canvas
BY INSTRUCTURE

System Redesign Report

Informatics 132

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*Executive Summary*_____

Canvas is an **educational management system** that allows schools K-12 and universities to organize their classes so that students have access to class information and assignments, which are managed by staff. It provides features such as a **discussion forum, inbox, calendar, and upcoming tasks** for communication and convenience.

METHODS

Our team has conducted a series of **competitive analyses, interviews, surveys, usability tests, cognitive walkthroughs,** and **heuristic evaluations** to study the Canvas website.

In competitive analyses, our team went over Canvas's direct competitors and potential indirect competitors to gain a clear knowledge about the industry. Comparing these competitors enables thoughts on sufficiency of Canvas and inspires the redesign plans.

To compose our user research, we interviewed nine student, who each experienced Canvas on different levels of familiarity, as well as distributed a survey to various communities and received 28 responses. With these data we have generated graphs and affinity diagrams to synthesize our acquired data.

Cognitive walkthrough is the method where we design the path for completing tasks on Canvas and find navigating issues while going through it. Six usability testing data were also collected for us to understand what are the issues that users have experienced.

After finishing the redesign, the team evaluated the redesign with Nielsen's Heuristics to spot positive features and negative features of the redesign.

KEY RESULTS & RECOMMENDATIONS

In our redesign, we have made changes in:

- Improving the navigation to the **peer review** page and the visibility of elements on that page**.**

- Improvements on ways of engagement in the **Discussion board**

- Improvements on the intuitiveness of the multi-level navigation bar section.

- Standardized the **homepage** with weekly categories

*Introduction*_____

This report documents our entire study, detailing our methods and findings as well as the conclusions we have drawn and taken into consideration in the redesign of the system. The report is meant to provide suggestions on how to improve the usability of certain features and processes, more specifically the Peer Review process, the Discussion Board, and elements relating to navigation, of Canvas—all of which are supported by our findings in our user research and usability testing.

Canvas is a learning management system utilized by K-12 educational institutions and universities to organize courses. In an effort to improve the user experience for students, through various research method, this report looks to reveal certain usability issues of Canvas. Various research methods used to reveal such issues included conducting user interviews and surveys, administering a cognitive walkthrough and handling usability testing. Once these issues were revealed, this document also provides a proposed redesign of Canvas and an explanation of how these changes can help improve the user experience. Lastly, this report analyzes these proposed redesign through an in depth heuristic evaluation.

*Competitive Analysis*_____

The Product - Canvas

I. **Accessibility**

Canvas may be accessed through any device with internet connection either on the website, mobile website, or application.

II. **Scope**

Our focus will be on the Canvas website's layout and multiple functionalities.

III. **Organization**

Canvas was founded by the educational company Instructure, which is located in Salt Lake City, Utah.

IV. **History**

In 2008, Instructure was founded by Brian Whitmer and Devlin Daley, who were two graduates from Brigham Young University. Canvas was launched in February 2011 and is available as a free open source software. The iOS application was launched in the same year while the Android application was released in 2013. Canvas Student and Canvas Teacher were then released as applications that split the original application into separate features for teachers and students. In 2016 Canvas parent was released

so that parents would have access to their children's assignments, grades, and performance in school.

V. Appeal

We decided on Canvas because as students, we use Canvas regularly to stay updated on our courses. From time to time, we have ran into difficulties or confusion during our use of Canvas, such as how the navigation and information structure can be counterintuitive-- specifically, the discussion board and the course groupings. Canvas and the way it is designed has a great impact on not only us, but to all the students, parents, and staff that use it regularly as well, so we wanted to find ways to improve upon it.

Direct Competitors & Indirect Competitors Analysis for LMS (Learning Management Software)

I. Canvas Instructor   *Link*: **https://canvas.eee.uci.edu**

   A. Description:

Canvas is an educational management system utilized by educational institutions to organize their classes. It allows both teachers/professors and students to provide and access class information and assignments, participate in forums, and an alternate way to submit and grade assignments, allowing users to communicate and learn beyond the classroom

   B. User Base:

Canvas is utilized by the professors, teacher assistants, and students, but we will be focusing on how the system is utilized by students.

   C. Functionality & Feature Set:

Students can refer to information about their courses by accessing the course "Syllabus" and "Announcements". In each course, students can keep track of their assignments and important deadlines and dates through the site's "Calendar" feature as well as the "To Do" and "Coming Up" informative sidebar. A Discussion feature provides students an opportunity to respond to or even initiate their own discussions and questions. Students can submit directly on the page which details their assignment as well as complete quizzes assigned by their course instructors

   D. The Problem Being Addressed:

The main problems with Canvas is the information architecture. Canvas divides information distinctly by classes but often blurs the line between the information of one particular class and the information of another. The features on here combines multiple classes, and users do not have the option to hide this. Another contribution to this problem is that all classes are subject to the same, default page formats. Users rarely have the opportunity to distinguish between classes upon initial look. Another aspect of the navigation also relates to one of

Canvas' features. Canvas' main problem is how it is organized, but it also has a minor problem of tracing user information among others on a public space.

Direct Competitors:

I. Google Classroom

    A. Description:
   Google Classroom is an online platform used to manage a class digitally by giving teachers the ability to create, distribute, and grade assignments for students. Google Classroom exists in connection with the rest of the Google account features, such as Google Drive, Docs, Gmail, and Google Calendar.

    B. The Problem Being Addressed:
   Google Classroom improves on the primary weakness of information architecture that exists with Canvas. All the specific class information rests respectively underneath their associated class pages. Once the user is inside a class page, all of the information specific to that class are available to the user and are the only things that are visible. Two of the main features seen at the top "Stream" and "Classes" only display information associated with the particular class. Only by clicking on "About" and the dashboard on the top-left will lead to navigation to other classes, whereas on Canvas there are often multiple options seen per page with a lot of options leading to resources in of other classes (it is also sometimes difficult to identify which resource belongs to which class, such is in the "Groups" option).

    C. Functionality & Feature Set:
   Google Classroom has very similar features and functionality in comparison to Canvas. Grades and assignments can be viewed, assignments can be turned in, and teachers can post discussion topics. The feature set in Google Classroom are placed in a more organized, simplistic fashion. Students can respond to a question posted by their instructor or start a discussion-like post themselves, but unlike Canvas, students using Google Classroom can only respond by writing textual comments. As mentioned above, Canvas' Discussions allows for users to contribute not only textual responses, but also links, images, and videos.

    D. User Base:
   The user base for Google Hangouts is about identical to the user base of Canvas. Students and teachers all together collaborate on a digital space divided by class.

    E. Other Similarities & Differences:
   A notable distinction Google Classroom has with Canvas is its compatibility with all Google Account features. The way Google Classroom pages are organized and how the page-layout is designed gives the users well-understood

information and allows for smooth navigation. Instead of multiple options per page with Canvas, there is limited amount of information seen per page, with primary options being big and bolded. Another notable quality of Classroom is that it has much faster performance speeds. Canvas edges Google Classroom when it comes to advanced features, however. Canvas allows for more interactive assignments, such as peer reviews and quizzes.

II. Blackboard   *Link*: **https://hlpusd.blackboard.com/**

A. Description:

This application is a course management tool designed to help instructors distribute class resources and help facilitate learning and teaching via the internet.

B. The Problem Being Addressed:

  i. Blackboard and Canvas helps makes material centralized in one location and is a space where students can learn and submit assignments virtually. Students on Blackboard can manage course information and engage in conversation with their instructors and classmates to make learning collaborative.

C. Functionality & Feature Set

  i. Both of these applications look to manage and display information about the courses taken by students. Blackboard allows students to assess their grades, post on a discussion forum, look at pending task and assignments, view course information and files. A unique feature that Blackboard has is that it allows students to receive notifications from organizations. Customization is much more prevalent on Blackboard than on Canvas.

D. User Base

  i. Blackboard learn and Canvas are both primarily concerned with students and instructors of university institutions to help manage course information on the web.

E. Other similarities or differences

  i. Blackboard Learn allows students to send email to organizations and instructors and has a comprehensive tab that details where to find help and support. Canvas contains a separate feature focusing on creating groups with classmates, whereas Blackboard does not have comprehensive group system.

Indirect Competitors:

I. Turnitin
Link: http://www.turnitin.com/

- A. Description:
  Turnitin is an online service that accepts essays, reports, articles, etc from K-12 and students in higher level. It checks plagiarism to ensure academic integrity.
- B. Functionality & Feature Set
  Turnitin offers the service of checking plagiarism, and it's rather simple. Students, teachers, or anyone who has the need of checking the originality of a writing piece can submit the .doc and .pdf files onto the website, and they shall receive a detailed report of the information they need.
- C. The Problem Being Addressed:
  Turnitin is more complicated to use than Canvas. Canvas is connected with user's online account at your institution already, whereas Turnitin requires the user to register, log in, enroll a course on Turnitin, and submit assignment.
- D. User Base
  Turnitin is generally used by teachers in K-12 education and students in college, and potentially anyone in the academy. It shares the user base with Canvas.
- E. Other Similarities & Differences
  Canvas at the first glance is offering more features and functionalities already. Turnitin focuses on only turning in assignments and returning a report on plagiarism. While submitting, Canvas is faster, easier to use, and some instructors embed Turnitin in the Canvas assignment page.Turnitin submission is often required by instructors, and Turnitin submission service is embedded on Canvas as well. Students interact with this service often, and it indirectly competes with the assignment submission functionality on Canvas. Users generally choose one over another not because one is simply better, but because they are in need of one's particular feature.

II. EEE Legacy
Link: https://eee.uci.edu/myeee/

- A. Description:
  - **i.** EEE Legacy is a comprehensive website created by internal UCI staff that manages course and student information.
- B. The Problem Being Addressed:
  - i. One of these problems revolves around the complexity of its functionality which is more varied and diverse in comparison to Canvas'. At first look, EEE Legacy's mainpage is overwhelming in the amount of features and links. This is a a weakness because EEE Legacy is taking on too many functionalities rather than having a specific functionality (of being a platform that focuses more on students' courses). This also plays into the issue of EEE Legacy's overwhelming and complicated interface. Canvas' system exhibits more aesthetic and minimalist design qualities

than EEE Legacy, which allows for user to more easily navigate and recognize certain functionalities.

C. Functionality & Feature Set:

    i. There are a lot of similarities EEE Legacy and Canvas share. Both have forum-related features (MessageBoard for EEE Legacy and Discussions for Canvas) as well as a Grade features. EEE Legacy also features additional features and functionalities not provided by Canvas.For example, students can access StudentAccess, ClassWebsites, WebReg, and DegreeWorks. Compared to Canvas, EEE Legacy is more integrated and connected to other UCI systems. On one hand, this can be advantageous as EEE Legacy can operate as a unifying platform for all things UCI-student related, but as mentioned above, can become a problem. There are huge differences in how EEE legacy handles submissions and how Canvas handles submissions. To submit an assignment on EEE Legacy, students must access a separate link specifically for EEE Legacy's Dropbox and deal with a confusing and outdated interface which features confusing features and links/buttons. In Canvas, students are able to submit their assignment on the same page as that provides them information about the assignment.

D. User Base:

    i. EEE Legacy is utilized by UCI professors, teacher assistants, and students. For this assignment, we are focusing how its use from the student's perspective.

*User Research*_____

Description of Methods

I. Interviews

The primary method used in this study was interviews. We aimed to interview participants of our target population: university students. Each of our group members contacted two university students whom we had connections with and requested a 30 minute to an hour time for interview. Interviews were conducted in a 2-to-1 format, where one person from the group was responsible for being the lead interviewer and another person was the notetaker, both interviewing the participant. Each interview started with the groups members giving the participants an interview consent form to agree and sign. Then the lead interviewer proceeded with the interview protocol, and the designated note taker recorded the answers of the interviewee on a typed
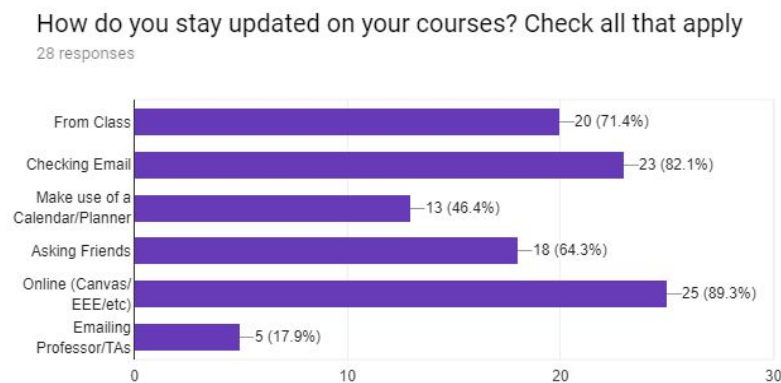
document. Due to conflicting schedules some interviews were done on a 1 to 1 format, with an moderator both asking questions and taking note of answers.

II. Surveys

The secondary method of research was gathering data through surveys. We created a survey based on our interview protocol, prompting similar types of responses. The survey was created on a Google Forum and posted on public, student-based pages on Facebook. The survey results provided the group with mostly quantitative data on the target population and their attitudes toward Canvas.

Findings

Information derived from numerous interviews and results from a participatory survey helped to gauge more information about our users and their behaviors, tendencies, and interests about school, technology, and Learning Management Systems. With technology being more prevalent and accessible recently than it was in previous years, all of our interviewees admitted to using and relying on technology on a daily basis primarily for education, entertainment, and communication. Since the majority of individuals studied were students, a sizeable amount of their day consists of being online, looking to stay updated on their courses. Results from Figure 1 indicates that 89% of responders stay updated with their courses online through either Canvas or EEE, two of the most prevalent learning management systems used by the University of California Irvine.

How do you stay updated on your courses? Check all that apply
28 responses

From Class	20 (71.4%)
Checking Email	23 (82.1%)
Make use of a Calendar/Planner	13 (46.4%)
Asking Friends	18 (64.3%)
Online (Canvas/EEE/etc)	25 (89.3%)
Emailing Professor/TAs	5 (17.9%)

Figure 1. Survey results on how students stay updated on school

I. How students look for answers

Although course information is displayed online for all to view, some information may still seem unclear. For those who would like to further ask question about course material, we found that the 89% would prefer asking other classmates for clarity, rather than asking in lecture, or sending an email to the professor or TA.

II.   How students organize

Students often have to find a way to juggle school, clubs, social activities, work, and much more. Results of our survey showcase that 67% of responders are involved in some form of extracurricular activity on campus with much of the information relayed through social media outlets such as Facebook and Instagram. When asked how were they able to keep track of their schedules and deadlines, there were numerous responses detailing that these students would much rather keep a mental note of short term tasks, whereas long term goals or activities were noted and stored for later. One particular respondent detailed that he would much rather "check for things throughout the week" and that planning day by day can "create extra and unwanted stress." Individuals who did keep track of their tasks on a day to day basis did so by utilizing either a digital or physical calendar. The primary reason as to why responder's grativated to using these calendars because they allow for users to "help layout certain gaps" and plan their day visually. Yet, despite the fact that either respondents rely on their memory or calendar to organize their tasks, 6 out of 10 interviewees admitted that when it came down to completing assignments and reaching deadlines, many of them tended to procrastinate.

III.   Working as a group

Working as a cohesive group is a critical skill that is learned and developed while in college. When asked about their experience working as a group, students who were surveyed and interviewed detailed the barriers they face when working as a team. The top three noted difficulties in working in a group involves aligning schedules with each others (60.7%), keeping communication (57.1%) and making decisions together (50%) shown on Figure 2.

When working as a group for a course, what barriers do you typically face (check all that apply)
28 responses
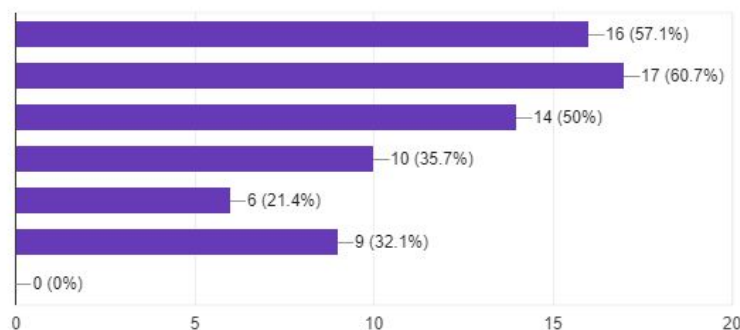
Figure 2. This bar chart shows the challenges of working in groups in college.

IV. Working together physically vs. working virtually

When working as a group, interviewees do not mind either collaborating in-person on online, as long as progress is being made. Although feedback is instantaneous when working in person as one interviewee noted, working online helps alleviate the difficulties of scheduling a time to meet all at once through the usage of collaboration tools like Google and chat applications. One interviewee feels as though that "Google Docs is definitely the #1 group work application because it's just easy for everyone to access and we can all be on at the same time and see everyone's edits."

V. How often Canvas is used

When asked about Canvas itself, the survey indicates that 64.3% of respondents use Canvas 1-5 times a day. The top three tasks that these respondents use within canvas include checking their assignment, viewing course material, and viewing their grades. 26 out of the 28 (92.9%) respondents indicated that these the most used tasks on Canvas. When asked about a which particular tab that is most useful within Canvas, one interviewee indicated that the modules tab is "broken down by weeks which is very helpful" and that it also includes "the ability to view files all in one spot."

VI. Frustrations with Canvas

Features that our respondents felt that was frustrating was the peer review section of Canvas. One interviewee detailed that the feature "was confusing on how you inputted your comment and making sure that it send through" as well as "accessing their work". Another explained that "you are only restricted in viewing in under the canvas display which can be annoying." In addition, our respondents felt that they felt that their canvas experience could be maximized if they were able to learn and experience other unused features such as the Inbox, Calendar, and Groups tabs.

*Usability Testing*_____

Description of Target Population

The individuals that are targeted for our study are college students from the ages 18 to 24. In particular, we will examining students who are enrolled in the University of California, Irvine. Students from UC Irvine utilize Canvas as their learning management

system for the majority of their courses. Although these students share the same learning management system, many of them come from a wide variety of cultures, communities, and socioeconomic standings. Although we are limited in viewing Canvas through a student view, we are also cognizant of professors and teaching assistants needs to facilitate materials, assignments, and announcements and how our analysis will affect the overall learning and teaching experience. Lastly, knowing that this system will replace the retiring EEE Legacy system at UCI, we will also keep note on what this transition will mean to the university and the professors making this change from EEE to Canvas.

Description of Methods

I. Methods Details:

Our usability testing involved 2 methods: cognitive walkthrough and usability test.

1. Cognitive Walkthrough:

For our cognitive walkthrough, all members of the group collaborated to go through a series of tasks in the system. At every task, we answered questions that focused on the visibility of elements and signifiers in the user interface and the interface's effectiveness in communicating the purpose of those elements and the necessary actions required to accomplish each (sub)goal in the task. As a group we facilitated roles with one facilitator monitoring the course of the conversation, a scribe who took notes on the conversation, and participants who would discuss each task.

Tasks utilized in Cognitive Walkthrough:
a) Submit and write peer review comments
b) Post on discussion board
c) Create a group

2. Think-Aloud Usability Test:

Our think-aloud usability tests required actual participants, users (both regular and novices) of the system, to complete several tasks within the system, which took around 30 - 45 minutes. While progressing through the task, they were to explain their thought processing out loud. The facilitator would encourage the user to speak their thoughts while the notetaker would observe and record the user. After the user informed us that they were done, we would move on to the next task. Each user's task was recorded via screen capture and timed. Afterwards, they filled out the post-test questionnaire provided to measure their satisfaction of Canvas.

Task utilized in Usability Test

      d) Submit post on discussion board
      e) Locate and conduct a peer review assignment
      f) Adjust notification preference
      g) Submit a message through the Inbox feature
      h) Create a group
      i) Submit an Assignment

II. **Participant Recruitment:**

  A. While we aspired to take into consideration and test users who span the entire spectrum of experience (from novices to experts/more regular users), we decided that we wanted to cull our participant pool primarily from regular users of Canvas. This is in part because Canvas is utilized in educational institutions which often distribute and enforces the use of the system, making Canvas a standardized learning management system used among many of the faculty and staff. Because Canvas is widely used by educators, many Canvas users/students would consequently utilize Canvas regularly—a fact that we verified through our user research in interviews and surveys. With this, we have come to a conclusion that most of participants should be regular Canvas users to ensure that our testing and redesign meets that particular population's needs.

  B. We contacted UCI students, a majority of whom use Canvas, as well as a few other students who have not had experience with the system.

Findings: Usability Issues

I. Difficulty in the Locating and Poor Visibilityof Course Material

  A. Most users had difficulty accessing and conducting a peer review within Canvas. The average time it took our all of participants to finish the peer review lasted for 7:55 minutes. Although there is a tab that allows the ability to view peer reviews within the home page of the course, half the participants tried to locate the peer review by searching for this under the 'Assignment' tab. When users do decide to go onto the 'assignment' tab many utilized the Control-F feature to find the peer review. There is no distinction between which assignments are needed for peer review within the 'Assignments' tab.

| Search for Assignment		SHOW BY DATE	SHOW BY TYPE

Figure 3. *These two tools were largely ignored when searching for assignments.*

Filtering for Assignments

None of our participants used the search bar titled "Search for Assignment" or the filter buttons of "Show by Date" or "Show by Type" shown on Figure 3. There is no adequate way to quickly search and select target items; often, users have to resort to scrolling through and scanning a long list of items. Most participants relied heavily on Command-F to find their target assignments after struggling to scroll up and down to search for their particular assignment.

### Difficulty locating the Rubric

While some users were able to locate the rubric for the peer reviews, others struggled to find it immediately. One user, a novice, after leaving the assignment page and frantically searching through other pages, asked why the rubric was "so tiny" when she finally found it. This issue can be seen on Figure 4.
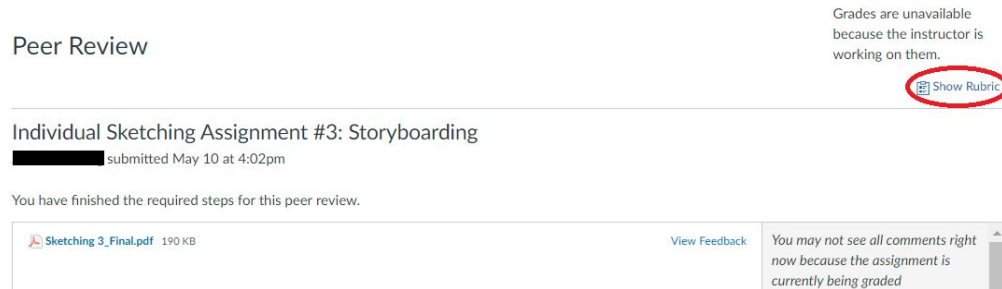
Figure 4. *Located at the top right corner with only the color of its font to slightly stand out, the Rubric is hidden from immediate view.*

Searching for students in Creating a Group

When it comes to searching for particular peers in a class, for example in group creation), it was frustrating for some to scroll up and down to find their peer's name as shown on Figure 5. One participant added how it would be helpful if there was some search bar to help her more easily filter and find the peer she needed when doing the group creation task (task #5).
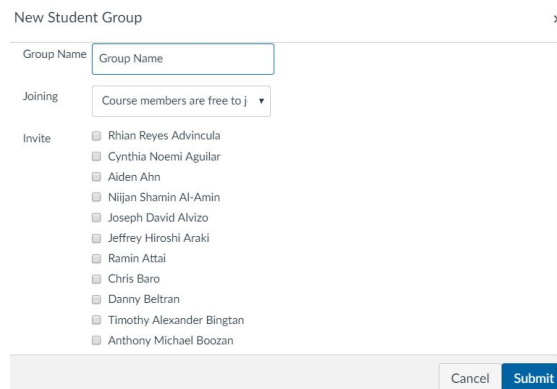
II.   Inconsistent Wording and Organization of Navigation Section

A. There is *lack of understanding* about the distinction between the main navigation bar and the navigation bar for the selected/current course the user is in. Most users didn't seem to immediately recognize, or even recognize at all, that there were 2 levels to the navigation bars to the right (with the further one with blue background being the main and the one the left with white background being specific to the selected course). Instead, they primarily looked for *keywords* (whatever matched what they were looking for) when looking through the tabs.

For example, participants who have not had experience with the Groups often selected the "Groups" tab on the main navigation bar when tasked with creating a group rather than selecting the Peoples tab. The "Groups" label can be *misleading* and does not meet user's expectation of what the page is designed for. The Groups tab only provides access to already made groups relating to the and fails to provide access to the same page which allows for account creation (which is exclusive to the individual People's tabs of each course). In addition, this tab does not allow you to view previous groupings in past courses.

Confusing mental model, or understanding of the system, for students
While Canvas aims to utilize this two-level navigation element to provide some organization among the courses, this organization is not used consistently. There is <u>little to no consistency</u> on how information is being displayed for the students. It is not clear that some functionalities are specific to whatever course is selected and some (i.e., the Calendar, Inbox, and Groups tab) integrate information from all the student's courses. As a result, users who experimentally select say, the Groups, tab are perplexed.

Since courses are set up differently by each professor, some tabs may be present in one course, whereas other courses certain tabs are left out.

Users were unfamiliar with the content and discoverability within Canvas. These features include:

     I.   **Inbox feature**: Most students are comfortable communicating with classmates and professors through email and do not make use of this feature.

    II.   **Group Page:** Students would much prefer to use a management system like Google Drive to store files, than make use of the Groups tab on Canvas.

        III.   **Discussion Tab:** Sites like Piazza is much more active than Discussion tabs on Canvas. Students admitted to only making use of this function when assigned to do so.

III.   Unclear labeling of and poor placement of important links/elements:

A. Participants struggled in finding how to access and navigate how to place comments within documents for peer review. Many had no problem recognizing the comment text box to the right, but for the participants who did not have experience with peer review, they did not realize that they could make comments directly on the document. When they were aware, they struggled to access the file. There is no clear control or signifier or anything that suggested that there was a way to directly access and utilize tools to comment on the file. Many incorrectly selected the link which would download a pdf of the peer's file and would become confused as to how they would comment on the pdf. After some exploration/trial-and-error, they *tried* selecting "View Feedback" which provided them what they needed. The "View Feedback" control on Figure 6 is an inadequate control; it fails communicate that it is where users can click to provide feedback. A few participants brought up how the phrasing itself, "View Feedback", was vague and one thought it was for viewing existing comments—not for actual editing/commenting.

Figure 6. *'View Feedback' allows you to create in-line comments within the document, but the phrase 'View' does not communicate that you can actually <u>create</u> comments leading many users to not select it.*

IV.   Unintuitive File Viewing Settings

A. When viewing documents on Canvas, the ability to access and work alongside these files is restricting as shown on Figure 7.

    1. Restricts users in only using the "+" and "-" to properly view the document in full resolution. Zooming in/out of the document with your mouse makes the document less pixelated and harder to read.

    2. The location to enter or exit full screen is not correctly positioned. Should be placed in the far right/left. Instead the mark tools are located there and can confuse user navigation.

    3. When peer reviewing it is difficult to view the entire document and view the rubic since document window is limited in size.
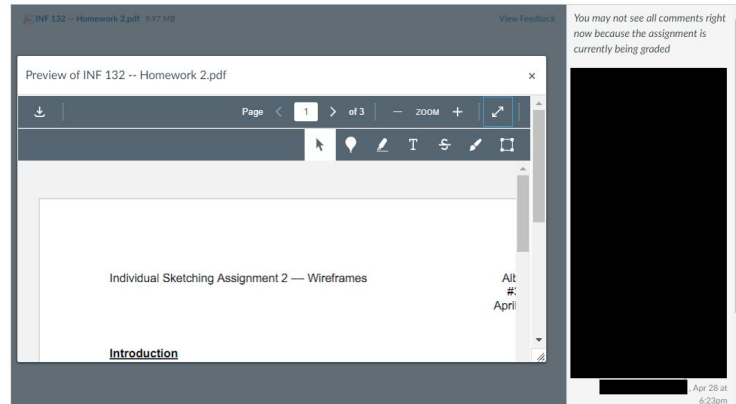
Figure 7. *This screenshot demonstrates the peer review document navigation features and tools.*

V. Lack of Completion Feedback in Peer Review Commenting

A. There is no clear indication that the comments/provided feedback/annotations were successfully saved. Some participants asked if there was a submission button—which there were none.

VI. Other Problems

A. **Poor treatment of icons/contents for the Notifications Page & Reply Button**

1. The legend which details the meaning of the icons for the Notifications page did not immediately stand out for a lot of the participants, but it was eventually recognized. This could be due to the fact that the contents/icons in the legend are in a gray color which fails to stand out among the other icons which were in the same color as all of the fonts on the same page. One participants mentioned that it would help if the legend stood out through color. Another area where the treatment of the element caused an issue, though minor and not as common, is the Reply button on the discussion post. It took a bit longer for some people to notice the Reply button and through our evaluation, we found that the Reply Button did not stand out due to the fact that it was the same color as the background and did not physically look like a clickable button.

B. **Placement of content when Canvas window shrinks**

1. When the page is half screen information is not easily visible and have to scroll all the way to the bottom. Especially visible on assignment writeups.

C. **Slow/delayed pop-up of Icon Labels**

1. A few of the peer review tool icons were not easily understood and all of the participants had to hover over the icons and wait for a label of the icon

name to appear to understand what it was. One participant hovered then quickly gave up when the label did not appear, assuming that there was none. This poor feedback created an inconvenience for the participants thought did not entirely hinder their use of the tools.

Redesign———————————————————

Redesign Targets:

I. Peer Review Process

    A. <u>Issues encountered in testing:</u>

        1. Locating and Accessing the Peer Review Assignment: Over half of users struggled to find their assigned peer reviews, sometimes using Command-F to search for an assignment with the term "Peer Review" and others overlooked the original assignment. When asked why, they explained that they did not expect that a new assignment like the peer review would be located in an assignment that was already submitted (which was how the old design handled it). This was clearly a **mismatch in the user's mental model, or their own beliefs or expectations about the system (**or how the system works).

        2. The original design required users to find and open up important elements such as the file the user is expected to review and the rubric. These links to open these elements were often ***difficult* to find** and were **unclearly labeled**. The view of certain elements, such as the rubric and file itself, were **inconveniently displayed**. The f**ile view was restricted and required further adjustments** (via the fullscreen) option to comfortably view it. On the other hand, once "Show Rubric" is selected, a pop-up of the rubric is awkwardly/inconveniently displayed below in the region displaying the file, obstructing the file from view. Viewing the rubric also poses a difficulty as the pop-up does not show the entirety of the rubric, requiring the use of a horizontal and vertical scroll bar to navigate around and read the rubric.

        3. Even though some editing tools were consistent with other document editing applications, and therefore familiar to users, others were **unfamiliar**. Users often did not understand the purpose of those unfamiliar editing tools.

4. There is **lack of confirmation about the completion** of the peer review assignment. Users were unsure about whether or not their in-file comments and annotations were submitted and whether they had successfully finished completing the peer review.

B. Redesign Goals:
1. Our goal when redesigning the peer review process is to improve the intuitiveness of the process by taking into consideration the user's expectations of how the system works.
2. We also want to allow users to have better visibility of the system status and let users know if they are successfully completing the task correctly through adequate feedback.
3. In addition, we look to have features that allow users to recognize and identify signifers on specific tools and features so that they are able to fully critique their peer's work.

II.   Discussion Board

A. Issues encountered in testing:
   A. According to the responses that we have collected from interviews, many users only uses Discussion board only when assigned. Two of our interviewees preferred Piazza, pointing to Piazza's distinction between instructor and student answers as one of its appeal.
   B. Users struggled to locate assigned mandatory posts among others.
II. Redesign Goals:
   A. Our redesign will include signifiers that differentiate these posts.
   B. To make efficient the search for a target post as well as encourage exploration. We also hope to use Piazza as inspiration for our redesign of the board.

III.   Navigation

A. Issues encountered in testing:
1. Although Canvas allows instructors to customize and determine which tabs will be featured in their courses, many students found that this variety to be confusing when switching from course to course.

B. Redesign Goals:
1. Our design looks to maintain consistency of what tabs will be used for all courses. Users should not have to questions whether different phrases or actions indicate the same thing.

IV.   Home Page

A. Issues encountered in testing:
1. Users would scroll up and down before relying on Command-F to search for target assignments.

A. Redesign Goals:

1. Within the homepage of the application, we look to organize course information, assignments, and materials by weeks. Since most students naturally think by week, our goal is to have the Canvas application speak to the user's language by having information be displayed in a understandable and natural order. Ideally, professors would input the topic of each week as the header as well as additional course material for that week. The course material can be organized based off lecture slides, assignments, readings, etc. When students click on one of these pages, it will redirect them to that specific page with additional information.

Sketching Process:

The three main features of Canvas that have been redesigned are:

a. Peer review
b. Page navigation
c. Discussion board.

I.   Elements of Interest found in Sketches:

A. Peer Review Sketches:

The Peer Review process contained many aspects that could be improved upon according to the group. It was determined that the peer review page could be more distinguishable from the original assignment, have better indicators as to whether a peer review has been completed or not, should eliminate unnecessary tools and further clarify the tools that are present, and improve on the overall visibility of page elements.

B. Discussion Board Sketches:

For the discussion board we used elements of each other's sketches to determine what we wanted for our redesign. Our main thing was to separate between assignment and discussion based responses. We utilized inspiration from other web forums such as Piazza to produce our redesign. Through careful consideration and input from our team members, we feel that this redesign will help elevate our user's experience.

C. Navigation/Home Page Sketches

For the page navigation of Canvas, it was determined that the two sidebar menus (one menu for the particular class, and one menu for Canvas as a whole),

needed to be separated out and have unnecessary, unused features eliminated to encourage smooth navigation and lessen confusion.

Redesign Mock-ups:

I. Peer Review Process:

Changes have been made to the Peer Review process improve navigation, visibility, and reveal things that may be hidden to the use to create a more convenient experience that helps students effectively perform and complete the peer review process.

A. Separating the Peer Review Assignment from the Original Assignment:

Taking into consideration the fact that over half of our test participants searched for a separate peer review assignment instead of going back to the original assignment—where the assigned peer reviews were to be accessed from (shown below in Figure 9). we suggest that the peer review feature be its own *separate* assignment (Figure 8a) with its own page (Figure 8b) apart from the original assignment page where students submit their file(s) for the assignment. When the peer review assignment is selected from either the Assignments tab or the Home page Assignments section, it automatically leads to the Peer Review page (Figure 8b).
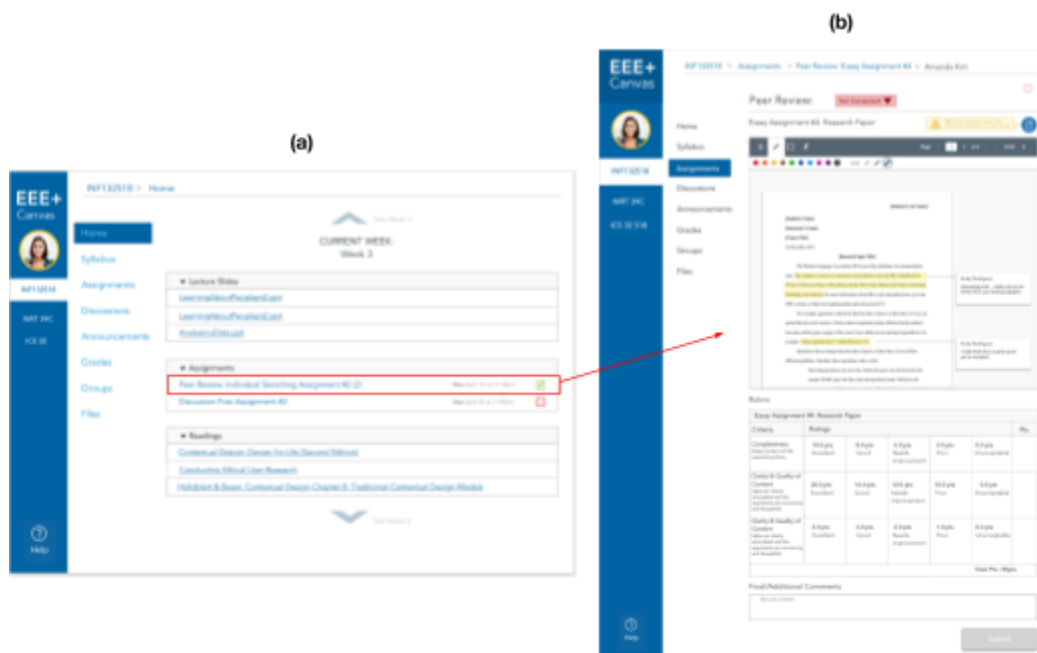
Figure 8. In accordance to user expectations, there will be a separate assignment (titled Peer Review) under

assignments (8a) to ease search. These assignments also have indicators to indicate whether or not they have been successfully completed and submitted. Selecting this assignment automatically leads to the Peer Review page (8b).

Figure 9. *The figure to the right is a <u>before redesign/original design</u>. Located in a past, already-submitted assignment, the assigned peer reviews are not as distinctly located (it is located under the Submission details section which details how the original assignment is already submitted.*

(10a)

(10b)

Figure 10. *The original Peer Review page (10a) Redesigned Peer Review page (10b): everything that was originally hidden in the original design (rubric and file) is conveniently visible as it is readily displayed on the page without the need to click a link to open it.*

B. Making the important elements readily visible and available to interact with:

At the page where the peer review is performed (Figure 10b), the user will find all necessary features conveniently placed on the page, clearly visible and not hidden like the original design. This allows users to bypass the extra step of clicking the vague "View Feedback" or "Show Rubric" link because all such information or elements are already presented.

The document under review will automatically be on display for the user, which would take up the width of the Canvas webpage (from the left sidebar to the far right-end of the page), without requiring the user to click the on document title, as needed in the original design. The assignment rubric (if available) will be on display in full at the bottom of the document. This is improving on the original design where the rubric is a small icon on the top with the text "Show Rubric". This icon hides the rubric until it is clicked. The low visibility of the original rubric often makes it overlooked by students, contributing to the chances a student may perform an incomplete peer review without realizing it.

Whereas the original design often resulted in some users missing crucial steps in the peer review process, like filling out the rubric, this redesign concept puts all the necessary sections in the user's view to encourage users to go through them before they get to the Submit button.

C. Improving the layout of the editing toolbar

Inside of the peer review document, the placements of tools in the toolbar (Figure 11) as well as the tools themselves have been changed to better suit the user. The tools have been cut down to peer-review tools that the test participants best understood or were more familiar with. These tools included: Free Draw, Highlight, Strikethrough, and Box Annotation. The specifications for each tools were also placed directly underneath the tools themselves as to allow users to easily recognize them.

Figure 11. *The top toolbar (11a) is the original design. In the redesign (11b), we have narrowed tools down to the 4 that were noted as the most familiar to the user and beneficial in use. Specifications (color or line width adjustments) for the tools are positioned directly under the tool themselves.*

D. Providing users a clear understanding of their progress on the assignment with the use of a Progress Dropdown Box and their progress on the current assigned peer review:
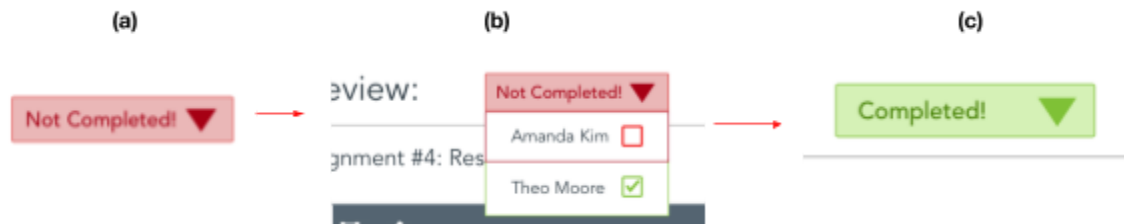
Figure 12. The progress drop-down box displays the status of the peer review assignment. When the drop-down arrow is selected, a list of assigned peers to review is displayed as well as their progress (12b). Once all reviews for assigned peers have been successfully submitted, the progress box changes to a green "Completed" box (12c).

There is a progress feature which displays the user's progress towards the completion of the entire peer review (meaning, all assigned peer reviews) When still not completed, it is in red and marked "Not completed!" (Figure 12a). This progress features a drop-down which displays all the names of the peers the user has been assigned to peer review (Figure 12b). Users can to annotated on the document (option), fill out the rubric (which will turn green at the selected points), and provide additional comments. Once everything is filled out, the Submit button will turn from gray (Figure 13), which communicates that everything for that peer is not completed) to green—meaning that the user can effectively submit that peer review. Once ALL peer reviews are completed, the progress bar turns green (Figure 12c) to communicate that the user has finished the peer review assignment.

Figure 13. Selection of submit button is grayed out to communicated that it cannot be selected due to the incompletion of all sections in the peer review.

Unlike the original design, which only contained a "Save" button for the individual Comment section to the right and no other Save confirmation for the in-document annotations/comments, the redesign features one "Submit" button. This "Submit" button is grayed out and does not allow for users to select it until they have finished all the requirements needed to send and save their work so that they know that their peer review has been fully completed. Having one unified Submit button, rather than having separate buttons to save or submit for individual sections, saves the user confusion about whether or not the entire peer review or merely one had been submitted.

E. Inclusion of a minimalist shortcut for reference:

The assignment guidelines should be made available to the user on the same page as the peer review editor by clicking on an indicated icon (Figure 14a below) on the top right, which will result in a pop up (Figure 14b). This has been made in order for the user to access guideline information without navigating away from the page, having to keep open a different browser tab (students often kept having to refer to the original assignment page to find peer review guidelines), or cluttering up the page with not as pertinent information.

(a)

⚠ **TIP**: Review assignment details and instructions here before you peer review!

(b)

Figure 14. *There is an Assignment Details icon. A yellow "Tip" pop-up (14a) offers some detail about the purpose of the icon and serves as a reminder to users. Selecting the icon leads to a change in the interface where a dialog pop-up box overlays the Peer Review page (14b). Users can exit this box when they are done reading through.*

Discussion Board:

Figure 15. *Discussions Home Page*

Figure 16. *Original/before redesign Discussions Home Page*

Figure 17. *The original Discussion post description: Reply button is not as obvious or does it look like a button.*

Figure 18. *Discussion Thread/Post Page*

I.   Ready and visible display of the textbox for responses:

      A. In the original design (Figure 17), 30% of our test participants mentioned that they did not notice the "Reply" button immediately and our cognitive walkthrough has shown that the color treatment of the button (white fill which looked like the white background it was placed on with not treatments that made it look like it afforded clicking), made the button less likely to be recognizable. For our redesign, instead of having to click "Reply," a response is encouraged by already having the text box shown on the page (Figure 18).
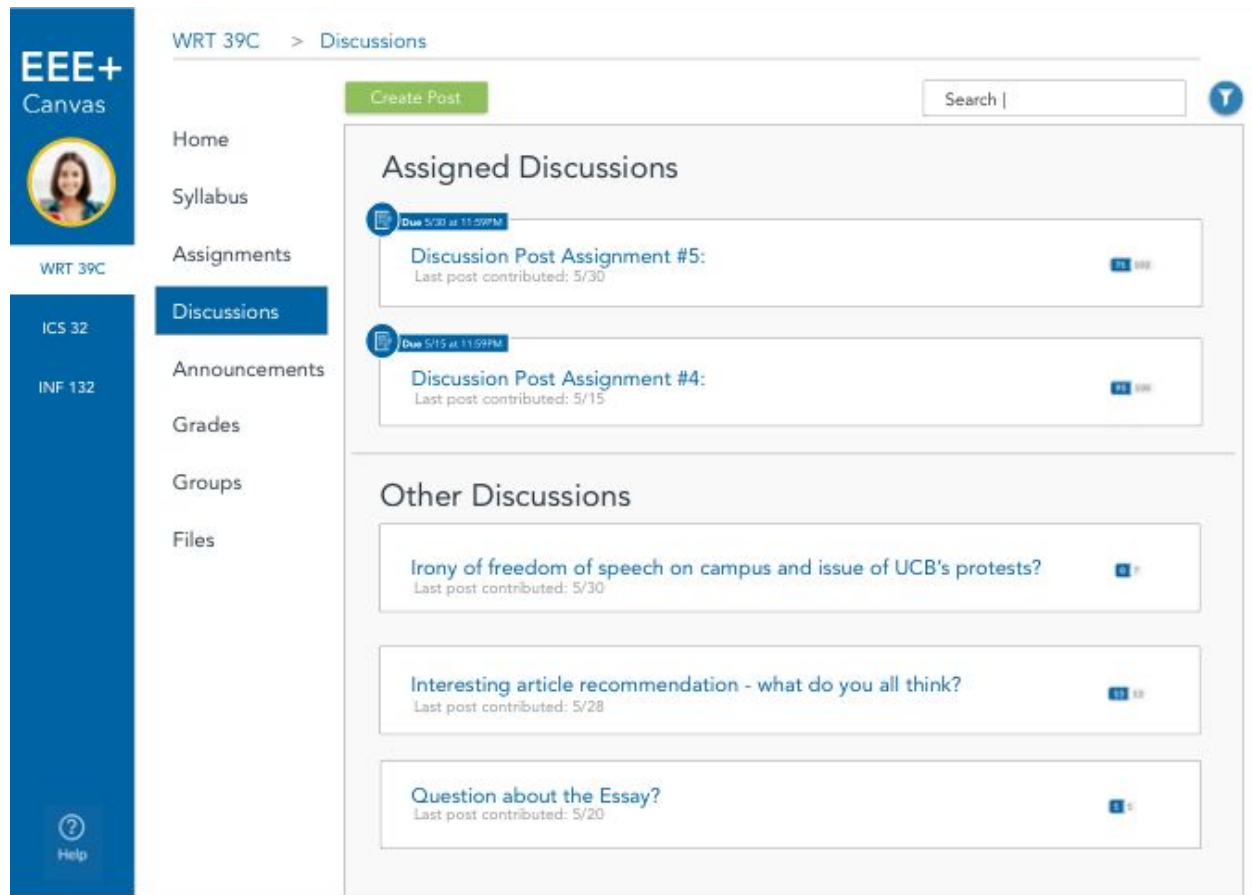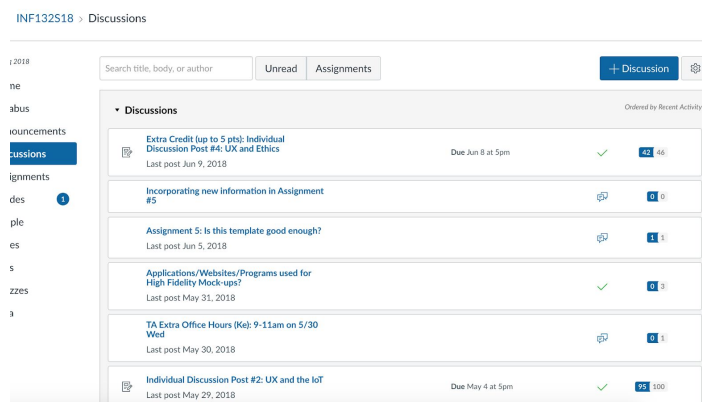
II.   Reorganizing of the toolbar:

      A. Additionally, the attach file symbol (Figure 18) has moved from the bottom to the toolbar and has been changed to "Insert" on the text box in order to make it more noticeable for users.

III. Distinction between Instructor and Student Responses:

      A. The Discussion feature has been redesigned to promote more discussion and to improve feedback within Canvas, as students only tend to post when it required as part of an assignment. Answers endorsed by the instructor will be marked with a yellow/gold seal labeled "instructor approved" and the instructor's name is in a yellow color font to help users distinguish instructor interaction from student interaction. A more interactive and responsive discussion section will ease the search for particular responses. Indentations to communicated responses to original responses are better visualized by the addition a blue line, helping users group together certain response threads and distinguish others (Figure 19).
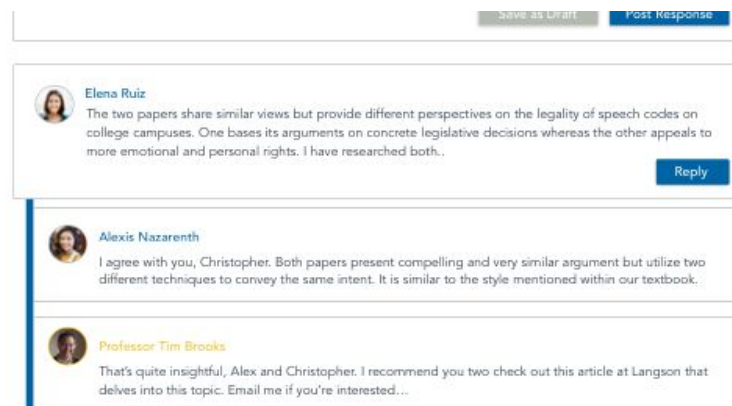
Figure 19. *To better communicate interaction and responses to original responses, a blue line helps emphasize the indentation.*

IV. Clear division of discussion types (assigned discussions, other discussions) for easy search:

      A. A few users, when tasked with the goal of posting in an assigned discussion, struggled to find their target discussion thread. 75% of users from our research

stated that the they mostly use the Discussion board to participate in the assigned discussion threads. To make it easier to locate such threads, the redesign of the Discussion homepage has a clear distinction between assigned discussions and "other discussions" (discussions that will not be graded) to aid users in the search for particular discussion posts (shown above in Figure 15).

V. Improvements for better understood signifiers and buttons:

    A. Instead of the unclear "+Discussion" button, we went with "Create Post" for a more clear and decisive call-to-action. The filter icon has been improved to follow more standard-looking filter icons as opposed to the "settings"-like/wheel icon utilized in the original design.

Navigation Section:
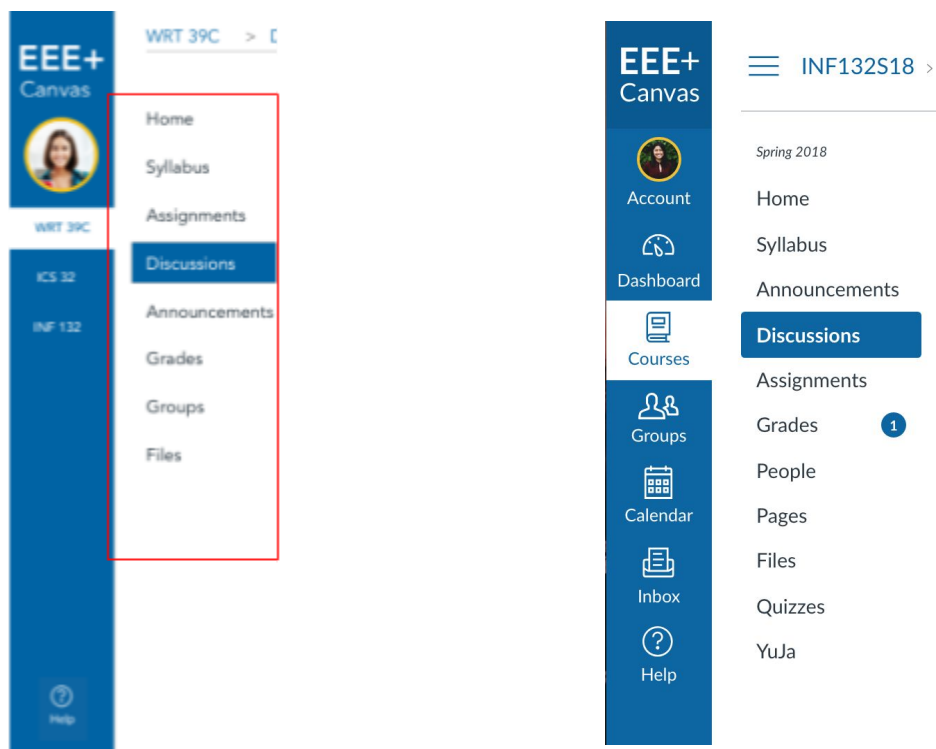
Figure 20. On the left is the original design and on the right is our redesign of the *Navigation Section. Highlighted in the red box is the nested/2nd level of navigation which features tabs to course-specific pages.*

I. Improvement of navigation layout between pages:

    A. Within the usability testing, a few of the test participants mentioned that they did not understand the purpose behind the Dashboard and the difference between that page/tab and the Courses tab. There was also confusion about the presence of nested, or another level of navigation "contained in" and underneath

the main navigation (this level deals with more course-specific pages - shown in Figure 20). Some tabs on the navigation bar were for pages or functionalities that involved cross-course information whereas others only were for course-specific information. Because a lot of our participants (interviewees and test participants) explained that they primarily focus on navigating between their courses, and do not visit other tabs on the navigation, we decided to narrow down the main navigation to focus on the courses themselves.

Home Page:
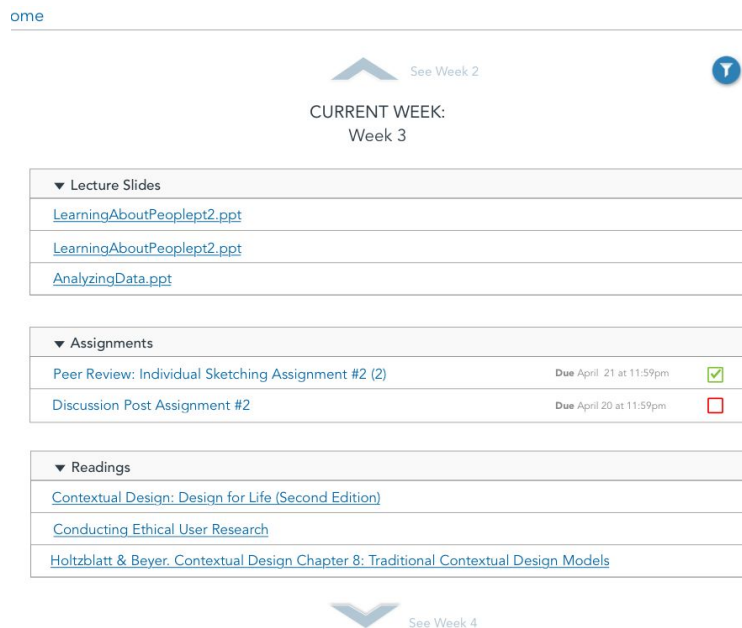
Figure 21. Standardization of home page

I.   Standardization of the home page: Use of module organization for home page.
   A. Feedback from user research participants and other users in the presentation of our progress presentation mentioned the lack of consistency and standardization throughout the system and more specifically the home page. Two of our interviewees mentioned how they liked how some of their courses had a module layout, wherein resources and assignments for the course are organized by week. Taking this into consideration, as well as user research results which revealed that students mainly go on Canvas to look for resources, we have decided that the home page should features a module-like layout. and The fact that students organize their schedules by weeks (mostly college

students) further supports the organization of a week-by-week schedule. When users open up this page, the interface reveals the current week and all relevant resources, such as lecture slides, assignments, and readings. Users can navigate by week via the arrows above and below. A filter feature can be accessed in the right-hand corner for other filtering and layout organization settings to offer more flexity in view (Figure 21).

II. Organization of module elements
  A. To improve on the original module design, we decided to categorize these resources and section the module block by these resource categories to ease the search for target resources, forgoing the need to search through a list of resources (also shown above in Figure 21).

*Heuristic Evaluation*_____

Visibility of system status

I. **Positive Features**
  A. Peer Review
    1. *System visibility has a very significant role in the redesign of the peer review process.* On the newly designed peer review page, a distinctive icon sits at the top of the page indicating whether the user has completed his/her peer review or needs to make more progress. The icon appears in a different color based on status: red if the user must make more progress and green if the user is finished.
    2. The Submit button is also a good improvement toward better visibility of the system status. By graying out and restricting the selection of the Submit button, users will know that they have not completed all necessary sections in order for the Peer Review assignment to be considered complete. Instead of having multiple Submit/Save buttons, which can be confusing, the redesign has one central Submit button. Once it is selected, users should know that _all_ areas they have worked on is submitted.
  B. Discussion Board
    1. Once users type within the text-box the "Save as Draft" turns blue, allowing the user to save their comment for later.
    2. Users will know whether a discussion post is approved by an instructor through a orange distinct visual aide.
  C. Navigation/Home page

1. The user will be able to identify which class he/she is currently looking at with the minimalist design of the far-left sidebar, which only lists the user's class options and highlights which class the user is currently on.

II. **Negative Features**

    A. Peer Review

        1. Even though the grayed out "submit" button signifies that the peer review is not completed, the user can be confused about which part of the peer review is incomplete--there is no sign showing that.

        2. No indicator of whether a peer review is saved or not or system pop-up if user accidentally navigates to another page without submitting their work.

    B. Discussion Board

        1. Professors often require students to submit a post within a certain word limit and it could be useful if there was a word count so that students know that they have the correct amount for the assignment. Users can still post if they are under the word limit.

        2. There is no indicator or icon to remind users whether or not they had already posted/participated in a discussion thread or assigned discussion.

Match between system and real world

I. **Positive Features**

    A. Peer Review

        1. The separation of the peer review task and the original assignment on the new design reflects the intuitive sense that performing the peer review and submitting the original assignment are two separate school tasks.

        2. "Submit" instead of "save" button which is used more often in students' life. This makes more sense to the user with what is happening. ("Save" implies that progress can be continued, when in fact, all things that enter the peer review are permanent once submitted.)

        3. The layout of the peer review is in a "step-by-step" order, laying out the things that need to be completed in order to complete the peer review assignment.

    B. Discussion Board

        1. "+Discussion" button is replaced by "Create Post," making it easier for students to recognize how to create a discussion post.

        2. Discussion section prioritizes assigned discussions first so that users can find their mandatory assignments more efficiently.

C. Navigation/Home Page
1. The layout of the home page is re-organized as weeks with headers indicating "Assignments", "Lecture Slides", "Readings", etc. Users of our system from interview indicated that they preferred to think by week instead of looking up information based on individual dates. This separation will help allow users to quickly discover information and course material.

User control and freedom

I. **Positive Features**
A. Peer Review
1. After the initial submission, the Submit button is reworded into a Resubmit button. Users can make changes to the different sections and resubmit the peer review sections with these new changes without having to fill everything out again.
B. Discussion Board
1. Users can easily leave the Discussion home page by selecting a different tab/page to navigate to via the navigation system
C. Navigation/Home Page
1. Users can see what course they are on at all times, and can switch courses easily.

II. **Negative Features**
A. Peer Review
1. There was no editing option or button for the user's in-document comments for their annotations. Once they create a comment, they are not able to change it. There are no redo or undo buttons in the toolbar.
B. Discussion Board
1. Users cannot delete or edit a discussion post that they have already posted.
2. Drafts are not automatically saved if user accidentally navigates to another page.
3. If user selects on one discussion post/thread, they would have to inconveniently click back or click on Discussions again. There could be an easier way to do go back to home page or quickly check out other discussion threads without navigating to the home page.
C. Navigation/Home Page
1. The home page has been standardized to a weekly format, which takes away some freedom from the instructors--there is less space for instructors to personalize/customize. The format is also restricted to placing class items into particular categories instead of being listed out chronologically.

2. There is no option to change the ordering of class items. Different users may have different ways of preferring class items to be organized. Though changes to the class items into weekly format and categorization may be beneficial to some students, others may find this an inconvenience and prefer a more conventional ordering, such as from before the redesign.

Consistency and standards

I. **Positive Features**
   A. Peer Review
      1. Uses familiar tools to other programs for in-document annotations.
      2. Navigation tools appear on top right of toolbar.
      3. The format of peer review is consistent in organization and visual appearance at every peer review assignment.
      4. The new design of the peer review enforces consistency among typical assignment pages: having the peer review separated from the original pages restricts the scenario where some assignments will have peer reviews inside their pages unindicative to the user on the surface level (such as when scrolling through a class's Assignments page) while others will not.
   B. Discussion Board
      1. The system utilizes similar word processing tools, allowing the users to edit and highlight their text.
   C. Navigation/Home Page
      1. The consistency of the home pages are improved by implementing standardized weekly categories. Users will experience similar course navigations rather than unique ones that are different among courses.

II. **Negative Features**
   A. Peer Review
      1. Users may be unfamiliar with the Area Annotation tool.
   B. Discussion Board
      1. There are features that are present in others that are not on here? Even though their exclusion promotes minimalism, the exclusion makes the redesign diverge from typical designs of the discussion forum.Such as:
         a) Some voting/rating functionality?
         b) Date/time in which the individual responses post was made
         c) Original poster-sponsored posts or indicators that indicate a post is resolved
            (1) *** NOTE: this may differ depending on assignment discussions vs. regular discussion posts
         d) Word count

C. Navigation/Home Page
1. The class-specific sidebars are not consistent with each other; the content varies by class.
2. Although we were focused on the student's perspective of how tabs will be displayed, we also should have took into consideration the tools and tabs that professors use most often. Some professors like to utilize a video lecture tabs like "Yuja" while others ignore these features.
3. The design of <u>course-specific/lower navigation</u> (the nested section, nested under the individual course tab navs) differs from other navigation bars. It is focused on top of the page and does not extend the length of the page like normal navigation bars. It is also not enclosed within a bar like the navigation bar is.

Error prevention

I. **Positive Features**
A. Peer Review
1. Restricting selection of and graying out of Submit button helps user not miss completing all necessary sections of peer review.
2. Having "Assignment Details" allows the users to see the original assignment requirements.
B. Discussion Board
1. Users discussions written in progress are saved in drafts, similar to emails. Therefore, if users are unexpectedly forced to leave, the data from the draft is not lost.
C. Navigation/Home Page
1. Since the homepages are standardized and a few unused sections(pages, people) are removed, it is less likely that users would make mistakes navigating through the website.

II. **Negative Features**
A. Peer Review
1. No indicator of whether a peer review is saved or not or system pop-up if user accidentally navigates to another page without submitting their work.

Recognition rather than recall

I. **Positive Features**
   A. Peer Review
      1. Instead of making users search on where the find the document to comment on, this system already has the document in full display for users to insert their comments.
      2. Selected tool is highlighted with thicker circle outline to remind users what tool they had selected. Users do not have to recall which tool they had selected because it is already indicated.
      3. The rubric is readily displayed underneath the file (editing) sectio, so there is no need to have to select "Show Rubric" and remember information provided from the pop-up box like in the original design.
      4. Option to open "Assignment Details" as a pop-up window for users to re-check the requirements of the original assignment as they check their peers' assignment.
   B. Discussion Board
      1. Users will know whether a discussion post is approved by an instructor through a orange distinct visual aide.
      2. Whenever a user would post on the discussion board, their post will be the first one to be displayed.
      3. Users will see the discussions that are required as assignments and their due dates immediately.
   C. Navigation/Home Page
      1. Automatically shows the week that the student is on and upcoming course material.

II. **Negative Features**
   A. Navigation/Home Page
      1. The removal of the calendar feature may not allow users to know and recognize the times in which they should meet for lecture or discussion.
      2. The removal of dashboard may require users to remember checking multiple courses' homepages for due dates.

Flexibility and efficiency of use

I. **Positive Features**
   A. Discussion Board
      1. The search and filter functionality allows for quicker search.
      2. A division between regular discussion posts and assigned ones makes it easier to find assignments (a common target/use of discussion board)

II. **Negative Features**
  A. Discussion Board
      1. There is no way to search inside of a discussion thread except for using "Ctrl-F."
  B. Navigation/Home Page
      1. Users will have to click up and down arrows to see every week. There is no way to jump to a specific week.

Aesthetic and minimalist design

I. **Positive Features**
  A. Discussion Board
      1. The discussion board display good minimalism as it only presents the necessary information (name of discussion posts, last contributed or which posts or threads were most recent, when the assigned posts are due).
  B. Navigation/Home Page
      1. The newly designed sidebar navigation eliminates clutter and otherwise distracting organization to the user. Having only the classes listed in the far-left sidebar allows the user to easily identify which class the user is presently in and to navigate to other classes with ease.

II. **Negative Features**
  A. Peer Review
      1. The description of criteria section might end up cluttering the space and may be hard to read given the small space it occupies. A solution may be to provide a drop-down arrow/See More link to display description which would allow users control in what they see/what is displayed.
  B. Discussion Board
      1. The icon on right side of individual posts is meant to be unread/read indicator, but its purpose is not as straightforward and may not seem as necessary.
  C. Navigation/Home Page
      1. Users will have to constantly click up and down arrows to go to a specific week. There is no way to jump to specific weeks.

Help users recognize, diagnose and recover from errors

I. **Positive Features**
   A. Peer Review
      1. User can re-submit the review to recover errors. If they leave unintended comments, they can revise the feedback and replace the unwanted comments.
      2. To allow for students to know when their peer reviews are finished these redesigns visual identify when these assignments are completed or not through use of color and labeling.
   B. Discussion Board
      1. In addition, if users decide to leave the page on the discussion board with text inserted on the reply box, the system will save these comments automatically and let the user recover from potentially losing all text that has been submitted.

II. **Negative Features**
   A. Peer Review
      1. Users will lose their work if they navigate to another page without submitting first.
   B. Discussion Board
      1. Not displayed in the static mock-up redesign is the interaction and handling of errors when working with the Insert button: if users try inserting the wrong element (e.g., inserting a file that is not compatible for images), an error message SHOULD be displayed (possibly as a pop-up) explaining why it was incorrect and help users perform the correct actions. For example, it would tell users what files ARE accepted/compatible

Help and documentation

I. **Positive Features**
   A. Peer Review
      1. The user can view assignment details on the peer review page in case they need to recall for it.
II. **Negative Features**
   A. Still, the Help button provided on the bottom of the left main navigation are is just a *general* feature that directs users to a page dealing with help documentation for more common issues. There is no help and documentation

for more specific or unique problems that users may encounter. Users may also miss the Help button.

*Conclusion*_____

Overall, our redesign should significantly improve the clarity of work flow in the peer review process. Novice users will experience a more friendly editing page, where they will no longer have to click certain things in order to view the document being peer reviewed or the rubric. Users will be able to be certain that the requirements have all been met in order for assignments to be considered as complete with the "Submit" button as the last step of the process. Signifiers have been improved to provide more visibility and awareness to the user. The discussion section has been redesigned to promote more conversation, with the response text box already opened so that the user can immediately begin his or her response. It also distinguishes the instructor's responses and students' responses, and is rearranged in the way that assignments are prioritized over other discussion. Our new Home Page has been redesigned to cater to how students think over the course of the different quarters, so that it shows course material on a weekly basis rather than by specific dates.

With consideration of other feedback, which brought up concerns with the redesign of the navigation page, we want to bring up other suggestions to address recent feedback. By focusing on the student view within this study, we did not consider the instructor view. Changes to the student view will inevitably affect the instructor view/experience of the system. In regards to the navigation bar, we have decided that, rather than taking out the cross-course features like Calendar and Inbox (both of which are important in the instructor view and experience), that there should be a division of navigation: one for course-specific features and pages and one relating to the user's account. The user navigation would include both Calendar and Inbox as these vary among users. These pages should be accessible through the Accounts navigation. By separating navigation between a course-related navigation hierarchy bar, and a user/account-related navigation, we will be addressing any confusion about the purpose behind the individual navigation tabs.

*Appendices*_____

I. <u>Interview Protocol</u>

    A. Goals:
        1. Understand people's habit in their education.
        2. Understand what users generally want in a LMS (Learning Management System).
        3. Understand interviewee's attitude towards the design of Canvas.
        4. Understand what kind of features they are looking for in a LMS.

B. General questions:
1. What's your first name? Major? Which year?
   a) What are you goals when pursuing your education?
      (1) Describe what kind of student you are? -- Don't be afraid to be honest (this is confidential)
      (2) When completing assignments, do you only do what's required? / If something interests you in class, would you do more work than required on it (to learn more about it)?
   b) What else do you do outside of school?
      (1) Do you use technology often in those involvements/activities?
2. What is your experience with technology?
   a) How often do you utilize your phone/computer/laptop/technology?
   b) What do you usually use it for?
   c) What's the first thing you check when you're using technology?
   d) Do you feel comfortable with using technology? Or do you usually rely more on pen and paper?
   e) How often do you run into problems when using technology
3. What is your experience with technology when it comes to school?
   a) How do you compare the educational experience of classes that are heavy on using mobile devices and laptops as opposed to offline, traditional pen and paper classes?
   b) Have you ever encountered any difficulties in your education?
C. Would you consider yourself an organized person?
1. If so, how do you organize yourself/your life?
   a) How do you keep track of events/deadlines?
      (1) Do you write it down? Keep an agenda? Use an application (Google Calendar)? Ask someone?
      (2) Why that method? How does that help you remember stuff easier?
   b) Have you ever missed a deadlines of some sort (paying bills/turning something in/an event)?
      (1) If yes, how come?
D. How do you stay updated on your courses? (if a student?)
1. Do you prefer to check your email? Pay attention in class for announcements? A friends?
2. When you check about your courses online do you prefer to view this information on your mobile device or on your desktop/laptop? Why?
E. Do you usually post online?
1. If so, how often?
   a) Do you participate on online forums (Reddit, etc) /comment on posts on social media?

         b) How about for discussions in class? (like Canvas…?)
             (1) Do you only post when you're assigned to or do you post out of your own interest?
                (a) If out of your own interest, why?
                (b) If you don't post outside of requirements, why? Is it intimidating? You don't have anything to add? Not interested?
   2. If not, how come?
      a) Would you prefer participating in person? Or online?
   3. Do you mind other people knowing your identity online or would you prefer to be anonymous when you post/respond something?
      a) How come?
      b) What is your boundary when it comes to the amount of information you would want people to know about you?
      c) If the people who saw your posts were people you were familiar with, would you be okay with them knowing your identity?
         (1) Who would you be okay with knowing your identity? Friends? Family? Peers/classmates/colleagues/co-workers?

F. Recall a time when you had to do a group project.
   1. Tell us how that went.
      a) Was your team able to set a meeting time?
   2. What tools do feel are the most effective at getting work done as a group?
   3. Did you utilize technology/collaborate online for that project?
      a) If so, what tools did you use?
         (1) How did you use those tools?
      b) Do you prefer meeting up in person or were you okay collaborating online?
      c) What parts did you collaborate online for?
      d) Was it difficult collaborating and communicating online? What could be improved to make collaboration easier?
   4. Do you prefer to receive criticism/feedback on your work?
      a) Tell me about a time when you had to peer review another student's work.

G. Do you have any experience with the Canvas website? / Have any of your classes required you to use the Canvas website?

H. -------Questions Regarding to Canvas -----

I. *Has there ever been a time when you encountered a problem while using Canvas?*
   1. *How long did it take you to become familiar with Canvas?*

J. *How often do you use Canvas? The website or the application?*
   1. *What often is your goal when you open Canvas?*

K. *Do you ever have any problems accomplishing these goals?*
    1. *What features do you use the most often on Canvas?*
L. *Are there any features that you would like to see on Canvas?*
M. *Are there any features that you feel are unnecessary?*
    1. *Have you ever used EEE?*
N. *Which one do you use more often?*
O. *Which one do you prefer? Why?*
    1. *Do you have any experience with other LMS (Learning Management Softwares) besides Canvas?*
P. *If so, what are they?*
Q. *How do they compare to Canvas?*
    1. *Has there ever been a time in which you had to peer review another student's work on Canvas?*
R. *What was your experience using and navigating this feature? Was it difficult or easy to use? Why?*
    1. *Tell me about a time when you used the inbox feature of canvas.*
S. *If you haven't used this feature, why?*
    1. *Considering everything we've talked about today, what's the one thing that's most important to you?*
    2. *Is there anything we didn't talk about today that you'd like us to know?*

II. <u>Second Method: Survey</u>

A. Link: https://goo.gl/forms/VjeK8U9oPBO5Urhl3
    1. Name, Year, Major
    2. School
    3. How important is school in your life?
        a) (extremely insignificant to extremely important)
    4. How do you keep updated on your courses? (Check all that apply)
        a) Paying attention in class
        b) Online
        c) Make use of a planner/calendar
        d) Asking friends
        e) Emailing professors/TA
        f) None of the above
    5. Are you involved in club or other extracurricular activities on campus?
        a) Y/N
        b) How do you keep updated with these organizations?
            (1) E-mail
            (2) Messenger Application, Group Me, etc
            (3) Social Media (Facebook, Instagram, etc)
            (4) Other
    6. What tool do you use the most to check your courses online?
        a) Desktop

b) Laptop
c) Mobile device
d) Tablet
e) Other (fill in)
7. Do you normally post online?
   a) Always always
   b) Often
   c) Sometimes
   d) Seldom
   e) Never
8. In what ways would you prefer in asking a question about a course? (check all that apply)
   a) Email the professor
   b) Email the TAs
   c) Ask in lecture
   d) Asking other classmates
   e) Send an anonymous message
   f) Other
9. When working as a group for a course, what barriers do you typically face (check all that apply)
   a) Communication
   b) Aligning schedules with each other
   c) Making decisions together
   d) Lack of participation
   e) Assigning roles for each member
   f) Lack of motivation
   g) Other
   h) None of the above
10. Have you used Canvas?
    a) yes/no
11. How many times do you use canvas on a typical day?
    a) 0 times
    b) 1 - 5 times
    c) 5 - 10 times
    d) More than 10 times.
12. How comfortable are you with navigating through canvas?
13. Which of the tasks do you do most often (check all that apply)
    a) Check assignments
    b) View course material
    c) View grades
    d) Use the calendar feature
    e) Check announcements
    f) Post on a discussion

g) Communicate with your group
h) Send emails through the inbox.
i) View old course material
14. Have you had any experience using the discussion board on canvas?
    a) Are you comfortable having your name and information displayed when posting?
    b) How satisfied are you with using the discussion board on canvas?
15. Have you had any experience creating a group on canvas?
    a) How satisfied are you with using the groups section on canvas?
16. Have you had any experience peer reviewing other students' work on canvas?
    a) Are you comfortable having your name and information displayed when posting?
    b) How satisfied are you with peer reviewing feature on canvas?
17. How useful do you believe canvas is for you?
18. Is there anything you like to change on canvas website?
19. Please rate your overall satisfaction with canvas out of 10.
20. Are there any other comments you would like to add?
    a) Open Text box question

III. <u>**Interview Consent Form**</u>

Purpose: We are conducting a study of how people navigate and make use of learning management systems. The information used in this interview will help inform researchers in how create a better design for this type of technology. These questions are not intended to test the individual's performance in any way. This study is being conducted as part of a course at the University of California, Irvine, titled, "Informatics 132: Project in Human Computer Interaction." This interview process will also be a training opportunity for us as student.

Procedure: Participants will be asked to partake in an interview. We will ask about your individual experience and opinions in a conversational manner. This interview will be approximately 30 minutes. On each of your responses, we will take notes and keep track of all the information you will present to us today.

Confidentiality: We will use the data you give, along with the information we collect from other participants, to design better technologies. To ensure confidentiality, we will not associate your name with your data.

Freedom to Withdraw: Participation is this study is voluntary. You may withdraw from the activity at any time without penalty.

Contact Information: If you have any questions or comments, you may contact us at joalmara@uci.edu, tbingtan@uci.edu, schokana@uci.edu, haor1@uci.edu, or tifftn12@uci.edu. You may also contact the instructor of the course: Mathew Bietz, Ph.D., mbietz@uci.edu

If you agree to these terms, please indicate your acceptance by signing below:
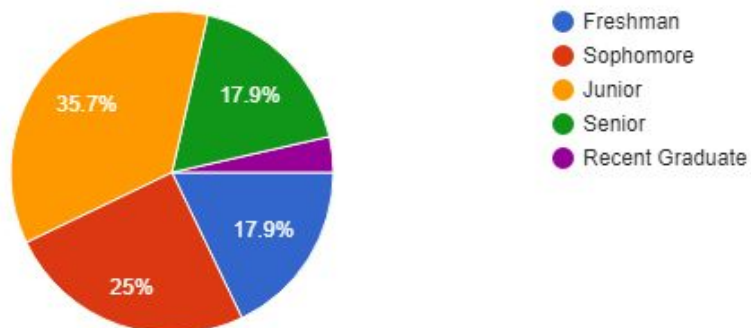
Signature: _____

Printed Name: _____

Date: _____

IV. Survey Data

Year

28 responses

How do you stay updated on your courses? Check all that apply

28 responses

Category	Count
From Class	20 (71.4%)
Checking Email	23 (82.1%)
Make use of a Calendar/Planner	13 (46.4%)
Asking Friends	18 (64.3%)
Online (Canvas/EEE/etc)	25 (89.3%)
Emailing Professor/TAs	5 (17.9%)
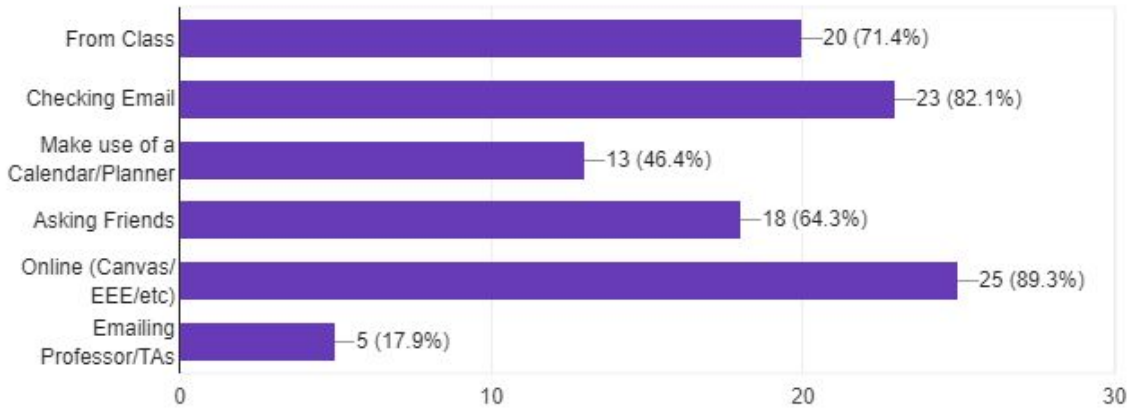
What tools do you use the most to check your courses online? (Check all that apply)

28 responses

Category	Count
Desktop	7 (25%)
Laptop	25 (89.3%)
Mobile device	19 (67.9%)
Tablet	0 (0%)
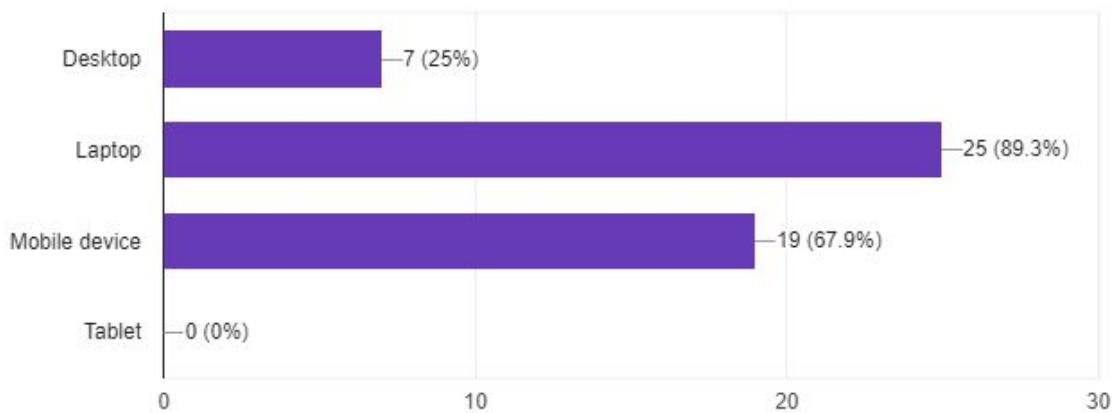
How many times do you use canvas on a typical day?

28 responses

- 🔵 0 times
- 🔴 1 - 5 times
- 🟠 5 - 10 times
- 🟢 More than 10 times

32.1%
64.3%
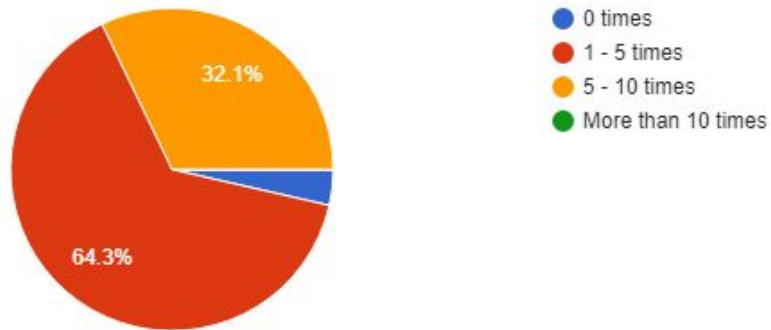
Have you had any experience creating a group on canvas?

28 responses

- 🔵 Yes
- 🔴 No
- 🟠 Don't remember

46.4%
7.1%
46.4%
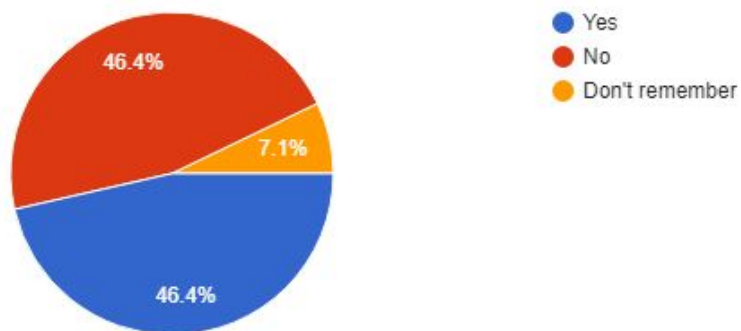
How satisfied are you with using the groups section on canvas?
27 responses
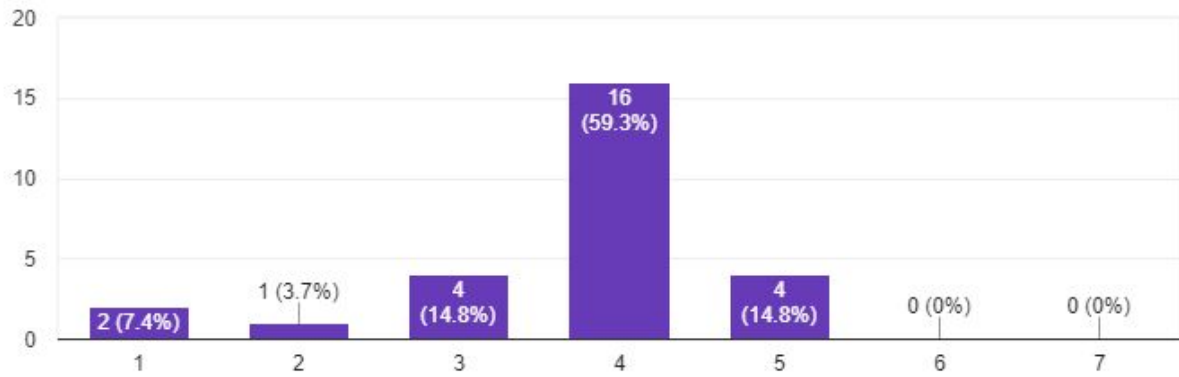
How comfortable are you with navigating through canvas?
28 responses

V. Personas

Elena Bartel

Xtensio

Intelligent   Procrastinator   laid-back

"When I put in my all, I know I am smart, but I'm just lazy and I tend to procrastinate."

Age: 20
Work: Full-time Student; On-Campus Job (Starbucks Barista)
Major: Computer Science
Location: Irvine, CA

Personality

Introvert	Extrovert
Thinking	Feeling
Sensing	Intuition
Judging	Perceiving

Goals

- Earn a bachelor degree in Computer Science and find an internship by the end of her 4-years at UCI.
- Better track assignment and project due dates and organize her study schedule.

Frustrations

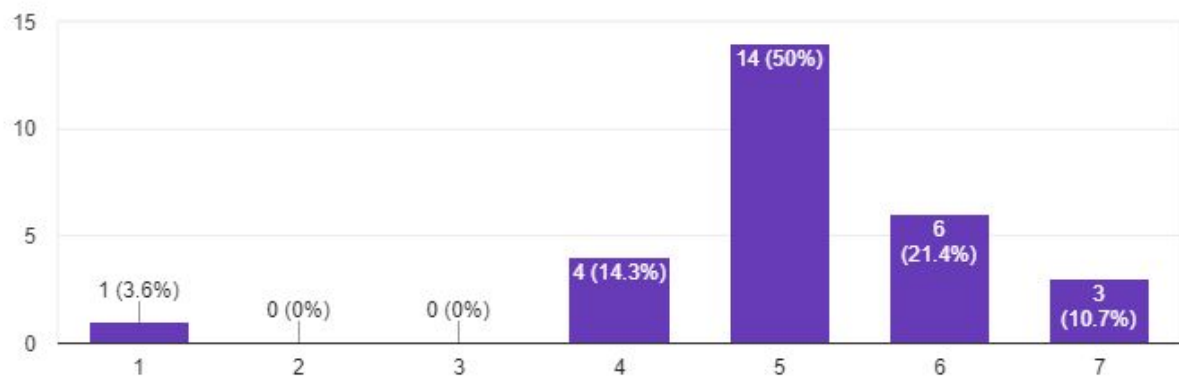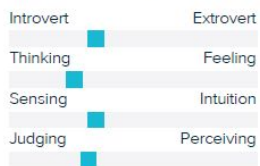- Struggles with pacing and time management. Usually remembers bigger deadlines but sometimes forgets/doesn't prioritize/underestimates how much time it takes to do smaller tasks.
- Has trouble communicating with her project groups about meet-up times and locations.

Bio

Elena is a third-year Computer Science major at UCI. She works part-time at the on-campus Starbucks as a barista to save up money so she can pay off future student loans. Though she gets her school work done, she constantly finds herself finishing her work at the very last minute and is constantly stressed. She does not use a calendar or planner because she admits she is a bit lazy and usually just keeps a mental note of what she has to do. She is not currently involved in a lot of school organizations; she usually spends most of her time working on her schoolwork, going to work, and hanging out with friends. Her courses require some partner/group work and she finds it hard to schedule a time to meet up with people to work on stuff. She considers herself on the shy side and prefers not to participate online unless it is required (for a class assignment)—she would call herself an "observer" or a "listener". She finds online forums a bit intimidating, but she likes reading through other students' posts because she finds them interesting and sometimes useful.

Motivation

Incentive	
Growth	
Power	
Social	
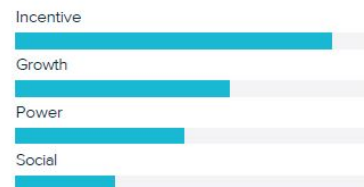
Technical Experience

'Makes use of Google Docs to organize her notes daily. Engaged in numerous group chats that range from family, friends, and colleagues. She feels competent in programming, but she much rather search the web than learn new coding concepts. If whenever she has a question about a certain topic, she prefers to use Piazza and ask anonymously to her classmates and instructors.

Preferred Note-taking Method

Pen & Paper	
Tablets	
Laptop	
Audio Recorder	

Adam Chen

Motivated   **Flexible**   **Gamer**   **Driven**

Goals

- Intends to get tasks done efficiently on his computer.
- Pursuing a B.A. in Business Administration - strives to be in a managerial position for a firm in the future.

Frustrations

- He gets frustrated with computer software that is complicated to use, especially if it is related to doing his tasks.
- He gets frustrated when his group is unable to schedule and meet in person to do group work.

Bio

Adam is a second-year Business Administration major working to build a resume to apply for future internships. He has been relatively involved on-campus, joining organizations relating to his major and challenging himself to network more. When not doing school-related stuff, he likes playing video games and hanging out with his friends. He tried using Google Calendar but still prefers writing down in things he needs to do or upcoming events on a planner. According to Adam, the physical act of checking or crossing something out gives him a sense of accomplishment. He doesn't always stick to his planner, but he tries. Because a lot of his classes require written work, he still prefers pen and paper notetaking over laptops, but he understands that a lot of his courses do revolve around technology and utilize online resources a lot. Despite his preference for pen and paper when it comes to notes, he utilizes social media for both personal and more professional reasons. He communicates with friends a lot on messenger/social applications but also relies on social media like Instagram and Facebook to keep up with and publicize stuff for his organizations.

"I have an idea of what I want to do with my life, but I am pretty open to exploring things so you can say I have no definite plans."
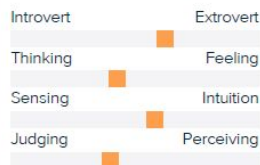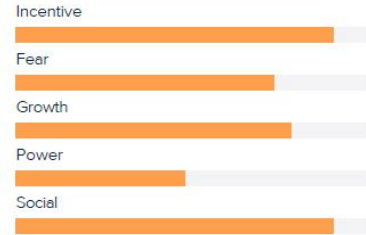
Age: 19
Work: Full-time Student
Location: San Ramon, California
Major: Business Administration

Personality

Introvert	Extrovert
Thinking	Feeling
Sensing	Intuition
Judging	Perceiving

Motivation

Incentive

Fear

Growth

Power

Social

Technical Experience

Adam is always updated on what is on the web. He spends most of his time scouring social media to find the latest trend and keep his followers updated on his organization. As the publicist for his organization, he is familiar with photo editing software and hopes to build a following. When accessing his courses, he doesn't spend much time on the websites, but does try to do what is required and nothing more.

Preferred Note-taking method

Pen & Paper

Tablets

Laptop

Audio recorder

Jacob Oldman

Xtensio

Organized | Disciplined | Hard-working

Goals

- Optimize his free time to be more productive.
- Pursuing a B.S. in Biology while in college in hopes of being a marine biologist.ts
- He wants to to take advantage of his resources and challenge himself to be more engaged in his courses.

Frustrations

- He gets frustrated when things don't go according to plan.
- He gets frustrated with himself when he feels as if he could be performing better in school.
- Wants to participate more online in discussions but is afraid how others might perceive his work/thoughts.

Bio

Jacob Oldman is a fourth-year Biology major who has struggled a bit with keeping up with a heavy course load but has made it a goal to become a better student. Because of his increasingly tight schedule, he likes to have things planned in advance and to be constantly aware of where his time is invested. Organization has become important to him, and though he isn't the best, he definitely makes the effort to discipline himself. Ever since he has started using Google Calendar, he has not stopped. He considers himself a visual type of person and likes having his day laid out before him so he can easily see gaps or chunks of his day. As prevalent as technology is, he is aware of its disadvantages; he prefers in-person communication and collaboration because he feels people are more engaged than they are online. Still, for classwork, he finds technology to be helpful in helping him keep track of his work and find resources.

"I started off college slow, but I recognized my bad habits and have made an effort to get my life together."

Age: 21
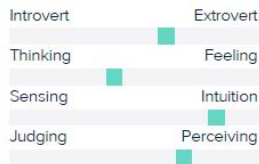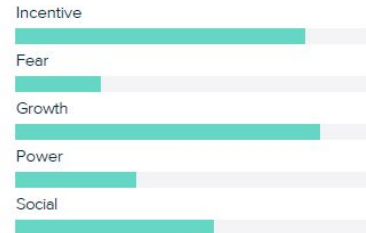**Work:** Full-time Student
Location: Cerritos, California
Major: Biology

Personality

Introvert — Extrovert
Thinking — Feeling
Sensing — Intuition
Judging — Perceiving

Motivation

Incentive
Fear
Growth
Power
Social

Technical Experience

Jacob has all of his courses bookmarked on his browser and you can always see him with one of the tabs open. To help in his studies, he utilizes learning tools such as Quizlet, Chegg, and Studyblue. Whenever he has a question about a particular topic, he usually post under a username on Reddit to get an in depth answer back.

Preferred Note-taking method

Pen & Paper
Tablet
Laptop
Audio recording
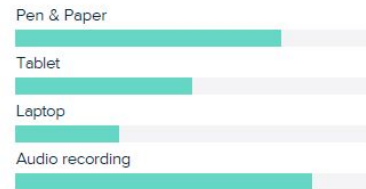
VI. Usability Testing

I. **Usability Test Protocol**
   A. *Evaluation Protocol*
      1. Time of completion
      2. Think-aloud procedures
      3. Participants actions and thoughts were recorded on a word processing document
   B. *Intro script:*
      1. "Hi _____, thank you again for taking the time to participate in this study. Before we begin, I'm going to give you a brief overview of the test and how it will work.

         We will be giving you a task to complete. Please read out the instructions, which will be handed out to you shortly, out-loud. Once you are finished reading out the instructions, we will start the timer and you will try to finish the task as quickly

as possible. You can ask for help, but we advise you do your best to accomplish the task by yourself.

It's really important to know that we are only testing the site, not you. You can't do or say anything wrong here. Please feel free to let me know at any time if there's something you like, dislike, if you're confused, etc.

Also, I'd like you to "think aloud" as much as possible. By that, I mean that I'd like you to speak your thoughts as often as you can. For example, you may be looking at a page, suddenly see something you didn't see before and want to click on it. In that case, saying something like "this caught my eye so I'm going to see what it is" would be very useful.

If at any point you have questions, please don't hesitate to ask. Do you have any questions so far?"

Task 1: Discussion Post

Instructions:

For this session, you are a student and your class (INF 132 S18) utilizes Canvas, an educational management system. Your professor has created an assignment that requires you to post on the class's discussion section. Find the discussion assignment titled "**Usability Test Discussion Post"** and read through the prompt (not an actual prompt).

You will be required to include (all of which will be provided in the "Template Responses" section below):

● a textual information
● an image
● and a link

The necessary image file required for this prompt will be made available to you in a folder on the desktop and you will be provided a link to include. You will not be required to type out an actual post; a textual template will be provided for you to copy and post (we are primarily focusing on the creation of a discussion post aspect in this session, not the actual act of writing a post). Once you have submitted your post, go through the discussion thread and comment/respond to at least one other student's posts.

TEMPLATE RESPONSES: Copy and paste these templates. We are testing the process, not the actual action of writing a discussion post and other tasks not relevant to our research—so don't worry!

Link: facebook.com

Textual prompt template:

Hi everyone! I am Alex and I am a 2nd year Informatics Major. I hope to improve my work ethic as a student as well as make the most of my experience in college. For academics, I aim to do well in my classes and even challenge myself to take courses that are more difficult or unfamiliar to me. Above all, I hope what I learn in my courses are things I can apply to things after college.

Task 2: <u>Doing a Peer Review</u>

Instructions:

For this task, you will be performing a peer review on Canvas. You have just submitted an assignment **(Individual Sketching Assignment #2: Wireframes)** on Canvas. Perform peer reviews for any of the two assigned students. Before you make any comments or open the document for the peer review, locate the rubric for the peer that you're reviewing on the comments/peer review page and read through the rubric. Once you're done reading the rubric, use what has been provided to you as your comment and do the specified editing/commenting action for each peer review comment (refer to template responses below). Be sure that your peer review is complete. As always, please "think aloud" as much as you can.

TEMPLATE RESPONSES:

Copy and paste these templates. We are testing the process, not the actual action of writing a discussion post and other tasks not relevant to our research—so don't worry!

<u>Add comment to Peer Review Assignment:</u>

COMMENT COMMENT COMMENT (Hello TA's and Jason, this comment has been put in place because of a Usability Test).

<u>Add comment on document #1</u> **(Point annotation Tool)**:

COMMENT COMMENT COMMENT COMMENT COMMENT COMMENT COMMENT COMMENT COMMENT COMMENT COMMENT COMMENT

<u>Add comment to document #2</u> **(Freetext annotation Tool)**:

I think this is very interesting!.... More COMMENT COMMENT COMMENT COMMENT COMMENT COMMENT COMMENT COMMENT COMMENT COMMENT COMMENT COMMENT

Add comment to document #3 **(Free draw annotation Tool)**: Smiley Face drawing

---

Task 3: Adjusting specific notification on canvas

Instructions

For this step, you will adjust the notification preferences on Canvas so that this type of information does not pass you by. You can make these changes through your account profile. The three areas in which you wish to get notified most frequently would be course **activities, discussions, and alerts**. Go ahead and allow yourself to get **weekly updates** on these features so that you will never miss a deadline again. Once you have changed your notification preferences, let us know when you are finished.

Task 4: Sending a message through the inbox feature

Instructions

Within the Canvas application, we will need you to send an email message to your team in order to relay important information regarding your project. Make sure you specify the correct course in which you will be sending your message within. Once you have selected the course, you will then specify the individuals who will be receiving the message. Go ahead and send this message to these individuals **Jason Almaraz, Soros Chokanarotewong, Tiffany Nguyen, Tim Bingtan,** and **Rui Hao**. Please title your subject name as "Questions regarding Project 1". As for the content of the message, we will provide you with an already made message to be sent. Please enter in this text for the content of the message.

Message Prompt:

Hello Team,

How should we approach the issue regarding editing and revising our video clips? When do you all have time to meet up and iron out these issues?

Thanks

Once you have inserted this information inside the textbox, please attach an image onto this message. The image can be located on the desktop titled "myimage.jpg". Once you feel all the information you have place is appropriate, send your message.

Task 5: Creating a group

Instructions

Let's say that one of your courses requires that you work as a team to finish a really important project. This course is a fake course titled INF 100000 and requires that you work in teams. The instructor has asked you to team up in a a group 6 (including yourself) via Canvas so that you and your team can communicate online and in person. After meeting your group in person, you've decided that your group name will be titled "Rice Krispie Destroyers". The instructor has asked that you make your group invitation only. The other individuals in your group are Jason Almaraz, Soros Chokanarotewong, Tiffany Nguyen, Tim Bingtan, and Rui Hao. Once your group has been created, go ahead and enter into the homepage of "Rice Krispie Destroyers".

Task 6: Submitting an Assignment

Instructions:

For this part of the session, you will be submitting an assignment on Canvas for the fake course titled INF 100000. We have given you a file document, which will be accessible on the desktop, to submit. This file is titled as MyTestHomework.doc and can be located on the desktop of computer you are using. Find the assignment titled: 'This is an example assignment' and upload the file document. Once you have uploaded the file document, submit it and confirm that it has been submitted.

Post-Test Questionnaire

1. Overall, please rate how easy or difficult it was to use this program.
   - ▢　　1 - very difficult
   - ▢　　2 - somewhat difficult
   - ▢　　3 - neither difficult nor easy
   - ▢　　4 - somewhat easy
   - ▢　　5 - very easy

2. How easy or difficult was it to figure out the correct menu choices and procedures?
   - ▢　　1- very difficult
   - ▢　　2 - somewhat difficult
   - ▢　　3 - neither difficult nor easy
   - ▢　　4 - somewhat easy
   - ▢　　5 - very easy

3. How much time do you think you would need before you felt proficient using this software to perform task you normally perform?
   - ▢　　10 to 30 minutes
   - ▢　　1 to 2 hours
   - ▢　　3 hours or more

4. Please rate your overall satisfaction with this website.
   - ▢　　1 - very dissatisfied
   - ▢　　2 - somewhat dissatisfied.
   - ▢　　3 - neither dissatisfied nor satisfied
   - ▢　　4 - somewhat satisfied
   - ▢　　5 - very satisfied

Overall Reaction to the website

5. I can effectively complete my work using this website

	1	2	3	4	5	6	7	
Strongly disagree	▢	▢	▢	▢	▢	▢	▢	Strongly agree

6. Whenever I make a mistake using the website, I recover easily and quickly.

	1	2	3	4	5	6	7	
Strongly disagree	▢	▢	▢	▢	▢	▢	▢	Strongly agree

7. It is easy to find the information I need

	1	2	3	4	5	6	7	
Strongly disagree	☐	☐	☐	☐	☐	☐	☐	Strongly agree

8. The information is effective in helping me complete the task and scenarios

	1	2	3	4	5	6	7	
Strongly disagree	☐	☐	☐	☐	☐	☐	☐	Strongly agree

9. The organization of information on the website is clear

	1	2	3	4	5	6	7	
Strongly disagree	☐	☐	☐	☐	☐	☐	☐	Strongly agree

10. The interface of this website is pleasant

	1	2	3	4	5	6	7	
Strongly disagree	☐	☐	☐	☐	☐	☐	☐	Strongly agree

11. The website has all the function and capabilities I expect it to have.

	1	2	3	4	5	6	7	
Strongly disagree	☐	☐	☐	☐	☐	☐	☐	Strongly agree

12. I think that I would like to use this system frequently

	1	2	3	4	5	6	7	
Strongly disagree	☐	☐	☐	☐	☐	☐	☐	Strongly agree

13. Overall, I am satisfied with this website

	1	2	3	4	5	6	7	
Strongly disagree	☐	☐	☐	☐	☐	☐	☐	Strongly agree

14. Is there anything you would like to let us know about your experience?

Cognitive Walkthrough

Questions: Utilized at each step for each task
1) Will the user try and achieve the right outcome?
2) Will the user notice that the correct action is available to them?
3) Will the user associate the correct action with the outcome they expect to achieve?

4) If the correct action is performed; will the user see that progress is being made towards their intended outcome?

Tasks (& their steps)

Task 1: *Submitting and writing peer review comments*

Starting step: Begin at the course dashboard (https://canvas.eee.uci.edu/)

Step 1: Locate the class you need to do the peer review assignment in on the dashboard.

Step 2: Under recent activity, click on Peer Reviews. This will help "show more" information regarding the tab.

Step 3: Select the correct and assigned peer review assignment from the drop down menu.

Step 4: Click on View Feedback to insert peer review comments on the document itself

Step 5: Open the document window onto the full screen view to get a better view of the document.

Step 6: Zoom in and out to get a better view of the document if needed.

Step 7: Decide the type of marks you would wish to insert inside the document. There are five in which you can choose from.

Step 8: Exit out of fullscreen mode

Step 9: Locate and click the "Show Rubric" button

Step 10: Insert a score you wish to give the student

Step 11: Add a comment for the assignment

Step 12: Save your comment

Task 2: *Posting on a discussion board*

Starting step: Begin at the course dashboard (https://canvas.eee.uci.edu/)

Step 1: Locate the class you need to do the discussion in on the dashboard.

Step 2: Click on the discussion tab on the middle of the screen. This tab will "show more".

Step 3: Choose the correct discussion page you would like to discuss in.

Step 4: Click on the reply button to post on the discussion board

Step 5: Insert textual information within the box

Step 6: Add any extra attachment or media within the message.

Step 7: Post reply

Task 3: *Creating a group*

Starting step: Begin at the course dashboard (https://canvas.eee.uci.edu/)

Step 1: Locate the class you need to do create a group in on the dashboard.

Step 2: Go into the people tab

Step 3: Click on the tab titled 'Groups'

Step 4: Press the button titled '+Group'

Step 5: Add a group name

Step 6: Determine who can join your group by choosing under the 'Joining' section.

Step 7: Invite the members of your group.

Step 8: Save your group information

Individual Heuristic Evaluations

Jason's Heuristics

Visibility of system status

The peer review process in our redesign helps allow the users know which stage they are in by giving users visual indication on whether they are finished or still need to continue. This is seen through the addition of the "not completed" section of the peer review which lets users know that their task is still incomplete. Previously there was no such blatant indication on whether users were finished with the peer review task. In addition, once users has completed all the neccessary comments and details needed for the peer review the grayed out 'Submit" button turns blue, letting the users know that the task has been completed.

Match between system and the real world

The layout for the assignments page and homepage have been reorganized so that the course material is structured by weeks. Students from several interviews suggested that they preferred the 'modules' tab much more than other pages since it is laid out in organized weeks, rather by separate due dates. Since most students like to thin by week, this redesign will allow users to quickly discover information and course material quicker than the list of files that is originally displayed. In addition, having the course material be divided by topics such as "Assignments", "Lecture slides", and "Readings" will also quicken users search for items. Also, the wording of "Save" on the peer review has been changed to "Submit" instead to let users know that they are completing and submitting assignment for grading.

User control and freedom

Users are able to submit or resubmit an assignment as well as submit an assignment after the due date. Users would also have the ability to choose

which type tool, color, and attribute when commenting on a peer review. In addition, when users are submitting a rating on the rubric, they can freely select and re-select specific rating before submitting the actual peer review. The discussion page also allows users to implement their own style of how to display text by including basic word processing tools in a clean and easy to use way. This redesign however, does not allow users to edit their discussion post after the fact that they have already submitted their text.

Consistency and standards

Each of the buttons, labels, and icons used within our mockups are all seemingly similar to each other and maintain consistency in terms of how information is organized and how color is utilited. The editing tool bar located at the peer review as well as the toolbar located on the discussion page are similar to toolbars located in standardized word and image processing applications. Comments within peer reviews have a similar display to other word processing application such as Microsoft Word and Google Docs so that users can be familiar with how information will be displayed within the document. Also, the incomplete boxes that are located within the peer review are also similar to the incomplete box icons located at the 'assignments page'. Much of the discussion new features were derived from Piazza, another discussion board application that is utilized by college students to ask and answer questions regarding assignments. This redesign looks to implement features as recognizing when an instructor, TA has commented, separation between assignment based post and question based post and having instructor approved comments be displayed prominently.

Error prevention

If users submit a premature pre-review, this redesin will allow them to re-submit their comments.The visual indication on whether a peer review assignment has been completed or uncompleted, which will hopefully allow users to identify their progress. This redesign however does not allow users to edit or delete their own discussion post after they have submitted their comments.

Recognition rather than recall

By reorganizing the assignments and home page by weeks and then by individual topics such as "Lecture slides", "Assignments" and "Readings", users who are familiar with viewing and finding information by weeks will quickly identify the material, rather than scrolling one by one to find a certain page. In addition, instead of having users click on "Course" and then have a menu displaying the type of courses they would like to switch their display, the

redesign now have the courses displayed on the sides so that they can quickly switch back and forth between classes. Another change that this peer review does is allows users to quickly view their peer review document when on the assignment page. Before users had to search for a way to locate and access the contents on the page, but now this will be viewable as soon as they are on the page. Also, whenever users will search on the search bar, the results will display in real-time whatever the user is typing.

Flexibility and efficiency of use

This redesign allows users to add extra features and design within the discussion post section. Users are able to add images, format text, and add links to other pages.Users can also direct themselves to the help button located on the bottom left to learn more about Canvas and its features. Although not displayed on the mockups, the redesign will still allow users to adjust their notification and view of Canvas to their own preferences.

Aesthetic and minimalist design

Since the names of the tabs for each courses vary from course to course, this redesign looks to standardize the names and features for each course so that users are not confused on which tabs will be utilized. We still kept with the original Canvas layout and did not change much in having a minimalist design pattern.

Help users recognize, diagnose, and recover from errors

To allow for students to know when their peer reviews are finished these redesigns visual identify when these assignments are completed or not through use of color and labeling. In addition, if users decide to leave the page on the discussion board with text inserted on the reply box, the system will save these comments automatically and let the user recover from potentially losing all text that has been submitted.

Help and documentation

For this redesign, we made sure we kept the "help" feature so that users can recognize and explore features of Canvas. By keeping this help page, we hope that there is readily information so that users can find any sorts of documentation.

Rui's Heuristics

Visibility of system status

The Canvas system originally had a fine signifier that shows the user information of the current page. It highlights the current tab with its contrast theme color: blue and white. It works well and we inherited that style in our redesign. The user should be able to distinguish their page soon by looking at the course name on the left side, and then the current tab, i.e. "Assignments." There will also be a bold label on the top of the page, so the user can quickly identify the current status.

Match between system and the real world

Canvas is a system that is heavily related to topics such as students, education, and college. The terms are understandable for the users since we are applying the terminologies that students are generally familiar with, like: submit, assignments, peer review. In our redesigned homepage, we also grouped things by weeks, which is the unit of time that college students commonly use.

User control and freedom

In our redesign, we heavily focused on the peer review function and we can see that now it's easy for the user to identify if they are submitting or submitting the assignments. It is easy for the user to choose which assignment that they want to peer review with. At the same time, I think the user control and freedom is limited in the redesign on the teacher's side since they will have to set up a homepage that is standardized to all. It might be controversial, but I think a standardized home page is more likely to help the students who are taking multiple different courses.

Consistency and standards

There are a few standards in Canvas's system. For example, the tabs for courses:
- Home
- Syllabus
- Assignments
- Discussion
- Announcements
- Grades
- Groups

- Quizzes

The consistent layout would benefit the students who are wandering on many different canvas pages. Previously, many instructors have different tabs and use them in different ways, it is confusing for the students to locate where they need to go in order to accomplish something in the course. We eliminated uncommon features and the ones that are consistent remain. I personally expect that students will find the pages more consistent and thus can improve their working efficiency.

Error prevention

Navigation

It was easy for amateur users to get into wrong sections--the sections that they did not expect. I'd say the redesign prevented errors by eliminating unused features such as Pages, Collaboration, and etc.. Those features are not commonly used and can be substituted with other functionalities. Now, since the navigation is simpler and with less buttons to click on, I think the errors while navigating through the websites will be prevented.

Peer review

"View feedback" was the problem that students could not spot how to leave comments. With the redesign, the user will no longer miss required steps such as marking the document and marking on the rubric.

The editing field now opens the first submitted document initially, so the users are less likely to run into errors.

Recognition rather than recall

The layout of the peer review page now has the greyed out submit button, which is recognized universally by the computer users as "not able to click." When the peer review is done, it lights up in blue and the users know that they can click on it to submit the document.

The simplified navigation also helps the user recognize the steps instead of memorizing which path they need to take in order to find what they want. The original Canvas navigation was intuitive, and we improved on it by eliminating unused features. Therefore, recognition rather than recall should be presented well in the redesign.

Flexibility and efficiency of use

Our redesign, in a sense, is in the favor of inexperienced users rather than experienced ones. We focused on making sure to not let new students confuse while navigating and doing work on Canvas. We minimized the unused features and tools. I do not think there are many "accelerators" in the redesign.

Aesthetic and minimalist design

The original design is minimalist in a way. There is no fancy pictures and other things that can possibly distract users. However, the redesign cut down the tab numbers and maintained the theme: blue and white. On the discussion page, the replies now have the blue strip on the left that indicates those are replies within a reply. This small detail is aesthetic and modern, it makes the page look new and minimalistic.

In the Peer review editing tool, the tools are arranged in a cleaner way and there are less "useless" tools. Overall the aesthetic and minimalist design of canvas has been improved.

Help users recognize, diagnose, and recover from errors

"Re-submit" is the thing that I can find out in this redesign. When user enters feedback that are unintended, they can re-write the review and re-submit with the light blue button. This way that the user can recover from his/her error. Also, the "keep in draft" in Discussion board can also help users to recover from errors in case they happen.

Help and documentation

Few Help features are mentioned in the redesign, I think the re-arrangement of the rubric was a documentation that helps the user to identify the steps that they need to take.

Tiffany's Heuristics

Peer Review

Visibility of system status

❖ Good visibility of system status (for PR ASSIGNMENT* due to progress drop-down box.
❖ Displays status of Peer Review assignment (Not Completed vs. Completed)

- ❖ When selecting drop-down arrow, provided a list of of assigned peers to review as well as whether or not the user has completed a peer review for that peer
  - ■ Status represented by check box & color (red for not completed/submitted & green for completed/submitted)
- ❖ NOT as clear on status/progress on current peer user is reviewing:
  - ➢ Only Indicator = Submit button is no longer grayed out/restricted from selection
  - ➢ Don't know which sections are necessary/incomplete/complete

Match between system and the real world

- ❖ No unfamiliar/esoteric wording which may confuse users → all in user's vocab
  - ➢ Name of tools understandable and match with real world (Strikethrough, highlight, free draw..)
- ❖ Understanding of rubric section (similar to rubric in real world)

User control and freedom

- ❖ No Editing button for Comments that have already been made on the document
- ❖ Users CAN RE-SUBMIT peer reviews
  - ➢ Should be able to edit/make changes to submitted peer reviews and not have to fill out everything else again (but not presented in mock-up)
- ❖ Rubric:
  - ➢ Once selected a rating for each criteria, not locked → can still change rating (not displayed on mock-up)
- ❖ ** Mock-up does not show interaction with tools (and how selection and commenting would go and how users can undo stuff)
- ❖ Users CAN EXIT out of assignment detail dialogue (thanks to X button on top right)

Consistency and standards

- ❖ Editing/toolbar for document consistent with other file editing programs/apps
  - ➢ Editing tools on left side of bar & specifications for current tool-in-use displayed directly below (instead of on other side of the toolbar)
- ❖ Tools (with acception of area-highlighting tool) consistent/found in other programs/apps

          ➢ E.g. strikethrough, draw, and highlight

  ❖ Restricting selection of and graying out of Submit button helps user not miss completing all necessary sections of peer review

Recognition rather than recall

  ❖ Selected tool is highlighted with thicker circle outline to remind users what tool they had selected (don't have to recall)
  ❖ Rubric: readily displayed on PR page underneath the file (editing) section→ no need to have to select "Show Rubric" and remember information provided from the pop-up box

Flexibility and efficiency of use

  ❖ No accelerators for expert users? (is there a need for one?)

Aesthetic and minimalist design

  ❖ Assignment details have been made available, but only accessible when necessary so as to not clutter up the page or overwhelm the user
      ➢ Assignment details
  ❖ CRITERIA section
      ➢ Description of criteria section might end up cluttering the space/hard to read if too small?
          ■ Solution: provide a drop-down arrow/See More link to display description? (allows users control in what they see/what is displayed)

Help and documentation

  ❖ A Help button/selection is available on left nav bar
      ➢ BUT… the Help button is general to all of Canvas (would have to go through Help page & find relevant question
          ■ Not specific to Peer Review

Navigation Bar

Visibility of system status

- ❖ Good feedback on status/what bars or tabs have been selected (selected bars/tabs distinguished by highlighting or different background colors)
  - ➢ White background for main nav
  - ➢ Blue background for course nav

Match between system and the real world

- ❖ Wording of tabs match with real world vocab

User control and freedom

- ❖ Users can easily switch between

Consistency and standards

- ❖ Layout/Design of **course-specific/lower navigation** (the nested section, nested under the individual course tab navs) unlike other navigation bars
  - ➢ Does not look like a navigation bar & Inconsistent with main navigation bar:
    - ■ Focused on top of the page
    - ■ Not enclosed within a bar (like the main navigation bar) **

Error prevention

- ❖ No possible errors in the usage of the navigation bar?

Recognition rather than recall

- ❖ All necessary information (e.g. labeling of nav tabs) are displayed (nothing is hidden/required to recall)

Flexibility and efficiency of use

- ❖ No accelerators for expert use??

Aesthetic and minimalist design

- ❖ All necessary, and only necessary, info is displayed

Help users recognize, diagnose, and recover from errors

- ❖ No possible errors in the usage of the navigation bars?

❖ Only a *general* help button

Discussions
Discussion Home Page

Visibility of system status

❖ No clear feedback on which discussion post the user has finished/completed or which discussion threads the user has contributed/posted in

Match between system and the real world

❖ "Create Post", "Search", Filter icon all resemble real world concepts/actions

User control and freedom

❖ Users can easily leave the Discussion home page by selecting a different tab/page to navigate to via the navigation system
❖ ** if user selects on one discussion post/thread, they would have to click back or click on Discussions again
  ➢ There could be an easier way to do go back to home page?? (but Discussions tab on left should be sufficient as the user only naviates to one post and cannot go further?)

Consistency and standards

❖ Diverges a bit from other discussions (though not very negatively) in that there is a sectioning of Assigned Discussions and other discussions
❖ There is a filter button and a search bar which is consistent with others
❖ DOES NOT include upvotes/views like other discussion forums?? → how important/advantageous or these to the experience?

Error prevention

❖ What possible errors could there be?
  ➢ Search engine: solutions →
    ■ Maybe it can produce a list of suggestions real-time to whatever the user is inputting (and resolves/predicts even if there are errors in their input)
    ■ Produces results that BEST match user's input (which may have been incorrectly put)

Recognition rather than recall

- ❖ Not an issue here ?

Flexibility and efficiency of use

- ❖ Search and filter functionality allows for quicker search? But no real accelerator..?
- ❖ Dividing between regular discussion posts and assigned ones makes it easier to find assignments (an importance)

Aesthetic and minimalist design

- ❖ Good minimalism → only presents the necessary information (name of discussion posts, last contributed?/which ones were most recent, when the assigned posts are due)
  - ➢ But… unclear about the icon/elements on right side of individual posts → meant to be unread/read indicator (but not as straightforward about what it is or which is which?)

Discussion Post Page_____

Visibility of system status

- ➢ Mockup does not show what happens after you've posted a post..?
  - ■ Will discussion post box at the top disappear??
  - ■ User's post will appear at the bottom (as the first post?)
  - ■ ***should display some sort of confirmation that the user's post has posted (not shown on mock-up)
    - ● No confirmation about whether discussion assignment has been done (especially if it's an assigned discussion)
    - ● Not obvious that user has posted in discussion? Besides looking for their post?
      - ◆ *****CONSIDERATION: marking whether student/user has posted once won't encourage constant engagement/interaction?? (or at least for regular discussion posts?)

Match between system and the real world

- ❖ Idea of Draft and posting and replying familiar to user and real world
- ❖ No confusing/esoteric wording

User control and freedom

- ❖ No editing or deleting options for already posted responses/posts
- ❖ Where can users find drafts if they saved something as a draft??

Consistency and standards

- ❖ Good consistency:
  - ➢ Editing tools for the post similar to external apps/programs
  - ➢ Wording consistency is good
- ❖ There are features that are present in others that are not on here? Such as:
  - ➢ Some voting/rating functionality?
  - ➢ date/time in which the post was made?
  - ➢ Original poster-sponsored posts?/resolved posts indicators?
    - ■ *** NOTE: this may differ depending on assignment discussions vs. regular discussion posts
  - ➢ Word count

Error prevention

- ❖ Possible errors not addressed in mockup:
  - ➢ Inserting wrong attachment??

Recognition rather than recall

- ❖ Everything the user needs is displayed? Nothing required is hidden or requires recollection
- ❖ ** Insert: may not be clear that user can insert/attach files/links/images using this button?

Flexibility and efficiency of use

- ❖ No accelerators for expert use

Aesthetic and minimalist design

- ❖ Does not include unnecessary elements → good adherence to aesthetic and minimalist design

Help users recognize, diagnose, and recover from errors

- ❖ Not addressed or displayed in the mockup

➢ Insert button: if users try inserting the wrong element (e.g., inserting a file that is not compatible for images) → An error message SHOULD be displayed (via pop-up?) explaining why it was incorrect/an error and what should the user do… for example, what files ARE accepted/compatible

Help and documentation

- General Help button

Soros' Heuristics

Visibility of system status

Peer Review

System allows users to know when peer reviews are completed/incomplete and when peer reviews are completed and ready to be submitted. Clicking on assignment details opens up the window as a pop-up and clicking on rubric highlights scores. Tools show their function on peer review document when used

Navigation/Home Page

System highlights appropriate section of navigation depending on level of navigation. System shows current week of school

Discussion Board

System shows how many students have posted and when due dates are. How will the system show how a response looks after it is posted ? Does not show whether user has posted or not, or whether they have a draft or not.

Match between system and the real world

Peer Review

Provides a "step-by-step" by laying out things that need to be done in order to complete the peer review. Uses tools that user is familiar with. "Submit" as a word of completion.

Navigation/Home Page

Focus on courses as main navigation words. Course navigation terms match familiar terms.Weekly basis since students think of their courses in terms of weeks rather than dates.

Discussion Board

Logical order--prioritizes assigned discussions first

User control and freedom

Peer Review

> Allows users to re-submit even after they've submitted. Does not have an undo/redo option. User must manually delete things they've edited on the document.

Navigation/Home Page

> User can switch tabs easily with courses as a priority.Users can navigate to any week to see past/upcoming things for courses.

Discussion Board

> User can save their draft if they are in the middle of writing a response. How can users delete their post?

Consistency and standards

Peer Review

> Uses familiar tools to Google Docs/other word programs.Users may be unsure about the Area Annotation tool. Rubric format is standard. Navigation tools appear on top right of toolbar.

Navigation/Home Page

> Two-level navigation.Replicates module tab to show weekly course material

Discussion Board

> Response to discussion post box is standardized. Tools are standardized.

Error prevention

Peer Review

> Does not show whether it has been saved or not if user accidentally clicks out of the page. No "Are you sure you want to navigate to another page? Changes will not be saved" pop-up.

Navigation/Home Page

> Help button on bottom of navigation.User can navigate to previous weeks. No indicator of which week student is actually on if they scroll to another week.

Discussion Board

> Save as draft. Doesn't save automatically though.How to delete post/responses? Should let users know assignment details in order to complete discussion post. Word count.

Recognition rather than recall

Peer Review

> Option to open "Assignment details" if users forget. Easy access to other peer reviews assigned.

Navigation/Home Page

Automatically shows the week that the student is on.Students can immediately see things that are due or upcoming.

Discussion Board

Doesn't show whether an assignment/post has been completed/made.

Flexibility and efficiency of use

Peer Review

Documents are already opened for efficiency of peer review.

Switching between peers to check is quicker.

Navigation/Home Page

Students will have to check every course for different things pertaining to a course.

Students don't just have one page to see what things are due.

Users cannot jump to different weeks.

Discussion Board

Search bar instead of "ctrl-f".

No way to search inside of a discussion thread except for "ctrl-f".

Aesthetic and minimalist design

Peer Review

Toolbar only shows necessary tools for peer-reviewing.

No option to download or full-screen document.

Navigation/Home Page

Shows only the week that user is on.

Discussion Board

Shows most important information.

Color shows instructor responses.

There is no color to show user's own response.

Help users recognize, diagnose, and recover from errors

Peer Review

Re-submit button

No undo/redo button on toolbar

Way to delete comments/final comments or redo rubric grading?

No system pop-up or automatic save if user accidentally navigates to another page

Navigation/Home Page

Students have to click all the way back to current week, but may get confused on what week they are on

Students can easily

Discussion Board

Does not automatically save draft, must click "Save Draft"

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Are there draft options for responses to other users?

How will users know if they have a draft, and whether it is to the discussion or to other users?

Help and documentation

Peer Review

View assignment details

Navigation/Home Page

Help button on bottom of navigation

Can be hard to see

Timothy's Heuristics

Visibility of system status

Peer Review

The new design of peer review significantly emphasizes that the system status is kept visible. A distinct icons sits at the top of the peer review screen. Appearing green indicates that the peer review is finished, but the icon appearing red shows that the peer review is not finished. The page also grays out the "Submit" button if not the user is not done, making him/her unable to submit.

Navigation/Home page

With a more minimalistic design and one that eliminates volume, the sidebar navigation system clearly highlights which class that the user is currently in, as well as the mode within the class. However, with the arrangement of the navigation toolbar, the cluster of options may still appear confusing to some users.

Match between system and real world

Peer Review

The separation of the peer review task and the original assignment on the new design reflects the intuitive sense that performing the peer review and submitting the original assignment are two separate school tasks. On the redesign, making a submission to the peer review has been labeled as "Submit" rather than "Save", which makes more sense to the user with what is happening. ("Save" implies that progress can be continued, when in fact, all things that enter the peer review are permanent once submitted.)

Discussion Board

The system matches users post in chronological order, indicating the logical order of occurrence.

The organization of sidebar tabs reflects the logical organization of classes as well as information hierarchy: first a user would associate any action he chooses to be within a class, and from within that class, a user may choose a specific activity: assignment, lecture, discussion, etc.

User control and freedom

Peer Review

The redesign of the peer review improves tremendously on giving the user control and freedom in his/her actions. On the peer review page, the user may access whatever is needed, from looking at the guidelines again and seeing the status of his/her progress. All this information is here without having to navigate to a completely different page.

Discussion Board

Users may easily go in and out of a discussion page by selecting a different tab/page to navigate to.

Navigation/Home Page

Users may switch sections on Canvas easily and may see which course and section they are on at all times.

Consistency and standards

Peer Review

The format of peer review is consistent in organization and visual appearance at every peer review assignment. The new design of the peer review enforces consistency among typical assignment pages: having the peer review separated from the original pages restricts the scenario where some assignments will have peer reviews inside their pages unindicative to the user on the surface level (such as when scrolling through a class's Assignments page) while others will not.

Discussion Board

Formatting and visuals are consistent for every discussion page and discussion post. Tools are consistent at every instance of the discussion editor.

Navigation/Home page

The navigation toolbars are consistent on every page. The far-left toolbar is present in every class, and the near-left toolbar is consistent within every section of the class.

Error prevention

Peer Review

The new design allows users to re-submit peer reviews, so if they make a mistake, they may redo their submission.

Users discussions written in progress are saved in drafts, similar to emails. Therefore, if users are unexpectedly forced to leave, the data from the draft is not lost.

Recognition rather than recall

Peer Review

System has document in full display, clearly indicating to the user the document that needs to be worked on.

Discussion Board

Users are able to recognize most recent post by seeing the posts displayed in chronological order.

Navigation/Home page

Organization of sidebars allows users to easily recognize class selections and class segment selections.

Flexibility and efficiency of use

Peer Review

The newly designed peer review mode gives users flexibility in accessing peer review guidelines while on the peer review page and makes the process more efficient without having to navigate to a separate tab/window to view guidelines.

Discussion Board

Allows for flexible navigation for the user by being able to scroll up and down as well as go in and out of post modules.

Navigation/Home page

The sidebars allow for flexible movement between different classes and pages on Canvas without having to go through separate windows or tabs.

Aesthetic and minimalist design

Peer review

May not be so minimalist with the addition of more significant features and signifiers. However, the design keeps itself aesthetic and appealing to the user by keeping in line with proper visuals for signifiers (color scheme and organization) and consistent with the color scheme of Canvas

Discussion Board

Discussion board remains minimalist and appealing to the user; it rightfully lacks features that are unnecessary.

Navigation/Home page

The newly designed home page gives a much more minimalistic design, eliminating unrelated and unnecessary features from the sidebars, such as "Calendar" and "Inbox". The left-sidebar options have been minimized to represent Canvas' proper information structure, which is to sort the information by classes and descending

downward to specific parts of each class, which the latter of these is given in the near-left sidebar.

Help users recognize, diagnose, and recover from errors
<u>Peer Review</u>

The new design of the peer review allows users to make changes once submitted peer reviews
<u>Discussion Board</u>

Users have the option to save drafts to their discussions, which lets them recover their work in case they run into scenarios where they are taken away from the page unintentionally.

Help and documentation
Only help is given at the bottom-left of the main navigation, but it may not be so easily seen to users.