

Technology Equity and Digital Inclusion

Team Mini-Design Plan

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Instructional design students at California State University Monterey Bay (CSUMB) are acquiring unique knowledge, skills, and attitudes to create online courses for diverse audiences with varying internet access and capabilities. CSUMB's mission is to prepare students to "contribute responsibly to California and the global community" (California State University Monterey Bay, 2022). Students in the Master of Science in Instructional Science and Technology (MIST) program are additionally guided by the Association for Educational Communications and Technology (AECT) *2018 Code of Professional Ethics*, which dictates a commitment to facilitating individual access to material (AECT Code of Professional Ethics, 2018). Our student's allegiance to their university's mission and their profession's ethical code requires that they prepare to facilitate technology equity and digital inclusion.

We aim to prepare our audience, Team Eight, to address the technology equity gap present in low-income California homes where K-12 students have limited access to Wi-Fi (Botts & Cano, 2021). The COVID-19 pandemic has made the impacts of this barrier strikingly apparent. Lack of affordability, low access, and limited digital literacy have resulted in many students falling behind. Katya Velasco, a resilient Coachella Valley high school student whose struggles included school hotspots blocking access to college application pages, resorting to phone hotspot access for hours-long AP tests, and weather-induced Internet shutdowns relays that she witnessed many of her classmates "just completely give up" (Botts & Cano, 2021, para. 57). Mario Ramirez, a previously highly engaged student, may now need to repeat the fourth grade due to inability to connect consistently (Botts & Cano, 2021).

In a time when much learning is remote, ensuring our instructional designer audience possesses a tool set to ethically address low-bandwidth is paramount. Equitable technology

access “can directly translate into workforce development, education, social inclusion, health and civic engagement opportunities” (Carl, 2015, p.7). Upon completing these learning modules, Team Eight will be able to provide equitable access to PDF files using the ALLY tool within a Canvas course, maximizing their student’s potential for success and development of digital literacy (Blackboard).

Analysis

The participants in our course are Team Eight from the MIST program’s 18th cohort. To gather data on Team Eight, we requested completion of a Google Forms survey (see Appendix). The results of this survey provided baseline information on their understanding of technology equity and digital inclusion and their personal experiences with equity. We also reviewed Team Eight’s Canvas profile introductions, available under the course roster, to collect additional background information on our learners.

Needs Assessment

Our needs assessment included internet data collection that confirmed the existence of a substantial California (CA) population with little-to-no home internet, which necessitates instructional designers prepared to build accessible educational courses. Despite existing high-speed internet infrastructure access for many, large communities in the U.S. still struggle with low-bandwidth (Rimmer, 2022). A 2020 study of 52 million U.S. households revealed that “3.7 million homes lack consistent connectivity” (Tenkorang, 2022, para. 1). While 85% of the CA population reported high-speed internet in 2020, this leaves a significant portion without. The affected populations include historically underrepresented ethnicities, households headed by adults 65 and older, low-income homes, and households headed by non-college graduates (Hayes

et al., 2022). With a population of over 39 million, this data indicates that approximately 5.9 million people in CA lack high-speed internet (United States Census Bureau, 2021).

Learner Analysis

We considered several approaches to gather information about our audience. We decided the best course of action was to conduct a brief survey to understand our audience's prior knowledge of technology equity and digital inclusion. We received responses from two members of Team Eight that influenced the development of our design plan. The survey was supplemented with our own current knowledge, skills, and attitudes on this issue, given our mutual experience in the MIST program.

We learned the following from Team Eight's free responses in the survey and our own self-assessment.

- All have a general awareness of technology equity and the affected populations.
- It was unclear whether learners know the steps involved to design a more equitable and inclusive course.
- When asked, "Who does digital inclusion affect most?" the responses included disabled population and "youths." We assume the Team Eight respondent was referring to K-12 students as "youths." Disabilities tend to be the first concern brought up when discussing technology equity and accessibility. We identified the need to expand Team Eight's knowledge of and attitudes toward additional populations that would benefit from more equitable and inclusive digital content.
- Our survey also indicated that our audience has first-hand experience with digital exclusion. One participant had no use of a laptop for a couple weeks, making it difficult

to complete their work in the CSUMB public computer spaces. This was a recurring issue that was prevalent in our research.

- Lastly, 75% of Team Four (the authors) had little-to-no knowledge of the ALLY tool in Canvas prior to selection of this topic. This prompted us to further examine the necessary course content, which is discussed later in this document.

Context Analysis

Given the nature of our project, we first addressed the internet-related elements that could disrupt the delivery of a lesson. We are dedicated to methods that evaluate the accessibility of a training and best practices to accommodate participants with little-to-no home internet, as well as the bandwidth limitation due to affordability. This course will be created in the CSUMB Canvas portal while leveraging its existing ALLY Learning Tools Interoperability (LTI) feature.

We plan to include the following design features in our lesson.

- videos and interactive content
- examples and non-examples of acceptable PDF files
- tools for self-assessment
- external resources for unanticipated applications

Lessons will also include quizzes and activities to encourage audience engagement. Team Eight will take pre- and post-tests to evaluate whether the learning objectives were met. At the end of the course, Team Eight will complete a survey to evaluate the course and offer feedback, including their major take-aways, flaws, and favorite features in our design.

Content Analysis

This lesson highlights the features and functions of ALLY LTI, an accessibility tool integrated into the CSUMB Canvas platform. We plan to follow Gagne's Nine Events of Instruction to stimulate intrinsic motivation and offer content, practice, and feedback (N. Illinois University).

1. Gain student's attention: Present a scenario where a student had difficulty accessing course materials and demonstrate how ALLY addressed the issue. Statistics on the frequency of barriers and affected populations may be relevant here. We will provide Team Eight with the long-term incentive of creating accessible final capstone projects.
2. Inform students of the objectives early in the course by highlighting how ALLY addresses the issue of technology equity & digital inclusion. Learners will know how to select or create a PDF that meets the ALLY standard and the alternate formats offered.
3. Stimulate recall of prior knowledge and experiences, both from the student and instructor perspective. MIST students may have had difficulty in accessing course materials and uploading files to Canvas. Participants are concurrently enrolled in the Technology Workshop (IST 501) and completed an assignment on Learning Management Systems (LMS) as an instructor in Canvas, including uploading a file.
4. Present the necessary components with active learning exercises to help learners understand how a PDF is recognized by ALLY in Canvas and the alternate formats created therein.
5. Provide learning guidance: Examples and non-examples of acceptable PDF files will be presented, along with tools for self-assessment and external resources for unanticipated applications.

6. Elicit performance: Activities will be designed to engage learners in the content. Team Eight will have several opportunities to upload PDF files to Canvas before formal assessment.
7. Provide feedback: The ALLY meter offers instant feedback for self-assessment. A red or yellow meter reading gives learners space to make mistakes and correct their work. Additional low-stakes evaluation may be built into the practice activities, including peer-evaluation, remedial feedback, and descriptive feedback.
8. Assess performance: Learners will undergo several knowledge checks throughout each lesson, as well as activities to demonstrate their ability to utilize ALLY in Canvas.
9. Enhance retention and transfer of knowledge: We plan to close the course by providing space for reflection on the importance of accessibility in their lives and how proficiency with ALLY can impact their ID careers.

Design

The design of this course will be heavily influenced by the Five-Step Model (Stolovitch & Keeps, 2011) and principles of Universal Design that demand “products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design (Connell et al., 1997).

Rationale

We recognize that many low-income students have limited Wi-Fi needed for full participation in their courses. We live in a time where much learning is remote and we want to ensure our instructional designer audience possesses a tool set to virtuously address this concern. We aspire to equip professional instructional designers with the knowledge and ability to

administer digitally equitable materials to learners with little-to-no home Wi-Fi. We assume that our Team Eight is devoted to uphold a Code of Professional Ethics that supports all individuals.

Objectives

This lesson will educate learners on the benefits and capabilities of ALLY to create technologically equitable & digitally inclusive courses. We can safely assume that learners have the prerequisite knowledge to upload PDF files to Canvas, given their concurrent enrollment in IST 501. The enabling objectives will build upon Team Eight's pre-existing knowledge of this LMS. We also aim to provide diverse perspectives to motivate Team Eight to further their education and support their future learners. From memory, Team Eight will meet the following declarative objectives with 100% accuracy.

- Describe the barriers students may face that necessitate the usage of ALLY.
- Define the following terms: ALLY and ALLY meter
- Describe technology equity and digital inclusion
- Describe the criteria for a file to be recognized by ALLY with a green meter.
- Describe features that cause yellow and red ALLY meter readings.
- List the alternative formats generated by ALLY: HTML, ePub, Electronic braille, Audio, BeeLine Reader, and Immersive Reader.
- Describe each alternative format listed above.

Given a list of ALLY requirements, Team Eight will meet the following procedural objectives with a green ALLY meter reading in Canvas.

- Identify examples and non-examples of accessible PDF files.
- Create accessible PDF files with the features required by ALLY

- Upload PDF files to Canvas
- Troubleshoot common issues: headings, alternative text for images, and color contrast

The enabling objectives above will ensure that the terminal objective is met. After this lesson, Team Eight will be able to select and generate PDF files that result in a green ALLY meter reading when uploaded to Canvas.

Agenda

Our module will be built in the CSUMB Canvas portal. This LMS was chosen because of its ability to operate with low-bandwidth on various view settings and it permits users to download content. The state of California has chosen Canvas as its LMS for all levels of higher education (Hill, 2021). Canvas is used in many K-12 areas throughout the state as well.

The technology equity and digital inclusion modules will use Gagne's Nine Events of Instruction as a framework and cover 20 minutes in length. With a wealth of information available to us, we could very easily triple the length of this lesson, but for the sake of this project, we have narrowed the scope to three key areas.

Module 1 is an introduction to technology equity and digital inclusion. We will present examples and scenarios of affected individuals to gain the learner's attention and connect in the affective domain. This will be presented in multiple formats, including digital and multimedia content. We will also share statistics to demonstrate the extent to which the CA residents experience digital inequities.

Module 2 is the heart of our lesson, providing instruction and hands-on experience with ALLY. We will provide information on the objectives and measures of success. Once understood, Team Eight will be given opportunities to practice ALLY-related tasks while

drawing attention to the instant feedback of the ALLY meter. We are still discussing additional components for this section, but a job aid may be necessary.

Module 3 prompts the learner to make meaningful connections by asking, “Why are we showing you this and why is it important?” We will provide space for learner reflection and self-assessment of long-term retention. We believe the understanding of *why* they just went through this exercise is as important as the exercise itself.

Feedback

Corrective and confirming feedback will be incorporated throughout this 20-minute learning solution through quizzes and exit tickets. The green, yellow, or red ALLY meter reading will provide instant feedback on the accessibility of Team Eight’s PDF files. In addition to providing constructive feedback to Team Eight, we will elicit their insights to direct the optimization of our lesson for future learners. Our group may adjust the pace and activities as needed.

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Appendix

Technology Equity and Digital Inclusion Google Forms Free-Response Survey

1. How would you define "technology equity"?
2. How would you suppose technology equity and digital inclusion might be implemented in a training?
3. What populations can benefit from digital inclusion?
4. What groups might be missed in technology equity and inclusion efforts?
5. Have you experienced or witnessed issues with technology equity and inclusion? If so, provide a brief example.
6. What technology devices do you have available for this upcoming course on Technology Equity & Digital Inclusion?