

## Table of Contents

PROBLEM STATEMENT SYSTEM MAP **UI PROCESS OVERVIEW INVESTIGATION** 12 **IDEATION** PROTOTYPING/EVALUATION 31 **PRODUCTION SUMMARY OF UI EXPLORATION** MOVING FORWARD 40 41 REFERENCES 42 **APPENDIX** 

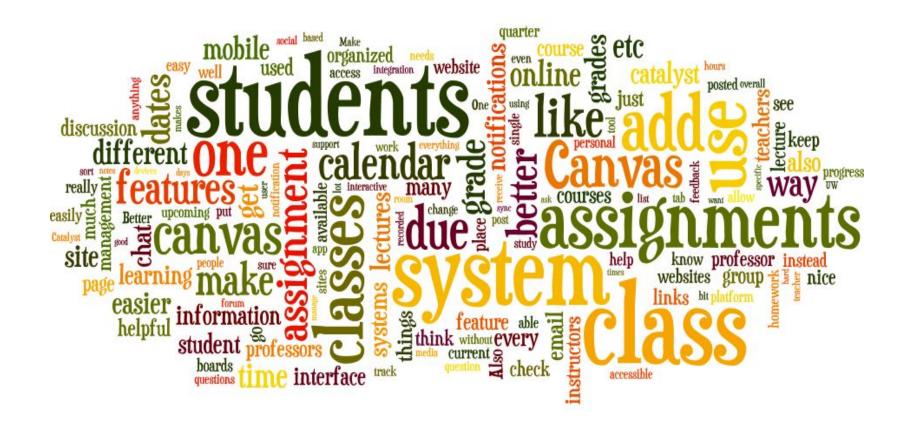
## Problem Statement

#### Introduction

Canvas is a learning management system (LMS) used by the University of Washington (UW) for professors to share course material and grade assignments. For students it provides a platform for viewing and submitting assignments, as well as collaboration between students, through discussion posts, chat, etc.

#### Goals

The goal of this redesign is to investigate current issues students have with the site, and then ideate potential solutions, which will then be prototyped and tested for feedback. After an iteration of testing, a high fidelity prototype will be created.

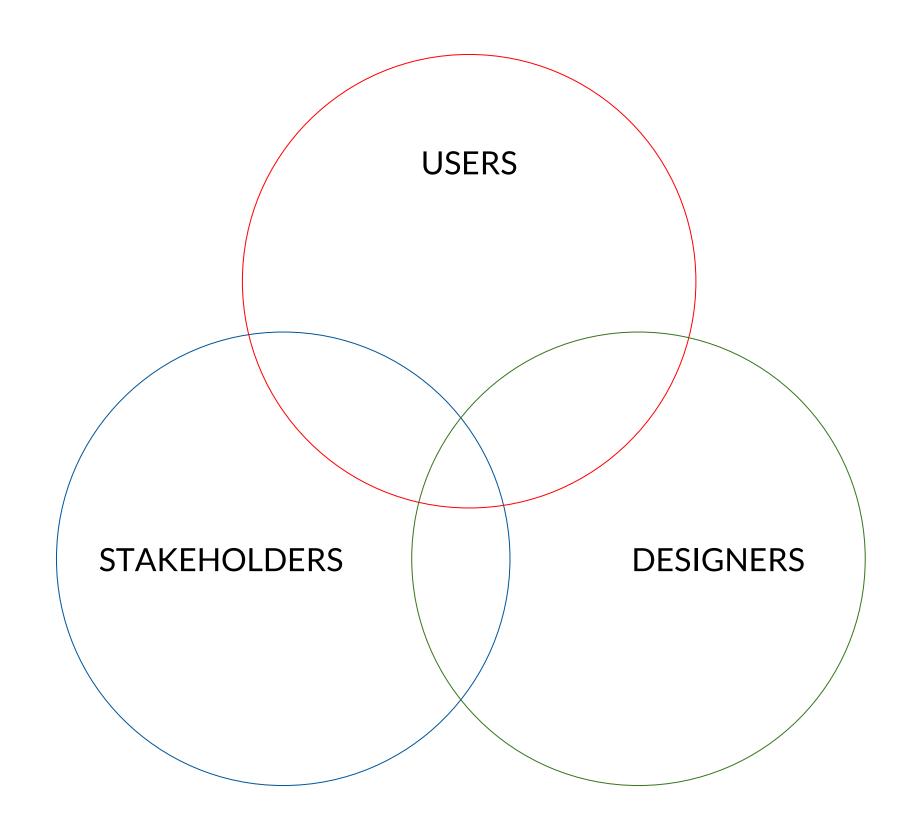


## System Map

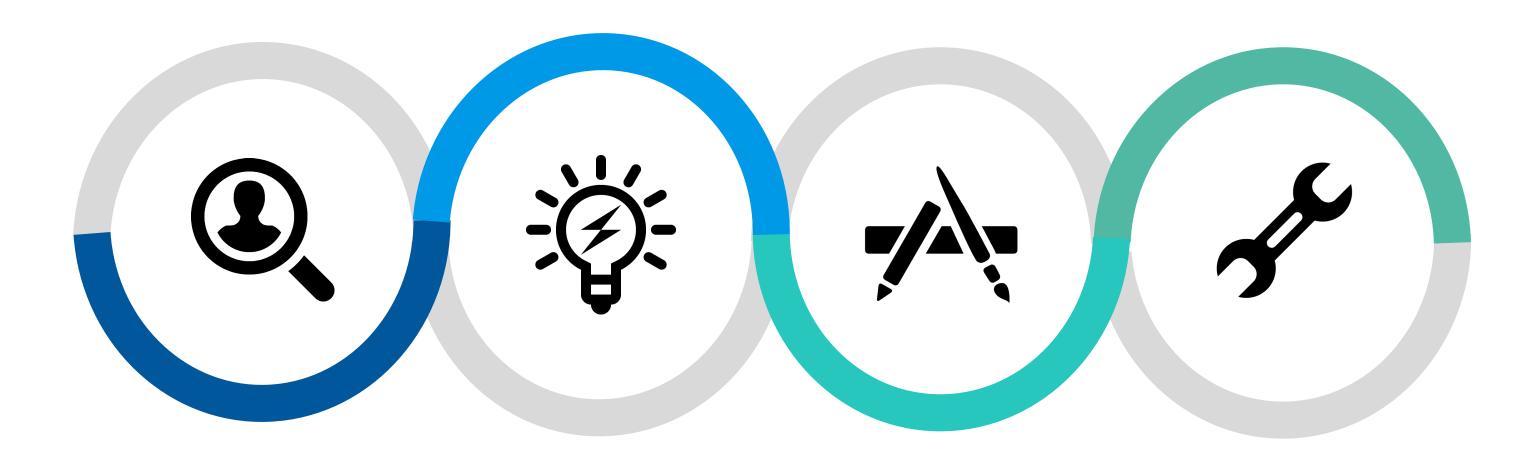
**Users:** The general user of Canvas are students who want to have convenient access to their assignments, readings, and discussions.

**Stakeholders**: The stakeholders are investors in UW who want a LMS that is easily scalable, with low licensing and maintenance costs

**Designers**: The designers are professors who are tasked with uploading and managing course content on Canvas, as well as UW IT who develop plugins when necessary



## **UI Process Overview**



#### Investigation

-SME Interview
-Semi Structured Interview
-Competitive Analysis
-User Task Matrix

#### Ideation

-Paper Sketch of UI
-Moodboard
-Storyboard
-Journey Map

#### **Prototyping/Evaluation**

-Heuristic Analysis -Site Map -User Flow -Wireframe

#### **Production**

-High Fidelity Mockups



# Stage 1: Investigation

## Understanding the Problem Space

To investigate user's issues with Canvas, several research methods were conducted. This consisted of both primary and secondary research to understand the current landscape for LMS tools. From the investigation, I decided to focus on making the UI more customizable and easier to use.

#### **Primary Research**

- → SME Interview (focused on 1st challenge, lack of customization)
- → Semi-Structured Interview (pulled out quotes related to UI or information architecture)

#### **Secondary Research**

- → Competitive Analysis\*\* (Canvas scored lowest in Ease of Use, and Customizable UI)
- → User Task Matrix (Canvas is most used on the Desktop across all grades)



## **SME Interview**

Tyler Fox Instructional Technologist



#### **Challenges:**

#### **Lack of Customization**

Instructors are unable to edit the UI on Canvas. This is so students' can transition easily to a new course, since the format is the same.

However, this omits the teacher's role in constructing an awesome learning experience, even if not all faculty is great with tech.

#### **Parity across Devices**

There is a lack of uniformity across the different platforms of Canvas, so it takes longer to learn.

This also makes it harder to identify the limitations of different platforms, such as the tablet, which provides instructors with the same view as students.

#### **Slack Functionality**

Although Canvas has communication functionality built in, its discussion board lacks the visuals and ease of use that a Slack channel provides.

Want a real time chat platform, but don't always want synchronous communication.

### Semi-Structured Interview

3 interviews were conducted with students from UW from all grades (Undergrad, Masters, PHD). The students came from different backgrounds including Computational Finance, Biology, and Information Science. Although Canvas use differed ranging from 2-3 times a week to almost daily, all students reported that they primarily used Canvas on their computer.

#### **1st Interview**

- Likes that Canvas has upcoming assignment deadlines on the right panel, which can be clicked to get started on the assignment
- Dislikes that datasets for assignments are located in Files instead of Assignments
- Suggests including submenu for lefthand navigation panel, to reduce clicks necessary to access assignment and its required files

#### **2nd Interview**

- Likes that Canvas discussions can be edited in case errors were made, since the whole class can see discussion posts
- Dislikes that the course homepage doesn't display announcements in right hand panel
- Suggests adding flat/reduced view of discussion thread instead of having to scroll through all the posts

#### **3rd Interview**

- Likes that readings can be previewed within the browser using box
- Finds the announcement and discussion pages to be redundant in terms of functionality
- Suggests consolidating the information architecture of the page, such as merging Discussions+Announcements, Assignments+Grade, and Chat+People

## Competitive Analysis

	CANVAS	BLACKBOARD	CATALYST	SLACK
A/SYNCHRONOUS COMMUNICATION	3	3	2	4
EASE OF USE	3	3	3	4
CUSTOMIZABLE UI	2	3	4	3
AVAILABLILITY ON ALL PLATFORMS	4	3	3	4
COLLABORATIVE TOOLS AVAILABLE	5	4	3	2
TOTAL	17	16	15	17

## User Task Matrix

ESKTOP

TABLET

	FRESHMAN	UPPERCLASS	MASTERS	PHD
VIEW/SUBMIT ASSIGNMENTS	High	High	High	High
VIEW CALENDAR FOR DEADLINES	Med	Med	Med	Med
CHECK ANNOUNCEMENTS	Med	Med	Low	Low
CHECK FOR GRADES	High	Med	Med	Med
VIEW/SUBMIT ASSIGNMENTS	Med	Low	Med	Low
VIEW CALENDAR FOR DEADLINES	Med	Low	Med	Low
CHECK ANNOUNCEMENTS	Low	Low	Low	Low
CHECK FOR GRADES	Low	Low	Low	Low
VIEW/SUBMIT ASSIGNMENTS	Low	Low	Low	Low
VIEW CALENDAR FOR DEADLINES	Low	Low	Low	Low
CHECK ANNOUNCEMENTS	High	Med	High	Med
CHECK FOR GRADES	High	Med	High	Med



## Generating Concepts

To generate potential concepts for Canvas, several ideation methods were conducted. This ranged from low fidelity sketches to convey ideas, to moodboards and journey maps in order to understand the user's experience. The focus of the concepts was making the UI more intuitive.

#### **Low Fidelity Ideation**

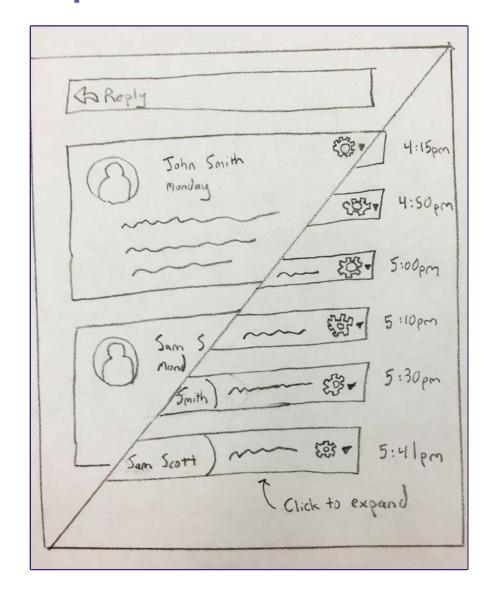
- → Paper Sketch (generated 3 potential UI redesigns on paper)
- → Storyboard (mapped out a potential concept that involves switching between desktop and tablet)

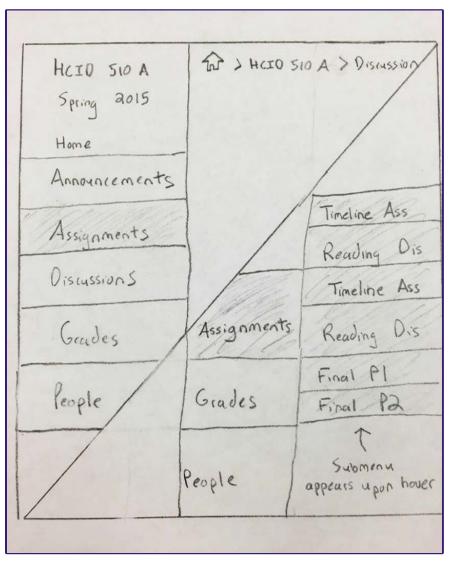
#### Mapping User's Experience

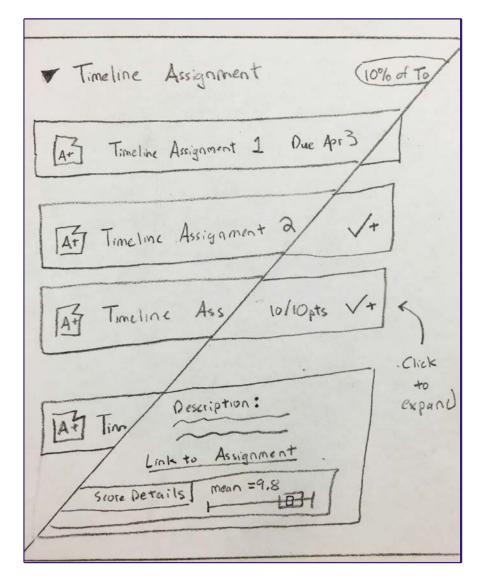
- → Moodboard (created moodboard to understand the emotion that redesign should evoke)
- → Journey Map (mapped out student's experience with Canvas assignment submission process)



## Paper Sketch of Ul





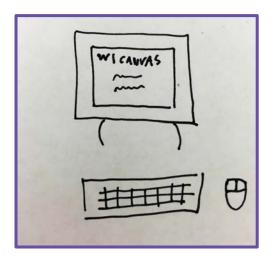


Redesign of the discussion thread page. Replacing the original threaded design with flat abbreviated view.

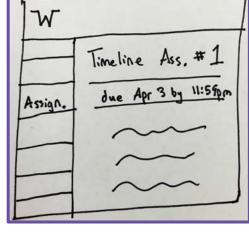
Redesign of the left hand navigation panel. Creation of a submenu for more convenient navigation.

Redesign of the Assignment and Grades page. Merging the two categories into one section.

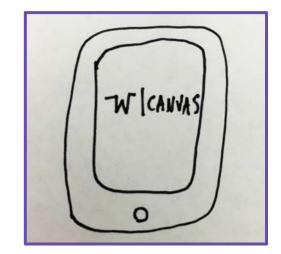
## Storyboard



Student accesses Canvas on computer



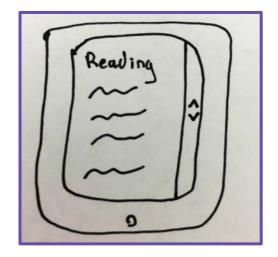
Checks latest assignment due



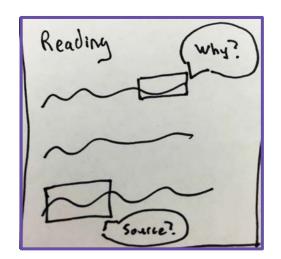
Opens tablet to view readings



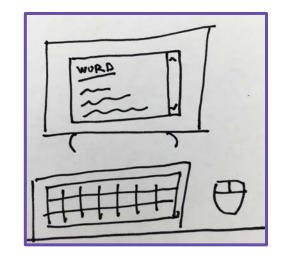
Navigates to Files section for readings



Opens reading on tablet



Adds any comments if necessary while reading



Begins typing assignment back on computer



## Journey Map

TIMELINE OF JOURNEY STAGES	CHECK ANNOUNCEMENT	VIEW ASSIGNMENT	COMPLETE ASSIGNMENT	SUBMIT ASSIGNMENT	REVIEW GRADE	RESUBMIT FOR REGRADE
TOUCHPOINTS Who or what are they interacting with?	<ul> <li>Mobile to view email notification</li> <li>Computer to view announcement</li> <li>Peers/Students in class</li> </ul>	<ul> <li>Computer to view assignment</li> <li>Tablet to view readings</li> <li>Peers/Students in class</li> <li>Instructor for questions</li> </ul>	<ul> <li>Computer to complete assignment</li> <li>Collaboration tool such as Facebook/Slack to discuss assignment</li> <li>Online/Offline resources</li> </ul>	Computer to submit assignment     Mobile if posting to discussion thread     Tablet if available	<ul> <li>Mobile to view email notification</li> <li>Computer or mobile to view grade</li> <li>Grading Rubric for instructor feedback</li> </ul>	<ul> <li>Computer to resubmit assignment on Canvas</li> <li>Email to instructor confirming regrade request</li> <li>Mobile to check on regrade progress</li> </ul>
CUSTOMER'S NEED  What is their top need? What needs are not being met?	<ul> <li>Keeping up to date with HW deadlines</li> <li>Keeping track of latest changes to assignment</li> </ul>	<ul> <li>Access to HW and any relevant files</li> <li>Assignment deadline and constraints</li> <li>Required readings and methods</li> </ul>	<ul> <li>Making sure assignment meets all the requirements</li> <li>Clarification of any parts of the assignment that are confusing</li> <li>Working collaboratively if group assignment</li> </ul>	<ul> <li>Submitting assignment in correct format</li> <li>Submitting assignment on time</li> <li>Submitting all the required modules</li> </ul>	Understanding instructor's feedback     Clear delineation of point deductions     Class grade distribution for assignment	<ul> <li>Clear directions for submiting regrade</li> <li>Peer feedback regarding assignment issues</li> <li>Communication channel with instructor</li> </ul>
THOUGHTS & FEELINGS What are their innermost thoughts at this precise moment?	Nervous     Anxiety/Dread	<ul><li>Frustration</li><li>Anxiety/Dread</li><li>Sad</li></ul>	<ul><li>Tired</li><li>Frustration</li><li>Stress</li><li>Regret</li></ul>	<ul><li> Happiness</li><li> Impatience</li><li> Fatigue</li></ul>	<ul><li>Nervous</li><li>Uncertainty</li><li>Relief/satisfaction</li></ul>	<ul> <li>Unhappy</li> <li>Anxiety to improve assignment</li> <li>Stress/Regret at having to resubmit</li> </ul>
CONTEXT  What else in the environment might influence them?	Coursework in other classes     Current work schedule	<ul> <li>Peer/Student discussion about assignment</li> <li>Nearby distractions</li> </ul>	<ul><li>Friends and Family</li><li>Work environment</li><li>Noise level</li></ul>	Other assignments due Internet Connection Access to computer	Comfort     Background noise     Time waiting for grades	<ul> <li>Overhearing grades of classmates</li> <li>Coursework in other classes</li> <li>Nearby distractions</li> </ul>
INSIGHTS & OPPORTUNITIES  What can you do to help them meet their needs, make the expe- rience easier, or more enjoyable?	Provide early enough notice for assignments so that students have enough time to prepare	<ul> <li>Keep the assignment prompt simple and easy to read</li> <li>Link assigned readings in assignment prompt</li> </ul>	<ul> <li>Minimize stress and anxiety while working on assignments (i.e. humor in assignment prompt)</li> <li>For large assignments, divide it into smaller more manageable deliverables</li> </ul>	Simplify assignment submission process, so there's only one way to submit each assignment     Allow user to view all submissions made     Provide template for assignment submission	Expedite this process, to reduce time waiting for grades     Provide verbal feedback instead of numerical feedback when possible     Make sure grading rubric is clear and concise	<ul> <li>Make regrade process easy and painless</li> <li>Provide clear channel be- tween instructor, TA's, and students when submitting regrade</li> </ul>



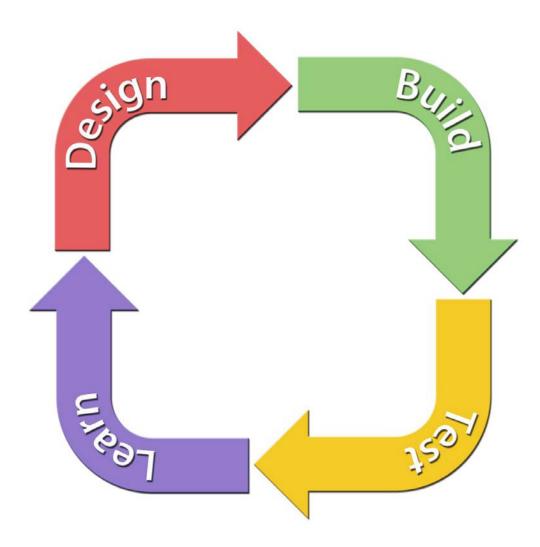
## Prototyping a Solution

From the investigation and ideation phase, I narrowed down the scope, with a target of revamping the navigation panel and the assignment/grade pages.

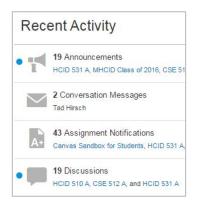
As a result, in this phase, a heuristic analysis was done to determine usability issues, while a site map and user flow were built to better understand the information architecture (IA) of the site. Then a wireframe was built and tested, to get user feedback for the final prototype.

#### Methods

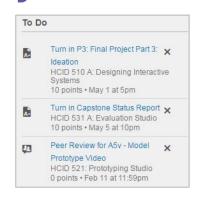
- → Heuristic Analysis (followed Nielsen's 10 heuristics, focusing on "recognition rather than recall" and "flexibility and efficiency of use")
- → Site Map (focused on the nodes that fall under the Courses & Groups section of the site)
- → User Flow (built to understand the assignment submission flow with respect to the journey and site map)
- → Wireframe (low-fidelity working prototype to test the redesign)



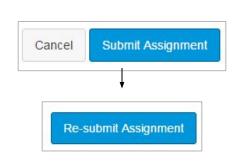
## Heuristic Analysis



Visibility of system status
Blue dot indicator on homepage
shows unread entries

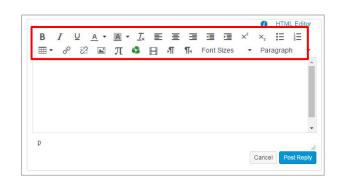


Flexibility and efficiency of use Can dismiss recent activity and items on the to do list

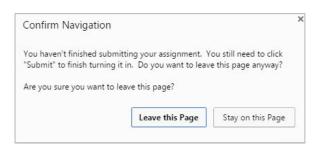


Help users recognize, diagnose, and recover from errors Can cancel assignment submission before upload

User Control and Freedom
Can resubmit assignment and overwrite previous submission



Match between System and Real World
Discussion thread post tools are similar to
other editing tools
Consistency and Standards
Uses terminology commonly associated
with learning management systems



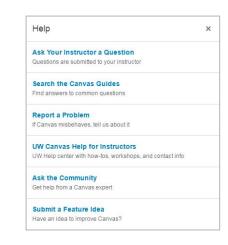
Error Prevention
Popup confirmation box when
navigating away from assignment
submission page



Recognition rather than recall
Breadcrumbs at top of page when
navigating course page

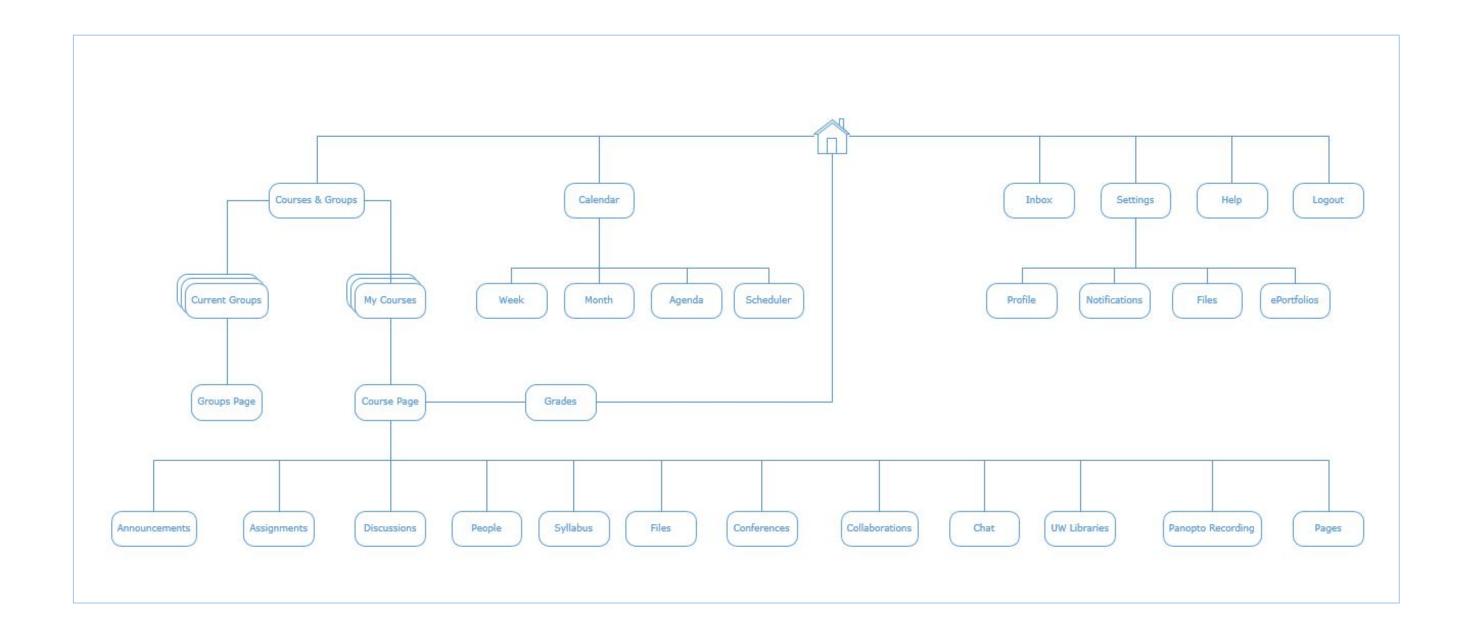


Aesthetic and Minimalist Design Site color scheme matches UW colors and is standardized across all pages



Help and Documentation
Help link is easily visible in upper right
navigation panel, but opens as a
popup instead of as separate page

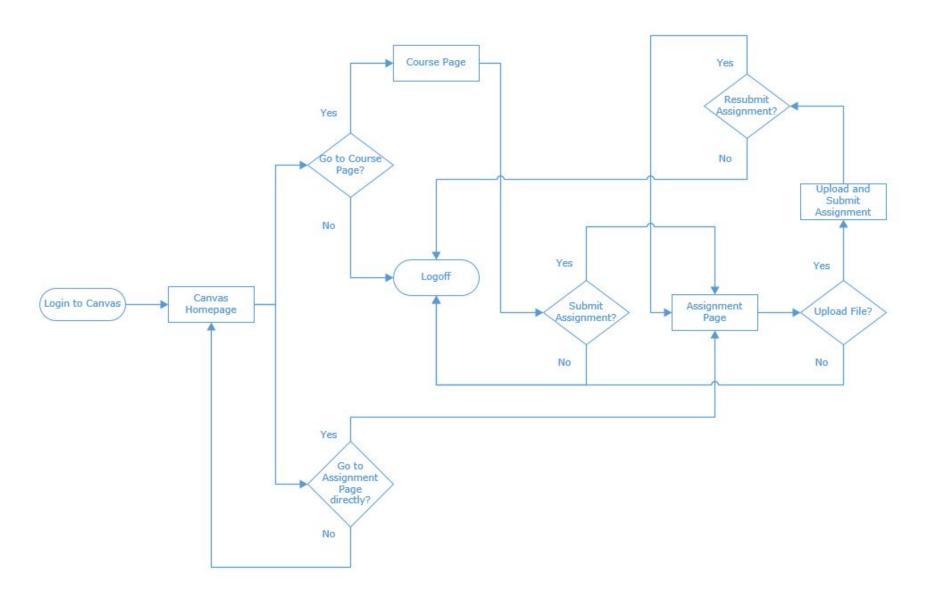
## Site Map



## User Flow

#### Task

- 1) Login to Canvas
- 2) Submit Assignment
- 3) Resubmit if necessary
- 4) Logoff



## User Test

The goal of this user test was to evaluate the wireframes that were prototyped for the Canvas redesign. The wireframes focused on the task of students accessing the Canvas assignment page, where they can view upcoming and past assignments, as well as their grades.

From the user test, I hoped to gain a better understanding of any pain points that may have been missed during the ideation phase, since only a small sample of students were interviewed.

#### Recruitment

- Users will be recruited from the University of Washington, and are required to be current students who have used the Canvas tool before for assignments
- 2. Since departments and professors use Canvas differently, participants will be recruited from different departments and age groups when possible
- 3. Participants will be rewarded for their time with a beverage of their choice

Where: Testing will be conducted either on campus or in a cafe setting, where users will feel comfortable talking and providing feedback

**Duration**: The test will last approximately 30 min., although this will depend on the speed of the user.

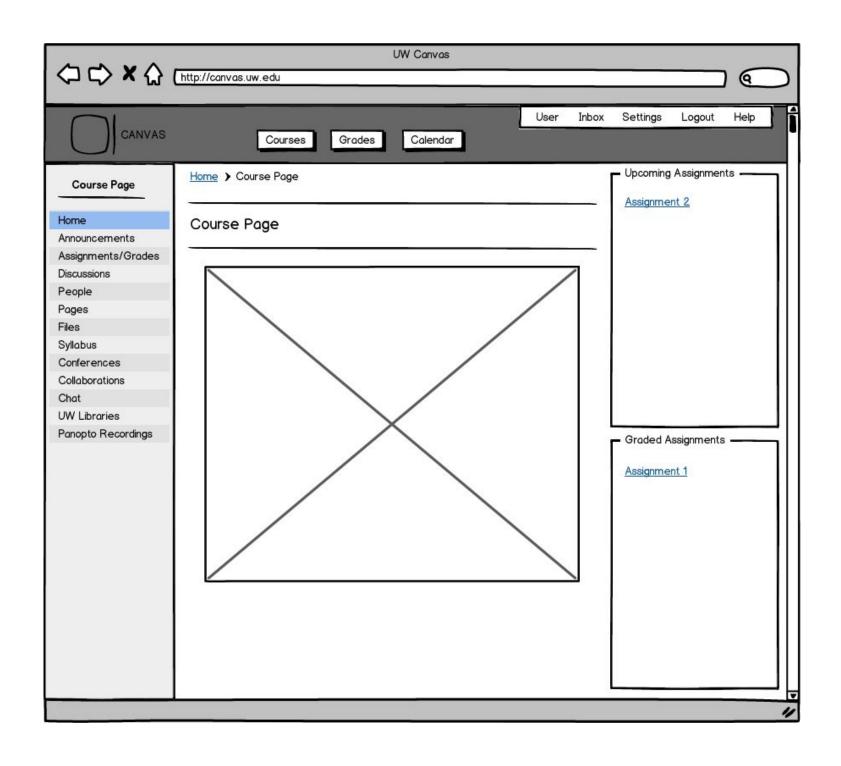
**Process**: The user test will be introduced to the participant, following the test script in the appendix. After each task, the user will be asked several follow-up questions.

## Wireframe



Removed To-Do quick links on right-hand side. Can be confusing to new users.

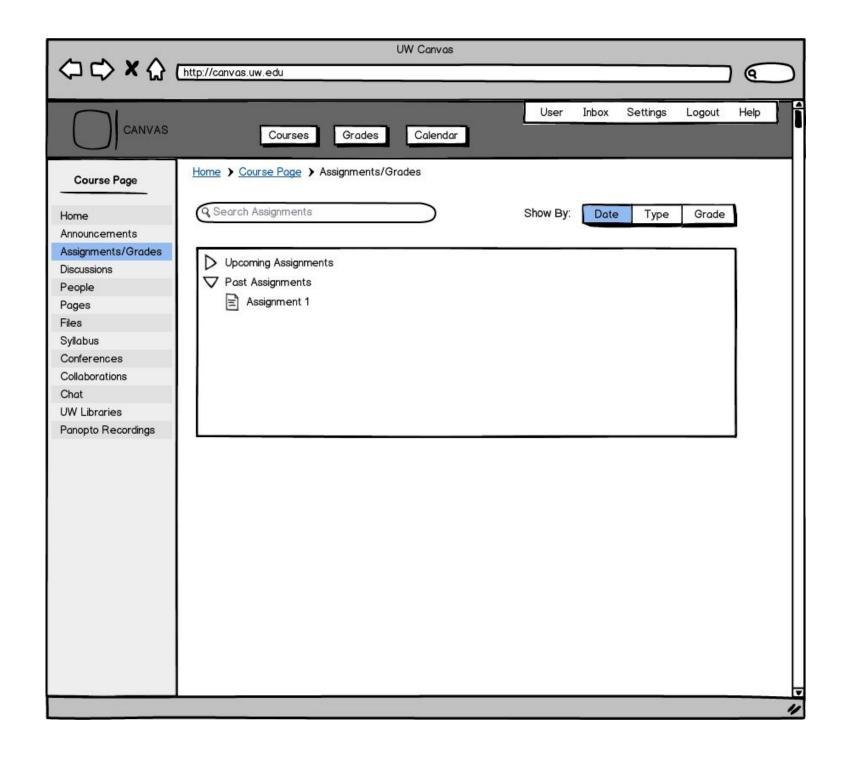
- 2 Replaced with Graded
  Assignments panel, which
  displays the most recently
  graded assignments.
- Upcoming Assignments panel has been moved to upper right corner, since this is a highly visited section.



Removed To-Do, Coming Up, and Recent Feedback quick links on right-hand side.

Replaced with Upcoming and Graded Assignments, so there is consistency between pages.

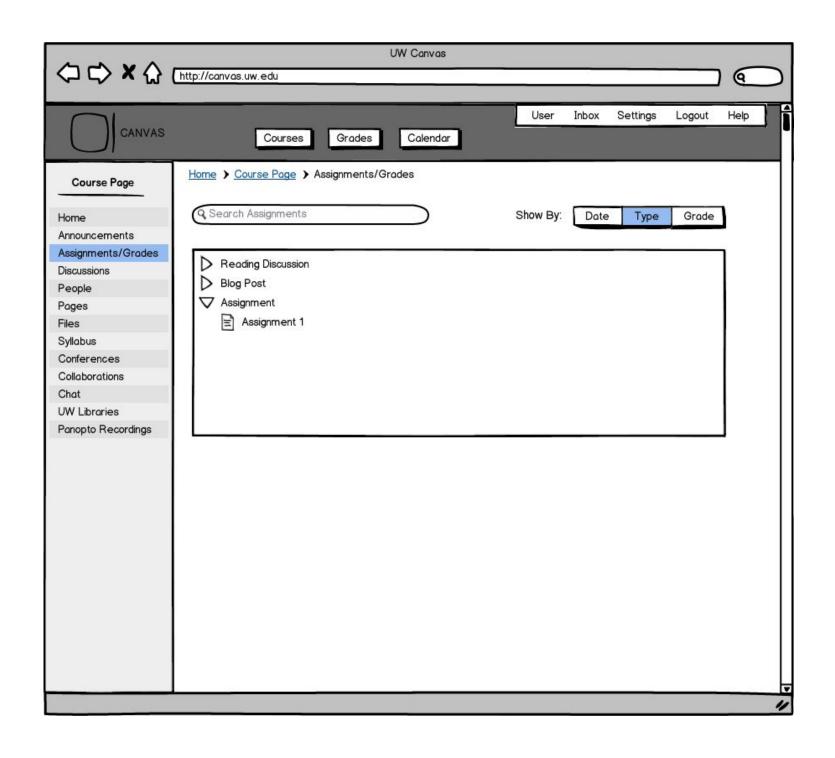
6 Merged Assignments and Grades pages on left-hand navigation panel, since they are redundant.



Changed original threaded design, into a nested tree for displaying assignments.

Added additional view option for grades, since Grades page for the course is no longer available.

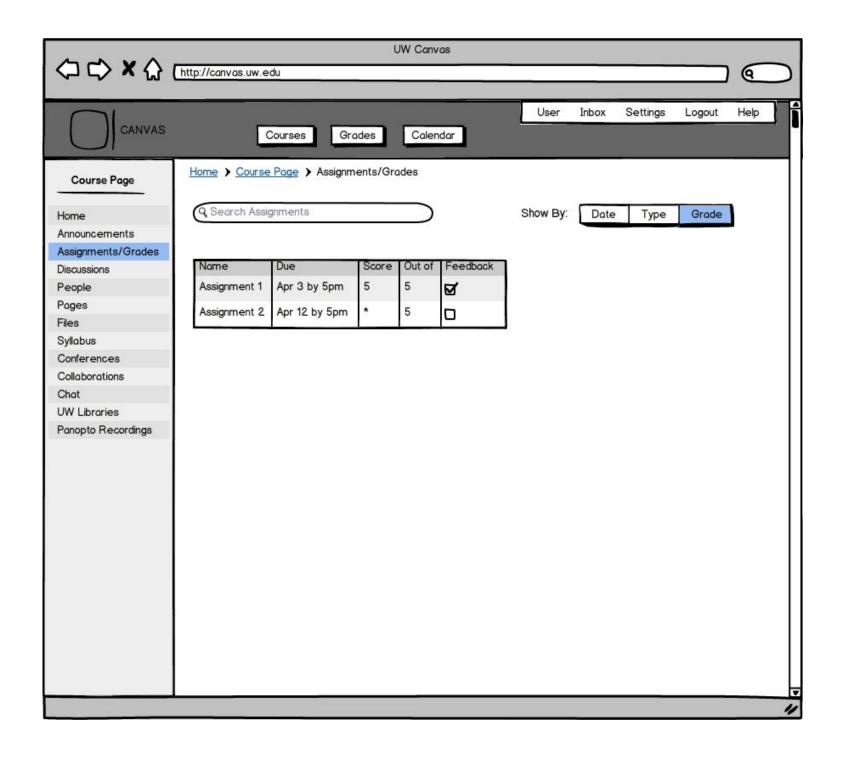
Merged Assignments and Grades pages on left-hand navigation panel, since they are redundant.



Changed original threaded design, into a nested tree for displaying assignments.

Added additional view option for grades, since Grades page for the course is no longer available.

Merged Assignments and Grades pages on left-hand navigation panel, since they are redundant.



Moved grade data from original Grades page to Assignment/Grades page

Followed similar format to previous Grades page so user is familiar with layout

To view overall/final grades for the course, user can select Grades button at the top of the page.

## Results

User	Task 1	Task 2	Task 3	Task 4
A	<ul> <li>I found the "Courses" link easy to find, but feel it could be changed to "My Courses"</li> <li>No issue finding the Assignment link from the quick links panel</li> </ul>	<ul> <li>Quick links panel on Homepage is the easiest</li> <li>Yes, requires less steps</li> </ul>	<ul> <li>Yes, especially since you can scan more quickly than before</li> <li>I usually use Date view for the most recent assignments</li> </ul>	<ul> <li>Yes, it's easy to quickly view your grades</li> <li>I like having it all in one place, but I wonder how you would display grading feedback, since it doesn't look like there is room to show the comments?</li> </ul>
В	<ul> <li>Yes, it's fine the way it is</li> <li>I prefer the old design which had the To Do list, since you could mark/remove completed assignments</li> </ul>	<ul> <li>The homepage was easier, since it was faster</li> <li>Yes, but like I said before, I like having the To Do list instead</li> </ul>	<ul> <li>It works well, but I also didn't have any issues with the previous design</li> <li>I always use Date view, since it shows upcoming assignments</li> </ul>	<ul> <li>Yes, but I wish it had the table on the side that shows the weight of each group of assignments</li> <li>The table works well, but again, wish it had another table to show the weight of each assignment on the final grade</li> </ul>
С	<ul> <li>No problem with the current design</li> <li>Maybe allow the user to hover over link to preview assignment?</li> </ul>	<ul> <li>Either is fine, depends which page I'm on</li> <li>Yes, it's helpful</li> </ul>	<ul> <li>Yes both Date and Type Views were easy to use</li> <li>I think I've always used Date view, never seem to need Type View</li> </ul>	<ul> <li>Yes it works well</li> <li>I like the table, since it is easy to scan through all your grades column by column</li> </ul>

## Evaluation of Results

Based on the feedback received during the user test, the changes to the homepage and coursepage worked well across all users. Some were fine with existing design, but expressed that the new design also worked for them.

However, there were conflicting views on the changes to the grades page. Due to the multitude of information available on the grades page, such as having a table on the side with the weight of each assignment category, some users wished for additional information for the Grades view in the redesign.

Another concern was the spacing of the new grades/assignment page, specifically the table. Since there is a feedback column, which is clickable, users wondered if it would expand like the original design did. Since it's now a table, and not a threaded design which can expand to show the grading comments/feedback, the best potential method would be displaying a popup upon clicking the feedback check mark.





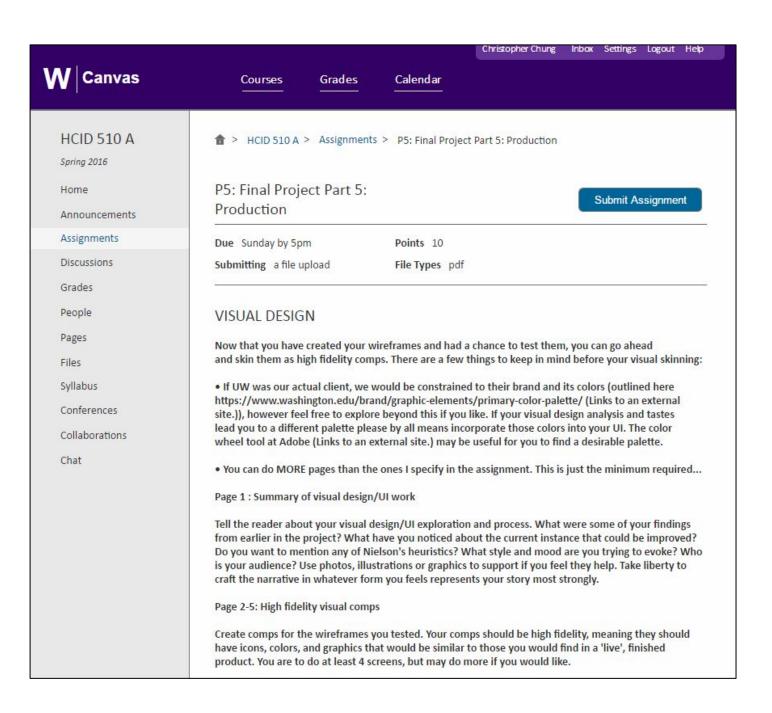
## Stage 4: Production

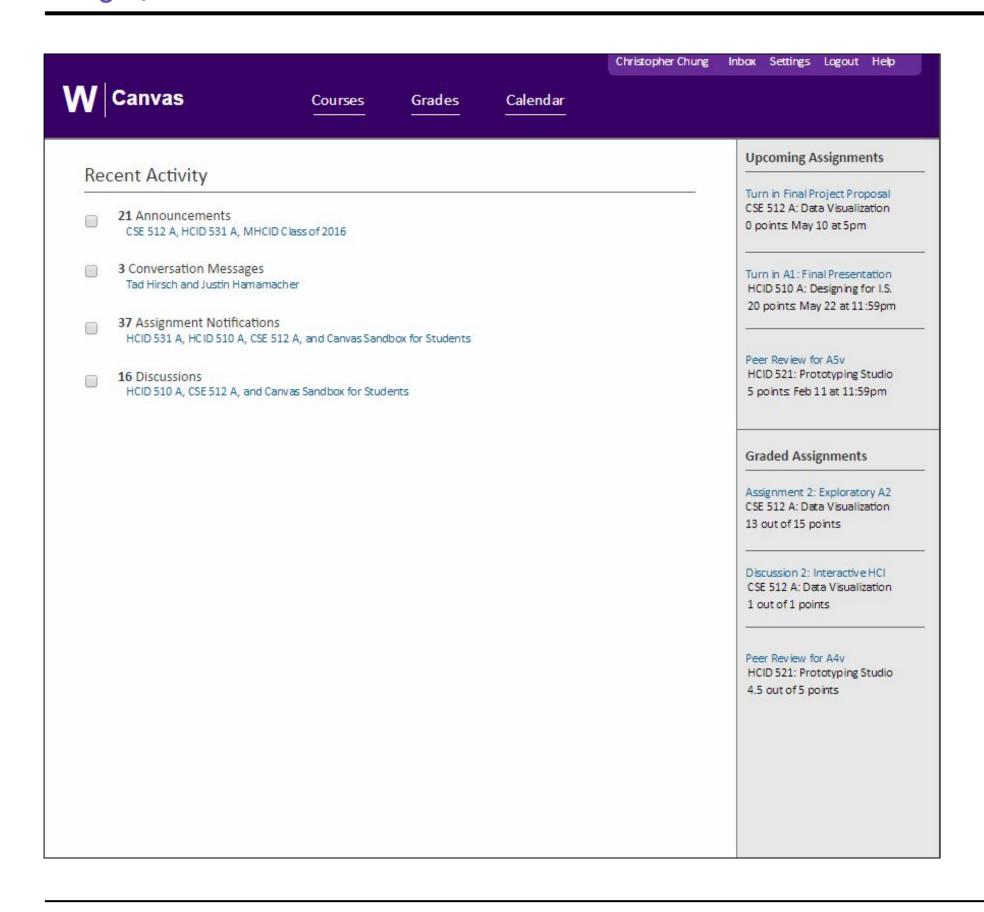
## High Fidelity Mockups

Based on the feedback received from the user tests and the insights gained from the first three stages, I built a high fidelity interactive prototype using Axure.

Link to live prototype:

www.chungware.com/test/home\_page.html





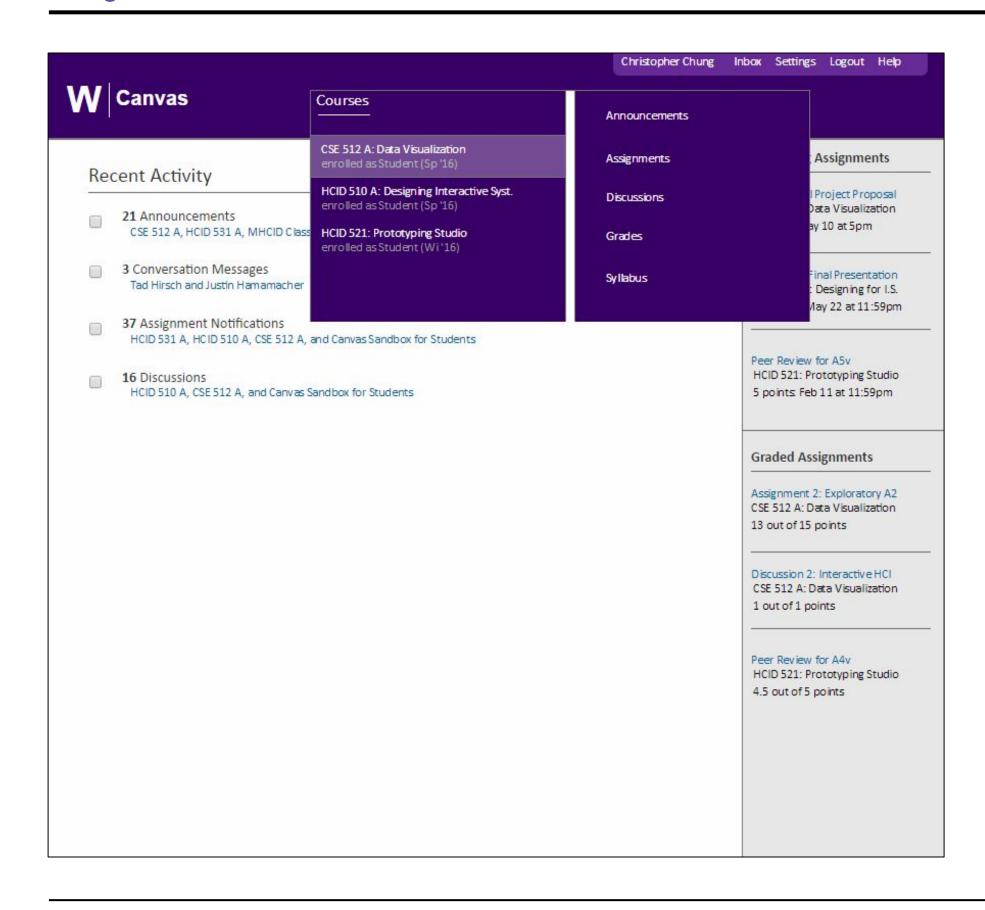


Removed To-Do quick links on right-hand side. Can be confusing to new users.

Upcoming Assignments panel has been moved to upper right corner, since this is a highly visited section.



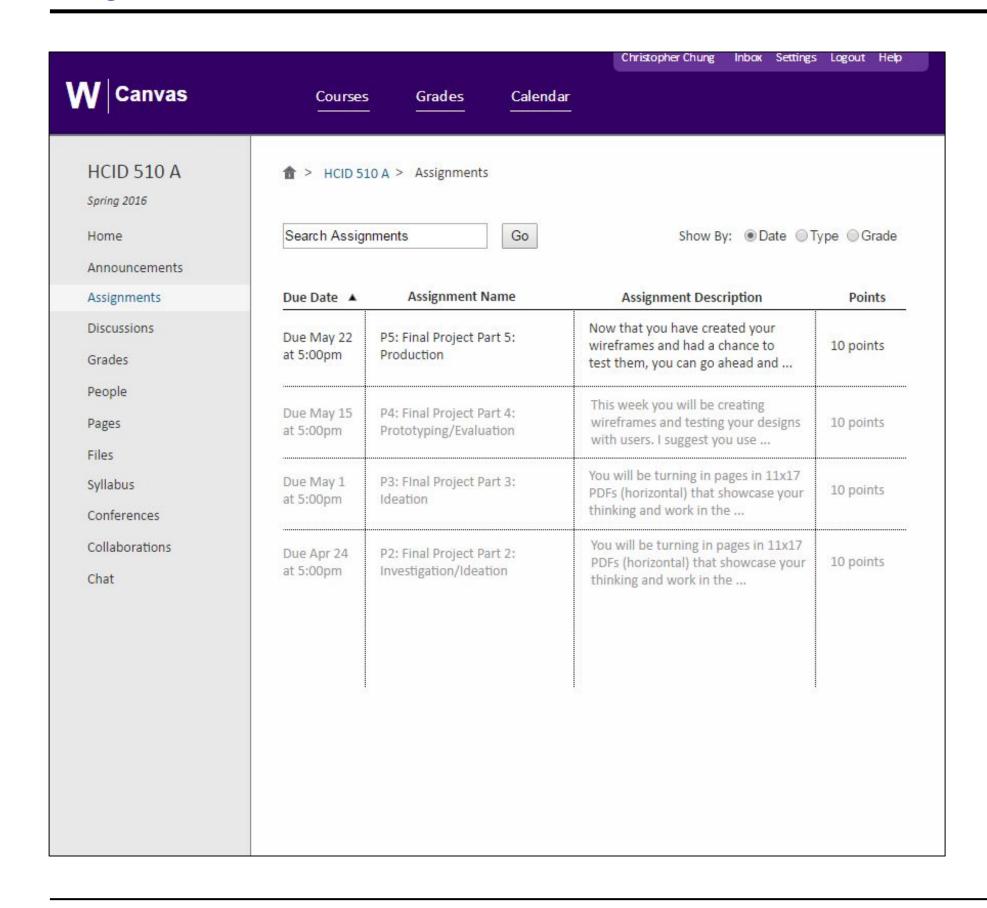
Replaced with Graded Assignments panel, which displays the most recently graded assignments.





Added second level navigation panel. This allows users to access course assignments, grades, etc. in a single click.

Previously, required 2 to 3 clicks in order to reach course assignments or grades page.

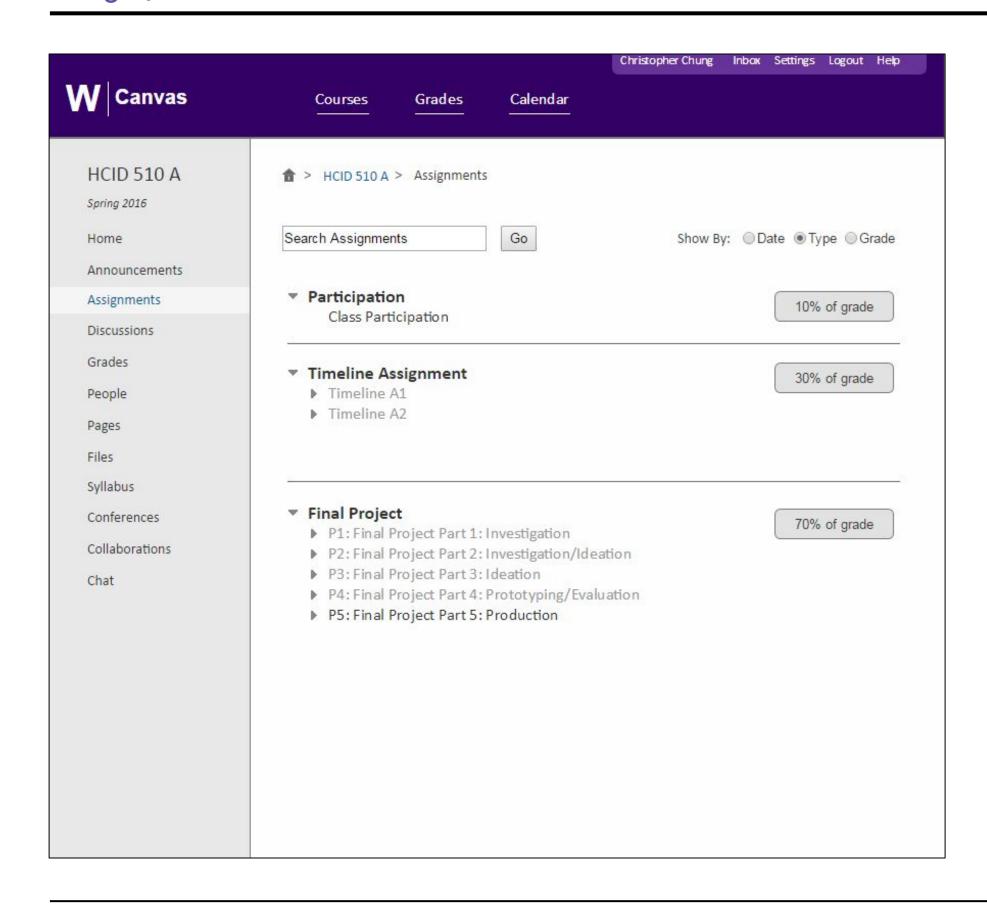


Added additional sort option for Grades. This allows users to toggle between Date, Type, and Grade views of their

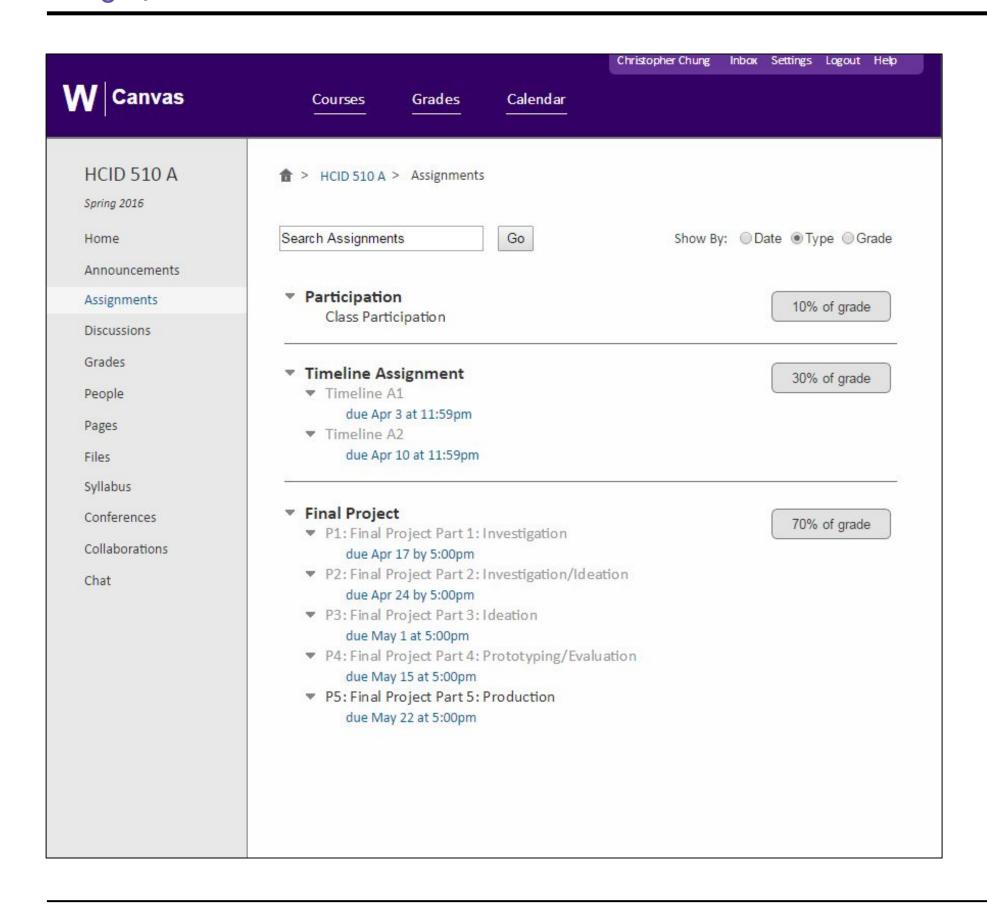
assignments.

- Replaced original assigment layout with table, which allows the user to scan through upcoming assignments more quickly.
- 6 User can also toggle the arrow next to Due Date to sort assignments in ascending or descending order.

Assignments are also shaded based on whether they've been submitted or still need to be submitted. Grayed out text indicates the assignment has already been submitted



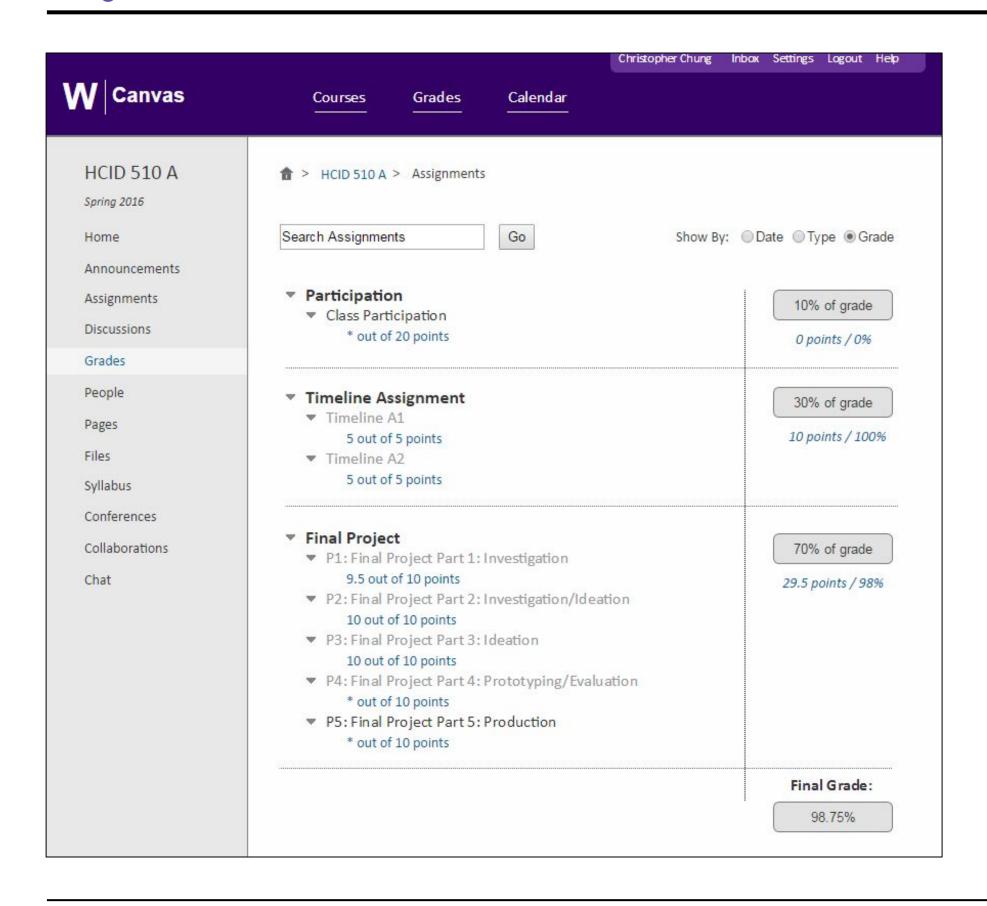
- Changed original threaded design, into a nested tree for displaying assignments.
- Added grade weights on the right hand side, to provide additional grading information based on assignment category





To hide secondary information, users are given the ability to toggle the due dates on and off.

This is because the dates can be easily viewed and sorted in the Date view, while the Type view groups assignments by category.



Original Grades page can now be accessed directly from the Assignments page, simply by using the radio buttons in the upper right hand corner.

The page has been simplified, since much of the original information available has been incorporated into the Type view.

Grade weights, which are visible on the Type view, are also visible on the Grades page.

Below them are the subscores, which are calculated based on graded assignments. These are then aggregated and displayed as the Final Grade on the bottom.

## Summary of UI Exploration

## **01**Findings

During the investigation phase, several issues were identified, primarily through the interviews and heuristic analysis.

Two major issues were the top navigation panel which had poor "recognition rather than recall" and the assignment and grade pag, which lacked "flexibility and efficiency of use"

## 02 Changes

To visualize the changes made, low fidelity paper sketches were generated, which later evolved into higher fidelity mockups.

Changes were made to the homepage, assignment page, and grades page. User tests were conducted using wireframes, for feedback to include in the final prototype.

## 03 Audience

This redesign is primarily targeted at general users of Canvas, which are students who want to have convenient access to their assignments, readings, etc.

Other stakeholders involved are instructors and IT support, who want a LMS that has a low learning curve, while being easily scalable, with low licensing and maintenance costs.

## O4 Style/Mood

The redesign was constrained by the required university branding/color style, which is dark purple, on white/gray background. As a result, much of the original color/font style was left untouched.

To gain a better understanding of the mood, a mood board was constructed, with a focus on ease of use and productivity. This was reflected in the redesign through a more streamlined and minimalistic interface, which removed redundant text/links to declutter the screen.

## Moving Forward

One aspect that was not considered in the redesign was showing the overall/final grade for the class. I made the assumption that the Grades page, which can be found in the top navigational panel, would be a separate page from the newly designed assignment/grades page. As a result, a good next step for future iterations of this redesign, would be to focus on redesigning the overall grades page.

Currently, this page allows users to toggle through every course, and view their overall/final grade. However, compared to the assignment/grades page, it does not provide as detailed of a view of the grade distribution. Perhaps the newly designed Grades page could include additional data visualizations that could help the user better understand their current progress across all classes. The visualizations might even help them identify which classes are their weak points, and possibly provide suggestions to improve.

Another possible next step is to branch the redesign into the tablet space. The current Canvas app on tablet lacks many of the features available on the desktop version. Perhaps many of the changes made in this redesign could be ported or translated over. Obviously several design constraints exist on tablet, due to the smaller screen real estate, and the interaction method of touch over mouse. However, this would only be necessary if there was a surge in Canvas users on tablet, as currently, desktop is still the dominant platform.

## References

- 1. <a href="http://depts.washington.edu/lingta/CanvasVsCatalyst.pdf">http://depts.washington.edu/lingta/CanvasVsCatalyst.pdf</a>
- 2. <a href="https://itconnect.uw.edu/wp-content/uploads/2013/12/document2.pdf">https://itconnect.uw.edu/wp-content/uploads/2013/12/document2.pdf</a>
- 3. <a href="https://www.emaze.com/@ALQIQZIC/Slack-Competitive-Analysis-Slides">https://www.emaze.com/@ALQIQZIC/Slack-Competitive-Analysis-Slides</a>
- 4. <a href="http://www.alamo.edu/mainwide.aspx?id=22961">http://www.alamo.edu/mainwide.aspx?id=22961</a>
- 5. <a href="https://www.trustradius.com/compare-products/blackboard-vs-canvas">https://www.trustradius.com/compare-products/blackboard-vs-canvas</a>
- 6. <a href="http://elms.umd.edu/sites/elms.umd">http://elms.umd.edu/sites/elms.umd.</a>
  <a href="edu/files/webfiles/documents/doc/ComparisonChart\_JULY18.pdf">edu/files//webfiles/documents/doc/ComparisonChart\_JULY18.pdf</a>

## Appendix - Test Script

#### Introduction:

Thank you for volunteering for our study. We appreciate your time and efforts talking wit hus. Our study will be testing a wireframe prototype of a redesigned assignment and grades page for the Canvas LMS. We will ask you some background info questions and then run you through several tasks.

#### **Background Info: (3 minutes)**

- How old are you?
- What major are you currently studying?
- What devices do you own? (i.e. tablet, laptop, smartphone)

#### **Using Canvas: (3 minutes)**

- How frequently do you use Canvas every week?
- Are there any classes where you don't use Canvas, or use another tool in conjunction with Canvas? (i.e. Slack)
- What device(s) do you use to submit assignments on Canvas?
- Do you have any issues with the current assignment or grades pages on Canvas?

#### Task 1: Navigating to the Assignments Page from Homepage (6 minutes)

#### Instructions:

- Please find the link to the Courses Page
- Then find the link to Assignment 1

#### Questions:

- Was it intuitive to look for the courses page under Courses?
- Was it easy to find the assignment page for the assignment specified?

#### Task 2: Navigating to the Assignments Page from Coursepage (6 minutes)

#### **Instructions:**

- Please find the link to the Assignments Page
- Then find the link to Assignment 1

#### Questions:

- Which method do you prefer for accessing the assignment page?
- Did you find the quick links panel on the right hand side of the coursepage/homepage helpful?

#### Task 3: Viewing Assignments by Date/Type (6 minutes)

#### Instructions:

- Please select the Date view on the Assignments Page
- Then switch to the Type view on the Assignments Page

#### Questions:

- Was the Date view easy to use? How about the Type view?
- Which viewing method do you prefer, Date or Type?

#### Task 4: Viewing Assignments by Grade (6 minutes)

#### Instructions:

- Please select the Grade view on the Assignments Page
- Then look for the grade received for Assignment 1

#### Questions:

- Was it easy to quickly view the grades?
- Do you like the table format for grades, or would you prefer something else?

