



Improving teacher candidates' knowledge of phonological awareness: A multimedia approach

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ABSTRACT

Knowledge of phonological awareness (PA) and how to teach students to develop PA is an important component of teacher preparation given its role in learning to read. We believe multimedia can play a key role in improving how educators acquire, master, and prepare to implement evidence-based reading instruction in any nation. One multimedia-based instructional practice, Content Acquisition Podcasts (CAPs), utilizes Mayer's Cognitive Theory of Multimedia Learning (2009) to ensure the looks and sounds of instruction help reduce extraneous cognitive load while maximizing active cognitive processes. In this empirical study, researchers randomly assigned 148 participants (education and non-education university students) to either watch a CAP or read a practitioner friendly article on PA and PA instruction. The dependent variable is an instrument that measures knowledge- and skill-based items related to PA and PA instruction. Results demonstrate a significant main effect and large effect size for the CAP group on the posttest and, several weeks later, a maintenance probe. Findings indicate that multimedia instructional tools, such as CAPs, may benefit undergraduates as they acquire necessary knowledge and skills that underwrite advanced practices for teaching students in general and special education settings.

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1. Introduction

Phonological awareness (PA) is the conscious sensitivity to different units of sounds in language (Pullen, 2004). Developing PA is essential for learning to read alphabetic languages, such as English (Adams, 1990; Snow, Griffin, & Burns, 2005), Spanish (Denton, Hasbrouck, Weaver, & Riccio, 2000), German (Naslund, 1990), Swedish (Lundberg, Olofsson, & Wall, 1980), and French (Comeau, Cormier, Grandmaison, & Lacrois, 1999). In any of these languages, a student with strong PA has foundational tools that are necessary (but not sufficient) for the rapid and accurate decoding of words (Stanovich, 1987), and later, comprehension of text (Snow, 2002). These critical tools include the ability to rapidly associate phonemes with their appropriate sounds, and segment and blend sounds within words (Snow et al., 2005).

Not surprisingly, members of the National Reading Panel (2000) from the USA, and many since around the world (see Morrow, Tracey, & Del Nero, 2011 for a review), report that explicit and systematic phonological awareness instruction is crucial to the development of successful readers, and should be a priority in reading education. This is especially true for students with disabilities related to reading (e.g., learning disabilities, dyslexia) (Verhoeven, 2011). Researchers and educators in different countries around the world infuse this understanding of PA into reading programs and other curricula that are variably highly prescribed or left to teachers' discretion (Denton et al., 2000; Gunderson, D'Silva, & Chen, 2011; Morris, 2011; Wharton-McDonald, 2011). Therefore, the manner in which teacher preparation programs prepare pre- and in-service teachers is of paramount importance given the numerous nation, district, and school-specific approaches to teaching reading (Leko & Brownell, 2011). Regardless of country, we believe multimedia can play a key role in improving how educators acquire, master, and prepare to implement evidence-based reading instruction.

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The purpose of this article is to introduce and provide empirical support for a multimedia-based instructional tool developed to help teacher candidates develop foundational knowledge needed for understanding and teaching PA. This tool is called Content Acquisition Podcasts (CAPs) (Kennedy, 2011; Kennedy, Hart, & Kellems, 2011; Kennedy & Thomas, 2012). CAPs are multimedia instructional vignettes that share characteristics with enhanced podcasts, but differ in that the looks and sounds of CAPs strictly adhere to Mayer's Cognitive Theory of Multimedia Learning (CTML; 2009) and instructional design principles (2008). Thus, each CAP contains judiciously scripted content for one core topic, and utilizes vivid images and occasional on-screen text to convey and represent information. CAPs can be used to package and deliver content in any subject area in order to capture the instructor's national or local perspectives. A detailed description of CAPs and empirical literature that supports this practice is provided in Section 1.2.1.

1.1. The need for improved pre- and in-service instruction regarding phonological awareness

1.1.1. Review of literature

In 1994, Moats published the results of a survey administered to 52 licensed teachers enrolled in a graduate program that measured knowledge of spoken and written language structures needed to teach reading. Her key finding is most participants had significant difficulty answering questions and applying knowledge relating to the basic building blocks of reading. This landmark study spurred a series of investigations that examined knowledge of early reading and language structures for general education teachers at the preservice (Spear-Swerling, Brucker, & Alfano, 2005; Washburn, Joshi, & Binks-Cantrell, 2011a) and in-service levels (Brady et al., 2009; Cunningham, Perry, Stanovich, & Stanovich, 2004; Kelcey, 2011; McCutchen et al., 2002; Moats & Foorman, 2003; Piasta, Connor, Fishman, & Morrison, 2009; Podhajski, Mather, Nathan, & Sammons, 2009; Washburn, Joshi, & Binks-Cantrell, 2011b), special education teachers at the preservice (Al Otaiba & Lake, 2007; Leko & Brownell, 2011; Spear-Swerling, 2009; Spear-Swerling & Brucker, 2006) and in-service levels (Bishop, Brownell, Klingner, Leko, & Galman, 2010; Cheesman, McGuire, Shankweiler, & Coyne, 2009; Dingle, Brownell, Leko, Boardman, & Haager, 2011; Seo, Brownell, Bishop, & Dingle, 2008; Spear-Swerling & Cheesman, 2012), and teachers from each of the above categories (Bos, Mather, Dickson, Podhajski, & Chard, 2001). Research in this area will and should continue, as the knowledge base is far from comprehensive (Carlisle, Kelcey, Rowan, & Phelps, 2011).

1.1.2. Key themes and need for improvement

Although there is ample evidence that shows the importance of PA (see Spear-Swerling, 2011), and high quality PA instruction for all children (see Morris, 2011), the previously mentioned studies demonstrate that this content is often misunderstood at definitional and conceptual levels by pre- and in-service educators (Moats, 1994, 2009; Washburn et al., 2011a, 2011b) and even some teacher educators (Joshi et al., 2009). Primary misconceptions include the belief that reading, phonological and phonemic awareness are the same thing, and that PA explicitly connects print letters with sounds (Bos et al., 2001; Moats & Foorman, 2003). In addition, several studies have found that pre- and in-service teachers lack ability to accurately identify, count, and manipulate phonemes within words (Cunningham et al., 2004). This is alarming; as educators' knowledge of the structures of reading and language development is critical for developing and implementing practices that will help early readers develop and improve their reading ability (Moats, 2009).

A key theme from these studies is that although many pre- and in-service teachers appear to have limited definitional and conceptual knowledge and understanding of the components of teaching reading, improvement can be made following professional development or coursework (see Moats, 2009 for a review). In some studies, improved teacher knowledge was associated with gains in K-12 student reading performance (McCutchen et al., 2002; Piasta et al., 2009; Podhajski et al., 2009; Spear-Swerling, 2009); however, the number of (experimental group) teachers involved in these studies is modest ($n = 24, 4$, and 19, respectively). Each study acknowledges this as a limitation and calls for additional research at a greater scale. Other criticisms of this literature are that most report results of studies conducted without control or comparison groups (Piasta et al., 2009), and the technical adequacy of measurement instruments is either questionable, or missing (Carlisle et al., 2011; Carlisle, Correnti, Phelps, & Zeng, 2009). Notable exceptions are the aforementioned studies by McCutchen et al. (2002), Piasta et al. (2009), and Podhajski et al. (2009). No studies identified in this literature base attempted to use technology to provide instruction or professional development, or to compare the effects of multimedia-based instruction to "traditional" methods.

1.1.3. Problem of practice addressed by the current study

Given the critical need to improve preparation of pre- and in-service teachers to deliver reading instruction, and the current lack of multimedia used in this charge, our research team undertook the current study. CAPs were originally created to address a well-known problem of practice in the field of special education: Most general education preservice teachers in America are only required to take one introductory course in the field of special education (Turner, 2003). This course frequently focuses on static information, such as special education law, history, and the characteristics of students with exceptionalities, but is sparse with respect to evidence-based practices needed to teach children (Rechly, Holdheide, Behrstock, & Weber, 2009). Although the focus of the introductory course in special education is not to provide general or special education teacher candidates with specific preparation to teach PA, it is a topic introduced in advance of future coursework.

As preservice educators in America move into their first teaching assignments, their lack of preparation for teaching individuals with exceptionalities often leads to achievement deficits for those children (Newman et al., 2011). This is especially true given the frequency with which students with disabilities in an area relating to reading struggle with PA (NRP, 2000; Pullen, 2004). Although general educators can typically rely upon support from at least one special educator, almost all American children with high incidence disabilities (e.g., learning disabilities) spend the majority of their school day in the general education classroom (McKenzie, 2009). Thus, across several semesters of teaching this universally required course, members of our research team recognized that there was not enough face-to-face instructional time to provide preservice teachers with ample exposure to the evidence-based practices they will need in future classrooms (Kennedy et al., 2011). Podcasting provided an intriguing possibility as a tool that could be used to deliver core content without needing to consume substantial face-to-face class time. However, we join those who believe technology should not be adopted and implemented without appropriate theoretical justification and empirical testing (see Clark, 2009; Mayer, 2011).

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