading Comprehension in Online Learning Modules?

The findings and interpretations from this study used three data sources to answer this question: 1) reading comprehension, 2) context clues, and 3) morphological awareness.

Reading comprehension

Existing research states that as students develop their reading skills and widen their language capabilities, vocabulary knowledge plays a vital role in their reading comprehension (Foorman et al., 2018; Oslund et al., 2018). Moreover, after students completed the vocabulary modules, their performance on the reading comprehension posttest increased significantly. In other words, students showed higher gains on the posttest, signifying explicit vocabulary instruction's positive impact on reading comprehension.

Context clues

Literacy scholars have found that explicitly providing instruction on context clues can support students when engaging with and comprehending challenging texts (Arnbak & Elbro, 2000; Berningeret al., 2010). This strategy has been established to improve reading comprehension and vocabulary acquisition (Blachowicz & Fisher, 2005; Dowds et al., 2016; Sáenz & Fuchs, 2002). Qualitative findings from this study revealed that students attributed improvements in their reading comprehension to the lessons

about context clues. In the semi-structured interviews, students reported that the ability to make meaning from unfamiliar texts and to analyze new words independently had improved their reading comprehension.

Morphological awareness

Previous research has found that the ability to understand and interact with smaller word parts, such as prefixes and suffixes, positively impact students' reading comprehension (Memiş, 2019; Tong et al., 2011; Wolter & Pike, 2015). However, the qualitative findings of this action research did not demonstrate a clear relationship between morphological awareness and improved reading comprehension. Students perceived the lessons on morphology as too challenging and struggled with understanding root words because many were reading below grade level. The difficulties they experienced may be due to their lack of exposure to Latin and Greek roots. Therefore, they may benefit from more explicit instruction using "strategic tool reasoning" (Conley, 2008, p. 87) as the primary cognitive strategy, ensuring morphological recognition, regardless of their vocabulary knowledge.

Research Question 3: What are Students' Perceptions of the Explicit Vocabulary Instruction in Online Learning Modules?

Even though few studies have been conducted on the topic, Brown and Concannon (2016) found that questions about students' perceptions of their vocabulary knowledge encouraged them to think deeper about what they already knew and would learn. The quantitative findings from the action research survey revealed that most students found online modules helped them acquire new vocabulary knowledge. Many also agreed that the online modules enriched their vocabulary knowledge.

For this reason, one of the themes was how *Students Perceived Vocabulary Modules as Helpful to Their Learning*. Having knowledge of oneself, the task involved, and the available strategies help students increase their expertise in strategy application (Dunlosky & Metcalfe, 2009). For instance, the students' use of and comfort with the digital format of the explicit vocabulary content allowed them to apply the strategies they learned more easily. The use of technology in the classroom is supported by cognitivist who state that using media and visuals helps educators further scaffold students' learning through direct instruction (Dalton & Grisham, 2011). As revealed in the qualitative findings, students perceived picture representation, the organization of the modules, Schoology's features, and the online assessments as effective strategies for understanding new words. For example, the picture representation method provided students with a way to visualize unfamiliar words to figure out their meanings. When pictures are used to create mental images in students' minds, it makes learning memorable and provides students with the schema necessary to construct new meanings (Yilmaz, 2011; Nation, 2006).

Despite the perceived benefits of the modules, students also shared difficulties and recommended areas for improvement. The suggestion of only using short mini-lessons highlights the role short-term memory plays during the learning process and the limited amount of information it can hold (Driscoll, 2005). It is crucial to use research-based word lists when choosing vocabulary for instruction. Biemiller (2009) referenced that students should be familiar with 2,000-3,000 specific root words. In order to develop the cognitive and meta-cognitive skills necessary for understanding unfamiliar words, instruction must be meaningful to students (Carlo et al., 2010).

Limitations

Because this study occurred during the second year of the COVID-19 pandemic, many students were quarantined, and as a result, module work became individually student-paced. Furthermore, since most of the fifth graders were below the average reading level for their grade, they experienced difficulties articulating themselves during the interview process, which resulted in vague or repetitive responses.

Implications for Future Research

In this action research, fifth graders from a Title 1 school entered the study with limited vocabulary (Nelson et al., 2015). Further investigations into fifth-grade vocabulary instruction strategies are needed to provide the scaffolding necessary for student's acquisition of vocabulary knowledge. Additionally, existing research shows students' ethnicities and socio-economic factors affect their vocabulary achievements (NCES, 2012). Although this study did not focus on the impact of these factors, future research could investigate how culturally sensitive approaches shape both the vocabulary knowledge and reading comprehension skills of students in Title 1 schools. Finally, future studies may consider integrating additional assessment methods. In this study, word knowledge was assessed via matching and fill-in-the blank items, but students suggested writing short paragraphs in order to demonstrate comprehension of new vocabulary terms as well.

Conclusion

It has been established that there is a strong correlation between vocabulary knowledge and reading comprehension (Cunnigham & Stanovich, 1997; Senechal, 2006). Even though some students can learn vocabulary incidentally or implicitly through wide reading, most students learn best when given strategies to determine the meanings of new words (Gallagher et al., 2019; Shany & Biemiller, 2010). This action research focused on morphological awareness and context clues as strategies for explicit vocabulary instruction. Morphological awareness allows students to analyze roots such as suffixes, prefixes, and Latin and Greek roots to get a deeper meaning of vocabulary terms, which in turn can improve reading comprehension (Bauman et al., 2007; Graves et al., 2017; Levesque et al., 2017; Manyak et al., 2018). Context clues, on the other hand, further expand students' vocabulary knowledge by providing them with the opportunity to determine the meanings of unfamiliar words.

Although research has been done on explicit vocabulary instruction, many focused on the lower grades. This mixed-method action research provided answers for implementing explicit vocabulary instruction in fifth grade. The quantitative data came from reading comprehension, vocabulary pretests, posttests, and a survey of students' perceptions of the online learning modules. They found that explicit vocabulary instruction positively impacted students' vocabulary knowledge and reading comprehension. Additionally, qualitative data collected from semi-structured texts suggested that reading comprehension improved when context clues and morphological awareness were explicitly taught.

Finally, the data showed that active engagement with word meanings improved reading comprehension (Wright & Cervetti, 2017). Therefore, one can conclude that explicitly teaching strategies for using context clues and analyzing word parts should be the norm for teachers, curriculum specialists, and textbook publishing companies.

Acknowledgments

Withheld for peer review.

Declaration of Interest Statement

There is not any potential conflict of interest in the work.

Data Availability Statement

The datasets generated during and/or analyzed during the current study are not publicly available due to the requirement of Institutional Review Board approval but are available from the corresponding author on reasonable request.

References

Alamri, K., & Rogers, V. (2018). The effectiveness of different explicit vocabulary-teaching strategies on learners' retention of technical and academic words. *The Language Learning Journal, 46*(5), 622-633.

Apel, K., & Thomas-Tate, S. (2009). Morphological awareness skills of fourth grade African American students. *Language, Speech and Hearing Services in School, 40*, 312-324.

Arnbak, E., & Elbro, C. (2000). The effects of morphological awareness training on the reading and spelling skills of young dyslexics. *Scandinavian Journal of Educational Research, 44*(3), 231-251.

Bauman, J. F., Edwards, E. C., Boland, E. M., & Olejnik, S. (2003). Vocabulary tricks: Effects of instruction in morphology and context on fifth-grade students' ability to derive and infer word meanings. *American Educational Research Journal, 40*(2), 447-494.

Bauman, J. F., Ware, D., & Edwards, E. C. (2007). "Bumping into spicy, tasty words that catch your tongue": A formative experiment on vocabulary instruction. *The Reading Teacher, 61*(2), 108-122.

Beck, I. L., McKeown, M. G., & Kucan, L. (2005). *Choosing words to teach. Teaching and learning vocabulary: Bring research to practice.* Mahwah, NJ: Erlbaum.

Berninger, V. W., Abbott, R. D., Nagy, W., & Carlisle, J. (2010). Growth in phonological, orthographic, and morphological awareness in grades 1 to 6. *Journal of Psycholinguistic Research, 39*(2), 141–163.

Biemiller, A. (2009). *Words worth teaching: Closing the vocabulary gap.* Columbus, OH: SRA/McGraw-Hill.

Bjerede, M., & Bondi, T. (2012). *Learning is*

personal: Stories of android tablet use in 5th grade. Retrieved from: https://www.goodreads.com/book/show/21218407-learning-is-personal---stories-of-android-tablet-use-in-the-5th-grade?ac=1&from_search=true

Blachowicz, C. L., Fisher, P. J., & Watts-Taffe, S. (2005). Integrated vocabulary instructions: Meeting the needs of diverse learners in grades K–5. *Learning Point Associates*, 1-37.

Brown, P. L., & Concannon, J. P. (2016). Students' perceptions of vocabulary knowledge and learning in a middle school science classroom. *International Journal of Science Education, 38*(3), 391-408.

Bryant, D. P., Goodwin, M., Bryant, B. R., & Higgins, K. (2003). Vocabulary instruction for students with disabilities: A review of research. *Learning Disability Quarterly, 26*, 117–128.

Burns, A., & Richards, J. C. (2009). *The Cambridge guide to second language teacher education.* Cambridge University Press.

Carlo, M., August, D., & Snow, M. (2010). Sustained vocabulary-learning strategy instruction for English-language learners. In E. H. Hiebert & M. L. Kamil (Eds.), *Teaching and learning vocabulary: Bringing research to practice* (pp. 137–153). Routledge.

Conley, M. W. (2008). Cognitive strategy instruction for adolescents: What we know about the promise, what we don't know about the potential. *Harvard Educational Review, 78*(1), 84-106.

Creswell, J. W. (2018). *Research designs: Qualitative, quantitative and mixed methods approach* (5th ed.). SAGE.

Creswell, J . and Plano Clark, V. (2007): *Designing and conducting mixed methods research.* Thousand Oaks, CA: Sage.

Cunningham, J. W., & Reutzel, D. R. (2019). *Curriculum associates.* Retrieved from https://www.curriculumassociates.com/-/media/mainsite/files/i-ready/research-overview-proven-to-work-brochure-2019.pdf

Curriculum Associates: i-Ready. (2022). Retrieved on June 22, 2022, from https://www.curriculumassociates.com/

Dalton, B., & Grisham, D. L. (2011). eVoc strategies: 10 ways to use technology to build vocabulary. *The Reading Teacher, 64*(5), 306–317.

Dole, J. A., Sloan, C., & Trathen, W. (1995). Teaching vocabulary within the context of literature. *Journal of Reading, 38*(6), 452–460.

Dowds, S. P., Haversack, H. R., & Parkinson, M. M. (2016). Classifying the context clues in children's literature. *The Journal of Experimental Education, 84*(1), 1-22.

Driscoll, M. P. (2005). Psychology of learning for instruction. Boston: Allyn and Bacon *Education Tech Research Dev, 65*, 1153–1174.

Dunlosky, J., & Metcalfe, J. (2009). *Metacognition.* Sage Publications.

Ender, A. (2016). Implicit and explicit cognitive processes in incidental vocabulary acquisition. *Applied Linguistics, 37*(4), 536-560.

Foorman, B. R., Petcher, Y., & Herrera, S. (2018). Unique and common effects of decoding and language factors in predicting reading comprehension in grades 1–10. *Learning and Individual Differences, 63*, 12-23.

Forbes, F. J., & Buchanan, E. (2018). Getting "clued" in: The usage and significance of context clues. *A Journal of Undergraduate Research, 11,* 114-128.

Gallagher, M. A., Barber, A. T., Beck, J. S., & Buehl, M. M. (2019). Academic vocabulary: Explicit and incidental instruction for students of diverse language backgrounds. *Reading & Writing*

Quarterly, 35(2), 84-102.

Galvan, J. L., & Galvan, M. C. (2017). *Writing literature reviews: A guide for students of the social and behavioral sciences.* Taylor & Francis.

Goodwin, P. A., & Cho S. (2016). Unraveling vocabulary learning: Reader and item-level predictors of vocabulary learning within comprehension instruction for fifth and sixth graders. *Scientific Studies of Reading, 20*(6), 490-514.

Graves, M. F. (2006). *The vocabulary book: learning and instruction* (2nd ed.). Teachers College Press.

Graves, M. F., Schneider, S., & Ringstaff, C. (2017). Empowering students with word-learning strategies: Teach a child to fish. *The Reading Teacher, 71*(5), 533-543.

Harmon, J., & Wood, K. (2018). The vocabulary-comprehension relationship across the disciplines: Implications for instruction. *Education Sciences, 101*(8), 1-9.

Houghton Mifflin Harcourt (2020). Journeys. Retrieved January 2020 from https://www.hmhco.com/

Hwang, G. J., Hung, C. M., & Chen, N. S. (2014). Improving learning achievements, motivations and problem-solving skills through a peer assessment-based game development approach. *Educational Technology Research and Development, 62*(2), 129–145.

İlter İ. (2019). The efficacy of context clue strategy instruction on middle grades students' vocabulary development. *Research in Middle Level Education, 42*(1), 1-15.

Innaci, D. L., & Sam, D.P. (2017). Using context clues as a vocabulary learning strategy: An experimental study. *Journal of English Language and Literature, 4*(3), 39-43.

Jitendra, A., Edwards, L., Sacks, G., & Jacobson, L. (2004). What research says about vocabulary instruction for students with learning disabilities. *Exceptional Children, 70*, 299–322.

Johnson, G., Gersten, R., & Carnine, D. (1987). Effects of instructional design variables on vocabulary acquisition of LD students: A study of computer-assisted instruction. *Journal of Learning Disabilities, 20*(4), 206-213.

Kendeou, P., Muis, K.R., & Fulton, S. (2011). Reader and text factors in reading comprehension processes. *Journal of Research in Reading, 34*(4), 365-383.

Kuder, S. J. (2017). Vocabulary instruction for secondary students with reading disabilities: An updated research review. *Learning Disability Quarterly, 40*, 155–164.

Kusumawati, E., & Widiati, U. (2017). The effects of vocabulary instructions on students' reading comprehension across cognitive styles in ESP. *Journal of Education and Practice, 8*(2), 175-184.

Lawrence, F. J., Hagen, M. A., Hwang, K. J., Lin, G., & Lerva, A. (2018). Academic vocabulary and reading comprehension: exploring the relationships across measures of vocabulary knowledge. *Read Writ, 32*, 285-306.

Leider, M. C., Proctor, P., Silverman, D. R., & Harring, J. R. (2013). Examining the role of vocabulary depth, cross-linguistic transfer, and types of reading measures on the reading comprehension of Latino bilinguals in elementary school. *Read Writ, 26*, 1459-1485.

Levesque, K., Kieffer, M.J., & Deacon, S. H. (2017). Morphological awareness and reading comprehension: Examining mediating factors. *Journal of Experimental Child Psychology, 160*, 1-20.

Lubliner, S., & Smetana, L. (2005). The effects of comprehensive vocabulary instruction on Title I students' metacognitive word-learning skills and comprehension.

Journal of Literacy Research, 37(2), 163–200.

Manyak, P. C., Bauman, J. F., & Manyak, A. (2018). Morphological analysis instruction in elementary grades: Which morphemes to teach and how to teach them. *The Reading Teacher, 72*(3), 289-300.

Martin-Sanchez, C. (2019). *An investigation of the effects of implicit vs. explicit vocabulary instruction on the word knowledge of first grade students in an urban elementary school.* University of West Georgia.

Maynard, K. L., Pullen, P. C., & Coyne, M. (2010). Teaching vocabulary to first grade students through repeated shared storybook reading: A comparison of rich and basic instruction to incidental exposure. *Literacy Research and Instruction, 49,* 209–242.

McKeown, M. G., & Beck, I. L. (2004). Direct and rich vocabulary instruction. In J. Baumann (Ed.), *Vocabulary instruction: Research to practice,* 13–27. New York, NY: Guilford.

Memiş, M. R. (2019). A research on reading comprehension and morphological awareness levels of middle school students and the relationship between these concepts. *Journal of Language and Linguistic Studies, 15*(2), 649-677.

Mokhtari, K., & Nieuderhauser, D. S. (2013). Vocabulary and syntactic knowledge factors in 5th grade students' reading comprehension. International Electronic *Journal of Elementary Education, 5*(2), 157-170.

Moody, S., Hu, X., Kuo, L., Jouhar, M., Xu, Z., & Lee, S. (2018). Vocabulary instruction: A critical analysis of theories, research and practice. *Education Sciences, 180*(8), 1-22.

Muhid, A., Chalim, A., Hilaliyah, H., Budiana, N., & Wajdi, M. B. (2020). The Effect of metacognitive strategies implementation on students' reading comprehension achievement. *International Journal of Instruction, 13*(2), 1308-1470.

Nation, I. S. (2006). How large a vocabulary is needed for reading and listening? *Canadian Modern Language Review, 63*(1), 59-82.

National Center for Education Statistics. (2012). *The nation's report card: Vocabulary results from the 2009 and 2011 NAEP reading assessments* (Report No. 452). Institute of Education Sciences, U.S. Department of Education.

National Reading Panel (U.S.) & National Institute of Child Health and Human Development (U.S.). (2000). *Report of the National Reading Panel: Teaching children to read: an evidence-based assessment of the scientific research literature on reading and its implications for reading instruction.* U.S. Dept. of Health and Human Services, Public Health Service, National Institutes of Health, National Institute of Child Health and Human Development

Nelson, K. L., Dole, J. A., Hosp, J. L., & Hosp, M. K. (2015). Vocabulary instruction in K-3 low-income classrooms during a reading reform project. *Reading Psychology, 36,* 145–172.

Ogilvie, E., & McCrudden, M. T. (2017). Evaluating the social validity of the early start Denver model: A convergent mixed methods study. *Journal of Autism and Developmental Disorders, 47*, 2899-2910.

Oslund, E.L., Clemens, N.H., Simmons, D. C., & Simmons, L. E. (2018). Direct and indirect effects of word reading and vocabulary on adolescents' reading comprehension: Comparing struggling and adequate comprehenders. *Read Writ, 31,* 355–379.

Reutzel, D. R., & Cooter, R. B. (2013). *The essentials of teaching children to read* (3rd ed.). Pearson.

Roskos, K.A., Zulolo, N., & Primm, A. (2017). A small-scale, feasibility study of academic language time in primary grade language arts. *Early Child Development and Care, 187*(3),615-629.

Sáenz, L. M., & Fuchs L. S. (2002). Examining the reading difficulty of secondary students with learning disabilities: Expository versus narrative text. *Remedial and Special Education, 3*(1), 31-41.

Shany, M., & Biemiller, A. (2010). Individual differences in reading comprehension gains from assisted reading practice: Pre-existing conditions, vocabulary acquisition, and amounts of practice. *Read Writ,* 23, 1071-1083.

Senechal, M. (2006). Testing the home literacy model: Parent involvement in kindergarten is differentially related to grade 4 reading comprehension, fluency, spelling, and reading for pleasure. *Scientific Studies of Reading, 10*(1), 59-87.

Sousa, D. A. (2001). *How the brain learns* (2nd ed.). Thousand Oaks, CA: Corwin.

Spencer, M., Wagner, R. K., & Petscher, Y. (2018). The reading comprehension and vocabulary knowledge of children with poor reading comprehension despite adequate decoding: Evidence from a regression-based matching approach. *Journal of Educational Psychology, 1,* 1-14.

Tomesen, M., & Aarnoutse, C. (1998). Effects of an instructional programme for deriving word meanings. *Educational Studies, 24,* 107–128.

Tong, X., Deacon, S. H., Kirby, J.R., Cain, K., & Parrila, R. (2011). Morphological awareness: A key to understanding poor reading comprehension in English. *Journal of Educational Psychology, 103*(3), 523-534.

Trundell, D., Le Scouiller, S. , Le Goff, L., Gorni, K., & Vuillerot, C. (2020) Assessment of the validity and reliability of the 32-item motor function measure in individuals with type 2 or non-ambulant Type 3 spinal muscular atrophy. *Neurology and Therapy, 9*, 575-584.

Watts-Taffe, S., Gwinn, C. B., Johnson, J. R., & Horn, M. L. (2003). Preparing preservice teachers to integrate technology. *The Reading Teacher, 57*(2), 130–138.

Wolter, J. A., & Pike, K. (2015). Dynamic assessment of morphological awareness and third-grade literacy success. *Language, Speech and Hearing Services in Schools, 46*, 112-126.

Wright, T. S., & Cervetti, G. N. (2017). A systematic review of the research on vocabulary instruction that impacts text comprehension. *Reading Research Quarterly, 52*(2), 203-226.

Yilmaz, K. (2011). The cognitive perspective on learning: Its theoretical underpinnings and implications for classroom practices. *The Clearing House, 84,* 204-212.

Zhao, Q., & Li, H. (2018). Application of new media technology in college English *Vocabulary Teaching. Educational Sciences: Theory & Practice, 18*(6), 3591-3598.