Inclusive Design Thinking- Model for Inclusive Course Development

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Abstract

This article focuses on designing college courses with Design Thinking processes combined with Universal Design for Learning as a rubric to ensure your course is inclusive and provides access for students with disabilities. Creating an inclusive course allows students of all abilities to access the materials and have an equal opportunity to learn. Inclusion begins by understanding your learners and considering user-centric approaches. Through the methods of Design Thinking, recommendations for building-in access throughout course design are discussed.

Inclusive Design Thinking- Model for Inclusive Course Development

Creating courses that are inclusive, accessible, and meaningful, with active engagement is an essential goal of distance learning administrators and faculty. Whether the course is designed to be delivered online, on-campus, blended, or as a Massive Open Online Course (MOOC) the intention is for all students to be able to participate in the educational experience. Inclusion and access specifically allow for the widest range of learners. Beginning with an inclusive plan is the key to accomplishing the best end product.

Design Thinking is a human-centered problem-solving method popularized by Stanford University's Design School and used by design firms such as IDEO. The Design Thinking model produces innovative solutions by putting users at the center of the design process, including course or instructional design. Using Design Thinking as a process can help administrators, course designers, teaching faculty, and supporting team members with the structure and processes to successfully collaborate and produce meaningful learning experiences for all learners. In addition, Design Thinking can incorporate Universal Design for Learning (UDL) guidelines into the course development process and as an evaluation rubric to better support all learners. In this article, we lay out the Design Thinking process for inclusive course design with UDL and accessibility connections throughout.

UDL is a research-based set of guidelines for the design of learning and other types of environments that are accessible and effective for all. Accessibility means that the course materials and digital environments can be used by all students. This includes individuals with disabilities using online environments and digital resources that should work with assistive technology. UDL strives to make educational environments welcoming, accessible, and usable for everyone. The UDL principles guide us to consider the needs of a broad range of learners by creating multiple means of representation, engagement, and assessment based on research into how the brain works and how humans learn.

The Design Thinking process includes five phases or stages, not always in linear order and frequently overlapping, that provides the map for understanding your students' needs, designing instructional materials, and testing their effectiveness.

- Stage 1 Empathize and Understand – your students' needs and how they see the world.
- Stage 2 Define – your students' needs and your course objectives.
- Stage 3 Ideate – explore and identify possible solutions, develop outlines, scenarios, and storyboards of learning activities and experiences.
- Stage 4 Prototype – develop authentic and meaningful learning activities and experiences.
- Stage 5 Test – use rubrics to evaluate your content and check for multiple means of presentation, engagement, and opportunities for expression. Check accessibility. Check your students' understanding, motivations, and attitudes.

The first through third stages in Design Thinking, lend themselves to the tasks that are typically found in course design. Course design is the planning and designing part of creating a course, which includes:

- researching your course,
- determining your audience,
- deciding instructional goals and learning outcomes,

- deciding content and materials,
- deciding instructional strategy,
- drafting your course topics,
- making connections between the lessons,
- deciding on learning activities and student engagement,
- considering accessibility for learning materials (such as videos, audio recordings, pages, and resources),
- and deciding on the learning management system (LMS) and other technologies.

Stage 1 Empathize: What are my students' needs and how do they see the world?

Empathizing with your students and understanding their needs is a primary means of engaging with them. This sets the tone for an inclusive course. Inclusive design practice considers that learners have needs across a spectrum of abilities, access to technology, time commitments, motivations, learning preferences, and background knowledge.

Learning about your particular students is impossible in the early stages of course design. Naturally, students have not learned of your course yet. Surrogate students may be found inside comparable classes. You could conduct a small amount of market research in advance of designing your course. Some tools for understanding students include:

• Surveys - Use surveys to gather information from students on preparedness, attitudes toward the subject, goals, motivations, interests, and gather students' background knowledge and possible misconceptions on topics.
• Interviews - Have students interview each other regarding what they want to learn, questions they have on the topic and generate a word web.
• Student profiles - Have students create simple friendly profiles to provide just a bit of information on themselves, so you can create some user personas to guide your course design.
• Feedback - Ask for feedback midway through the course. Don't rely on tests, and other assessments as the only way to gauge progress, ask students if there are areas of confusion where they need more information or clarity.

Empathy and understanding of students should occur throughout course design, course development, and course delivery. Requesting feedback from students will help you to change direction and adjust when needed, for example reteaching a complex area. If you have taught the course previously, you can also use the experience of your past students as part of your information gathering.

UDL connection: Understanding your students and their motivations will help you provide multiple means of engagement, including providing individual choice and autonomy and designing relevant and authentic activities.

Accessibility Connection: To assist you in developing meaningful educational tasks, it may help to create personas for potential students. A persona is a contrived biography of a specific person with their strengths and challenges. Personas represent real students and provide answers to how they will interact with your course. These personas should include students with disabilities.

Stage 2 Define: State your students' needs and your course objectives

In this stage, you will identify your course goals and objectives as they relate to the needs of your users. You will Identify inclusive design resources. You will identify possible barriers and biases in language.

Define your course objectives and generate a list of why students should know these objectives. Defining why students should know something is necessary, so you will be able to use this list to brainstorm when designing multiple means of representation, presentation, expression, and action in the next phase.

Define your course design team and define their roles. Designing a course requires a lot of planning and time. One solution that ensures your time and effort will be worthwhile is to assemble a team of professionals with specific expertise. While the instructor is the subject matter expert (SME), designing a course has many factors that should be considered.

Course design team members do not need to be involved with every aspect of the course design, but rather be available for advisement. The recommended practice is to schedule check-ins with team members. Possible team members could include:

• the educator (SME),
• instructional designer,
• user experience person,
• accessibility expert as a consultant,

- literacy expert (developmental reading department),
- multimedia designer.

Instructional designers are critical. They have the ability to advise on learning theory, course design, learning measurements, and instructional alignment between the goals and learning outcomes. Instructional designers offer guidance regarding the materials, assessments, and activities. They also know what is possible with the LMS and the integration of learning tools.

An instructor is an expert in their area. Everyone is influenced by their own background, knowledge, expertise, motivations, and bias. Members of your course design team are helpful to develop a plan for the language you will use. Be aware of attitudinal barriers or value-laden language that could contribute to stereotyping, prejudice, or discrimination. Choose words that convey healthy attitudes and are inclusive.

Become familiar with the plain language initiative, which has its origins in a U.S. Federal requirement to incorporate plain language in government documents. Students do need exposure to advanced vocabulary to learn and master higher education texts, but there are many situations where plain language is appropriate. Plain language should be used in areas where vocabulary learning is unnecessary. Plain language certainly lends itself to learning activity instructions, or the course syllabus, or instructions for interacting with the learning platform.

UDL connection: Taking the time to consider why a course goal and objective is important is a component of UDL. In the next phase you will prototype or spend time drafting and developing lessons, activities, and assessments to bring the why, what, and how together.

> **The core principles of Universal Design for Learning are:**
>
> - **Provide multiple means of engagement connecting to the WHY of learning.**
> - **Provide multiple means of representation connecting to the WHAT of learning.**
> - **Provide multiple means of action and expression connecting to the HOW of learning.**
> - The UDL guidelines used to implement the UDL framework can be accessed online: http://udlguidelines.cast.org.

Accessibility Connection: Consider some of the barriers that a college student with the following types of disability may encounter in a classroom environment and define solutions to those barriers.

Deaf or Hard of Hearing:

- Videos and multimedia resources must include captioning or text representation.
- Online lectures must be presented with captioning or a transcript.
- Student discussions must include a text representation.
- Lighting and visibility in on-line classes or seating arrangements for on-campus classes should allow for speechreading during lectures or discussions.

Low Vision or Blind:

- Instructional materials must be accessible to work with assistive technology.
- Instructional materials also include navigation and alternative text descriptions.

Learning Disabilities:

- Instructional materials must be accessible to work with assistive reading technology.
- Allow for extended time on timed exams and essays.

Attention-Deficit/Hyperactivity Disorder

- Allow for extended time on timed exams and essays
- Allow for distraction reduced testing environments

Mobility and Physical Disability

- Provide accessible digital instructional materials and assignments

Stage 3 Ideate: Explore and identify possible solutions, develop outlines, scenarios, and storyboards of learning activities and experiences

Now that you have assessed your student's needs, defined your objectives, and have identified possible solutions to barriers faced by students with disabilities, it is time to brainstorm a list of how students can meet these objectives in multiple ways.

Identify topics where the addition of images, diagrams, and videos would enrich the content and provide multiple means of representation. Brainstorm a list of resources that includes visual and audio content including podcasts and interviews. Identify possible Open Educational Resources including textbooks, and image and video libraries. Identify areas that lend themselves to service-learning or project-based learning that can facilitate multiple means of engagement, allow students to make real-world connections, and put their learning into action. Ideas to incorporate project-based learning:

- Provide opportunities for students to take leadership roles.
- Provide opportunities for collaboration through group work.
- Using discussion forums or private messaging, provide opportunities for peer feedback.
- Use discussion forums for students to assist each other and answer questions.
- Hold office hours for real-time question and answer sessions.

The key to the Ideation stage is to generate many ideas. Allow yourself to think outside the box. Try to come up with a number of ideas before judging or rejecting them. This type of thinking can lead to innovation.

UDL Connection: The objectives and learning outcomes assist in generating a list of multiple means of engagement. Consider avenues to develop or engage students' interests and provide opportunities for choice and autonomy and motivation and collaboration.

Accessibility Connection: With the personas in mind, discover several methods for students to demonstrate understanding of the learning tasks. There are myriad ways for a student to show their mastery of the learning task leading to the most successful way for them. For example, students required to present to the class may present orally or create a video in sign language with subtitles to accommodate those that do not understand sign language.

Students who are deaf and use sign language as their preferred mode of communication may require sign language interpreters for your synchronous course lectures. Students who are hard of hearing and do not prefer sign language will need real-time captioning for access to your synchronous lectures or discussions. Accommodations for sign language interpreters and real-time captioning are typically managed by a college's disability support office. Realtime captioning and interpreting is available remotely and is possible in a variety of online systems. In both accommodations, the service providers will need clear audio. The use of a microphone greatly enhances audio quality and is recommended.

Stage 4 Prototype: Develop authentic and meaningful learning activities and experiences

The fourth and fifth stages in Design Thinking, lend themselves to the tasks that are typically reserved for course development. This stage is the how of learning. Course development is the doing part of creating a course, which includes:

- writing your lesson scripts,
- writing out learning activities,
- dividing the content into brief lessons,
- developing the presentations (including photos and videos),
- setting up or adopting an LMS template,
- loading content into the LMS,
- testing and launching the course.

Help support independence by providing detailed assignment descriptions and due dates. Provide students with rubrics that identify how assignments will be graded and allow students to evaluate themselves before submission. Provide opportunities for knowledge checks before an assessment and allow opportunities for students to revise and resubmit for additional credit.

In the define stage, you envisioned your team. Now consider how to utilize them and bring them to action. Keep in mind these are job descriptions, not position titles. Team members may be named differently, but their tasks are identical.

Educator – subject matter expert, charged with providing the academic content related to standards and learning expectations. May be accompanied by **community experts** who may provide opportunities for service-learning projects and interviews with experts. As well as accompanied by **teaching assistants** who may lead class discussions and assignment facilitation.

Instructional designer – review objectives and make sure they are student-centered and that learning activities are aligned with objectives. They can also help you identify the technologies you can use to facilitate how you provide information, how students engage with the information and activities, how students show their learning, and how you assess their learning.

User experience person – organize information, understand human behavior as it relates to the course, create an interactive experience that allows students to focus on the course material instead of the site design.

Accessibility expert – recommendations for accessible tools and services to incorporate in the course, make recommendations for evaluating the accessibility of course links, and consult on Universal Design and overall accessibility of the course.

Literacy expert/Library staff – assist in writing plain language instructions that can be used in your course. They understand reading difficulties and can assist with in-course strategies that may improve comprehension of the course materials. They may assist with locating accessible digital textbooks and materials.

Multimedia designer – create multimedia products that combine text, sounds, graphics, video clips, virtual reality, digital animation, and assist with access to these media for all students.

When developing presentations or selecting media, it is now possible to locate stock photos and videos that include people with disabilities. However, this has not always been the case. Swift (2019) points out that, "Although nearly one in five people have a disability, just two percent of publicly available imagery depicts their lives." Getty Images launched a partnership with Verizon Media, and the National Disability Leadership Alliance (NDLA) to create imagery that portrays people with disabilities. To date, there are 2,882 images in the collection.

Various stock photo and video sites provide images and videos of people with disabilities, Storyblocks, Shutterstock, Google images, Pinterest, Photoability, to name a few. Search whatever stock photo site you have access to and begin selecting and acquiring photos and videos of people with disabilities that would make a good addition to your image options.

Inclusive design should include examples of people with disabilities. There are a few studies that show when learners have the opportunity to read multicultural literature they may find themselves represented in the literature. We can easily apply this same idea to students with disabilities. A recommendation is to include learning situations that include people with disabilities. There are people with various disabilities in all professions that may be highlighted in your lessons.

Presentation tools such as PowerPoint are very useful in preparing lecture information. You may consider creating an outline of your discussion points. An outline allows students to follow the lecture and possibly use as a note-taking tool. Students will have the ability to refer back to key points. This may increase participation for all students.

UDL Connection: Provide multiple means of action and expression. Develop a prototype or draft assignments for:

- How to deliver the content (Multiple means of representation)
- How students interact with the content, activities, and each other (Multiple means of engagement)
- How students show what they have learned (Multiple means of expression or assessment)

Accessibility Connection:

1. Provide PowerPoint presentations in advance.
2. Use graphic organizers that include images. This helps students with learning disabilities and students with ADHD.
3. Have teaching assistants write alt text descriptions for complex charts and graphs.
4. Have students write alt text descriptions of complex charts and graphs as an assignment. Ask students to vote for the best descriptions and use them in the next iteration of the course.

Stage 5: Test— use rubrics to evaluate your content and check for multiple means of presentation, engagement, and opportunities for expression. Check accessibility. Check your students' understanding, motivations, and attitudes.

Use the principles of Universal Design for Learning as a rubric and checklist to evaluate the resources you have created in the prototyping phase. Distance learning administrators and course designers must consider UDL.

For added impact, solicit a pool of students (student worker staff) to provide user feedback and formative assessment on the instructional materials and activities during the design/develop process. Learning how students perceive your course and what attitudes they have about your design plan could alleviate problems and promote learning. One idea may be to use reviews such as thumbs up and 5-star reviews that are used in social media sites to enable students to provide feedback.

Accessibility connection: Many individuals with disabilities use assistive technologies to better access resources and content. Some examples of assistive technologies include braille in both print and electronic form, magnifiers, both analog and digital, audio access, computers, and software programs including screen readers.

Check the accessibility of your resources:

- All readings and handouts are in accessible text form, not images (Word docs and PDFs include headings, Alt text descriptions, and accessible tables).
- All videos have captions and transcripts are available.
- Tools and technology including quizzes, surveys, and discussion forums are accessible to assistive technology including screen readers.
- Use the built-in accessibility checkers in Microsoft products and the LMS.
- Accessibility Resources:

Microsoft Office Accessibility: https://www.microsoft.com/en-us/accessibility/office?activetab=pivot_1%3aprimaryr2
Adobe PDF Accessibility: https://helpx.adobe.com/acrobat/using/create-verify-pdf-accessibility.html

Using an inclusive design thinking approach with collaborative methods and practices can help you build a solid structure for team contributions, feedback, and revisions. Shared practices and expectations ensure a successful team approach for course development that meets the needs of diverse learners including those with disabilities.

You don't have to re-invent the wheel to incorporate best practices and accessibility. Other useful guidelines exist and should be considered. Particularly for designing online courses, follow the Web Content Accessibility Guidelines (WCAG) to design for online access. Use UDL guidelines to consider the needs of a broad range of learners and create multiple means of representation, engagement, and assessment.

The benefit of using the Design Thinking process to create your course and then apply the UDL guidelines as a rubric to assess your course ultimately leads to the outcome of prepared students. All students had the ability to participate in your course and engage with your material. Students were exposed to multiple means of engagement which leads to them becoming more purposeful and motivated. Students who experienced multiple means of representation themselves grow to be resourceful and knowledgeable. Students allowed multiple means of action and expression have become strategic and goal-directed. These beneficial accomplishments are in addition to the content knowledge they gained from your course.

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UDL

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