"Are We Excavating Today?" A Portrait of Vocabulary-Enhanced Intervention Practices

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This case study focused on the design and implementation of a third-grade vocabulary-enhanced reading intervention for below grade-level readers. The activities aimed to simultaneously engage students in tending to phonological, orthographic, syntactical, and semantic elements of new vocabulary words while also taking into account the vital role that collaboration and social interaction play in student learning. Descriptive statistics were integrated with qualitative methods focusing on language use in order to paint a complete portrait of students’ and teachers’ experiences with revised instructional practices. Findings suggest vocabulary instruction in an intervention setting can encourage student collaboration and social interaction while providing opportunities for students to tend to multiple aspects of new vocabulary words.

Keywords: vocabulary instruction, literacy intervention, academic language use, elementary curriculum, practitioner-based research

Figure 1. Students dig for artifacts as part of a hands-on excavation experience.
This activity is serving as an initiating event to scaffold the vocabulary in a challenging text these third-grade children will soon be reading. Teachers are poised to intentionally use target vocabulary words throughout the activity, giving students direct experience with the new words they will encounter when they read. Multisyllabic, thematically related words like *discover* and *excavate* are used in as many morphological forms as possible (*discovered, excavation*) to give students exposure to families of words in an authentic context.

Instead of occurring during “social studies” in their classroom, this event is happening in students’ pull-out intervention setting, where traditional reading activities usually occur (e.g., flashcards, phonics games, timed passage reading). The teachers are reimagining how they approach reading intervention, specifically involving vocabulary instruction. Activities have been designed to provide students with opportunities to acquire shared background knowledge as an anchor for the new words and text they will be expected to read. In addition, follow-up activities aim to maximize opportunities for students to use the words through socially engaging, problem-solving activities. Teachers meet on a weekly basis to continually reflect on their practice and improve the instructional design.

These teachers are my colleagues, and I was fortunate to work with them to develop vocabulary instructional practices that would “stick” beyond the moment our students decoded the words on the page. This article provides an illustration of some of the activities that we developed as well as the way language was used through the implementation of these activities.

**Background**

Differences between a student’s home language experiences and those valued in school can present unique challenges in learning to read. School-based texts are written in an academic register where vocabulary words and language form can be quite different from language forms students use at home, making them more difficult for some children to read and understand (Schleppegrell, 2004). Related differences in reading abilities become labeled as “gaps,” specifically around students’ knowledge of academic word meanings (e.g., Dudley-Marling, 2007; Fernald et al., 2013; Hart & Risley, 1995; Schleppegrell, 2012). Current trends in schooling aimed at closing such reading gaps have led schools to implement frameworks, known as Response to Intervention (RTI) models (Fletcher & Vaughn, 2009; Torgesen, 2004). In these models, general classroom instruction is referred to as Tier 1, and students who perform below their grade-level peers in specific subject areas participate in supplemental, small-group instruction, or Tier 2 intervention (Ritchey et al., 2012). These students receive supplemental pull-out instruction that tends to focus on foundational, print-related skills such as phonological awareness, phonics, or word recognition (Torgesen, 2004; Wanzek et al., 2016), sometimes overlooking the important role student language use and background knowledge play in reading and understanding academic texts. This limitation of content to discreet skill development reinforces the “pedagogical divide” (Cummins, 2007, p. 564) where students who find academic texts difficult participate in activities that focus heavily on skill development while their peers participate in content-based activities. Although some skill-based work is certainly important, missing from this model are intervention practices that encourage socially situated language practices within student-driven methods. Thus, our goal in this study was to design intervention practices that would expand on skill development to include content and socially oriented activities within a vocabulary instructional design.
As a third-grade teacher in an elementary school that serves an economically diverse population of students, I have been eager to identify instructional methods that support all students’ acquisition of reading skills. Based on over 15 years of experience teaching younger students (preschool, kindergarten, and first grade), it was clear to me when I began teaching third grade that unique demands are placed on readers during this year of their schooling. Texts become more complex, including more multisyllabic words and longer sentences (Kearns, 2015). Students are expected to read and understand these texts, applying the skills they learned in the younger years, yet some students’ decoding skills are still developing. As they work to make meaning from more complex text, students’ knowledge of word meanings impacts their reading ability, perhaps even more heavily than in earlier years (Suggate, 2010). Claims related to vocabulary instruction for younger elementary students are often generalized to include third-grade readers, even though studies may not include them. For instance, in an Educator Practice Guide completed in 2016 by What Works Clearinghouse (Foorman et al., 2016), only six out of 56 studies actually included third-grade students, and studies reviewed for the recommendation relating specifically to language were based solely on students in kindergarten through second grade, likely related to a lack of available studies focusing specifically on third-grade students. Thus, there remains a need for further exploration of vocabulary-oriented reading intervention practices aimed at middle elementary students whose decoding skills are still developing.

At the time of this study, I was on sabbatical from my third-grade teaching duties, pursuing my doctoral degree in curriculum and instruction. Thus, I was fortunate to have the time and space to act as participant observer (Atkinson & Hammersley, 1998), or both a researcher and a participant, in this study. This ethnographically oriented stance enabled me to actively work with teachers (participant) as an “insider” while also working for teachers (observer) as an “outsider” (Atkinson & Hammersley, 1998). Working with a team of my own colleagues to develop language-rich intervention activities in this real-life context, we focused specifically on integrating collaborative, student-driven learning opportunities in an intervention setting, seeking to answer the following research questions:

1. How do social interactions support student learning of new words?
2. How do teachers facilitate students’ use of new words?

Theoretical Framework

Our intervention activities aimed to encourage socially oriented use of language while also providing opportunities for students to develop fluent access to the meaning of words they were reading. We drew on two theoretical constructs in the design and analysis of these activities: one related to students’ social use of language (Mercer & Littleton, 2007) and one related to developing knowledge of new words (Perfetti, 2007).

Teacher Role and Student Talk

Because social interaction plays a vital role in learning (Vygotsky, 1986), it is important to consider ways that vocabulary instruction may encourage students to interact around the words they are learning. According to Mercer and Littleton (2007), a relationship exists between teachers taking a facilitator role and increased student language use. In addition, they claim that student dialogue plays a vital role in learning, where collaborative inquiry and problem solving become opportunities for students to “inter-think” (p. 4), or develop shared understandings of new concepts through social interaction.
Collaboration is further optimized when “learners need to work together” on “open ended, challenging tasks” (p. 31). In these instances, “exploratory talk” emerges, where students share knowledge and challenge each other’s ideas in order to reach “rational consensus through conversation” (p. 62). Using Mercer and Littleton’s frame for encouraging student language use and social interaction in this study, we sought to design activities that included a hands-on collaborative element, in which students would be asked to work together, using language to solve a problem or complete a specific task while teachers facilitated students’ conversations.

**Vocabulary Learning in the Context of School**

Knowledge of word meanings and familiarity with school-based language impacts students’ ability to read new words in the context of academic texts (Perfetti, 2007; Schleppegrell, 2004). According to Schleppegrell (2004), the specific ways language is used in school varies between academic and conversational registers. So in order to build familiarity with academic language, “all children need opportunities to develop awareness about academic language and to practice engaging in activities in which academic language is used” (Schleppegrell, 2012). Embedded within this academic language form are vocabulary words that are also unfamiliar to students. In his lexical quality hypothesis, Perfetti (2007) suggests that the strength of a new word’s representation or identity within our lexicon relates to knowledge of how a word sounds (phonology), looks (orthography), and is used in language (grammar and meaning). These components support efficient reading; as Perfetti describes, “the rapid, low-resource retrieval of a word identity” enables a student to read a word easily (p. 359). Thus, in order to learn to read and make meaning of new words, students should have opportunities to hear them, see them, and use them in an academic context.

Utilizing these two theories (Mercer & Littleton, 2007; Perfetti, 2007), we designed elements of our intervention that included opportunities for students to collaboratively solve problems (Mercer & Littleton, 2007) while also seeing, hearing, and using target vocabulary words (Perfetti, 2007). Each week’s intervention activities included multiple exposures to vocabulary words in both written and oral form while also requiring students to use the words in context to successfully complete the task at hand.

**Review of Literature on Vocabulary Learning and Instruction**

**Incidental Word Learning and Making Connections**

Research has emphasized the value of providing opportunities for students to learn words incidentally through interaction with both students and teachers in authentic contexts (Blachowicz et al., 2013; Carlisle et al., 2013; Sedita, 2005). Graves (2016) has described immersing students in “real communicative situations” (p. 7), where they are exposed to “a rich array of language experiences so that they learn words through listening, speaking, reading and writing” (p. 6). Relatedly, when teaching new vocabulary, it is recommended that teachers set a goal of 20 repetitions of a new word across varying contexts after students’ initial encounter (Graves, 2016). Thus, by integrating speaking, reading, and writing through communicative situations, vocabulary instruction can be designed to incorporate the phonological (sound), orthographic (print), and meaning elements through communicative situations as described in Perfetti’s (2007) lexical quality hypothesis.

In addition, when new vocabulary words are learned, they are clustered together by meaning in a speaker’s lexicon, aiding in word recognition and recall of meaning
Early educational research related to young children’s vocabulary learning has reported that students who were taught words in conceptual clusters or semantically related groups demonstrated a deeper understanding of those words (Neuman & Dwyer, 2011; Parsons & Bryant, 2016). Therefore, vocabulary instruction should be designed around semantically related banks of words, enabling students to establish strong semantic connections across words and strengthening their overall lexical quality.

**Building Morphological Awareness**

An association has been established between reading and the development of morphological awareness of both spoken and written language (Carlisle, 2010; Bowers et al., 2010; Reichle & Perfetti, 2003). Morphological awareness, or the awareness of meaningful chunks in words, can be developed through listening and speaking (Carlisle et al., 2013). Graves (2016) has supported this notion, positing that students engage in “morphological generalization” (p. 28), whereby they make meaningful connections across morphologically similar words. For example, when a student recognizes that the prefix re- in recreate means to create again, then they may also understand the role of re- in reconstruct and rediscover by generalizing through hearing and using these words. Morphonically complex words (e.g., de-con-struct-ion) have been found to constitute 60%–80% of all new words that school-age children encounter in texts (Nagy & Anderson, 1984), and it has been shown that words occurring in third- and fourth-grade texts become increasingly morphologically complex (Kearns, 2015). Thus an instructional focus for this age group should be on expanding students’ strategies for using word parts (prefixes, suffixes, and roots) to read longer words, building their morphological awareness.

**Current Study**

The focus of this case study (Creswell, 2007) was to explore how designed activities encouraged students to use new vocabulary words in a social setting and how teachers interacted with students to support this use. Activities were designed to create experiences for students that would put them in the driver’s seat, by incorporating a problem-solving element into each task (Mercer & Littleton, 2007). Teachers focused on staying active as facilitators within students’ learning process, attempting to guide students toward answering their own questions, rather than providing answers. Activities also aimed to maximize opportunities for social interaction, positioning students as problem solvers within the confines of an intervention setting. In addition, intervention practices were designed to encourage students to simultaneously access multiple aspects of each new word (print, sound, and meaning) as they completed each task (Perfetti, 2007).

**Description of Intervention Activities**

Each week’s activities centered around a theme chosen to specifically relate to classroom content (see Table 1). Target base words were selected from Wilson controlled-text passages (Wilson, 1996; used with permission) that related to the classroom content. These short passages are usually used in an intervention setting to provide opportunities for students to practice connected text reading in the Wilson Reading System’s intensive intervention (Wilson, 2004). We began each week with an initial activity aiming to mirror the content of the focal text. The first 2 weeks’ activities were designed to support the social studies theme in the classroom, which was Ancient Egypt. During the second 2 weeks, we
delved into science, focusing on the body.

Table 1

<table>
<thead>
<tr>
<th>Week</th>
<th>Theme</th>
<th>Initial activity description</th>
<th>Target base words</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Egyptian pyramids</td>
<td>Small ceramic bricks were buried in pans of soil, replicating remnants of a structure buried over time. Students acted as archeologists, working together to discover the hidden objects.</td>
<td>detect, discover, expect, expert, expose, excavate, investigate, object, observe, relic, research, reveal</td>
</tr>
<tr>
<td>2</td>
<td>Egyptian history</td>
<td>Students reenacted Cleopatra’s castle becoming immersed in water during an earthquake by pouring water over a castle they had worked together to build. After the flood, they then worked to rebuild the structure under the water for a future museum exhibit.</td>
<td>appear, artifact, astonish, construct, create, examine, exhibit, explore, extend, invade, vanish</td>
</tr>
<tr>
<td>3</td>
<td>The circulatory system</td>
<td>In pairs, students worked together to create a model of the heart using straws and balloons to mimic the pumping of blood. When they were finished, they tested it with liquid.</td>
<td>balance, circulate, compress, condense, contract, distribute, enlarge, expand, import, export, fluid, transport</td>
</tr>
<tr>
<td>4</td>
<td>The respiratory system</td>
<td>Using a balloon to represent a lung, students first drew bronchioles and small sacs and then attached yarn to represent nets of capillaries. They then let air out of the balloon and blew it back up to mimic inhaling and exhaling.</td>
<td>elastic, eliminate, exhale, inhale, expel, exchange, infect, pollute, separate, stretch, transfer, divide</td>
</tr>
</tbody>
</table>

*Description of Weekly Activities and Related Vocabulary Words*

Each week’s core list of target base words were drawn from the focal text and then expanded to include a larger bank of semantically related words (excavate → reveal, expose, uncover). A list of the target words was provided to teachers, and they were encouraged to use them in context as much as possible. After a cursory review of third-grade classroom texts, we had discovered that most of the morphologically complex words students would be expected to read contained fairly common suffixes (-ed, -s, and -ing). Thus, in order to provide frequent exposures to word parts, morphologically related words (e.g., excavated, excavating, excavation, revealed, revealing) were created using the suffixes that we had found to be most common in the text students would read (see
Figure 2). Example of a semantically, morphologically related bank of words.

These were largely inflectional suffixes (endings that do not change the grammatical form of the word, e.g., -s, -ing, -ed), although some derivational suffixes (endings that do change the form of the word, e.g., -er, -ion, -ly) were included as well. Word cards containing all forms of each base word were created for use across the activities. Although the intervention activities included phonological awareness activities, word-building games, and repeated readings, only the three word-building activities are described in depth here. These tasks were ones that best represented our goals for the activities: to engage students in socially oriented problem-solving tasks that encouraged them to use the words while attending to their meaning and printed form. These activities—kick-off event, pix match/retell, and word sort—are described below.

**Kick-off event.** The initial exposure to the set of base words occurred in the first session of the week during a hands-on activity that directly mirrored the event students would read about in the focal text (see Table 1). As students engaged in this activity, teachers narrated the event using as many of the target base words as possible. This narration sought to maximize students’ phonological exposure (listening) to words while being immersed in a meaning-making experience. This activity would also build shared background knowledge from which students could draw when engaging in the subsequent intervention activities.

**Pix match/retell.** Beginning on day two and continuing through day four, students sequenced pictures and retold the sequence of activities from the kick-off event. After working in pairs to sequence their pictures, students collaboratively
matched cards containing semantically related base words to the pictures while planning how they would tell their story to their peers. This activity ended with an informal presentation of their story to the rest of the group. Building on connections from their experience the day before, students had the chance to hear the vocabulary words, read them, and collaboratively determine their meaning as they used them in a broader social context. This activity also provided an opportunity to apply morphological knowledge as the verb forms changed each day depending on how they would retell the story. For instance, on day two, the words were in the past tense and contained the suffix -ed, requiring the story to be told in the past tense, whereas day three may have included words with the -ing suffix, requiring students to use a progressive form. We hoped this activity would provide collaborative opportunities for students to connect new vocabulary words with previous concrete experiences as they worked to determine meanings while using a variety of morphological forms. For analysis, this activity was broken down into two parts: pix match, which involved sequencing pictures and matching vocabulary cards to the pictures, and retell, which included just the students’ informal presentation.

**Word sort.** Each day, directly following the activity or retell, students would be asked to sort the printed versions of these words into various categories. On day one, these categories were based on pictures from the text that mirrored the kick-off event, day two might involve a sort based on a morphological feature like base words or suffixes, and day three might involve yet another morphological or semantic aspect. If we were unsure of students’ knowledge of the words, we also incorporated a sort into two groups: know and don’t know. Our intent in the design of this activity was to incorporate print and meaning aspects of word learning within a task that required students to collaboratively attend to word parts and meaning. Unfortunately, due to time constraints in our data collection process, only base word, semantic, and know/don’t know sorts were recorded, thus we were not able to include sorts involving suffixes in the analysis of this activity.

**Methods**

**Setting and Participants**

**The school.** This study occurred in a public, suburban elementary school (N = 376) in southern New England where class sizes ranged from 15 to 20 students and there were three classes of students at each grade level. Approximately 80% of students were eligible to receive free or reduced-price lunch (Vermont Agency of Education, Annual Statistical Report, 2017) Each grade-level team included an academic specialist who provided extra support to small groups of students in math and literacy. The school relied solely on Aimsweb R-CBM fluency measures (Shinn & Shinn, 2002), a screening tool that asks students to read a one-minute passage aloud in order to identify students who may be at risk for reading difficulties. Students who scored below the 38th percentile when compared to national norms (Hasbrouck & Tindal, 2006) were identified as “at-risk” and were eligible to participate in small-group, pull-out intervention (Tier 2) focusing on specific skill areas. Assessments used at this time related solely to oral reading fluency for screening and phonics-based diagnostic tools for instructional planning. No comprehension tools were used by the school.

**The students and teachers.** Using purposive sampling (Devers & Frankel, 2000), a small group of five English-speaking third-grade students (three girls and two boys) were chosen to participate in the study. Following the schoolwide model for intervention,
these students were chosen based on challenges in reading fluency (indicated by Aimsweb R-CBM scores). Mirroring a usual intervention group scenario, we focused on one small group of participants, enabling us to reflect deeply on their experiences and language use within the designed practices throughout the study.

School-based adult participants included the district literacy coach, a third grade classroom teacher, a grade-level interventionist, and me. The interventionist delivered most of the instruction, I taught one session per week, and we co-taught one session per week together. At the time of this study (spring 2017), the two teachers and I had worked as a team for 3 years; we developed lessons aimed at enabling students to comprehend specific texts in both whole-class and intervention settings. Students participated in a total of 20 sessions that lasted 45–60 minutes each and occurred in a small, pull-out setting. Eight of the sessions (two per week) were audio recorded for later transcription and analysis. These intervention sessions were intentionally selected to provide examples of the three focus activities each week as well as a sampling of teaching configurations (the interventionist, me, or both of us).

Data Sources

Data collection occurred from March to June 2017 and included field notes, transcripts of intervention sessions, and teacher focus group meetings. As a participant observer (Atkinson & Hammersley, 1998), I met with teachers eight times for approximately one hour each and attended and co-taught intervention sessions twice per week, for a total of eight complete sessions in four instructional weeks. Detailed field notes were taken mostly by me throughout the study. Jottings were taken during classroom observations, and I wrote detailed notes after each classroom observation and focus meeting. When I co-taught, I jotted notes after the session based on reflection and discussion with the other teacher, who also shared notes pertaining to her solo lessons on a weekly basis via email. Teacher focus group meetings were audio recorded and used as a reference for instructional revisions. Intervention sessions were audio recorded and reviewed initially within 48 hours, when I took notes to inform our immediate instructional revisions and marked areas for later transcription. A second review of intervention recordings was used to label and roughly transcribe individual activities, and a third, closer review provided an opportunity to edit the transcription for accuracy. Due to the overlapping dialogue among students during the activities, it was not always possible to determine which student was speaking, thus comparison of dialogue between specific students was not possible.

Data Analysis and Findings

In the following sections, I first report analysis methods and findings related to overall student and teacher vocabulary and language use across activities. Next, examples of student dialogue illustrate ways that student interaction led to vocabulary use as well as how teachers positioned themselves as fellow learners or facilitators to encourage students to explore new word meanings through exploratory talk.

Student and Teacher Target Vocabulary Use

To examine how students’ social interactions supported their learning of new words, I applied top-down and multiple rounds of axial coding (Creswell, 2007). All instances of target vocabulary use were first identified using the text search tool in QSR International’s NVivo software (to compare student and teacher vocabulary use across activities, see Figure 3).
In this initial round of coding, the use of multiple vocabulary words by one participant was coded as one reference, and multiple uses of the same word by several participants were also coded as one reference. Interactions in which teachers and students both used the same words were coded as both teacher and student use. Findings indicate that, as we had hoped, teachers were responsible for most of the vocabulary use in the kick-off activity, whereas students used vocabulary more often in the subsequent activities.

**Vocabulary Use in Context**

The context surrounding each instance was coded again to identify episodes of interaction between teachers and students (teacher-student) as well as between students (student-student). These episodes were limited to ones that involved at least three responses, aiming to illuminate occasions where threads of ideas were carried among multiple participants while eliminating single acts of question and response. Next, the teacher-student category was coded for “extended interactions,” looking specifically at turn taking within each reference. In order to identify instances where students engaged socially with each other, references were coded to two categories (teacher-facilitated and teacher-directed). Interactions within the teacher-facilitated category were determined by a pattern of turn taking that occurred between students (T-S-S-S-T), whereas the teacher-directed category contained only back-and-forth interactions between teacher and student (T-S-T-S-T-S).

To further explore the quality of interactions in relation to Perfetti’s (2007) lexical quality hypothesis, a subsequent query was used to compare instances of student vocabulary use within general interactions with those that occurred during extended, teacher-facilitated interactions (n = 71) and a much lower number of these instances within extended, teacher-facilitated interactions (n = 8). In addition, more of these instances occurred during the first 2 weeks of activities (M = 9, SD = 3.7) than the second 2 weeks (M = 6, SD = 1.4), thus the examples

**Figure 3.** Average instances of student and teacher vocabulary use in context

![Vocabulary Use Across Activities](image)
described in detail were chosen from the first 2 weeks of instruction.

Table 2  
Comparison of General Interactions with Extended, Teacher-directed and Teacher-facilitated Interactions

A final round of coding involved closely reviewing each of the extended, teacher-facilitated and teacher-directed interactions. The interactions were divided into two categories: total interactions and extended, teacher-directed interactions. The total interactions were 153, while the extended, teacher-directed interactions were 87. The extended, teacher-facilitated interactions were 29.

<table>
<thead>
<tr>
<th>Total # of references</th>
<th>Extended, teacher-directed interactions (T-S-T-S)</th>
<th>Extended, teacher-facilitated interactions (T-S-S-S-T)</th>
</tr>
</thead>
<tbody>
<tr>
<td>153</td>
<td>87</td>
<td>29</td>
</tr>
</tbody>
</table>

# of references that focus on multiple features of words

<table>
<thead>
<tr>
<th>Example of interactions focusing on multiple features of words</th>
<th>Week 3, Day 2: Pix Match</th>
<th>Week 3, Day 2: Students read the word circulating: S1: Like circulation. T: Yes, exactly. S1: Like when you cut circulation off your fingers when you put a rubber band on it. T: Yes, that’s when your blood isn’t circulating; you cut off your circulation. Week 3, Day 2: T: You’re looking for transporting? S1: I have transporting. S2: Do you know what transporting means? S3: Transporting? It means like you port it, you like carry it or it’s something like that something along those lines. T: Transporting means you carry it somewhere, good.</th>
</tr>
</thead>
<tbody>
<tr>
<td>S1: I just want to say we are expanding the design, and we are creating and expanding. S2: We are having trouble with our balloons because our balloons weren’t expanding because there was holes; the air was not trapped.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
teacher-facilitated interactions to categorize episodes into Mercer’s (2000) three types of talk: disputational, where they disagreed without resolution; cumulative, where they constructed knowledge through accumulation of partial responses; and exploratory, where they challenged each other’s ideas and came to new understandings collaboratively.

### Exploratory Talk Within Student Interactions

In order to analyze types of talk within each event, a coding query in NVivo was used to view references across Mercer’s (2000) types of talk sorted by the type of intervention activity in which they occurred (see Figure 4). This query revealed that each designed intervention activity elicited different quantities of student talk types.

**Figure 4.** Types of talk references within each designed intervention activity (teacher-facilitated, extended interactions)

In the following sections, examples of exploratory talk episodes within each activity are discussed, considering students’ vocabulary use as well as the teacher’s role within each interaction.

**Kick-off event.** On average, the kick-off event elicited all three types of talk somewhat equally across student interactions, with disputational talk occurring most frequently. This is likely due to the logistics involved with the activity itself, such as sharing materials and deciding how to approach the challenge or problem. The kick-off event also contained fewer instances of exploratory talk. This is likely related to the design of the activity, with teachers acting as narrators, providing exposure to new words as they related to students’ actions in the moment.
Figure 5. Students reconstruct Cleopatra’s palace underwater as part of the kick-off event.

*Example 1: Kick-off event.* The following example illustrates students’ expansion on their own and each other’s thinking, an important element of exploratory talk. This episode, taught by the grade-level interventionist, occurred during week two, as students worked to recreate Cleopatra’s palace underwater (see Figure 5) and one group was having difficulty finding pieces in the water. The discussion turned to how this might have happened in real life, when artifacts become buried over time. It’s worth noting that the word *excavate* was a target word from the previous week’s list, had been unfamiliar to most students, and had now become easily used within the discussion.

Transcript: Week 2, Day 1

4. T: Yeah, like sometimes things get buried and we have to go down and excavate them.
5. S1: Wait, but it wouldn’t excavate.
6. S2: You can’t really take an excavator into the water.
7. T: Yeah, so I wonder how…
8. S1: Yeah, you can.
9. T: How would they excavate under the water? There must be a way…
10. S1: I know a way,
11. S3: Submarines
12. S2: Submarines!
13. T: Submarine excavators? It’s a thing?
14. S2: You can put an excavating scoop on a submarine.
15. T: That would make sense.
The teacher in this example first elaborates in line 4 on a student’s idea that relics became buried over time, using the vocabulary word *excavate*. Student 1 challenges her idea and student 2 elaborates on student 1’s challenge. In line 7, the teacher first acknowledges the challenge and then uses the words “I wonder” to elaborate on student 2’s claim, acting as a participant and opening the door for the students to wonder with her. In line 9 she continues her elaboration, encouraging students to participate in social dialogue rather than individually directing their responses back to her. In line 13, when she asks, “Submarine excavators? It’s a thing?” she takes on the role of a learner, empowering student 2 to become the holder of knowledge in line 14. She also models complex use of the word *submarine* to describe excavators (*submarine excavators*), playing with words to create a noun phrase, a step into the academic register. Student 2 then takes up the vocabulary word in a different morphological form (*excavating*) to describe the scoop, using a similar grammatical form: a noun phrase (*excavating scoop*). This combination of questioning and elaboration in this example illustrates a teacher collaborating with students, taking on the role of learner, and engaging in dialogue with students without directing them.

**Word sort.** The word sort activity contained the highest number of exploratory talk references overall. Viewing these exploratory talk episodes individually revealed that they contained questioning initiated by both the teacher and the student, aligning with Mercer’s (2000) suggestion that problem-solving activities lend themselves to generating exploratory talk because each question related to solving a problem.

Example 2: Word sort. In the transcript below, I was acting as the teacher and students were discussing which category the word *expert* should be placed in. There were four choices based on the language students had used the previous day during the kick-off activity: *studying, digging, hiding, and finding*. The group had just read the words in the *finding* category.

![Figure 6. Word sort example.](image)
Transcript: Week 1, Day 2

13. T: Do we agree that these all have to do with finding?
15. S2: Well, not...
16. T: Do you disagree? Tell us...
17. S2: I don’t think experts go kind of with finding because…
18. S1: They kind of go with all of them.
19. S2: Cause experts kind of can … they can, they can be experts at studying, finding, hiding, or digging.
20. T: (gasp) What if we put experts up here, big title?
21. S3: Like they can do all of this. Experts can sometimes do all of the things. They can re-, they are researchers finding, good at hiding and digging also.
22. T: Now could that be true about researchers also? Could researchers also do findings?
23. All: YES!
24. T: Isn’t that interesting? People can be experts; people can be researchers.
25. S2: Wait, expert researchers!
26. All: Gasp.

In this example, the teacher joins the students in a collaborative way even though she is leading the activity. First in line 16, she asks, “Do you disagree?”, encouraging student 2 to elaborate on his idea by adding “tell us.” In lines 17–19, the two students collaborate in resolving their challenge toward the initial placement of the word. In line 20, the teacher contributes to the discussion as a participant, asking students, “What if we put it up here, big title?”, modeling how one might suggest an idea, asking permission to try a new move. This initiates student 3’s participation in line 21, as he elaborates on the first two students’ idea that expert could go in any group. Later, in student 3’s response, he begins to use the word research when he says, “They can re-” and then adjusts his language to accurately use the word researchers, a more morphologically complex form of the vocabulary word. Although her final statement is not a question, the teacher models excitement about learning and student 2 takes her enthusiasm up with his word-play, “expert researchers,” where he combines vocabulary words to form another complex noun phrase.

Pix match and retell. The retell portion of this activity really acted as a sort of performance and therefore contained minimal exploratory talk episodes, whereas the pix match portion acted as a rehearsal for the retell and thus contained more interactive episodes. Reviewing the episodes of exploratory talk in this activity showed that a unique factor existed on one specific day, leading to an increase in exploratory talk. The students had been asked to retell the sequence using words with the suffix -ed to indicate past tense, a feature of the academic register found in narrative stories (Schleppegrell, 2004). Interestingly three out of the four references were between students, with no teacher involvement.
This shift in teacher participation does not necessarily relate to what teachers did say, but what they did not say, for as Cazden (2001) points out, sometimes a teacher’s silence plays a unique role in student interactions.

**Figure 7.** Students work to match vocabulary words with ‘ing’ to sequenced pictures of themselves.

**Example 3: Pix match.** In the following example, under the guidance of the grade-level interventionist, students were attempting to find the appropriate placement of the word *expected* in the sequence of their pictures (see Figure 7 for similar example). They needed to simultaneously consider the meaning and the morphological form in order to identify and describe the point when they were digging in the soil but had not found anything yet.

**Transcript: Week 1, Day 3**

1. S1: Expected. So we’re… no.
2. S2: We were unexpected,
4. S1: Was expecting to add more.
5. T: Is that the right suffix, though? Expecting? Can you change it to be expected?
6. S3: (S2)...
7. S1: Or we could
9. S1: We could, ’cause this is the past, we could say, we expected.
14. S1: But still. Wait, we were exp... no, right here because we were expecting, we expected more but we....
15. S3: and then we couldn’t discover it.
16. S1: Something like that?
17. S1: Because it was in the past.
18. S3: Yeah, but this is when S2 told me that she thinks there was more. S2 expected there was more.

This interaction illustrates students working collaboratively while attempting to use a morphologically complex vocabulary word (expected) in an academic register (telling events in the past tense). In lines 1 and 2, student 1 reads the word expected and student 2 attempts to add the prefix un-, using it incorrectly (“we were unexpected”). Student 3 seems to recognize that the use of the word does not sound right, so he continues to play with finding ways to use expected in lines 6 and 13. In line 5, the teacher offers her only remark in the interaction, using questioning to direct students’ attention to the morphological element: suffix -ed. While they are focused on the content of the pictures, the two students continue to grapple together with using the word expected and relating it to the sequential placement within the picture order. In line 9, student 1 identifies the meaning of the -ed suffix, saying it’s “in the past,” then reverts back to the -ing form in line 14, finally adjusting her use to eliminate the word “were” when she says, “We expected more.” Student 3 then takes this up, repeating, “[She] expected there was more.”

Later, in the retell portion, students successfully used the past tense.

S3: And then here is when we first discovered ob… relics.
S2: You could say... (inaudible whisper)
S1: I expected more relics after I found that one.

This progression of interactions between these students illustrates a collaborative learning sequence where the meaning of the morpheme -ed did not need to be explicitly taught for the students to find a way to use it accurately as they retold their story. Instead, they were given the time and space in the activity to experiment with its use in an authentic context. In addition, the teacher’s silence for the majority of the episode allowed this to emerge naturally through student inquiry.

Reflecting on our original conversations on the design of these activities, another interesting point concerning this example emerges. Although we had decided to maintain a narrow focus on inflectional suffixes, we expected that students would be able to use words with these suffixes fairly easily. However, students’ challenges in using the -ed suffix indicates that although students may be able to read single words with inflectional suffixes, they may still struggle when they are required to make meaning of the word in longer phrases and sentences.

Example 4: Pix match. Another challenge emerged for students when -ed acted as a derivational suffix in words like undiscovered, undetected, and unexpected. Students knew that the prefix un- meant the opposite, but the combination of un- and -ed created a whole new grammatical form (discover = verb → undiscovered = adjective), and students were not sure which noun was being described (themselves or the relics). This grammatical form is more common in the academic register and is less frequently used in conversational language. The example below illustrates a brief interaction in which two students, while focusing on the content in the pictures, grappled with using the word undiscovered.
Transcript: Week 1, Day 3

1. S1: Undiscovered.
2. S2: Undiscovered.
3. S1: We were undiscovered.
6. S3: And they were still undiscovered ... unexposed
7. S2: No, because you found one.
8. S1: They were unexposed here.
9. S3: Yeah, yeah

In lines 1–4, the first two students seem to agree that “we were undiscovered” sounded okay; however, in line 6, student 3 steps in and says, “They were still undiscovered.” Here he is referring to the items that are buried in the sand and modeling correct use of the words undiscovered and unexposed. In line 8, student 1 then takes up this use, stating, “They were unexposed here.” This example of collaborative language use illustrates students sharing their lexical resources (Perfetti, 2007) as they work to apply grammatical information to a morphologically complex word form. Later in the retell portion, again the student was able to hesitantly use the complex word form.

S1: Ummmm. We were... the relics were unexposed in the sections.

This can be contrasted with another student, who was grappling alone with using the word unexpected later in the same activity.

S4: We un... we were un. We unexpected that we were going to find more. We und... we were unexpected. It doesn’t make sense.

As this student works alone to find a way to use the word unexpected, he eventually gives up, stating, “It doesn’t make sense.” Without collaboration with a peer or teacher, this student’s use of unexpected is limited to his own lexical resources (Perfetti, 2007), supporting Mercer and Littleton’s (2007) claim that exploratory talk elevates students’ knowledge through “inter-thinking” (p. 4).

Discussion and Implications

The overarching goal of this study was to design intervention practices that would enable students to learn new vocabulary words through social, collaborative activities while developing strong lexical representations of those words. Findings indicate the design shows potential for providing language-based vocabulary learning opportunities that encourage students to focus on multiple features of multisyllabic words. Different activities engaged students in varying levels of social dialogue, and close review of exploratory talk episodes revealed a trend in the teacher’s role, where instead of leading the activity, she acted as a facilitator, joining the students as a fellow learner.

Furthermore, the thematic content was related to the effectiveness of the design, supported by the difference between the average number of extended episodes in the first ($M = 9, SD = 3.7$) and second ($M = 6, SD = 1.4$) 2 weeks of intervention. It seemed that when the content included complex scientific concepts (see Table 1), it became difficult to incorporate text-based vocabulary in the kick-off event, which then limited students’
engagement in extended interactions using new vocabulary in later activities (word sort and pix match). Thus, the examples selected for deeper analysis in this article were from the first 2 weeks of the study. This limitation is discussed further in the final section of this article.

**Intervention Design**

**Vocabulary use.** The broad count of vocabulary use in the sequence of activities (see Figure 3) showed that our overarching goals focusing on student vocabulary use were met. These goals included first exposing students to vocabulary words in use during a shared experience (kick-off event) and then encouraging students to use those words during problem-solving tasks (word sort and pix match/retell).

**Simultaneous focus on multiple features of words.** Our efforts to provide opportunities for students to attend simultaneously to multiple features of words were fueled by Perfetti’s (2007) emphasis on the importance of building connections in order to secure a word’s identity in the lexicon. Therefore, the simultaneous attention to how a word looks, sounds, and is used (including morphological form and meaning) remained a goal across the activities we designed. We were fairly successful in this area as there were many interactions that focused on multiple word features. For instance, in example 3, students attended to visual features when they read the word *expected* and morphological features as their attention was drawn to the suffix *-ed* (rather than *-ing*), and student 1 explained, “It’s in the past,” and the meaning of the word in order to match it to the appropriate picture and the grammatical use in their discussion and preparation for retelling the event. The extent of these examples (which were quite frequent) is not represented fully here, because they often occurred during teacher-directed interactions and were not analyzed for this article.

**Student collaboration.** Another design element that was fairly successful was our focus on developing practices that encouraged collaborative learning. As evidenced in the examples of exploratory talk, there were many occasions when students worked together to solve problems focusing on vocabulary. The progression from the word sort activity, where students used vocabulary words in interactions with teachers, to the pix match activity, where students used them with each other, indicated that the sequence of these activities supported students’ developing use of the academic register. However, the overall proportion of exploratory talk episodes in the entire study compared to the amount of teacher-directed dialogue indicates that this is also an area for future design development.

**Teacher role.** A relationship between the teacher’s role and the students’ interactions was revealed in examples of exploratory talk. In these episodes, when the teachers positioned themselves as fellow learners during an activity, their collaborative role led students to extend their thinking through exploratory talk. This is evidenced in example 1, where the teacher used questioning statements such as “I wonder…” and “How would…” to encourage students to extend their thinking through collaboration. Furthermore, the decreased role of the teacher in the pix match/retell activity coupled with the high incidence of exploratory talk suggests that allowing time for students to grapple with vocabulary use in an academic register is important and can lead to successful use of target vocabulary.

**Implications**

The findings from this case study indicate that intervention activities can be redesigned to include opportunities for students to engage in collaboration while learning
new vocabulary words. Although research supports the importance of direct instruction in learning new vocabulary words (Graves, 2016) and I do not seek to negate the role of direct instruction in an intervention setting, examples in this study show that collaborative intervention activities can provide opportunities for students to use vocabulary words in context, perhaps increasing their comfort with and knowledge of new words.

Perfetti (2003) encourages teachers to engage students with phonological, orthographic, morpho-syntactic, and semantic properties, but teachers often address these features in different skill-based activities. The best instructional design would involve students tending to multiple elements of a word simultaneously. I hope this study demonstrates that activities can be designed to encourage the development of lexical representations without separating skills into “practice sessions.” Providing exposure to words during a hands-on learning activity followed by subsequent print-related activities can set the stage for students to collaboratively apply their emerging knowledge of morphologically complex forms of vocabulary words in context. The activities described in this article (kick-off event, feature-based word sort, and sequencing pictures to retell a familiar, content-related event) require students to tend to multiple features of words (phonological, orthographic, morphological, grammatical, and semantic) while also encouraging social interaction and problem solving. Perhaps we can expand our intervention activities to include more student-led, interactive elements without compromising instruction.

An important finding in this study relates to the role of the teacher in the designed learning activities. By assuming the role of facilitator, rather than knowledge holder, teachers encourage students to collaborate in order to apply their emerging knowledge and ability to use vocabulary words. At times, allowing students to grapple with the correct usage of morphologically complex words can lead to correct usage and developing knowledge through “inter-thinking” (Mercer & Littleton, 2007, p. 4). A key aspect of this approach requires the teacher to remain tuned in to student conversations, poised to jump in and guide them toward accurate learning. Thus, a small-group intervention setting provides the perfect environment for teachers to hear students’ language and guide learning from the “back seat,” enabling students to drive their own learning process.

Finally, this case study illustrates the importance of conducting research on small samples of students to more closely examine the nuances of student language use as well as the teacher’s role in their shared interactions. The setting for these activities is ideal, enabling the teacher to interact closely with a group of students throughout their participation in vocabulary learning. Overall, the designed activities illustrated in this article provide examples of the powerful potential of engaging students in socially oriented, problem-solving activities in a small-group, intervention setting.

Limitations and Future Research

This study adds to the literature on vocabulary learning; however, there are a number of limitations that could direct further analyses of this study or potential future directions of similar research. First, a possible second set of analyses of this data could more deeply explore the progression of student talk over the course of the study, including how types of talk and occurrences changed over the four weeks of intervention sessions and how they differed in relation to who was teaching. In addition, the variance of content between the first and second halves of the study limited students’ use of new vocabulary in their extended interactions during the second two weeks, given that their understanding of new scientific concepts needed to first be solidified. Therefore, a follow-up study should include multiple weeks focusing on similar content rather than varying themes across each week.
Although this study provided an intimate portrait of language use during vocabulary intervention practices, the inclusion of pre-post assessments that measure students’ developing vocabulary knowledge, multisyllabic word attack, phonological and morphological awareness, and general reading fluency would provide more specific information related to their overall skill development. Although the small sample size was a strength in supporting our ability to focus closely on student language, similar studies that include a larger sample size but maintain a focus on the language used by small groups of students in an intervention setting are needed. Finally, a comparison between language used during direct instruction and language used in problem-solving tasks would augment our ability to reflect on the value of these differing types of activities.

With so many potential next steps, this case study should serve as an initial exploration or snapshot of an alternate approach toward intervention. The portrait of activities and student talk provided in this study may further inform our conceptualization of intervention, leading to designs that incorporate student language use and problem-solving as important components of vocabulary learning in an intervention setting.

Conclusion

I end this article as it began, with an illustration of a student’s experience in our study. It was toward the end of our work together, in the final week of the study. As we were preparing to begin our activities, one of our students was describing a spelling activity that had just occurred within his regular classroom.

“It was so cool,” he exclaimed. “When we did the word explore, everyone in our reading group spelled it really fast!” He was excited because the kids in “our reading group” were not usually the ones to be first or fastest in an academic activity. When I asked him why he thought this was the case, he replied, “Because we already saw it a bunch, and used it a bunch, and we know what it means and how to spell it.” (Transcript: 5/9/17)

This student not only transferred his vocabulary learning across settings, he also was cognizant of the importance of attending to multiple aspects of a word in order to learn it well. It is my hope, as we shift the focus of our research inquiries to include the ways in which our students learn, that they may become more aware of not only what they learned, but how they learned it, approaching their literacy learning as a collaborative process that is worth their attention and effort.

About the Author

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