Chapter 15
A Multimedia Tool for Teacher Education and Professional Development

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ABSTRACT
This article describes a tool that can be used in teacher education called Content Acquisition Podcasts (CAPs). CAPs are short multimedia vignettes designed to teach targeted, specific concepts. They are developed in accordance with design principles that are intended to reduce learners’ cognitive load (Mayer, 2009). CAPs are simple to create and can be made with readily-available software; this accessibility and their flexible design makes them extremely versatile. They can easily be incorporated into flipped or blended classes. In this article, the authors explain how CAPs are created, describe three ways to integrate CAPs into teacher education and professional development, and explore how CAPs can begin to address the challenges of preparing teachers for a complex working environment.

BACKGROUND
Even the best teacher education programs lack the time to prepare special and general education teachers for every possible employment scenario they may encounter (Grossman & McDonald, 2008). For example, special educators need a broad range of preparation because in many states they can be hired to teach students with any disability in any subject area at any grade level. They also must develop skills for teaching content in both self-contained and inclusive settings (Brownell, Sindelar, Kiely, & Danielson, 2010). Special educators must be prepared to meet the needs of students across all of these possible settings and therefore need to be well-versed in a variety of evidence-based practices.

Similarly, general educators have a wide array of possibilities for career placements. General educators must develop deep understanding of their curriculum content and acquire skills in behavior management,

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classroom organization, and effective teaching strategies for use in varied contexts (Darling-Hammond, 2008; 2012). In addition, 90% of students with disabilities (SWD) receive their education primarily in general education settings (National Center for Education Statistics, 2012), so general educators also need to learn about at least basic evidence-based practices for teaching SWD.

In addition to these content concerns, teacher education programs of all kinds must include instruction and modeling of technology use in the classroom. Research shows that although most teachers believe technology helps them engage students at all levels and report that technology benefits students’ learning, the majority of teachers (both novice and experienced) do not routinely incorporate technology into their teaching (Grunwald Associates, 2010). In particular, teacher candidates need to learn how to incorporate technology that is simple to use and easily accessible because lack of time and lack of access to technology are the main reasons teachers do not use technology more often (Bauer & Kenton, 2005; Lu & Overbaugh, 2009). Even if these challenges can be overcome, SWD face an additional challenge because very few digital curricula or online systems are designed to be accessible for them (Center for Online Learning and Students with Disabilities, 2012); therefore, technology in teacher education should include evidence-based practices for SWD as well. With all these areas to cover, it is essential for teacher educators to maximize their instructional time in classes. CAPs are one tool that can help them accomplish this goal.

**CAP DEFINITION**

CAPs are short multimedia vignettes that combine carefully-chosen images and words with narration to explicitly teach specific concepts or terms. They are designed according to the principles of Mayer’s Cognitive Theory of Multimedia Learning (CTML; 2009). According to the CTML, many multimedia products overwhelm learners’ cognitive load because they combine too many visual and auditory elements. This complexity requires learners’ visual and auditory senses to compete for attention, resulting in more attention being paid to sorting out the disparate inputs and less to learning the actual content. Mayer (2009) proposed 12 design principles that are designed to streamline the inputs for learners, thereby lessening the cognitive load demand and allowing for more efficient learning. All 12 principles have been examined and verified through extensive research (Mayer, 2008). Table 1 provides brief definitions for these principles, and a more detailed explanation of them and how they relate to CAP creation is described in Kennedy, Aronin, O’Neal, Newton, and Thomas (2014).

**Types of CAPs**

There are three distinct variations of CAPs: CAPs for Students (CAP-S), CAPs for Teachers (CAP-T), and CAPs for Teachers plus Video (CAP-TV). Each has a specific purpose and design, which will be explained in this section.

**CAPs for Students**

CAP-S are intended for use with elementary and secondary students. They are typically under three minutes long and are narrowly focused on the main points about a specific topic. To date, they have primarily been used for vocabulary instruction for K-12 students. A single CAP-S introduces a vocabulary