



Use of instructional technology to improve teacher candidate knowledge of vocabulary instruction



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ABSTRACT

Teacher educators play an influential role in the chain of improvement needed to address gaps in vocabulary knowledge and performance for some children. If created in careful accordance to design principles, multimedia can serve as a tool to improve preservice teacher knowledge in this domain. The present experimental study investigated a multimedia-based intervention, which pairs a modeling video with a Content Acquisition Podcast (i.e., video plus CAP), to teach preservice teachers ($n = 101$) about an effective vocabulary intervention for students at risk for or with learning disabilities. Preservice teachers were randomly assigned to either watch a video plus CAP or read a practitioner-friendly reading on vocabulary instruction. Those who watched the video plus CAP significantly outperformed the comparison group on a posttest and maintenance test of knowledge.

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1. Introduction

Children's earliest language experiences vary depending on the number and quality of words they hear in their environment (Ramey & Ramey, 2004). Significant differences among children can emerge beginning at 18 months of age depending on language experiences (Fernald, Marchman, & Weisleder, 2013). There is a corresponding achievement gap that is observed in schools, especially in low-socioeconomic areas (Hart & Risley, 1995). Therefore, by the time children from disadvantaged backgrounds step foot in a school, their language skills can be substantially different from advantaged peers (Ramey & Ramey, 2004). Early academic struggles frequently snowball into later reading deficits that are difficult to remediate (Biemiller, 2001). To illustrate, the predictive relationship between early vocabulary knowledge and later reading comprehension is very strong (Graves, 2006). As children's struggles compound over time, early educators and primary teachers are faced with the challenge and need to provide high quality vocabulary instruction for these students (Beck & McKeown, 2007; Graves, 2006).

Evidence shows there is a lack of high quality vocabulary instruction in preschool through second grade classrooms (National Reading Panel, 2000). On average, teachers spend less time explicitly teaching vocabulary compared to other literacy skills (Maynard, Pullen, & Coyne, 2010; National Reading Panel, 2000). Numerous preschool classrooms lack high quality language and literacy instruction (Justice, Mashburn, Hamre, & Pianta, 2008). In addition, many teachers do not make sufficient use of reading practices supported by research (Klingner, Urbach, Golos, Brownell, & Menon, 2010). One reason for these findings is that teachers may lack knowledge necessary to teach vocabulary and other essential components of reading (Moats, 1994; Washburn, Joshi, & Binks-Cantrell, 2011). A possible explanation for why teachers lack this knowledge is many teacher education programs may not provide pertinent information required to teach reading (Leko & Brownell, 2011; Spear-Swerling & Cheesman, 2012). Reports on effective reading instruction emphasize the importance of teachers' knowledge of reading (McCardle & Chabra, 2004); after all, "teachers cannot teach well what they do not understand themselves" (Moats, 2009, p. 387).

Considering the need to address the language and vocabulary deficits of children, it is paramount that teacher education programs effectively foster knowledge necessary to implement evidence-based vocabulary instruction (Brownell et al., 2009; Carlisle, Kelcey, Rowan,

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& Phelps, 2011). However, designing teacher education methods that teach evidence-based practices, all while meeting cognitive needs of preservice teachers, is a complex task (Brownell, Sindelar, Kiely, & Danielson, 2010). New thinking is therefore indicated to help address this problem of practice. Multimedia instructional tools can be successful mechanisms to augment preservice teacher knowledge of evidence-based reading practices (Kennedy, Driver, Pullen, Ely, & Cole, 2013; O'Brien, Aguinaga, Hines, & Hartshorne, 2011).

The purpose of this article is to present a multimedia-based tool that improves preservice teacher knowledge in the domain of improving teacher candidate vocabulary knowledge. Researchers created a multimedia tool that pairs a modeling video with a Content Acquisition Podcast (i.e., video plus CAP). CAPs have similar characteristics to enhanced podcasts, but are created in adherence to Mayer's (2008, 2009) Cognitive Theory of Multimedia Learning (CTML) and accompanying design principles. To illustrate, CAPs are carefully constructed around one core topic with relevant images, targeted on-screen text, and audio to present information in a manner that is optimal for learning. A sample CAP can be viewed at <http://vimeo.com/58496686>. Six studies support the use of CAP in teacher education to promote learning of content related to teaching (Kennedy et al., 2012, 2013; Kennedy, Hart, & Kellems, 2011; Kennedy, Newton, Haines, Walther-Thomas, & Kellems, 2012; Kennedy & Thomas, 2012; Kennedy, Thomas, Aronin, Newton, & Lloyd, 2014). CAPs can present core information about instruction, but are limited in that they do not show examples of real teaching. The current study expands the CAP tool by adding a video component. Research supports videos that model teaching practices to increase teacher knowledge (Santagata, 2009; Zhang, Lundeberg, McConnell, Koehler, & Eberhardt, 2010) and teaching ability (Dieker et al., 2009). The video created for the current study models evidence-based vocabulary practices that are introduced in a CAP.

1.1. Evidence-based vocabulary instruction

Rich and explicit vocabulary instruction through storybook reading can result in substantial vocabulary learning of students with varying needs (Biemiller & Boote, 2006; Coyne, McCoach, Loftus, Zipoli, & Kapp, 2009; Coyne, Simmons, Kame'enui, & Stoolmiller, 2004). Furthermore, when working with children at risk for or with learning disabilities, it is recommended that teachers use multiple vocabulary approaches and provide recurring exposure to target words (Beck & McKeown, 2007; Biemiller & Boote, 2006; Justice, Meier, & Walpole, 2005). Studies suggested the following practices to decrease the widening vocabulary gap that exists between typically-developing students and struggling readers: (a) explicitly teach word meanings (Coyne et al., 2004), (b) implement rich vocabulary instruction (Coyne et al., 2004), (c) directly teach the meanings of sophisticated words or those of mature language users (Beck & McKeown, 2007), and (d) conduct repeated shared storybook readings, with explanation of target words as they appear in text (Biemiller & Boote, 2006).

The video plus CAP used in the current study is based on a research-supported vocabulary approach called, Intensified Vocabulary Intervention (IVI) (Maynard et al., 2010). IVI incorporates aforementioned components that support vocabulary acquisition. Moreover, IVI directly teaches word meanings within the context of a story, followed by extended after-reading opportunities to interact with target words

During Reading Behaviors

1. Chose "word-rich" story
2. Chose appropriate words (tier 2)
3. Chose an appropriate # of words to teach (3)
4. Identified target words prior to reading
5. Prompted students to pronounce words prior to reading
6. Told students to listen and raise hands when they hear a target word
7. Discussed/introduced text
8. Read story throughout
9. Acknowledged raised hands or prompts students when target words occur
10. Provided explicit definition of target words
11. Used "student-friendly" definitions
12. Read definition of target words in the sentence in place of target words
13. Asked students to repeat the target words
14. Was encouraging and enthusiastic about word learning
15. Actively engaged students (e.g., to respond, repeat, answer, participate)
16. Taught word-learning strategies
17. Discussed text during and after reading
18. Helped students relate to words with prior knowledge/experiences

After-Reading Activity Behaviors

1. Chose at least one after-reading activity (from intervention)
2. Provided and used appropriate lesson materials
3. Introduced words and said student-friendly definition of words
4. Prompted students to say/repeat words
5. Prompted students to repeat definition
6. Administered a complete after-reading activity
7. Prompted students to use word in *complete sentences*
8. Was encouraging and enthusiastic about word learning throughout
9. Actively engaged students (e.g., to respond, repeat, answer, participate)
10. Repeated/incorporated definitions throughout (i.e., multiple exposure)
11. Brought activity to a close by reviewing target words
12. Brought activity to a close by reviewing target word meanings

Fig. 1. Intensifying vocabulary intervention (IVI) teaching behaviors. A condensed and simplified version of IVI behaviors shown in the video plus CAP. Adapted from Pullen et al. (2010) [details removed for peer review].

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