

# Strategically Inclusive E-Learning Design

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## OVERVIEW

Modeling strategic flexibility and experiential learning approaches, this module focuses on foundational concepts for designing accessible educational materials and applying Universal Design for Learning (UDL) guidelines. The module was implemented during two weeks of a 16-week asynchronous online graduate course on e-learning pedagogy and design. Content is represented in varied forms, including video presentations and readings. A structured discussion offers asynchronous and synchronous options and utilizes a five-step scaffold to consider UDL-related prompts applied to provided lesson scenarios. Students complete a hands-on activity to better understand accessible document design.

Topics: Diverse Online Learner Needs, Inclusive E-Learning Design Practices, Universal Design for Learning, Web Content Accessibility Considerations

Time: 2 weeks asynchronous with one-hour synchronous session option

## MATERIALS

- [Student Handout](#)
- [“Designing Strategically for Diverse Learning”](#) video (21:41; Gronseth, 2022)
- [“How to Make Online Teaching Accessible and Inclusive”](#) video (1:18:09; Gronseth, 2020)
- [UDL Guidelines](#) (Center for Applied Special Technology [CAST], 2018)
- [AEM Center](#) (CAST, n.d.a)
- [Creating Accessible Documents](#) (CAST, n.d.c).
- [Designing for Accessibility with POUR](#) (CAST, n.d.d)
- [“Inclusive Design for Online and Blended Courses: Connecting Web Content Accessibility Guidelines and Universal Design for Learning”](#) (Gronseth, 2018)
- [“Accessibility in Online Courses”](#) (Baldwin & Ching, 2021)

## CONTEXT-AT-A-GLANCE

### Setting

A module within an e-learning pedagogy and design graduate course at a large, public institute of higher education in the southwestern United States.

### Modality

Primarily asynchronous online with an optional synchronous meeting.

### Class Structure

The module is part of a 16-week, 3-credit hour graduate-level course for educators in master’s and doctoral programs in Curriculum and Instruction. Course components are organized via the LMS and are largely hands-on and interactive.

### Organizational Norms

Instructional presentations are linked with activities, discussions, quizzes, and assignments. The course structure facilitates the application of course concepts in students’ professional lives.

### Learner Characteristics

In Spring 2022, the course enrolled 28 adult learners who were PK-12 teachers, entry-level instructional designers, and full-time graduate students.

### Instructor Characteristics

The course instructor has a Ph.D. in instructional systems technology and 15+ years of experience in online course design and teaching.

### Development Rationale

The module introduces instructional design techniques and e-learning course development skills, relating to flexibility and accessibility, alongside strategies for inclusive online teaching and learning.

### Design Framework

Universal Design for Learning (UDL); POUR Principles of Accessibility

## SETUP

Setup for this module can be completed within an hour. First, the instructor posts the course materials in the LMS and enables student view access (see Learning Representation section for materials setup). The discussion activity can be completed in synchronous and asynchronous formats. For the synchronous session, a Microsoft Teams session (or similar platform with breakout room/small group capability) will need to be created, and the join information provided to students. In the synchronous session, breakout room/small group functionality will be needed. The “Applying UDL” Discussion (pp. 4-9 in the Student Handout) should be uploaded to a cloud storage (e.g., Office 365 or Google Drive) with a link for editing access/downloading enabled and shared with the students. For the asynchronous format of the discussion, a forum will need to be created on the LMS discussion board. Finally, an assignment submission entry will need to be created for students to submit their completed activity.

## STANDARDS

The module addresses benchmarks 2.5.a and 2.5.c under the Designer Standard of the International Society for Technology in Education (ISTE, 2017) Standards for Educators.

## CONTEXT AND SETTING

This lesson was designed as the second of five modules in a three-credit-hour graduate course entitled “E-Learning Pedagogy and Design.” This new course was created in response to students’ increased interest in online teaching and learning skills and competencies, accelerated partly due to the broad emergency remote teaching implementations during the COVID-19 pandemic. The course focuses on applying instructional design processes to developing online educational materials and enacting research-supported best practices for virtual teaching.

## LEARNER CHARACTERISTICS

In Spring 2022, the course was developed and taught at a large, public research-intensive university in the

southwestern United States. The university is a recognized Hispanic Serving Institution (HSI) and an Asian American and Native American Pacific Islander Serving Institution (AANAPISI) and enrolls a diverse student body. Most of enrolled students (86%) were in the Curriculum and Instruction with Learning, Design, and Technology (LDT) specialization master’s degree program; the remainder were LDT graduate certificate or Ph.D. students. Typically, students in these programs work full-time in educational settings and enroll in two graduate courses each semester.

## INSTRUCTOR CHARACTERISTICS

The instructor was the course designer. She has 15+ years of experience in online course design and teaching, 11 years at the current University. In addition, the instructor has had previous related experiences in varied other educational contexts, including PK-12, community college, and corporate training e-learning development, that she draws from when connecting course concepts to different instructional settings. The instructor also serves as the coordinator for the master’s and graduate certificate programs within which this course was offered. Through this role, she has a broad understanding of the programs’ curricula and how new content additions could align with areas of growth and student interest. The instructor’s prior experiences in accessibility and UDL included special education teaching certifications (K-12), leadership roles for related professional organizations’ special interest groups in UDL and special education technology, and as a speaker and author on these topics.

## COURSE DESCRIPTION

Beginning with a systems perspective of online education (Tamim, 2020), the course topics span *macro*, *meso*, and *micro* levels of online education systems. Major theoretical frameworks are introduced at the macro level that ground approaches to designing and teaching online. At the meso level, current empirical research is explored to identify tools and strategies for implementing the theoretically-based recommendations. At the micro level, practical teaching and course design guidelines are offered. As such, the course content aims to equip individuals with best practices for designing

innovative and impactful e-learning experiences in varied contexts (e.g., K-12, college, professional development, training, MOOCs, etc.). Upon completion of the course, students should be able to make more adequate decisions about structuring online courses effectively, attending to diverse learner needs proactively, supporting student and instructor wellbeing, engaging learners actively and collaboratively, utilizing open educational resources, and incorporating data points for assessment and evaluation.

The course modules are:

1. A Systems View of Online Education
2. Strategically Inclusive E-Learning Design
3. Strategies for E-Learner Engagement
4. Design and Curation of E-Learning Materials
5. E-Learning Assessment and Evaluation

## DELIVERY FORMAT

The course was offered in an asynchronous online format as defined by the Texas Higher Education Coordinating Board wherein students and the instructor are not in the same physical setting for the majority (more than 50 percent) of instruction (19 Tex. Admin. Code § 4.257, 2010/2015). In addition, the instructor incorporated course components that align with the U.S. Department of Education’s “regular and substantive course interaction” requirements, which specify that three-credit hour online courses contain about an hour or more of interactive activities with the instructor each week (34 Institutional Eligibility, 1994/2020, Distance Education section, bullet 1). Such activities included synchronous session opportunities, forum discussions, assignments, and instructor-created quizzes with built-in feedback.

Course delivery included the university-supported LMS, Blackboard, to post assignment details and announcements with some integration of Microsoft Teams for collaborative learning opportunities. The presentation of course material generally followed a study-discussion-action format. Readings discussed e-learning design and teaching concepts in varied instructional contexts, including PK-12, higher education, and corporate training. Access to readings was available online through the Blackboard LMS, and no textbook purchase was required.

## DEVELOPMENT RATIONALE

Students are guided to pose questions, seek clarification and expand upon information, and contribute to the overall class atmosphere. Student-initiated exploration and sharing of related resources are also encouraged for the mutual benefit of the class community. Presentations of material, readings, and other related resources are linked with activities, discussions, quizzes, and assignments.

This course structure is designed to facilitate the learning and mastery of material, techniques, and their applications in students’ professional lives. Course components are largely hands-on and interactive; some activities are to be completed individually, and others are done collaboratively. Instructions and grading information are provided in the module materials.

The second module, “Strategically Inclusive E-Learning Design,” is the focus of this lesson and contains two graded components (“Applying UDL” discussion, pp. 4-9, and “Accessibility Checks” activity, p. 10, in the Student Handout) that will be further described in the Learning Representation section. Out of 200 total possible points in the course, the “Applying UDL” discussion was designated 15 points, and the “Accessibility Checks” activity was 10 points; together, these constituted 25 points (12.5%) of the course grade. Accessibility and UDL-related concepts and skills were also incorporated into more cumulative course components later in the course, including, as part of quiz items, a video-based scavenger hunt activity, an open educational resource selection and creation assignment, and a case study investigation.

## DESIGN FRAMEWORK

UDL and the POUR principles of accessibility (perceivable, operable, understandable, and robust; CAST, n.d.d) serve as the cornerstone of the module design. The module aims to not only teach the concepts and skills related to these topics but also model them. UDL is a curriculum design framework that recognizes learner neurodiversity and prompts educators to address potential learning barriers through accessible design and supportive learning options (Meyer et al., 2014). UDL consists of three principles – providing multiple means of 1) engagement, 2) representation, and 3) action and

expression (CAST, n.d.b). Each principle has three guidelines at designated levels of access, build, and internalize (see Steps 3-5 in the Student Handout). The alignment between UDL and accessibility can largely be seen at the access level of the framework, which includes checkpoints such as:

- “Optimize individual choice and autonomy” (CAST, 2018, Recruiting Interest section, 7.1).
- “Offer alternatives for auditory information” (CAST, 2018, Perception section, 1.2) and “visual information” (CAST, 2018, Perception section, 1.3).
- “Vary the methods for response and navigation” (CAST, 2018, Physical Action section, 4.1).
- “Optimize access to tools and assistive technologies” (CAST, 2018, Physical Action section, 4.2).

Online learning technologies can support UDL-grounded design by serving as a conduit for planning instructional experiences that attend to diverse learning needs and expand characteristics of flexibility, accessibility, and connectedness in the learning design (Gronseth & Bauder, 2022). Applying UDL into course design, for example, can involve providing varied ways of communicating the content, such as through voice, text, video, concept maps, and other visuals. Varied practice opportunities and assessments can also be used, such as case discussions, games, and projects that connect learners to authentic data sources and experts in the field. Students are supported in being able to demonstrate what they are learning meaningfully and in ways that exude their unique talents, experiences, and personalities. Options and scaffolds are provided to equip learners to take ownership of their learning, self-regulate, and develop leadership skills in the classroom community and beyond.

UDL and POUR informed the teaching of the module in multiple aspects, such as the following:

- Multimodal learning materials grounded each week’s instruction, which aligns with UDL checkpoint 3.1, “activate or supply background knowledge,” (CAST, 2018, Comprehension section) within the principle of providing multiple means of representation. The videos and readings target requisite foundational knowledge that learners will then be able to build upon in the discussion and activity that follow.
- Connected to UDL checkpoint 5.1, “use multiple media for communication,” (CAST, 2018,

Expression & Communication section), the discussion design supports learner preferences for synchronous and asynchronous formats. It uses different communication media and interactive web tools, including whole group and breakout real-time voice conversations, threaded discussion board forum postings, and collaborative and individual writing using a scaffold discussion guide.

- To support the POUR principle, Perceivable (CAST, n.d.d), transcripts and captions accompany module videos. The POUR principle, Understandable, (CAST, n.d.d) is facilitated through attention to the consistency and clarity of module instructions.

## LEARNING REPRESENTATION

### MODULE OVERVIEW

Strategically inclusive e-learning design involves first recognition by the designer of the diversity of needs, experiences, interests, strengths, prior knowledge, skills, and backgrounds that learners bring to a learning experience. Second, this recognition of learner diversity is then used to inform the planning and implementation of the instruction. In this way, the instructional design and teaching aim to support learners individually while also making personalization possible at scale. Attending to learner diversity as an integral part of the design process is about incorporating flexibility and accessibility from the beginning of instructional planning to mitigate potential barriers to learning and to elevate the unique contributions of all learners to a learning experience. The curriculum design framework of UDL is examined to identify ways to plan more inclusive e-learning. Through this, accessibility is centered as the foundation of inclusive e-learning design. It assumes that if students cannot access the learning materials, they will be limited in their ability to engage, persist, and ultimately meet their learning goals.

A suggested module schedule for this two-week lesson is as follows:

#### **Week 1 – Designing for Diverse Online Learners**

- [“Designing Strategically for Diverse Learning”](#) video (Gronseth, 2022).

- [“Inclusive Design for Online and Blended Courses”](#) reading (Gronseth, 2018).
- “Applying UDL” discussion (pp. 4-9 in the Student Handout).

### Week 2 – Accessible Educational Materials

- [“How to Make Online Teaching Accessible and Inclusive”](#) video (Gronseth, 2020).
- [“Accessibility in Online Courses”](#) reading (Baldwin & Ching, 2021).
- “Accessibility Checks” activity (p. 10 in the Student Handout).

## OBJECTIVES

By the end of this module, learners will be able to:

1. Discuss how designers can attend to diverse online learner needs.
2. Identify components of the Universal Design for Learning framework.
3. Connect UDL guidelines to Web Content Accessibility Guidelines (WCAG).
4. Describe accessible educational material.
5. Describe inclusive e-learning design practices that support learner self-regulation, cognition, and engagement.
6. Identify two reasons why online course designers and teachers should incorporate accessibility practices.
7. Apply techniques for addressing accessibility issues in Microsoft Word/Google Docs.

## INTRODUCTORY VIDEOS

The presentation [Designing Strategically for Diverse Learning](#) (21:41; Gronseth, 2022) highlights the main components of the UDL framework and explains how UDL can be used to inform strategic instructional design that attends to diverse learner needs. As part of this video, learners are encouraged to look closely at the UDL Guidelines from CAST (2018).

[“How to Make Online Teaching Accessible and Inclusive”](#) video (1:18:09; Gronseth, 2020) illustrates applications of accessibility practices and UDL. The presentation describes how to recognize access barriers, offers practical steps for designing accessible online course materials, and recommends

ideas for how to enact inclusive strategies. There is a Q&A portion at its conclusion.

## READINGS

Learners are provided with two readings that discuss UDL and accessibility considerations in online course design (Baldwin & Ching, 2021; Gronseth, 2018). The readings explain how inclusive design for online and blended courses connects the WCAG and UDL framework to address learner variability as an intentional part of course design. Inclusive design fosters expanded options in how learners access learning materials, engage in learning experiences, and demonstrate the knowledge and skills they have learned. Practical applications of WCAG and UDL for the design and facilitation of inclusive online and blended courses in the post-secondary setting are offered in Gronseth (2018). Baldwin and Ching (2021) synthesize best practices for WCAG, alongside a discussion of UDL considerations, to strategically design online learning experiences that increase learning, engagement, and equity. Practical ways that educators can get started in implementing accessibility guidelines into online course design are highlighted. A useful “Online Course Accessibility Checklist” is included in the Baldwin and Ching article as well.

## “APPLYING UDL” DISCUSSION

The “Applying UDL” discussion (pp. 4-9 in the Student Handout) is designed to scaffold student conversation around connections between the UDL framework and an example instructional scenario. Two scenario options were used in the implementation of this lesson. One scenario was situated within a sixth-grade math lesson context (pp. 4-6), and the other was in an industrial training setting (pp. 7-9).

Brief descriptions of these scenarios are as follows:

- *Sixth-grade math lesson scenario* – At Middle School X, the sixth-grade math department is lesson planning for next week to teach triangles in an online format and wants to improve the lesson created last year by applying UDL practices.
- *Industry scenario* – “Safety #1” is a multinational company that offers building and grounds maintenance services for US University facilities.

After restructuring the human resources department, the new director of professional development found an alarming and growing number of errors reported during “Hot Work” (which involves any riveting, welding, flame cutting, or other fire or spark-producing operations). The investigation shows that such errors lie in competency gaps in personnel; therefore, the professional development director decided to hire your team as learning design consultants to review the current training program, identify improvements, and transform it into an effective tool for competency development.

Handouts for each scenario (pp. 4-9 in the Student Handout) provide students with scenario details and prompt them to review and discuss. The handouts were inspired by a step-by-step UDL lesson design planner (Posey, n.d.). Following the scenario description and instructional materials, notetaking areas are provided in a five-step organization:

1. Discuss the key outcomes.
2. Consider differing learner needs.
3. Ensure access/accessibility.
4. Build learner expertise.
5. Optimize internalization.

The steps start with consideration of lesson goals and the diversity of anticipated learner needs. Then, students consider applications of UDL at each level of the framework, beginning with the Access level (Step 3), then the Build level (Step 4), and finally, the Internalize level (Step 5). Each step contains questions for initiating or deepening the discussion.

The steps and associated discussion prompts are as follows (also found on pp. 4-9 in the Student Handout):

1. Discuss the key outcomes:
  - What are the main goals of this instruction/training?
  - What aspects of these goals are required for all learners?
  - What aspects of these goals can potentially vary in options for practice/demonstration of understanding/skill?
2. Consider differing learner needs:
  - Describe the target learners for this instruction/training.

- In what ways might this group of learners differ?
  - Are there any potential barriers that learners in this group may encounter that could inhibit their success in this instruction/training?
3. Ensure access/accessibility:
    - Engagement: In what ways can learner choice, autonomy, connection to the target content, and safety be incorporated into the design of the planned instruction/ training?
    - Representation: What accessibility considerations should be incorporated into the development of the materials? In what ways could the content be communicated through varied means or enable learners to customize its display?
    - Action & Expression: What aspects of the instruction/training will involve physical action? How can varied methods of response and navigation be supported as part of the design of the instructional activities?
  4. Build learner expertise:
    - Engagement: In what ways could the instruction/training support the sustaining of student effort and persistence (such as connecting the target content to their interests/goals, providing appropriate challenge/difficulty, social learning, formative feedback, etc.)?
    - Representation: How could language be planned for and supported in the instruction/training (such as specific vocabulary/notations/symbols, English proficiency, varied means of representation, etc.)?
    - Action & Expression: In what ways might assessment (formative, summative) be varied through the use of different media, formats, scaffolding, tools, etc.?
  5. Optimize internalization.
    - Engagement: In what ways could the instruction/training support learner empowerment, motivation, positive classroom climate, self-assessment/self-reflection, and self-direction?
    - Representation: How could the instruction/training connect target content with learner background knowledge/prior experience? How could information processing be supported in the design (e.g., identifying

patterns/relationships, visualization, manipulations, multi-sensory, training transfer/generalization, etc.)?

- In what ways could the instruction/training support learner goal-setting and self-monitoring of their learning?

## DISCUSSION FORMAT OPTIONS

For the discussion, students have the option of choosing to attend a scheduled one-hour synchronous session or to participate asynchronously.

### SYNCHRONOUS SESSION

The synchronous session option is about one hour in length. An overview of the agenda is as follows:

- Welcome (5 min.)
- Explanation of discussion activity (10 min.)
- Breakout groups (30 min.)
  - Scenario discussion (25 min.)
  - Three key takeaways (5 min.)
- Whole group share-out (10 min.)
- Questions and closing remarks (5 min.)

After a brief welcome to the session, the discussion activity is explained. Students are then divided into breakout discussion groups, with about 4-6 students in each group. One student in each group is asked to serve as a group facilitator, and other group members can take on the roles of notetaker, reporter, timekeeper, and idea contributor. Each group is provided an editable access link to one of the scenarios to take note on the handout (pp. 4-9 in the Student Handout). Upon joining their breakouts, they record their names and roles in the spaces provided at the top of the handout.

The extent to which students can delve into each of the five steps can be varied, as needed to meet student needs and time availability. In the implementation of this module, students were provided 25 minutes in the breakout portion in which they were instructed to complete Steps 1 and 2 as a group and then to discuss one or more prompts within Steps 3, 4, and 5 for the remaining time. Instructors can circulate within the breakout groups during this time, as well as check in on groups via their cloud-stored notetaking sheets.

Before closing the breakout rooms, groups are provided five minutes to identify three key takeaways. Students are then brought back to the whole group for a share-out portion of about 10 minutes. Each group is provided a few minutes to report highlights from their breakout time conversation as articulated through their key takeaways. The synchronous session is wrapped up with time for questions and final remarks from the instructor.

### ASYNCHRONOUS FORUM

In the asynchronous format, students consider one of the provided scenarios, complete an initial posting to the associated Discussion Board forum in the LMS (in this case, Blackboard), and then complete at least two reply postings as follow-up to others. In the individual, initial post, students are asked to summarize their thoughts (about the length of a paragraph) relating to Steps 1 and 2 and describe two ideas in relation to any of the areas within Steps 3, 4, and 5. In the two reply postings, the students are encouraged to extend, compare, contrast, or offer resources related to the presented ideas of their classmates. The asynchronous discussion is open and active throughout the first week of the module.

## DISCUSSION RUBRIC

A rubric is used to score student participation in the selected discussion format, based on 15 points as follows:

- 15 points:
  - Option A: Synchronous – Fully participated in the scenario breakout activity.
  - Option B: Asynchronous – Fully completed three postings (one initial and two replies) relating to the scenario activity.
- 8 points:
  - Option A: Synchronous – Partially participated in the scenario breakout activity.
  - Option B: Asynchronous – Partially completed the expected three postings relating to the scenario activity.
- 0 points:
  - Did not participate in either discussion format option.

## “ACCESSIBILITY CHECKS” ACTIVITY

The National Center on Accessible Educational Materials (AEM; CAST, n.d.a) is a resource for expertise on creating and using accessible educational materials and technologies that support learners with varied disabilities. The AEM Center is also now part of CAST (n.d.a), the organization for the UDL guidelines. In the “Accessibility Checks” activity (p. 10 in the Student Handout), students become familiar with the AEM Center, learn about how to check online learning materials for common accessibility considerations, and practice applying some accessibility techniques on a digital document.

The activity is designed to be exploratory and estimated at one to two hours of work on p. 10 in the Student Handout. First, students are guided to visit the AEM Center website (Activity Instructions bullet 1). They are asked to then use the information from the website to define what it means for educational materials to be “accessible.” They then articulate two reasons why online course designers and teachers should incorporate accessibility practices into their courses.

In the second part of the activity, students navigate to the “[Designing for Accessibility with POUR](#)” (CAST, n.d.d) website. The POUR acronym synthesizes WCAG into four concise principles of consideration for the design of accessible educational content. Students can explore instructional videos, guides to creating various types of educational materials, and how-tos for each of the four POUR principles. Students are tasked to identify three takeaways that they would like to remember from this portion of their exploration (Student Handout, Activity Instructions bullet 2).

Finally, students are instructed to visit the “[Creating Accessible Documents](#)” website (CAST, n.d.c). Students are to read through the page, explore the video playlist (para. 2), and check out the AEM Center resource “[Getting Started with Document Accessibility](#)” (National Center on AEM, 2020). Students then apply techniques for adding alternative text for images, improving the heading structure, and making links descriptive to the AEM Center’s Microsoft Word or Google Docs practice documents (Try it Yourself section, CAST, n.d.c). Students self-check their work using a corresponding exemplar document from the AEM Center (see “after’ versions” in Try it Yourself section, CAST, n.d.c) or running their

practice document through an accessibility checker (such as the one built-in to Microsoft Office or the Grackle add-on for Google Suite). As a final question on their activity handout, students are asked to reflect on their exploration of the pages on the AEM Center website (CAST, n.d.a, n.d.c, n.d.d) and practice applying accessibility techniques to documents and then write about what they specifically will commit to doing as a creator of online learning materials now and in the future to ensure that they are proactively supporting accessibility (bullet 5 in the Student Handout).

## ACTIVITY RUBRIC

After students work through the three items of the activity, they submit page 10 of the Student Handout containing their responses. Note that the AEM Center’s Microsoft Word or Google Docs practice documents they made more accessible are not requested as part of this submission. Due to its exploratory approach, the activity is graded with a completion criterion, based on 10 points as follows:

- 10 points:
  - Activity fully completed. Responses demonstrate exploration and application of focal ideas.
- 5 points:
  - Activity partially completed. Responses somewhat demonstrate exploration and application of focal ideas.
- 0 points:
  - Activity was not completed.

## CRITICAL REFLECTION

## LESSONS LEARNED

The module was taught in Spring 2022 as part of the larger e-learning pedagogy and design graduate course. The course enrolled 28 adult learners who were PK-12 teachers, entry-level instructional designers, and full-time graduate students. About 70% of the learners were currently teaching or had prior experience as educators at the PK-12 level. Given the synchronous and asynchronous discussion format options, about half of the class chose to participate in the synchronous session and the other half through the asynchronous forum.

With 13 students in the synchronous session, the structured discussion activity worked very well in the breakout groups of about 4-6 students each. At the start of the session, the instructor presented the “[Designing Strategically for Diverse Learning](#)” video (Gronseth, 2022), which reserved less time for the breakouts and whole group sharing. Thus, this presentation is now provided as a pre-recorded video that students watch before the session. In each breakout, the students serving in the facilitator or notetaker roles opened their group’s scenario handout and shared their screens for the rest of the group members to view. Having five minutes designated for identifying three takeaways towards the end of the breakout discussion timeframe enabled students to bring closure to their group discussion before going back into the whole group.

In the asynchronous format, the majority of postings were done during the latter three days of the designated week (which happened to be Friday-Sunday). Most students (79%) chose to work through the sixth-grade math scenario, which corresponded to the PK-12 context familiarity of many of the students. The length of the initial postings averaged around three paragraphs. Students seemed to engage in follow-up discussions across both scenarios, no matter if their classmates had analyzed the same scenario. There were many examples in the postings of how students connected ideas being discussed from the scenarios to their own experiences.

The “Accessibility Checks” activity (p. 10 of the Student Handout) worked well in the asynchronous online format. It provided flexibility for students to engage with the AEM Center resources at a time that worked for their schedules. It enabled them to explore portions of the vast amount of AEM materials that were of interest and relevance to their work and supported their experiential learning of some of the most common techniques for ensuring accessibility in documents.

## FUTURE CONSIDERATIONS

As only an hour was allocated for the discussion in the implementation, students were instructed to mainly focus on Steps 1 and 2 and then select one prompt from Steps 3-5 (pp. 4-9 of the Student Handout). Thus, there is potential for expanding this discussion activity to a longer timeframe, either in similar online formats or in a half-day in-person

workshop setting. This expanded timeframe could enable students to fully apply the provided five-step scaffold to one of the given scenarios or lessons/instructional plans from their own classrooms. Future implementations could also expand the provided scenario options (pp. 4-9 of the Student Handout) to include additional content areas, grade levels, or instructional contexts.

While the activity focused on documents, the AEM Center provides similar resources for EPUB, video, websites, social media, and STEM-related education materials (under Create tab of CAST, n.d.c). Students looking to go deeper in this area could thus expand their exploration and practice using the resources of these additional material types. The activity could be further deepened by students sharing their own instructional materials for review using the provided accessibility checks scaffolding from the activity. Students could then work together to apply the strategies for addressing identified inaccessible aspects.

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