CSCI 4390 Senior Project
Project Proposal

Title: Accessibility Course Development (CD) Shell

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Problem/Opportunity Statement: What's the specific issue you're trying to solve or improve? Identify the problem you are addressing in one or two sentences.

Online courses hosted in Brightspace often meet baseline accessibility standards while still presenting navigational challenges for students. This project aims to improve the online course experience by providing accessible layouts, templates, and widgets that enhance navigation clarity and reduce cognitive overload; particularly for students with disabilities and first-time LMS users.

Background: Provide context and explain the factors that give rise to the problem or opportunity. This might include how people struggle with existing technologies within a certain domain. Explain in one or two paragraphs.

Following UTRGV's transition from Blackboard to Brightspace, many migrated courses became visually cluttered and inconsistently structured. Instructors, regardless of training, often struggled to revise their Course Development (CD) shells to meet accessibility standards. While many issues were minor; such as inconsistent font usage, text sizing, or links opening in the same browser tab…they frequently required technical knowledge beyond what many instructors possessed.

And from the students' perspective, these inconsistencies resulted in confusion and disorientation. Various students reported difficulty locating materials when: items were not properly linked to the "Content" area, when duplicate links existed, or when the "Course Home" page presented too much information at once. In particular, the default "Work To Do" widget often failed to clearly communicate deadlines or priorities, contributing to an overwhelming course experience.

Survey of Solutions: What existing solutions attempt to address the identified problem? Research and analyze at least three current approaches. Compare their strengths and weaknesses in

contrast to your proposed solution. Demonstrate your ability to critically assess and deconstruct the problem from a computational perspective.

Resources:

→ https://www.d2l.com/accessibility/
→ https://community.d2l.com/brightspace/kb/articles/5683-reach-every-learner-with-brightspace-accessibility-features

Solution 1: Built-in Brightspace Accessibility Features

Brightspace includes built-in accessibility features designed to support screen readers and assistive technologies, such as standardized page layouts, consistent navigation patterns, and structured heading hierarchies. These features align with WCAG guidelines and promote predictable interactions across tools.

Strengths

- Standardized page designs
- Consistent use of semantic heading structures
- Improved compatibility with screen readers and assistive technologies
- Reduced need for instructors to manually implement accessibility features

Weaknesses
Despite these standards, instructors and students with limited technical knowledge often struggle to navigate the interface and identify key actions. Platform-wide consistency prioritizes consistency over course-specific usability, resulting in cluttered interfaces that display more information than students immediately need. Grouped tools, such as the "Work To Do" widget, may overwhelm users rather than guide them.

Proposed Improvement
This project proposes the use of simplified, task-focused widgets that help students easily locate assignments, quizzes, discussions, tools that can aid with reducing cognitive load and improving engagement.

Solution 2: WCAG-Compliant Course Design Standards

Brightspace enforces WCAG-aligned heading structures and page layouts to ensure logical content organization and baseline screen reader compatibility.

Strengths

- Clear semantic structure using standard heading levels
- Compatibility with assistive technologies such as ReadSpeaker
- Encourages instructors to follow accessibility best practices through built-in checkers

Weaknesses
While WCAG compliance ensures structural accessibility, it does not fully address individual learner needs such as dyslexia, ADHD/ADD, or visual learning preferences. Standardized layouts may be technically accessible while still presenting challenges related to readability, focus, or sustained engagement.

Proposed Improvement
The proposed course shell incorporates accessible visual design elements, including guided color usage, geometric content separation, and readable typography options, to enhance engagement without compromising compliance.

Solution 3: CSS and HTML Customization for Low-Vision Users

Brightspace supports browser-based scaling, contrast adjustments, and limited CSS customization to improve accessibility for low-vision users.

Strengths

- Supports screen magnification and contrast adjustment
- Allows customization through HTML and CSS templates
- Compatible with assistive technologies and screen magnifiers

Weaknesses
Customization is constrained by Brightspace's CSS limitations and requires technical expertise. Most instructors are unfamiliar with CSS customization, and even those with experience may find it time-consuming to maintain.

Proposed Improvement
This project will provide reusable HTML/CSS templates with clear documentation, enabling instructors to apply accessible designs without requiring advanced technical knowledge.

Proposed Solution: What do you propose to build, or replicate, as a solution to the identified problem? Focus on the core set of requirements that must be satisfied to solve the problem. Also, how will you evaluate whether the system you build effectively addresses those requirements? What metrics or testing approaches will you use to assess success?

- **As an Instructional Designer…**
  - *I would like to develop a standard for courses to ensure that accessibility remains consistent across the LMS. This includes creating lesson plan and course templates for instructors that use ADA and WCAG standards as a baseline. In addition, my background in Psychology allows me to stray from the standards using research into learning disabilities to help improve the weak points from both associations with online learning.*
- **As a Developer…**

o *I want to develop widgets that professors can utilize for easy navigation or organization. I also want to develop a course layout that won't feel overwhelming to students accessing Brightspace for the first time. As someone who has studied Computer Science for six years now, I realize that Professors around the age group of 50-65+ have difficulty with understanding technology; so having a soft layout may help with overload as well.*

Survey of Technology: What technologies or data will you use to develop your solution? Identify at least three products, software, hardware, computer language, tools or frameworks, and assess their pros and cons based on your core requirements. Consider practical elements such as:

Team expertise and learning goals. It is legitimate to choose a technology because team members want to learn it, just weigh that in with other factors.
Availability of resources. Consider the availability of data, models, time, and others.

The project will use the following technologies:

- **Brightspace LMS (Production Environment)**
  Provides the deployment environment for testing and demonstration.
- **HTML5 / CSS3**
  Used to develop accessible content templates and layout components
- **Google Sites**
  Used as an external preview and documentation platform
- **GitHub**
  Used for version control, documentation, and template distribution
- **Visual Studio Code**
  Used for development and testing of HTML/CSS assets
- **AI Implementation**
  Copilot or ChatGPT or other AI tools to help build custom apps & widgets like API calls

Risk Considerations: What major challenges do you expect with your project? Identify at least one significant challenge you may encounter. For example: 1) Software/hardware complex or novelty. 2) Scalability concerns with large data sets or user volumes and 3) Security or privacy issues.

The primary challenge anticipated is restricted system access due to student role limitations within Brightspace. These restrictions are necessary for security and privacy but may limit customization. This risk is diminished through administrative access granted by the LMS Admin at COLTT and the use of external preview platforms.

Project Management Strategy: How does your team plan to manage this project? Emphasize the importance of ongoing coordination and iterative planning, especially when multiple

contributors are working in parallel. You may consider: 1) defining team roles and responsibilities, 2) planning and progress-tracking methods (e.g. Jira, Trello, etc.) 3) selecting tools (e.g., Gantt charts, project boards, shared documents, version control), and 4) establishing communication practices (e.g., regular checkins, updates, decisions logs)

Anne George – Instructional Designer
- Creating a course template within the Content area that maps out a few examples of how instructors can make their lessons more accessible for students.

Teresa B. Molina – LMS Developer
- Creating a new home page layout with up to 5 widgets that can be more accessible and visually less overwhelming when accessing the course for both instructors and students.
- Creating up to 8-12 HTML Page templates that instructors can use to add into their courses. Ranging from accessories to useful tools.

Progress Tracking: via GitHub Timeline

Tools:
- GitHub, Visual Studio Code, Copilot/ChatGPT (AI implementation), Google Sites…

Communication Method: Teams with weekly meetings to establish quick progressive results. Our goal is to have this project done in correspondence to COLTT's Accessibility update for the LMS in April.

Deliverables: How many templates, widgets, features, etc. delivered in which manner. We should have a very clear view from here to look back on and say if the project was successful. Especially for a project like this that has so many possible things that can be done with it.

The outcome of this project will consist of a clearly defined set of accessible, reusable artifacts designed for use within the Brightspace Learning Management System. The deliverables are intentionally bound to ensure the project remains achievable while still providing meaningful impact.

1. Accessible Course Home Layout

- One redesigned Brightspace Course Home layout
- Limited to a maximum of five widgets
- Designed to reduce cognitive load and improve navigation
- Implemented in a production Brightspace shell for evaluation

2. HTML Content Template Library

- Eight to twelve (8–12) reusable HTML content page templates
- Templates provided as copy-and-paste code with documentation
- Distributed via GitHub and optional course copy

3. External Documentation and Preview Platform

- One Google Sites platform showcasing templates and layouts
- Includes use-cases, accessibility rationale, and optional feedback collection

Evaluation of Success
The project will be considered successful once all deliverables are completed within possibility, function correctly within Brightspace, and demonstrate measurable improvements in accessibility and usability compared to default layouts.