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.

- We want to improve online course taking by providing more accessible themes and widgets. These new inclusions can help navigate an online course better and encourage students to log in; especially those with disabilities.

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.

- It first started when Blackboard transitioned to Brightspace. We noticed that the courses looked cluttered with every migration, and professors seemed to be confused with or without training to be able to "fix" their course(s) [CD shells] to accessible standards. There would be minor format errors like font style, text size, and links opening in the same tab that are simple enough to fix, but could be "too technical" for our professors who don't understand technology well.
- Students have also stated being lost in their course as certain items wouldn't be linked to the Content area or there would be duplicate items to choose from. And the course viewing would sometime be overwhelming or the **To-Do** widget "wouldn't give proper deadlines/information".

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 provides a range of built-in accessibility features designed to support screen readers and assistive technologies (consistent page layouts; standardized navigation patterns, structured heading hierarchies). These features align with WCAG guidelines and aim to provide predictable interaction patterns 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 having these standards, we have noticed that professors and students (of either no technology knowledge or very little) still struggle upon navigation and locating buttons (knowing technical terms like "navigation bar")
- The identical designs of buttons and tabs prioritizes platform consistency over course-specific usability, often resulting in cluttered interfaces that display more information than students immediately need.
- Tools such as the "Work To Do" widget aggregate content in ways that may overwhelm users rather than guide them.

Proposed Improvement:

- This project proposes the use of custom widgets that will help aid students in better navigating assignments, quizzes, labs, projects, etc. so that the cognitive load is reduced and to improve student engagement.

Solution 2: WCAG-Compliant Course Design Standards

Brightspace enforces WCAG-aligned heading structures and page layouts that ensure content follows a logical and accessible hierarchy; providing a baseline for screen reader navigation.

Strengths:

- Clear semantic structure using your average heading levels (h1, h2, h3, h4, etc)
- Improved compatibility with assistive technologies (ReadSpeaker for example)
- Encourages instructors to follow accessibility best practices (via accessibility checker)

Weaknesses:

- While WCAG compliance ensures structural accessibility, it does not address certain learner needs like dyslexia, ADHD/ADD, or visual learning preferences. Even standardized typography and layouts may be technically accessible while still presenting barriers related to readability, focus, or engagement.

Proposed Improvement:

- The proposed course shell will incorporate accessible visual design elements such as color option tutorials, geometric separation of content (using HTML pages or images), and readable typography (options) to enhance engagement without sacrificing compliance.

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

Brightspace supports browser-based scaling, contrast adjustment and custom CSS for low vision users to visually adapt. These capabilities enable instructors to override default styles when necessary.

Strengths:

- Supports screen magnification & contrast adjustments
- Allowing customization through CSS and HTML templates
- Compatible with assistive technology\ies and screen magnifiers.

Weaknesses:

- Due to the limitations of CSS in Brightspace, it may be difficult to effectively customize what we may want to do as developers and designers
- If we take account to the instructors themselves, most are probably not aware of how to customize via CSS; and to those that can, it is time consuming.

Proposed Improvement:

- Our course development shell can create reusable HTML/CSS templates to choose from, and if edits need to be made, we can create instructions on how to change it (mostly colors or text for now).

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…
  - I want to develop widgets that students can utilize for easy navigation or organization. I also want to develop a course layout that won't feel as overwhelming to students.

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.

- We will be using the following technologies for our project:
  - Laptop devices – to access LMS
    - Pros: everyone has a device that can log into an LMS
    - Cons: the LMS itself can run into technical difficulties
  - An empty Course Development Shell within the LMS – to develop from scratch
    - Pros: this created a virtual environment for sand testing
    - Cons: depending what we develop and import, we have to watch out for memory limits. (Bigger the files, the longer the lag!)
  - GitHub – track project progress; along with marking a code log
    - Pros: We can tack our progress and document issues we come across
    - Cons: Could easily be forgotten if not on top of it.
  - Visual Studio - to test HTML/CSS/JavaScript code
    - Pros: easily pinpoint bugs or mistakes

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 major challenges we may expect is the role restrictions that will be imposed on our accounts as there is only so much we can have access to as "students". This is for security & privacy protocols from within the department.

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 will be the lead Instructional Designer giving me design ideas to code as her developer.
- We'll communicate through any communication most convenient and track our progress using Canvas or any organizing site.
- Teresa will organize widget code, html and css code via github for easier troubleshooting fix / code history