Open Educational Resources From the Innovative Resources for Instructional Success Center

Kristin L. Sayeski, PhD[1] iD, and Bethany Hamilton-Jones, PhD[1]

Abstract

Since their launch in 2002, open educational resources (OER) developed by the Innovative Resources for Instructional Success, better known as the IRIS Center, have become a staple of teacher preparation programs. In the spring of 2019, a survey of users revealed a diversity of ways teacher educators incorporate IRIS Center OERs within their preparation programs. This article describes these innovative applications and presents a snapshot of who IRIS users are and which IRIS Center OERs are most frequently used.

Keywords

IRIS, instruction, accommodations, design, program delivery, use in teacher preparation, technology

Teacher educators are continually challenged by the demand to do more with less, cover more content, and promote skill-acquisition to higher levels of mastery and fidelity within ever constrained conditions (Brownell, Sindelar, Kiely, & Danielson, 2010). As a result of these conditions, teacher educators seek reliable, effective, and efficient methods of preparation. Researchers have consistently found that open educational resources (OER) from the Innovative Resources for Instructional Success (IRIS) Center (https://iris.peabody.vanderbilt.edu) meet the triadic need of reliability, effectiveness, and efficiency for providing preservice teachers and school-based personnel with foundational knowledge related to the delivery of special education services (Matyo-Cepero & Varvisotis, 2015; Sayeski, Hamilton-Jones, & Oh, 2015; Smith & Bryant, 2014; Test, Kemp-Inman, Diegelmann, Hitt, & Bethune, 2015). The IRIS website and its OERs are quite popular, as demonstrated by the 2.4 million users who accessed IRIS resources in 2018 alone. In 2018, 984 or 93% of colleges and universities with state-approved licensure programs in both general and special education, 100% of universities with special education doctoral programs, and 368 or 73% of teacher education programs with state-approved general education preparation programs accessed IRIS OERs (IRIS Center, 2018).

The IRIS Center was founded in 2001 through funding provided by the U.S. Department of Education's Office of Special Education Programs (OSEP). The IRIS Center website offers a variety of OERs such as (a) *STAR Legacy* modules, (b) case study units, (c) activities, (d) interviews with experts, (e) fundamental skills sheets, and (f) information briefs on topics related to improving outcomes of students with disabilities (see Table 1). In addition, teacher educators can find curriculum planning tools such as sample syllabi, wrap-around content maps, and curriculum matrices on the IRIS Center website.

In the spring of 2019, a survey of approximately 1,000 IRIS Center users revealed a variety of ways in which IRIS OERs were used for the preparation and support of teachers (IRIS Center, 2019). Of the 588 higher education faculty who responded, 78% were special education faculty. Of all the higher education faculty who responded, there was a fairly even distribution across rank (i.e., assistant = 152; associate = 159; full = 111; clinical = 81; adjunct = 72; others such as deans, graduate assistants, retired = 13). Findings from the survey demonstrated that teacher preparation faculty primarily used IRIS OERs within methods classes (45%) and introductory courses (38%), but a small percentage (11%) of faculty also used IRIS OERs within

[1]University of Georgia, Athens, GA, USA

Corresponding Author:
Kristin L. Sayeski, University of Georgia, 517 Aderhold Hall, Athens, GA 30602, USA.
Email: ksayeski@uga.edu

Table 1. Types of IRIS Open Educational Resources.

IRIS OER	Description	Specific Example
STAR Legacy modules	Follow the STAR Legacy learning cycle, which was based on Bransford's research for the *How People Learn* text (Bransford, Brown, & Cocking, 1999). The learning cycle consists of a challenge, initial thoughts, evidence-based multimedia resources and perspectives, wrap up and assessment questions (IRIS Center, 2005).	*Classroom Management (Part 1): Learning the Components of a Comprehensive Behavior Management Plan*: In this module, information about the importance of establishing a comprehensive classroom behavior-management system is presented (https://iris.peabody.vanderbilt.edu/module/beh1/)
Case study units	Target a particular topic through multiple case-based classroom examples, often including student work samples that progress in complexity. Solutions to the scenarios are provided through STAR (Strategies and Resources) sheets that detail researched strategies applicable to cases. Materials are paper-based.	*Mathematics: Identifying and Addressing Student Errors*: This case study unit briefly presents the evidence base behind analyzing errors in mathematics and includes five student examples across grade levels and mathematical skills. STAR sheets detail how to collect data, systematically analyze errors, determine patterns of error, identify reasons for errors, and address errors (https://iris.peabody.vanderbilt.edu/wp-content/uploads/pdf_case_studies/ics_matherr.pdf)
Fundamental skill sheets	Cover discrete skills and practices in an abbreviated format; include a definition of the skill, brief summary of research, steps for implementation, tips for implementation, implementation video examples (both exemplar and nonexemplar) and references and resources.	*Behavior Specific Praise*: This fundamental skill sheet provides a succinct definition of behavior-specific praise followed by procedural directions for using this technique. Tips for effective implementation of behavior-specific praise and other classroom/school considerations are outlined. Multiple examples, including two embedded videos, highlight correct and incorrect ways to deliver behavior-specific praise (https://iris.peabody.vanderbilt.edu/wp-content/uploads/misc_media/fss/pdfs/2018/fss_behaviro_specific_praise.pdf)
Activities • Case-based • Group • Independent	Supplement module and case study content by providing a variety of case-based examples, group problem-solving scenarios, and independent practice activities. Discussion questions for whole or small group debriefing are included. Estimated completion time for each activity is given.	*Mnemonic Strategies*: In this independent activity, information on how to use the keyword mnemonic strategy for supporting students' recall is provided. Participants can follow the steps provided to create a keyword mnemonic. Discussion questions are included (https://iris.peabody.vanderbilt.edu/wp-content/uploads/pdf_activities/independent/IA_Mnemonic_Strategies.pdf)
Interviews	Include a variety of nationally recognized experts from the field of special education discussing their areas of expertise. Transcripts included.	*Considerations for IEP Development*: Jim Shriner responds to questions about IEP development and use (https://iris.peabody.vanderbilt.edu/interview/considerations-for-iep-development/)

Note. IRIS = Innovative Resources for Instructional Success; OER = open educational resources; IEP = individualized education program.

applied settings such as field-placement or clinical courses as well as doctoral (2%) and other graduate courses (4%). Faculty identified the most frequently used OERs as those relating to accommodations, behavior and classroom management, response-to-intervention and multitiered systems of support, assessment, and transition. Although IRIS is well-known for its *STAR Legacy* modules, faculty reported slightly higher use of IRIS activities and case studies when compared with module use. Finally, faculty reported using a variety of methods for assessing candidate knowledge of IRIS content. The majority of faculty not only reported using IRIS-provided assessment questions but also reported (a) creating their own assessments, (b) using performance assessments, or (c) using other methods such as discussions, graphic organizers, and presentations. Given this profile of use, this article provides teacher educators with

guidelines and examples of how to select, plan for, and use IRIS OERs within a teacher preparation program.

Planning for Resource Use

Although researchers have demonstrated positive learning outcomes associated with IRIS OER use (Kuo, 2014; Montrosse, 2012; Sayeski et al., 2015), guidance from empirical research on effective instruction within higher education can be brought to bear when planning to use IRIS OERs. Specifically, findings from evidence-based principles for learning shed light on those practices that can help teacher educators yield even greater, more durable learning outcomes. Within each of the following steps, specific practices that have been shown to enhance learner outcomes are provided.

Step 1: Identify Key Concepts

Many scholars have enumerated the value of identifying and communicating priority outcomes (e.g., goals, skills) as a tool for increasing student learning (Chan, Graham-Day, Ressa, Peters, & Konrad, 2014; Marzano, 2009). Therefore, the first step in planning for IRIS OER use is to review course or program content to identify key concepts. Broad professional standards (e.g., *"Use effective and varied behavior management strategies";* see Council for Exceptional Children [CEC], 2015) can point educators in the right direction, but to drill down to the level of specificity recommended by research, specific topics such as differential reinforcement of behavior, behavior-specific praise, and structured choice need to be identified.

Within any course, there are high, medium, and low priority topics (Sayeski & Higgins, 2014). *Low-priority* content facilitates the development of background knowledge or general understanding of a concept. For special education, basic ideas such as inclusion and evidence-based practice provide the foundation for learning more detailed, nuanced content. *Medium-priority* content, therefore, builds upon foundational knowledge and requires a greater level of specificity (e.g., name specific, evidence-based behavior-management practices). Finally, *high-priority* content reflects the knowledge and skills that are important for students to learn at a high degree of accuracy.

The IRIS Center OERs can be used across the continuum of priority. They can be used to build background knowledge necessary to facilitate an in-class discussion or respond to an online post. They can also be used to develop student facility with concepts. Familiarity with terminology, available resources, or key concepts in special education, for example, help to increase student professionalism. Likewise, IRIS OERs can be used for teaching knowledge and skills (i.e., the skills needed to plan and deliver effective instruction for students with disabilities). To do so, careful attention to the manner in which students engage with the material will increase the likelihood that robust learning will occur.

Step 2: Select an Appropriate Resource

The IRIS Center offers a variety of OERs that range from brief, informational interviews or fact sheets to self-contained, instructional modules (i.e., STAR Legacy modules) and application activities such as case studies and in-class activities. Many of the materials lend themselves to integrated use. For example, students can review a *fundamental skill* sheet on choice-making and then complete a case study in which the use of choice-making is applied. The website's search feature facilitates the identification of complementary materials. To review and select IRIS OER content, teacher educators can use the IRIS Resource Locator (https://iris.peabody.vanderbilt.edu/resources/iris-resource-locator/;

see Figure 1). All materials are sorted by topic (e.g., assessment, differentiated instruction, learning strategies, mathematics). Once a topic is selected, a description of available OERs is presented. Users consistently identify ease of navigation as a strength of the IRIS website (Montrosse, 2012).

Step 3: Design the Lesson

Many different evidence-based techniques can be drawn up when planning for the incorporation of IRIS OERs. Although numerous practices could be applied, for the purpose of this article, the following practices are highlighted: (a) active learning, (b) distributed practice, and (c) integrated assessment. The sample lesson plan presented in the final section of this article reflects these practices.

Active learning. Active learning requires students to engage in the learning process (Weiman, 2014). In contrast, under passive learning conditions, students have the option of engaging with content (e.g., thinking about lecture content, writing reflective notes while watching a film), but the delivery of content (i.e., lecture, film) does not require engagement. Under *active learning* conditions, the learning circumstances compel students to think, perform, or affectively engage (i.e., associate feelings) with the content (Ismail & Groccia, 2018). Engagement with the material promotes recall, a necessary condition for the retention of content (Pyc & Rawson, 2010). Thus, the more students recall, reflect, elaborate, perform, and respond to content, the more likely they are to gain knowledge and/or skills.

Commonly used forms of active learning in higher education include (a) questioning techniques (e.g., quizzes, online games like Kahoot!, think-pair-share, Socratic methods, reflective journals), (b) direct practice (e.g., role-playing, jigsaw, presentation, peer-teaching), and (c) applied problem-solving (e.g., case studies, application activities, project-based learning; Barkley, 2009; Ismail & Groccia, 2018). Although IRIS *STAR Legacy* modules have elements of active engagement such as embedded questions and interactive games, and other IRIS OERs are specifically designed for active engagement (e.g., case studies, application activities), instructors can further enhance learning outcomes by designing lessons that include both IRIS-developed and instructor-created active-learning elements. Instructors can mix and match these active-learning elements when designing IRIS OER-based instruction (see Figure 2).

Distributed practice. Distributed practice refers to repeated, spaced engagement with material over a specified period of time (Dunlosky, Rawson, Marsh, Nathan, & Willingham, 2013). The term *practice* can refer to physically engaging in a particular skill (i.e., practicing the piano or free-throws) or participating in activities more commonly associated with
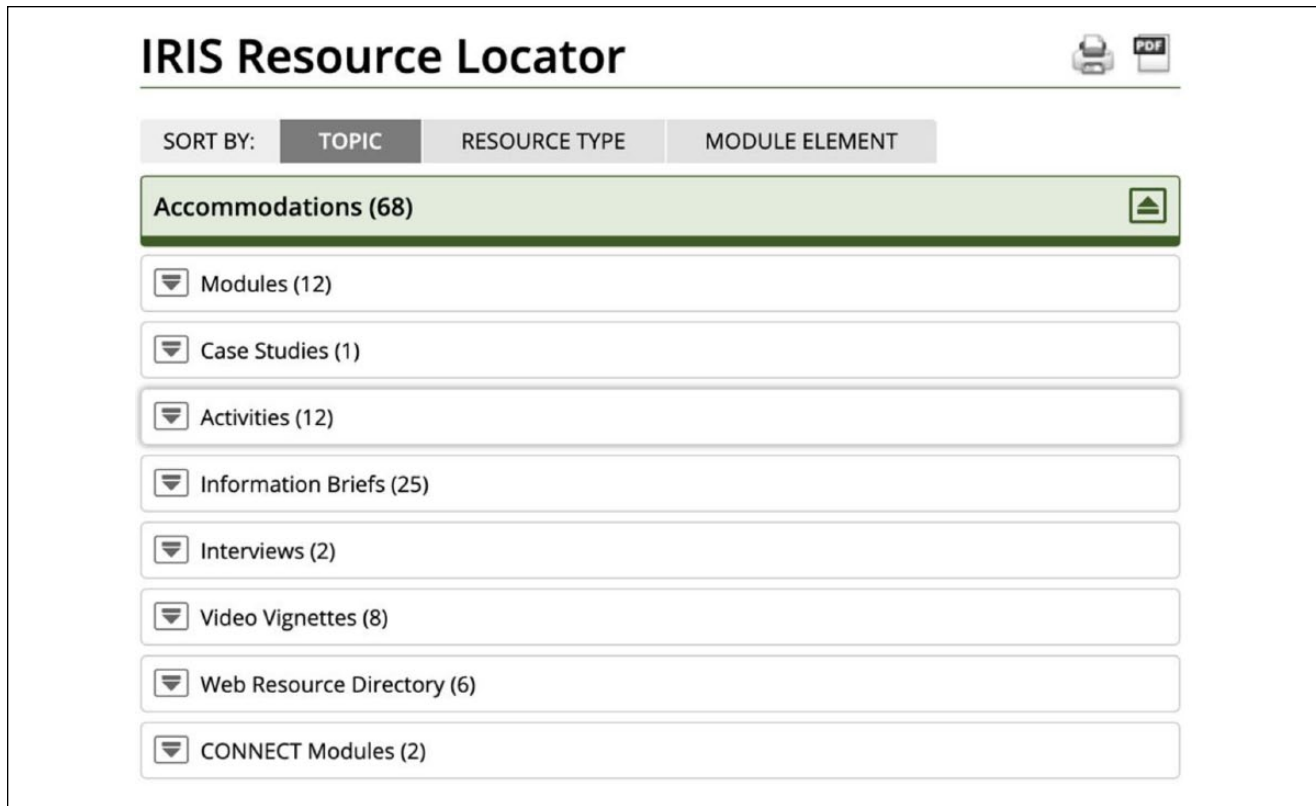
IRIS Resource Locator

| SORT BY: | **TOPIC** | RESOURCE TYPE | MODULE ELEMENT |

Accommodations (68)

Modules (12)

Case Studies (1)

Activities (12)

Information Briefs (25)

Interviews (2)

Video Vignettes (8)

Web Resource Directory (6)

CONNECT Modules (2)

Figure 1. IRIS resource locator (image used by permission).
Note. IRIS = Innovative Resources for Instructional Success.

academic learning (e.g., solving mathematics problems, answering questions, flashcard drills). Regardless of whether a skill is physical, cognitive, or both, researchers have consistently found that the distribution of learning across days, weeks, or months results in stronger learning outcomes than massed exposure even when massed exposure (e.g., one session of 40 min of studying) is longer in duration than total amount of distributed sessions (e.g., three 10-min sessions distributed over 5 days; Cepeda, Pashler, Vul, Wixted, & Rohrer, 2006; Gerbier & Toppino, 2015). In other words, distributing engagement over time typically results in greater learning (Cepeda et al., 2006) with fewer learning trials (i.e., less time). More importantly, distributed practice results in stronger retention of learning (Dunlosky et al., 2013; Pashler et al., 2007). Given the efficiency of distributed practice and its capacity to enhance long-term retention, instructors should plan for repeated exposure to IRIS-related content. As noted previously, the grouping of IRIS OERs by topic facilitates the selection of activities that can be distributed over time. For example, assigning a *STAR Legacy* module for homework, providing a case study activity during class, and quizzing students on the content over subsequent class sessions is one way an instructor can plan for distributed practice when using IRIS OERs.
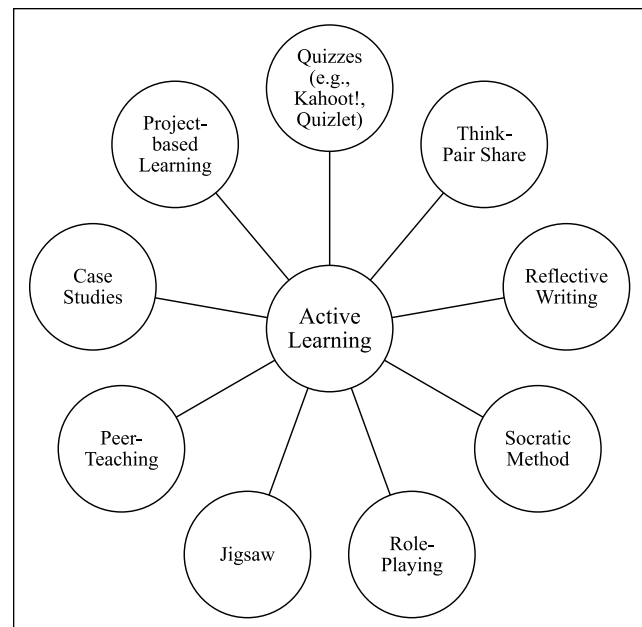

Figure 2. Active learning techniques.

Integrated assessment. A strong relationship between testing and learning exists (Roediger, Putnam, & Smith, 2011).

Table 2. Accommodations Lesson Plan.

Instructional Activity	Description
Homework: *STAR Legacy* module	• Assign students the accommodations module for homework. ○ Accommodations: Instructional and Testing Supports for Students With Disabilities (https://iris.peabody.vanderbilt.edu/module/acc/) • Require students to submit responses to the questions provided on the Assessment section of the module prior to the next class meeting.

In-class student engagement	• Partner Activity: Accommodations vs. Modifications
	  ○ Provide students with the *Accommodations vs. Modifications* handout (https://iris.peabody.vanderbilt.edu/wp-content/uploads/pdf_activities/independent/IA_Accommodations_versus_Modifications.pdf)
	  ○ Allow students time to read the 1.5 page overview.
	  ○ Have students work in pairs to determine if the examples provided are accommodations or modifications.
	• Debrief
	  ○ What is the difference between an accommodation and a modification?
	  ○ Why does this matter?
	  ○ Review and discuss student responses to the activity.
	• Group Work: *Making Presentation, Response, Setting, and Timing & Scheduling Accommodations* (e.g., https://iris.peabody.vanderbilt.edu/wp-content/uploads/pdf_activities/independent/IA_Presentation_Accommodations.pdf)
	  ○ Divide students into small groups (3–5 students to a group).
	  ○ Assign each group to complete one of the four activities (i.e., presentation, response, setting, or timing & scheduling). For this activity, students will review the cover page instructions and then select Option 2 on page 1: "If you are not currently teaching, use the student in the scenario below to complete this activity." In their small groups, students will then complete the two tasks—an accommodations worksheet and the applied activity (i.e., select one accommodation and provide an example of how you would implement the accommodation)
	  ○ Using a jigsaw format, have groups present their work to the whole class.
	• Exit Ticket
	  ○ Provide students with the following exit ticket prompt: A student has a learning disability and is unable to decode grade-level material. Identify two PRESENTATION accommodations a teacher could provide to accommodate the student's lack of reading ability.

Distributed practice	• To ensure students' retention of the content, provide opportunities for recall on a distributed schedule. For example, begin the next class session with a brief review that includes a few questions related to the content or include an application question within a written weekly quiz.
	Sample questions
	• Accommodations reflect which type of change?
	  a. A change in expectations of student learning
	  b. A change to how students' access learning
	  c. A change to what students are learning
	  d. A reduction in requirements of student learning
	• Presentation accommodations refer to accommodations that
	  a. Allow students to present what they know in a variety of ways
	  b. Allow students to access information in ways other than the standard or typical way in which other students receive information
	  c. Allow students to give oral presentations rather than written presentations
	  d. Allow flexibility in terms of when or how long a student has to complete assignments or assessments
	• Read each scenario. First, decide if the adaptation described is an accommodation or a modification. Then, if it is an accommodation, determine what type (presentation, response, setting, timing, and scheduling) of adaptation it is.
	  a. A student has an emotional behavioral disorder, which results in frequent outbursts due to frustration. To help reduce the student's frustration, the student is allowed frequent breaks during work time.
	  b. A student has a learning disability, which makes it difficult for the student to organize thoughts and write long responses. The student is allowed to write two to three sentences rather than two paragraphs for journal work.
	  c. A student has Duchenne muscular dystrophy, which makes holding a pencil difficult. During handwriting instruction, the student works with a specialist on learning to use speech-to-text software.

Summative assessment and evaluation	• As a summative assessment, have students complete a graphic organizer in which they list as many accommodations as they can for each type (presentation, response, setting, scheduling, and timing) as they can. • Provide students with a brief, self-report evaluation regarding their perceptions of the instructional activities.

Specifically, the *testing effect*, the finding that learning and memory are aided by the retrieval of content from memory, is a well-established principle of learning (Pyc & Rawson, 2010; Roediger et al., 2011). Although assessment (i.e., testing) involves elements of active learning (i.e., recall of content) and distributed practice (i.e., spacing between initial

presentation and delayed recall), the utility of assessment goes beyond these elements. Specifically, in addition to aiding retention, engaging in assessment helps students (a) identify gaps in learning, (b) enhance how information is organized within memory, (c) transfer learned material to novel conditions, and (d) retrieve nontested material. In addition, assessment data can provide important feedback for instructors (Roediger et al., 2011).

Educators frequently differentiate between formative and summative assessment. Formative assessment occurs before or during the learning process for the explicit purpose of informing the delivery of future instruction to improve performance. Summative assessment occurs after the learning process and is used as a gauge of overall achievement. Under both formative and summative conditions, students can benefit from being tested (Wininger, 2005). In addition to student gains, integrating assessment within the delivery of IRIS OERs can provide teacher educators with valuable information. Teachers often overestimate what their students know (Roediger et al., 2011); however, assessment of students can provide direct feedback on student learning, which can be used to inform future instruction. Given the benefits of frequent assessment, teacher educators should make use of assessment tools embedded within IRIS OERs. In addition, as found in the 2019 survey of IRIS users, many educators create their own assessments (e.g., concept maps, performance assessments, quizzes) to complement existing IRIS-provided assessments.

Step 4: Implement and Evaluate Engagement

The final step in planning to use IRIS OERs includes implementation and evaluation of student engagement with the materials. Although engagement can be narrowly defined as time on task (Brophy, 1983), broader conceptualizations of engagement include measuring students' cognitive, behavioral, and affective engagement (Chapman, 2003). To assess student engagement with materials, instructors can use self-reports. For example, after engaging with an IRIS OER, students can respond to prompts such as (a) rate the mental effort expended on this task (i.e., very low, low, moderate, high, very high); (b) rate the value you believe this task has to your future work as an educator (i.e., no value, low value, moderate value, high value, very high value); (c) rate your overall engagement with the material during the activity (i.e., very low, low, moderate, high, very high); and (d) rate the overall quality of the materials provided (i.e., poor, fair, good, very good, excellent).

Applications for Teacher Preparation

In this section, a comprehensive lesson plan that includes each element of the four-step process and a variety of IRIS OERs are provided (Table 2). Under the topic of

accommodations, there are 68 IRIS OERs available (e.g., 12 STAR Legacy modules, one Case Study Unit, 12 Activities; see Figure 2). The sample lesson provided in Table 2 includes the use of a module and several different activities. As the delivery of appropriate accommodations is an integral aspect of providing appropriate supports for students with disabilities (IDEA, 2004), the topic of instructional and testing accommodations can be found in the majority of general and special education introductory textbooks (Campbell & Collins, 2007; for example, Hallahan, Kauffman, & Pullen, 2019; McLeskey, Rosenberg, & Westling, 2013; Smith, Tyler, & Skow, 2018). Given its relevance for general and special educators, teacher educators can use a collection of accommodation-related IRIS OERs to build student understanding of this important concept.

Conclusion

A majority of special education teacher preparation programs include IRIS OERs within their courses (IRIS Center, 2018; Smith, Lewis, Montrosse, & Brown, 2015). Researchers have found gains in student learning as a result of IRIS OER use (e.g., Sayeski et al., 2015). Gains in learning can be attributed to the quality of the content (e.g., reliable presentation of content, high-quality user interface; Matyo-Cepero & Varvisotis, 2015; Test et al., 2015), but gains in learning can also be attributed to the fact that IRIS OERs reflect evidence-based principles for learning such as active learning, distributed practice, and assessment. Teacher educators can enhance their use of IRIS OERs by being attendant to these features, selecting related IRIS OERs that reflect a variety of these evidence-based principles for learning, and creating their own enhancements that reflect these principles.

ORCID iD

Kristin L. Sayeski ![ORCID iD] https://orcid.org/0000-0002-0259-0644

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