Using Multimedia to Create Explicit and Culturally Responsive Content Area Vocabulary Lessons

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Mr. García, a special educator, and Ms. Walters, a general educator, are collaborative teachers serving an inclusive sixth-grade science class in a culturally and linguistically diverse (CLD) school district. During their weekly coplanning meeting, Mr. García expresses concerns with the new topic they need to teach the following week pertaining to the Earth's energy distribution process. He tells Ms. Walters that the topic may be very challenging for their students who lack background knowledge from earlier grade levels related to energy. Additionally, he says that he is worried about students' understanding of key vocabulary terms—such as radiation, conduction, *and* convection—*because they are specific to science class and may take on different meanings in other contexts. Ms. Walters agrees with Mr. García and suggests having students look up and copy down the term definitions in their notes prior to participating in any activities.*

Mr. García responds that he thinks this approach will not be enough support for students like Allie, a CLD student with a specific learning disability in reading. Although Allie's primary language is English, she has Spanish-speaking family members in her home. So when presented with a task like copying down a definition, Allie faces multiple, intersecting learning challenges, including: (a) trying to build connections between the new term's meaning, her home culture, and her current funds of background knowledge in science and (b) trying to read and write the new term and definition with a specific learning disability in reading that impacts her decoding ability, which, in turn, affects her comprehension of information. He asks if they can reconvene tomorrow so he can take some time to look through and identify other approaches to effective vocabulary instruction.

Unfortunately, the predicament that Mr. García and Ms. Walters face is not exclusive to their content area coteaching experience. Many students struggle with academic-specific vocabulary because specialized terminology, multiple-meaning terms, and gaps in prior knowledge impede students' comprehension of concepts (Cervetti et al., 2015; Crosson et al., 2020; Logan & Kieffer, 2017). As a result, engagement and achievement within content area courses can be negatively impacted, and learning challenges faced by disadvantaged student groups, such as students with disabilities (i.e., those identified under one

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of the 13 disability categories of the Individuals With Disabilities Education Act, 2004) and CLD students (i.e., students whose home cultures and languages are not White and monolingual, Standard American English), are exacerbated (Artiles et al., 2010; Babino et al., 2019). Learning challenges may be further compounded for students like Allie, who are identified as having a disability and coming from a CLD background, because these students may experience double forms of oppression and difficulty in accessing culturally appropriate services and instruction (Annamma et al., 2018; Liasidou, 2013).

In this article, we outline the specific steps for creating content area vocabulary lessons using a multimedia approach to instruction. We provide detailed descriptions of how to (a) identify and prepare content that will be taught; (b) create the multimedia presentation slides for use with students, including a template that can be downloaded, edited, and used in content area classrooms; and (c) record the vocabulary lesson presentations for repeated exposures to content. We begin by describing elements of effective content area vocabulary instruction for CLD students with disabilities as they relate to this multimedia instructional approach and culturally responsive practices for teaching vocabulary.

What Does Effective Instruction Look Like for Students With Disabilities From CLD Backgrounds?

Despite agreement on its importance to students' understanding of new concepts across content areas, research suggests that teachers are seldom equipped with the knowledge and skills to provide effective, targeted vocabulary instruction (Carlisle et al., 2013; Nagy & Townsend,

2012; Wright & Neuman, 2014). CLD students who are also identified as having a disability may face particular difficulty with complex vocabulary encountered in content area courses because the teachers who serve them may lack training in language-appropriate and/or culturally responsive instruction reflective of students' specific needs and backgrounds (Barker & Grassi, 2011; Klingner et al., 2012). As such, educators must create accessible curricula and inclusive learning environments using multiple pedagogies to address the intersections of ability and cultural and linguistic diversity that impact students' success.

Focusing on how CLD students' information processing systems work, Hammond (2015) developed the Ready for Rigor framework, which includes a four-step lesson planning guide (see *Table 1*) to support teachers' understanding and implementation of culturally responsive instruction. The first step, *ignite*, suggests the use of culturally oriented strategies to activate prior knowledge related to new concepts and generate excitement about and attention toward learning. In the next step, *chunk*, content should be presented in small, "digestible" chunks so students can connect new information with current funds of knowledge. The third component, *chew*, recommends the use of unstructured think time and prompts for specific cognitive routines to support students' processing of new information. Finally, the last step, *review*, states that students should be provided opportunities to apply new learning through deliberate, repeated, team-based practice with peers to support retention of information in long-term memory (Hammond, 2015). Furthermore, researchers who have implemented these four culturally responsive instructional approaches (i.e., activating prior knowledge, breaking

Table 1 **Four-Step Lesson Plan Framework to Support Information Processing Among Culturally and Linguistically Diverse Students (Hammond, 2015)**

Macro-level instructional strategies	*Description and specific strategies*
Ignite	Use culturally oriented attention-getting strategies to generate excitement about and attention toward learning. Specific strategies may include: • Call and response • Music • Provocations (e.g., quote, images, video clip) • Talk (e.g., think-pair-share)
Chunk	Present content in small, digestible chunks so students can connect new information to their current funds of knowledge, supporting working memory.
Chew	Help learners "chew on," or process, the information they just received using unstructured think time. Additionally, use cognitive routines that require students to ask questions related to new material, including: (a) similarities and differences, (b) whole-to-part, (c) relationships, and (d) perspectives. Specific strategies for unstructured think time may include: • Prompting students to make sense of concepts by drawing or writing during a 5-minute break following 15 minutes of instruction. • Using "talking to learn" protocols (e.g., four on a pencil, give one get one). Specific strategies to use with cognitive routines may include: • Using "talking to learn" protocols (e.g., four on a pencil, give one get one). • Rhythmic mnemonics • Generating a story • Recursive graphic organizers, infographics, and other nonlinguistic representations • Metaphors, analogies, and other word play activities
Review	Provide opportunities for students to apply new learning through deliberate, repeated, and intensive practice to help them build understanding and support long-term memory retention. Specific strategies include: • Playing games (e.g., Jeopardy, Pictionary, Family Feud) • Setting up a real-world problem or mystery to be solved • Project-based activity connected to a real-life community issue

complex skills down into smaller parts, using cognitive routines, and using cooperative learning activities in support of collectivist cultural traditions) provide evidence of the effectiveness of such strategies in supporting CLD students' vocabulary development and overall academic achievement (Gay, 2002; Kent et al., 2015; Lesaux et al., 2010; Margolis et al., 2016).

Regarding students with disabilities, one instructional tool that has demonstrated effectiveness in supporting content area vocabulary knowledge is

called *content acquisition podcasts for students* (CAP-S; Kennedy et al., 2014, 2015; VanUitert et al., 2020). CAP-S support knowledge of key terms and concepts among students with and without disabilities through a multimedia slide presentation that combines foundational elements of explicit instruction (Archer & Hughes, 2011) and multimedia design principles (Mayer, 2020). Vocabulary instructional strategies embedded in CAP-S lessons consist of a review of key background information, a student-friendly definition, and a range of

examples related to the new term as well as clear nonexamples and morphological instruction when applicable.

Grounded in Mayer's (2020) cognitive theory of multimedia learning (CTML), the design principles for multimedia presentations (see *Table 2*) utilized in CAP-S are intended to help educators create instructional materials that reduce learners' cognitive load, thus facilitating a better chance of successful learning. Specifically, creating CAP-S in alignment with these design principles ensures that lessons are formatted and presented in a

Table 2 **Instructional Design Principles of Mayer's (2020) Cognitive Theory of Multimedia Learning**

Instructional goal	Instructional design principles	Description of instructional design principles
Reduce extraneous processing	Coherence principle	Exclude irrelevant or extraneous information from materials.
	Signaling principle	Add cues that highlight the organization of content.
	Redundancy principle	In fast-paced lessons, graphics and narration is preferred to graphics, narration, and text.
	Spatial contiguity principle	Present corresponding words and images in close proximity to one another.
	Temporal contiguity principle	Present corresponding words and images simultaneously.
Manage essential processing	Segmenting principle	Break presentations down into smaller parts.
	Pretraining principle	Review background knowledge needed for understanding new concepts.
	Modality principle	Pairing images with spoken words is preferred to printed words.
Foster generative processing	Personalization principle	Speech should reflect a conversational style rather than a formal style.
	Voice principle	Human voice is preferable to computer-generated voice.
	Embodiment principle[a]	If using on-screen characters to present material, these characters should embody human characteristics to support learning.
	Multimedia principle	The combination of related words and pictures benefits learning more than words alone.
	Generative activity principle	Knowledge retention is supported through generative learning activities during multimedia lessons (e.g., summarizing, mapping, drawing).

[a]The embodiment principle of cognitive theory of multimedia learning does not apply to content acquisition podcasts for students because content material is presented by the teacher rather than on-screen characters, supporting alignment with the personalization and voice principles.

way that allows students to cognitively digest information by processing content through visual and auditory channels connected to the brain, where it eventually lands and is further processed in the working memory system. Students' working memory is then tasked with building connections between new content and related information that has been stored over time through the use of explicit cognitive routines (e.g., asking students to identify similarities and differences between concepts, to describe how a smaller concept relates to a larger concept,

etc.). Then, the working memory system moves the newly connected information into long-term memory for storage and later retrieval as needed (Smith et al., 2016; Swanson et al., 2015). Regarding evidence of the effectiveness of CAP-S, researchers have found that secondary school students with and without disabilities who accessed this instructional tool to learn new vocabulary terms demonstrated greater knowledge of term definitions in social studies courses (Kennedy et al., 2014, 2015) and were able to apply key terms in open-ended responses in science courses (VanUitert et al., 2020).

However, CAP-S were initially developed for the purpose of supporting students with disabilities participating in inclusive content area classrooms. Therefore, culturally responsive instructional practices that students with disabilities from CLD backgrounds need to be successful were not purposefully embedded. Nonetheless, although CAP-S were not intentionally designed to support students with disabilities from CLD backgrounds, there were many commonalities found between the explicit instructional practices embedded in

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CAP-S and those recommended for supporting learning among CLD students. In the following section, we discuss these commonalities and describe how culturally responsive instruction can be more purposefully integrated within the current CAP-S framework to maximize vocabulary learning among CLD students with disabilities.

Integrating Frameworks to Increase Vocabulary Knowledge Among CLD Students With Disabilities

When comparing Hammond's (2015) four-step lesson planning guide to the instructional design principles of CTML (Mayer, 2020) and core elements of explicit instruction (Archer & Hughes, 2011) that currently comprise CAP-S, several corresponding components are identified. First, both CAP-S and Hammond's lesson planning framework were designed with the intent of targeting the place where learning happens—students' information-processing systems in the brain. With this intent, all three frameworks recommend reviewing relevant background knowledge at the start of the lesson and segmenting the different lesson components into smaller chunks to help students process, or digest, new information presented.

Although there is evident overlap between the explicit instruction elements and instructional design principles that comprise CAP-S and the four-step culturally responsive lesson planning framework, one element that is missing is the incorporation of a team-based application activity satisfying the final review element of the lesson planning framework (Hammond, 2015). Incorporating team-based activities within the strong explicit framework currently comprising CAP-S taps into the collectivist cultural traditions of families from CLD backgrounds (Hammond, 2015), which may better serve the needs of CLD students with and without disabilities participating in inclusive content area classes.

Mr. García shares the idea of using CAP-S for their vocabulary lessons with Ms. Walters when they reconvene to finish planning the next day. Excited to find an instructional tool with embedded practices that are effective for CLD students with disabilities, the collaborative teachers decide to move forward with this plan. Mr. García offers to create the multimedia presentations for their lessons based on the information he discovered about CAP-S and in accordance with the four-step culturally responsive lesson planning framework. As the content area expert, Ms. Walters agrees to review and refine the presentations and develop the team-based application activities that they will add to their CAP-S to ensure that the content presented is appropriate and accurate for the grade-level standard to be covered.

How Do I Make CAP-S for My Content Area Vocabulary Instruction?

In addition to the benefits that this multicomponent instructional tool has to offer for supporting knowledge and comprehension of key vocabulary terms and concepts among CLD students with disabilities, CAP-S are easily made and customizable. The only materials required are some form of presentation software or program (e.g., PowerPoint, Keynote, Prezi, or Google Slides) and teachers' content area expertise. Additionally, CAP-S can be recorded and uploaded to a class web page, which can facilitate the repeated exposures to disciplinary-specific information that CLD students and students with disabilities benefit from (Kennedy & Ihle, 2012; Klingner et al., 2012). A step-by-step guide, including checklists and figures, is provided and described in detail in the following.

Step 1: Identifying and Preparing Content

The first step to creating a CAP-S is to identify the curriculum standard that will be the focus of the lesson and the essential terms and concepts within that standard that will be explicitly taught. As you proceed with preparing the specific content, keep it organized into smaller, predetermined segments that have a logical flow (e.g., review background knowledge, define new term and related concepts, provide examples and nonexamples, provide morphological instruction). For the review portion, think beyond the standards for students' current grade level to related standards from earlier grade levels to target gaps that may exist in prior learning experiences. When teaching about the Earth's energy distribution process in sixth grade, for instance, students should have some basic knowledge about energy (e.g., types of energy sources) from fifth grade that you will want to review.

When introducing and defining the new vocabulary term, rephrase technical definitions to be "student-friendly" and make note of any additional related concepts beyond the basic definition of the term that are critical to students' understanding. For example, a student-friendly definition for radiation may simply state, "the movement of energy through space," whereas a related concept may include that radiation is one type of thermal energy transfer. Furthermore, consider and note a range of examples related to the term as well as clear nonexamples of the term when applicable. Ensure that each example/nonexample reflects something that students will recognize and be able to connect with their prior knowledge and/or their personal and cultural experiences. For instance, if presenting a nonexample of

Figure 1 **Checklist for Step 1 in creating content acquisition podcasts for students**

☑	Step 1: Identifying and Preparing Content	Example
☐	Identify the curriculum standard, and substandard if applicable, that will be the focus of your lesson.	✔ *6th Grade Science Standard:* • Students will investigate and understand Earth's energy distribution process. ✔ *Substandard:* • Radiation, conduction, and convection distribute energy.
☐	Identify prior background knowledge for review that will support students' understanding of the current standard.	✔ *Things to Review:* • The definition of energy • Basic sources of energy (e.g., thermal, mechanical, and electrical energy).
☐	Identify the essential vocabulary terms that should be taught within that standard.	✔ *Essential terms*: • radiation, conduction, convection
☐	Select **one** of those essential vocabulary terms as the focus of your CAP-S presentation slides and identify a student-friendly definition.	✔ *Term Selected:* • radiation ✔ *Student-Friendly Definition:* • The transfer of energy through space.
☐	Identify any key concepts related to the term, beyond the basic definition, that should be explicitly taught.	✔ *Related Concepts:* • Solar radiation is the major source of energy on Earth. • There are different types of solar radiation.
☐	Identify a range of examples, as well as non-examples (if applicable).	✔ *Examples:* • Sunburn (ultraviolet light) • Flashlight (visible light) ✔ *Non-Examples:* • Roasting marshmallows in a campfire (conduction) • Heating a pot of water for rice on the stove (convection)
☐	If appropriate, provide a breakdown of the term's morphological word parts.	✔ *Morphological Breakdown of Radiation:* • Root word = radiate, means spreading energy from a central point • Suffix = -tion, means "the process of" • (radia~~te~~) + (-tion) = the process of spreading energy from a central point (e.g., the sun)

cooking on the stove to represent convection, consider using pictures of cooking popular food items from students' respective cultures. Additionally, plan to provide a breakdown of the new term's morphological word parts if possible because morphological instruction has been shown to improve decoding, encoding, vocabulary, and comprehension skills among CLD students and students with learning disabilities (Goodwin & Ahn, 2010; Katz & Carlisle, 2009; Lesaux et al., 2010). *Figure 1* provides a checklist of the components to Step 1: Identifying and Preparing Content and examples of how Mr. García planned out each piece in their first vocabulary lesson on radiation.

Step 2: Creating the Presentation Slides

A checklist with the recommended layout for all lesson segments is provided in *Figure 2*. *Figure 2* also includes a description of the overlapping elements of culturally responsive instruction, explicit instruction, and the instructional design principles of Mayer's (2020) CTML found in each lesson segment. Additionally, a template that can be used to create CAP-S presentations is accessible for copying and customizing by following this link: https://cap-s.link/Template_with_Directions.

The first lesson segment should provide a quick and clear introduction to

Figure 2 **Checklist for Step 2 in creating content acquisition podcasts for students**

| ☑	**Step 2: Creating the Presentation Slides**	**Culturally Responsive CAP-S Components**

☐	*Lesson Segment #1: Introduction Slides*
	● Explain lesson roadmap.
	● Introduce the key vocabulary term for the lesson.
	● Engage students in higher-order/deep activation question.
		Culturally Responsive Lesson Elements (Hammond, 2015):
		   ● *Ignite*
		CTML Design Principles (Mayer, 2020):
		   ● *Coherence principle; Signaling principle; Generative activity principle*
		Explicit Instruction Elements (Archer & Hughes, 2011):
		   ● *Logically sequence skills; Design organized lessons; State the goal of the lesson; Help students organize information*

☐	*Lesson Segment #2: Review Prior Knowledge Slides*
	● Provide explicit cue for review.
	  ○ Review relevant terms and concepts.
	● Provide explicit cue for check-in questions.
	  ○ Ask questions, incorporating cognitive routines.
		Culturally Responsive Lesson Elements (Hammond, 2015):
		   ● *Ignite; Chew*
		CTML Design Principles (Mayer, 2020):
		   ● *Coherence principle; Signaling principle; Pre-training principle; Generative activity principle*
		Explicit Instruction Elements (Archer & Hughes, 2011):
		   ● *Review prior skills and knowledge; Provide opportunities to respond; Provide distributed and cumulative practice; Help students organize information*

☐	*Lesson Segment #3: Vocabulary Slides*
	● Provide explicit cue for **"student-friendly" definition**.
	  ○ Define new vocabulary term.
	● Provide explicit cue for **additional related concepts**.
	  ○ Explain related concepts.
	● Provide explicit cue for **examples**.
	  ○ Show a range of examples.
	● Provide explicit cue for **non-examples,** if applicable.
	  ○ Show a range of non-examples.
	● Provide explicit cue for **morphology instruction,** if applicable.
	  ○ Show breakdown of word parts, define each word part, and reunite word parts and definition.
	
	*After each piece in this segment, provide explicit cue for check-in questions and incorporate cognitive routines.
		Culturally Responsive Lesson Elements:
		   ● *Chew* (Hammond, 2015)
		   ● *Provide morphology instruction* (Goodwin & Ahn, 2010; Katz & Carlisle, 2009; Lesaux et al., 2010)
		CTML Design Principles (Mayer, 2020):
		   ● *Coherence principle; Signaling principle; Generative activity principle*
		Explicit Instruction Elements (Archer & Hughes, 2011):
		   ● *Provide demonstrations; Provide examples and non-examples; Provide opportunities to respond; Help students organize information*

☐	*Lesson Segment #4: Closure Slides*
	● Provide explicit cue for final review.
	  ○ Review the newly-defined vocabulary term.
	● Provide explicit cue for check-in questions.
	  ○ Ask questions, incorporating cognitive routines.
		Culturally Responsive Lesson Elements:
		   ● *Chew* (Hammond, 2015)
		CTML Design Principles (Mayer, 2020):
		   ● *Coherence principle; Signaling principle; Generative activity principle*
		Explicit Instruction Elements (Archer & Hughes, 2011):
		   ● *Provide opportunities to respond; Help students organize information*

☐	*Lesson Segment #5: Team-Based Activity*
	● Provide directions for team-based application activity.
		Culturally Responsive Lesson Elements:
		   ● *Review* (Hammond, 2015)
		CTML Design Principles (Mayer, 2020):
		   ● *Coherence principle; Signaling principle; Generative activity principle*
		Explicit Instruction Elements (Archer & Hughes, 2011):
		   ● *Provide opportunities to respond; Help students organize information; Provide distributed and cumulative practice*

Note. The lesson segments satisfy the chunk component of Hammond's (2015) culturally responsive lesson planning framework, the segmenting principle of Mayer's (2020) cognitive theory of multimedia learning instructional design principles, and the explicit instruction element that suggests segmenting complex skills.

the lesson topic by including the following three presentation slides: (a) a roadmap of the lesson, serving as an organizer to support students with following along as each segment is presented; (b) a clear introduction slide (e.g., "Today we will learn about…"); and (c) a higher-order/ deep-question slide to activate, or ignite, students' prior knowledge and support connection building with students' cultural backgrounds and the content

ahead. Presenting an introductory activation question that asks students to think about the broader concept as it relates to their personal lives, as seen in the example slide in **Figure 3**, is one way to promote cultural relevancy within the lesson. Teachers may also direct students to partner with a peer to collaboratively brainstorm and discuss responses to the introductory activation question, respecting collectivist cultural traditions.

Although the remaining number of slides will vary based on the amount of information you need to address, the following vocabulary lesson segments should also be included after your introduction: (a) an explicit review of prior knowledge, including key terms and concepts that will support students' understanding of the new term to be introduced; (b) an introduction to the new vocabulary term, including a

Figure 3 **Example of a culturally relevant introductory activation-question slide**
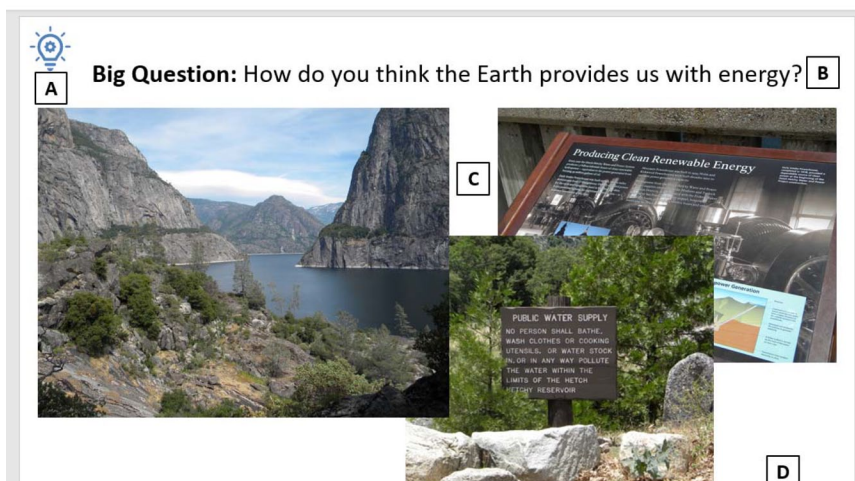
Speaker Notes: We all need energy to do the things we do every day, like walking, breathing, learning, and even sleeping! How do you think the Earth provides us with energy? These pictures from Mr. García's trip to Yosemite National Park last summer may help you think of some ideas! Brainstorm with a partner for 2 minutes.

A. Visual cue reminding students that this is the introductory activation question.
B. Question prompts students to start building connections with their own experiences.
C. Images are provided and are tied to the question to support students in generating ideas.
D. Speaker notes include comment asking students to brainstorm with a partner, respecting collectivist cultural traditions (Hammond, 2015).

student-friendly definition and additional key concepts related to the term; (c) a range of examples and clear nonexamples, if applicable; and (d) a breakdown of the term's morphological word parts, if applicable.

Furthermore, at the start of each segment, provide a slide that includes an explicit cue or signal to alert learners to the segment that will follow. After each segment, provide a few slides with different types of comprehension questions. Built-in opportunities for students to respond to material through questioning not only provides teachers with quick formative assessment opportunities but also helps to keep students engaged throughout the lesson. Provide students with a range of question types, including choral/group questions (e.g., "Everyone! What is the new term for today?"), rote questions (e.g., "What is the definition of the new term?"), and higher-order/deep questions (e.g., "Why is this term important to our topic?"). Additionally, when planning your higher-order/deep questions, be sure to utilize the specific cognitive routines (e.g., "How is this new term similar to, or

different from, other terms we've learned about?") because use of cognitive routines is recommended in the culturally responsive lesson planning framework and the elements of explicit instruction and instructional design principles (Archer & Hughes, 2011; Hammond, 2015; Mayer, 2020).

As promised, Ms. Walters went ahead with planning a team-based application activity for the students to participate in after their vocabulary lesson on radiation. She found a web-based simulation activity that asks students to develop solutions to different obstacles pertaining to radiation in the real world. Ms. Walters compiles directions and a link for the activity and sends the information to Mr. García through email so that he can include it in an additional slide at the end of their CAP-S presentation. In her directions, Ms. Walters makes clear that students will collaborate with their peers in small groups to solve a variety of problems related to radiation together.

As previously mentioned, a team-based application activity is the one culturally responsive lesson element that is missing from the current CAP-S layout. Individualistic cultural traditions tend to

favor independent activities; however, CLD students tend to ascribe to oral traditions of collectivist cultures and benefit from team-based activities involving discussion and collaboration with peers (Hammond, 2015). To support collaborative learning, include a slide with directions for the activity that the students will complete with peers in pairs or small groups. If available when teaching remotely, use online meeting room functions, like breakout rooms, to provide this small-group collaborative time with peers.

Teachers may also choose to include additional slides throughout the CAP-S lesson, such as demonstrations or video segments related to the concept being presented, that may support deeper understanding of the new vocabulary term and concepts being presented. Finally, wrap up the lesson with a final closure segment, reviewing the targeted key term definition and related concepts.

Step 3: Formatting the Presentation Slides

The directions for formatting the CAP-S slides relies on the instructional design

Figure 4 Example of content acquisition podcasts for students slide with description of formatting components

Radiation: the movement of energy through space

Speaker Notes: Radiation is the movement of energy through space. For example, the rays of sunlight that you see in this photo are radiating, or moving, energy from the sun to the Earth through the space between these trees.

A. Visual cue reminding students that this is the student-friendly definition part of the vocabulary lesson segment.
B. Large (36 point), plain font-type.
C. Font color is a clear contrast to the background color of the slide.
D. Large, clear image placed near related text.
E. Image has a clear connection to the text, is described in speaker notes, and explicitly pointed out with the addition of an arrow shape.

principles of CTML (Mayer, 2020) that were described in *Table 2*, and a visual of these formatting elements is shown in *Figure 4*. To best support students' ability to process the information presented, only one word, short phrase, sentence, or explicit cue should be included on a single slide, and each should be paired with an image that is clearly representative of and emphasizes the term, concept, or cue discussed. Images should also be selected based on their relevancy to students in the classroom. If working with students with or without disabilities from CLD backgrounds, promote cultural relevancy by choosing images that are relatable and representative of their home cultures. To help make connections between images and text even more explicit, shapes such as arrows can be used to bring attention to specific elements.

Placing a smaller version of the explicit cue image that was used at the start of a segment in the corner of each slide within that segment can also help students stay on track throughout instruction. In addition, teachers may choose to pair these explicit cue images with culturally oriented attention-getting strategies, such as call and response, to access oral traditions of CLD students' collectivist cultures (Hammond, 2015). When images are paired with clear, spoken language that matches on-screen text, these recommendations coincide with several CTML principles, including: the coherence principle, signaling principle, redundancy principle, spatial and temporal contiguity principles, modality principle, multimedia principle, personalization principle, and voice principle (Mayer, 2020).

In addition to a clear connection between images and text, it is crucial that images are visibly clear with high resolution. If using PowerPoint, high-resolution images can be located through the icons menu or clipart functions built into the program. Otherwise, use a web-based search engine to locate copyright-free images for use in the slides. The type, size, and color of the font used for text also requires consideration. A plain font (e.g., Times New Roman or Arial) formatted to size 28 point or larger should be used, and contrasting font and slide background colors should be chosen to support greater visibility of information presented. This can be accomplished by using a black font color on a white slide background, for example.

After creating and formatting the presentation slides for their vocabulary lesson, Mr. García decides that it may be helpful to record the presentation. That way, any students who are absent for the lesson or may need to review the information presented later will be able to access the recording through the class web page as needed. After confirming Ms. Walters's agreement on this idea, he investigates the steps he needs to follow to create a recording of the vocabulary lesson on radiation.

Step 4: Recording the Presentation

The CAP-S can be presented live in the classroom or during synchronous class meetings through an online meeting room. In either case, you may have students who are learning remotely, receiving homebound services, absent when the lesson is presented, or would benefit from

Figure 5 **Links to directions for recording presentations**

Programs	Links to Recording Instructions
PowerPoint *Create slides and record your presentation directly in the program.*	Directions for recording PowerPoint presentations: https://support.microsoft.com/en-us/office/record-a-presentation-2570dff5-f81c-40bc-b404-e04e95ffab33
Keynote *Create slides and record your presentation directly in the program.*	Directions for recording Keynote presentations: https://support.apple.com/guide/keynote/record-presentations-tan81813d552/mac
Prezi* *Create your Prezi and record your presentation using Prezi Video.*	Directions for recording a presentation in the Prezi Video desktop app: https://support.prezi.com/hc/en-us/articles/360036062854
Google Slides *Create slides and record your presentation using the screenshare function of a program listed below.*	Directions for recording Google Slides via Screencastify: https://learn.screencastify.com/hc/en-us/articles/360051335194-Record-a-Google-Slides-presentation
Zoom *Create your slides in another program and use the screenshare function to record your presentation.*	Directions for recording a presentation using screenshare in Zoom: https://support.zoom.us/hc/en-us/articles/201362473-Local-recording
Vimeo *Create your slides in another program and use the screenshare function to record your presentation.*	Directions for recording a presentation using screenshare in Vimeo: https://vimeo.zendesk.com/hc/en-us/articles/360046142052-Using-the-Vimeo-Record-Chrome-extension
Screencastify *Create your slides in another program and use the screenshare function to record your presentation.*	Directions, user guides, troubleshooting, and FAQs about recording: https://learn.screencastify.com/hc/en-us/categories/360003891314-Record

*Note. To use Prezi and Prezi video, a paid license is required.

reviewing the information repeatedly. As such, an asynchronous recording of the CAP-S lesson can be created, saved, and uploaded to a class web page. This allows students to access the lesson as needed throughout the year and in perpetuity over the years, which can facilitate the repeated exposures to content area information that is beneficial to CLD students and students with disabilities (Kennedy & Ihle, 2012; Klingner et al., 2012).

When creating a recorded CAP-S, a video recording or audio narration of yourself talking on each slide can be embedded in the presentation. If choosing to include a video of yourself, be sure that the video's placement does not obstruct

students' view of the content included on the presentation slides. Additionally, there are a multitude of ways to record presentations. If the slides are created in PowerPoint or Keynote, audio and/or video recordings can be made directly in those software programs. However, if the slides are created in a web-based program such as Google Slides, the presentation will need to be recorded through another program using the screen-share function. Creating a recording using the screen-share function can be done for free through programs such as Zoom, Vimeo, or Screencastify. If you are a licensed Prezi user, the Prezi video desktop app can be downloaded and used for recording purposes. Links to

step-by-step directions for recording presentations through any of the methods described are provided in *Figure 5*.

Conclusion

When students struggle with content area vocabulary, it affects their comprehension of concepts, ability to successfully participate in class activities, and their overall engagement and achievement. However, thanks to available technologies such as the CAP-S, providing the targeted vocabulary support students need for success does not have to be a time-consuming prospect that impedes on content area instruction. Instead,

instruction can be enhanced by creating and using customizable CAP-S that are integrated with culturally responsive practices to provide explicit instructional support for comprehension of complex content area terms and concepts that CLD students with disabilities need to be successful. Additionally, CAP-S are easy to make and are a versatile option for the range of educational settings that students may participate in. An added bonus is that by following the steps provided in this article for planning, creating, and formatting your CAP-S presentation slides, you can ensure that evidence-based practices effective for students with disabilities as well as CLD students are embedded in your instruction from the start.

AUTHORS' NOTE

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DECLARATION OF CONFLICTING INTERESTS

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

FUNDING

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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