

PROJECT 2A

Usability of a course management system for students

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INTRODUCTION

Problem:

Canvas is a course management system designed to make teaching and learning easier. It is currently being considered for adoption by UCI. With the intention of helping the university make such decision, this report provides research and insight on the usability of the Canvas system with a focus on the following functionalities: Announcements, Discussions, People, Files, Outcomes, Modules, Collaborations, and Chat. Our studies evaluate the Canvas ease of use and satisfaction among the UCI student demographic. Based on the usability attributes – learnability, efficiency, adaptability, and simplicity – we have included in this report significant findings obtained from our various usability tests, as well as a few final recommendations.

Our choice in using the usability attributes – learnability, efficiency, adaptability, and simplicity – as a basis for our evaluation was influenced by our own understanding of course management systems. We felt these were good measures for testing user performance and user perceived quality. Because change is often an unfavorable option, we acknowledge the fact that the transition from the current EEE system to Canvas must be a simple and easy one. The possibility of a smooth change increases the chances of users finding more satisfaction with their new tools, and therefore, giving them a richer learning experience.

INITIAL ANALYSIS

Heuristic Evaluations:

The Good:

- Flexibility and Efficiency of Use
- Consistency and Standards
- Visibility of System Status

The Bad:

- Help and Documentation
- Help Users Recognize, Diagnose, and Recover from Errors
- Error Prevention

The Heuristic Evaluations served as the primary benchmark by which we focused much of our usability assessment and redesign efforts this quarter; it served as our first ability to gauge the Canvas platform in its entirety without personal bias to negatively impact our evaluation of the technology.

Our group utilized Jakob Nielsen's usability heuristics coupled with a rating scale that we developed to accurately measure how good or bad the existing Canvas user interface was. Nielsen's heuristics measured the following fields:

- Visibility of system status

- Match between system and the real world
- User control and freedom
- Consistency and standards
- Error prevention
- Recognition rather than recall
- Flexibility and efficiency of use
- Aesthetic and minimalist design
- Help users recognize, diagnose, and recover from errors
- Help and documentation

For our purposes we will go in-depth with regards to what particular fields our group thought that Canvas implemented really well; we will also address what fields that we thought the learning platform did not necessarily engineer so well. Our group used a rating scale from zero to five (zero being the best case scenario).

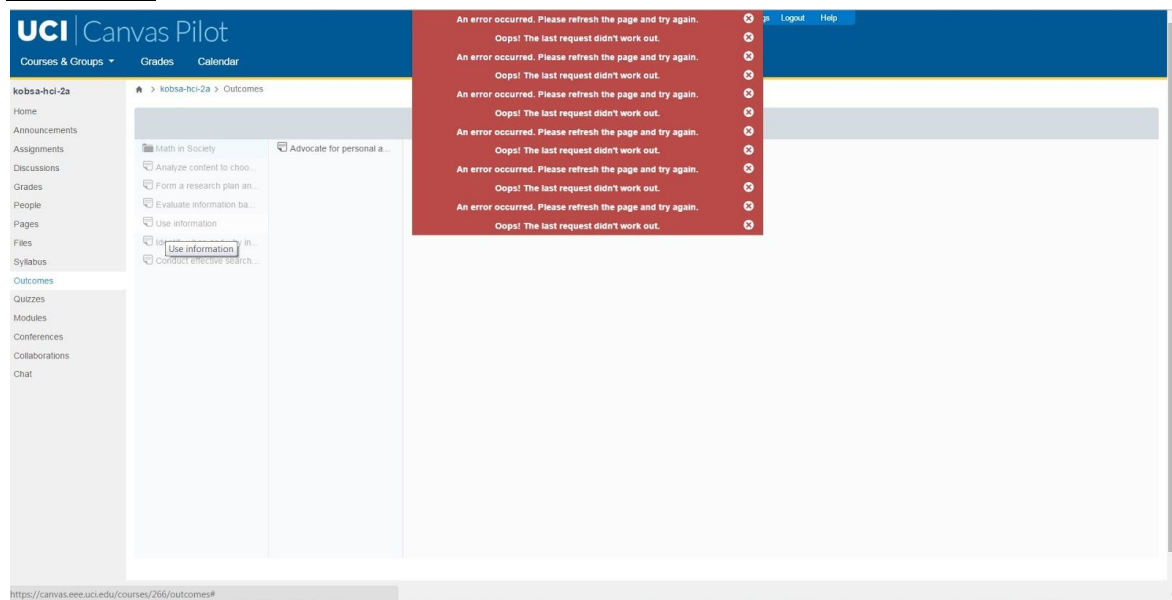
The Canvas Learning Platform is both an enhanceive and dynamic tool for teachers and students alike because of ability to bring to consciousness the most relevant and important action-items at a granular level. What empowers users to use this technology directly corresponds to the flexibility and standardization of a diverse set of features and functionalities offered with the Canvas web infrastructure. In a world of complexity and “information overload” our group immediately fell in love with Canvas’ ability to prioritize and make aware to the user the most relevant and time-sensitive information to its users. Users want to minimize traversing a learning platform to access the specific type of information that he or she seeks. As most of us were first time Canvas users this was something that we all immediately recognized and took note of. Canvas also really impressed us in its’ ability to deliver flexible use to its end user. The user can only access the specific features and functionalities that he or she is meant to access. The Canvas website does a great job to showing only what users can access; for instance, there is no administrator or teacher-specific functionalities that a student can view from his or her web portal. This limits any additive permissions errors or confusion for first time users. Our group also concurred that the Canvas developers did a fanatical job in planning the standardization of the website in the requirements engineering and prototyping phases. This was evident in the current Canvas build that was offered to us from the get-go. In these areas the Canvas Learning Platform exceeded our expectations; these three items from Nielsen’s heuristics all scored a zero, meaning that we didn’t believe that there was any usability problems associated with these respective fields.

It is important to note though that the Canvas Learning Platform had some major weaknesses that we were able to flesh out in the heuristics evaluation process. These weaknesses can be associated with Canvas’ inability to provide proper help, documentation, and support for its end users. When using Canvas for the first time many of us were disappointed in the lack of resources offered to us in the event that we encountered any bugs or errors. We believed that with any platform, especially a third party learning platform the users should be able to interact with an ticket queuing support system, so that if a student cannot access course materials or submit an assignment on time there is an available support engineer to help and the audit-logs to provide a teacher.

We also didn't believe that Canvas had yet solved some of the bugs that we experienced in the heuristics evaluation process which we will explore more in the Reproducible Bugs section. These items do not limit the Canvas Learning Platform's ability to provide students with an excellent resource to plan and prioritize all things school-related, but could be a serious limitation during the technology adoption phase when students are just beginning to transition from using MyEEE to using Canvas. These three items from Nielsen's heuristics all scored a two, meaning that we believed there was a minor usability problem associated with these three respective fields.

Reproducible Bugs:

Screenshot:



- No notification for new chat messages -- mockup below under “Redesign based on results” as Image 5.1.

Problem Statement: When the user interacts with the drag and drop functionality between the two columns to the right of Canvas Dashboard Features List he or she received two errors, one of which states, “An error occurred. Please refresh the page and try again.” and the other which says, “Oops! The last request didn’t work out.” These error messages negatively impact the user’s ability to use this particular feature because the error messages stack iteratively.

Steps to Reproduce the Error/Bug: These errors are faulty because although the errors indicate that the content was not able to be moved from one column to another, but after the errors clear (approximately three to four seconds after the error populates the web page) the content is updated in its new column. If the user repeatedly tries to move content from one column to another the error messages start to stack and negatively affect the user experience.

Solution: Our group suggests correcting these faulty errors that populate the web page and/or limiting the error message to one messages that persists based on the number of

exceptions that the user invokes. For instance if the user invokes one error the message persists for two to three seconds, but if he or she invokes two errors back-to-back the error message should last four to five seconds.

Cognitive Walkthrough:

For our cognitive walkthrough, we made sure that we went through all of the tasks that we had to cover. We came up with eight task scenarios for each of the eight different features – Announcements, Discussions, People, Files, Outcomes, Modules, Collaborations, Chat – that we had to test out. The overall results from the cognitive walkthrough were very good, as we only found trivial issues with the entire system that needed only slight modifications to ensure the smoothness of the system. These minor issues were only cosmetic issues, such as the “History” link icon that is not as clear in the chat page and the Zip file icon in the Files module that cannot be found immediately.

The cognitive walkthrough helped us not only in being able to keep an eye on these minor cosmetic issues, but it also was helpful in helping us to formulate the tasks that we can hand to the participants when they will be doing the think-alouds. Overall, for us, the cognitive walkthrough gave us insight on what we were dealing with, and it also gave us a heads up to see if the participants would be running into the same issue as we did. If the participants would also be running into the same issue, we would be making changes that would ensure the effectiveness of the performance of the course management system.

FIRST GENERATION TESTING

Think-Aloud Sessions and Findings:

1. Accessing and viewing old chat messages was difficult for users. As seen in the image below, the “History” link is displayed in a pale gray font which makes it hard to see against the white background. A mockup of a proposed solution is below in the “Redesign based on results” section as Image 1.2.

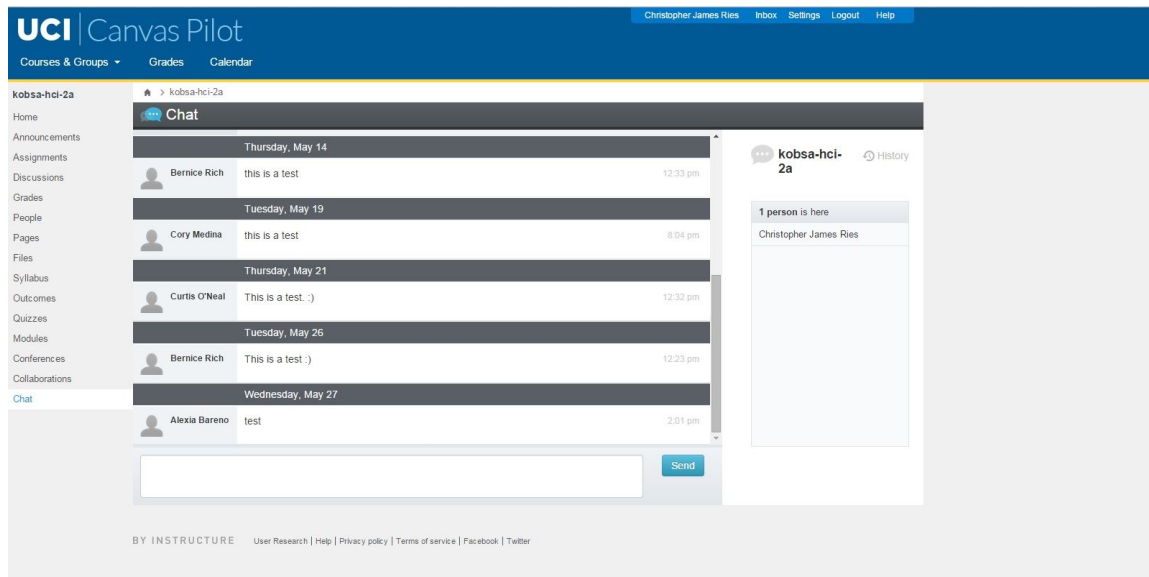


Image 1.1 ChatHistory_Old

- At least one of our Canvas users felt that the Modules page was confusing. Her view of all the pages, assignments, and quizzes was much more complicated on her account. One of her complaints concerned the organization of the modules. Her modules were sometimes cluttered with many different types of documents, so searching for a specific one was difficult. She would scroll down through a good number of modules and overlook whatever she was looking for. Our test user suggested having some viewing options that would allow her to filter and sort through her modules based on week number, due date, or type of assignment. Mockups of a proposed solution is below in the “Redesign based on results” section as Image 2.2 and Image 2.3.

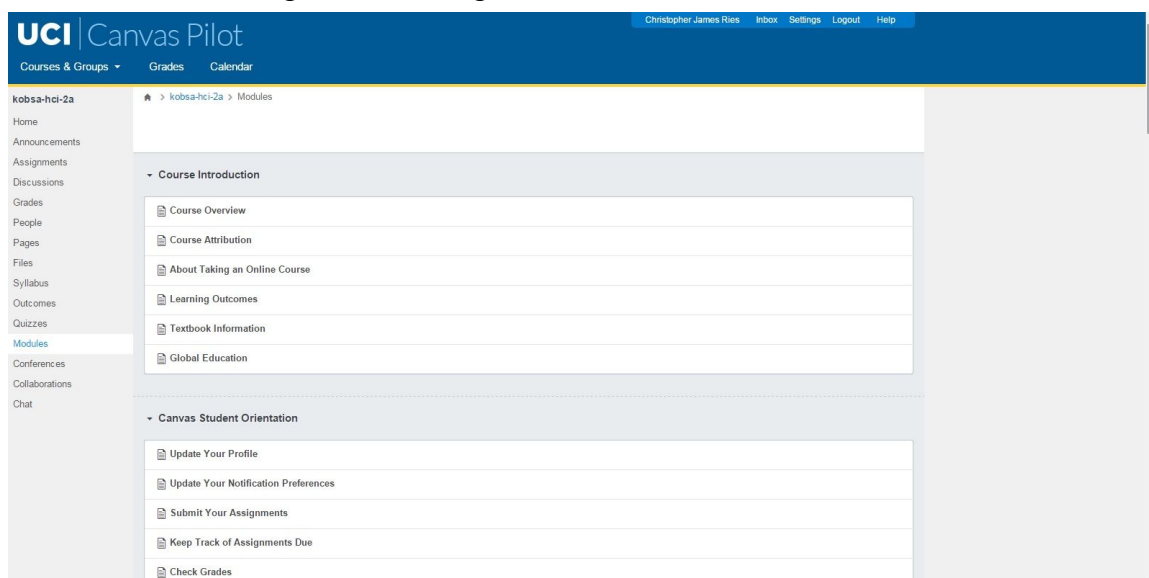


Image 2.1 Modules_Old

3. When a student creates a new discussion, there are two methods of embedding an image: (1) using the right panel, or (2) using the tool editor. The right panel doesn't allow for students to upload files using a URL or from their computer while the icon in the tool editor does. The performance rate at which our test users were able to complete the task of embedding an image depended on whether they saw the panel or the tool editor first. Mockups of proposed solutions for embedding an image through the right panel and through the tool editor are below in the "Redesign based on results" section as Image 3.3 and Image 3.4.

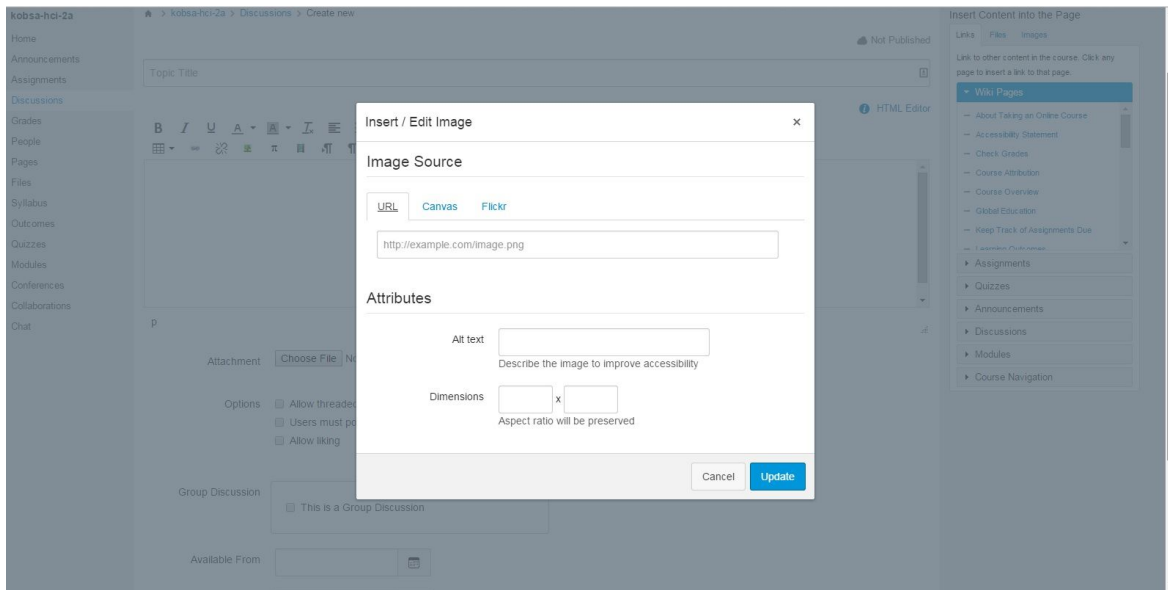


Image 3.1 EmbedImageFromToolEditor_Old

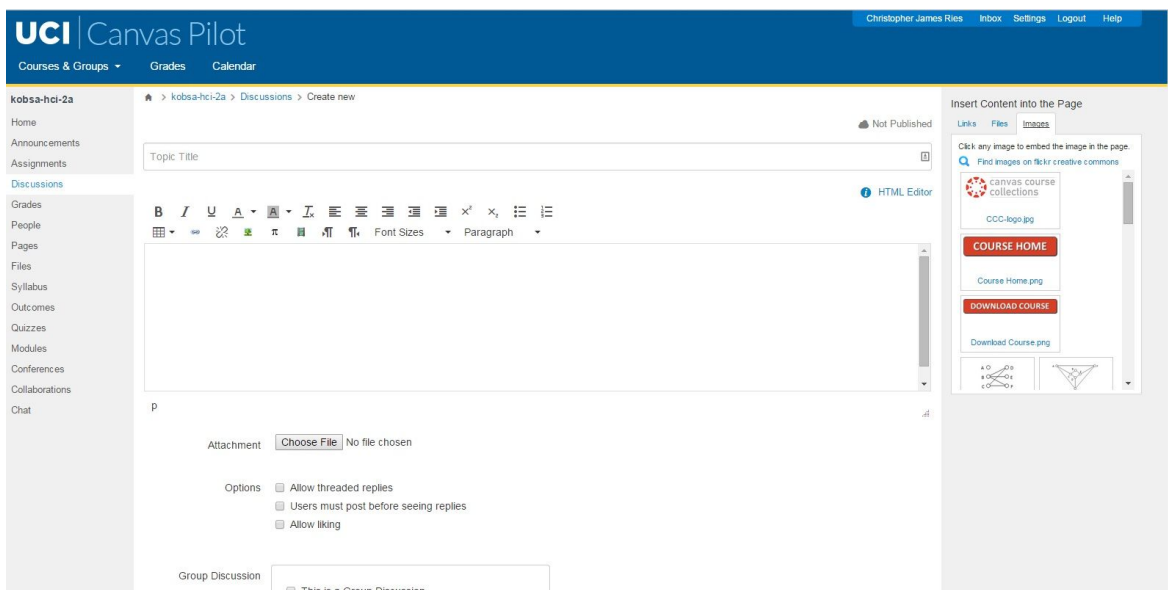


Image 3.2 EmbedImageFromRightPanel_Old

4. Downloading a folder under the Files section showed to take a bit longer than expected. Most of our test users struggled to find the zip icon at the far right corner of the page. A mockup of a proposed solution is below in the “Redesign based on results” section as Image 4.2.

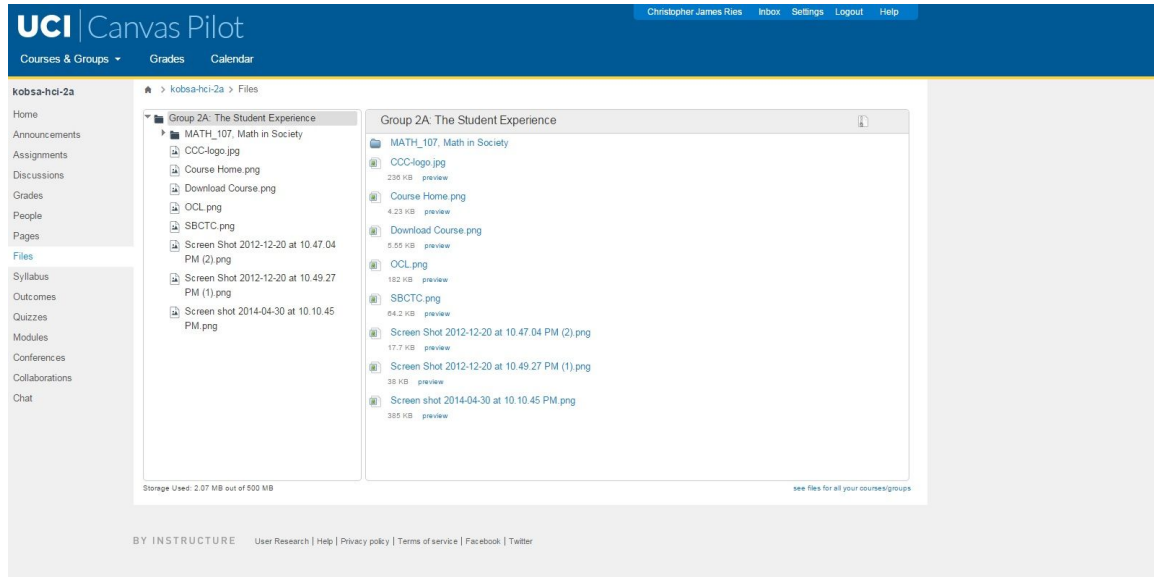


Image 4.1 ZipFiles_Old

User Interviews and Results:

Interviews were a critical component in our usability study because we gathered the most important information regarding user’s opinions about their Canvas experience through them. The interviews followed the think-aloud session and they consisted of questions pertaining to the participant’s opinions about how Canvas’ features felt, while completing the tasks that we had assigned to them. We interviewed individuals from two user type groups: those that were Canvas users and those that were Non-Canvas users. We interviewed a total of 7 individuals, with three participants belonging to the Non-Canvas User group and four participants belonging to the Canvas User group. In the table below, we provide a brief demographic of the participants involved by identifying their classification and major.

Non-Canvas User

Canvas User

User A Second year, Pharmaceutical Sciences	User D Fourth year, Biological Sciences
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User B Fourth year, Informatics	User E Fourth year, Biological Sciences
User C Third year, Chemical Engineering	User F Fourth year, Biological Sciences
	User G Fourth year, Environmental Engineering

Two individuals from the Canvas User group were recruited from a list containing participant's contact information which was provided to us by our clients. The original incentive offered to the individuals in the contact list who agreed to participate in our usability study was a \$10 Starbucks giftcard. In our first two attempts to garner participants from this list, we were faced with unresponsiveness. A reason may have been that it was midterm season and most individuals were busy, however, despite this possibility we were able to hear back from two individuals after adding the extra incentive provided by one of our group members: a free meal swipe into any of the UCI dining locations. The other two users from the Canvas User group were recruited from outside the contact list by two of our group members. As for the participants from the Non-Canvas User group, none of them were from the contact list and so they instead were friends or acquaintances recruited by some of our group members.

Interview Results

Upon completion of all interview sessions with our participants, we determined that the overall reaction to Canvas was an accepting one. Most users shared that they thought Canvas provided a navigable interface that allowed them to move through the different areas of the site to perform a task without any major problems. Despite the overall positive reaction to Canvas, however, the interviewees brought up minor issues, and a few major ones, that they encountered during their think-aloud session. They felt these issues could be improved either because of a lack of an action in the feature or because the current implemented feature did not fully meet their needs or expectations for the completion of a task.

1. History link in Chat

One of the issues presented to us by four out of our seven participants (Users A, B, C, and E) was that of finding the "History" link which allowed the user to view archived messages in the Chat feature. We noted that this was a problem given that most of our participants would comment, "I can't find it" or "I don't see it" during the

think-aloud session. They would spend about 5-7 seconds looking for it before they finally were able to locate the link. The issue with the “History” link is one related to its appearance. The text is in a very light tint of gray that almost completely blends in with the white background of the site. Because of the lack of contrast between the text and the background, users can’t locate the “History” link at first glance which renders viewing the archived messages a bit of a challenge for some as demonstrated by our participants.

2. Modules

The overall layout of the Modules page proved an issue to User E in that she found it inefficient having to scroll too far to the section of the page where the module she was looking for was located. She commented that it was very helpful to have the class work categorized in units, but that the feature should allow users to access the modules in a more efficient way. User E suggested that the Modules be shown in a tile layout that would allow users a better overview of the many modules. Clicking on the module would provide a drop-down style menu that displayed the contents within that module. In redesigning the Modules page this way, the user believed that this would eliminate the “clutter” of having everything loaded on the page when the user visits it.

User C suggested a different approach to the redesign of the Modules page, suggesting that there be an addition of a filter toolbar that would allow the user to search for the items in the modules based on their classification (ex: pages, assignments, quizzes, etc.) This would also eliminate the need to scroll through the Modules page to find the item of interest.

3. Error handling

As previously mentioned, prior to conducting our usability study our group explored the different features of Canvas that we were expected to test with our participants. One of the larger issues that we encountered with Canvas was its lack in ability to handle certain errors. We came across this issue while looking into the Outcomes feature which offers files that detail the instructor’s expectations for each assignment and how they will go about grading those assignments. An unusual issue, we discovered that the user may click and drag files but once they release the mouse button to where they would like to move it, nothing shifts. If a user attempts to drag one of these files to the overarching folder at the top of the list, Canvas yields two error messages at the top of the screen and the system temporarily becomes unresponsive. Users, however, may still continue to click and drag the files which yields many error messages at the top of the page.

We kept the issue of error handling in mind while conducting our usability study in order to identify whether or not this proved an issue anywhere else on Canvas. While we did not identify issues anywhere else, one of our participants, User A, came across the same issue and commented that “the canvas platform needs a better capacity for error handling.” This problem is not something that can be fixed by providing a mockup given that the issue isn’t a cosmetic issue for Canvas. As a group we feel that it is something that the Canvas developers need to address. Ideally, the Outcomes page should act similarly to the Files page which does not allow the user to click and drag files. As User C pointed out, in withdrawing this user-performed action from the Outcomes page, the problem is eliminated and prevented from happening.

4. Embedding an image

The task that generated much confusion from our participants was that of embedding an image in a post. Our participants experienced difficulty in finding the option that allowed them to add an image to their discussion post. We initially let them try to figure it out on their own, however, when it became clear that they were about to give up and move on to the next task, we gave them the hint that they needed to look through the options in the toolbar that they were provided. When User C was told to look at the toolbar and then found the button she commented, “Oh, I didn’t see that. It’s so small.”

User C spoke for all of our participants when she suggested during our interview that the button to embed an image should be larger, because the icon is so small it’s hard to discern what it does. She did appreciate, however, that hovering over the icon provided a text description. User C shared, “I still think it’d be better if the icon was next to the attach icon on the bottom, that way users can see it when they want to put a picture in the message.” In doing so, User C believes that users will appreciate having both options side-by-side when looking to include an image in their post because she thinks it will be easier for them to find. Another aspect of embedding an image that we learned through our users is that Canvas does not allow the users to insert an image saved on their computer when trying to embed it in the post. Such an option would included in the pop-up window that appears when the user clicks on the icon to embed an image.

5. Downloading zipped files

The final issue encountered by all of our non-Canvas participants was that of downloading class files in a zipped folder. The problem was similar to that of the “History” link described earlier in that this was also an issue of appearance. During our interview, we learned from our non-Canvas participants that they had trouble finding the button to download the files in a zipped folder and they suggested that we redesign it so

that users will notice it right away and not have to spend time looking for it. User E commented that she couldn't find the button because it was "on the top corner and too small." She also mentioned that the icon has no text description, so standing alone makes its purpose ambiguous to users who happen to notice it. User B also described the issue with the button in the same way, suggesting that it include a text description so that users know what its purpose is.

In summary, the majority of the issues addressed by our users during our usability study were minor cosmetic issues that required the addition of simple things like text or a change in color. Two of the issues, however, as described by our participants do require the developer's attention in order to make the user's interaction with Canvas better suited to the user's needs. The Modules page would benefit from a redesign that would allow the user to navigate through the modules efficiently, avoiding having to scroll through the page until finding the module of interest. Lastly, the Outcomes page needs to be adjusted so that it may handle the identified errors better, without interrupting the user's Canvas experience.

Redesign Based on Results:

1. Image 1.2 below addresses the issue of users not being able to locate the "History" link. In order to fix the problem (as shown in Image 1.1), we added contrast by changing the color of the text to black which makes it easier for the users to notice.

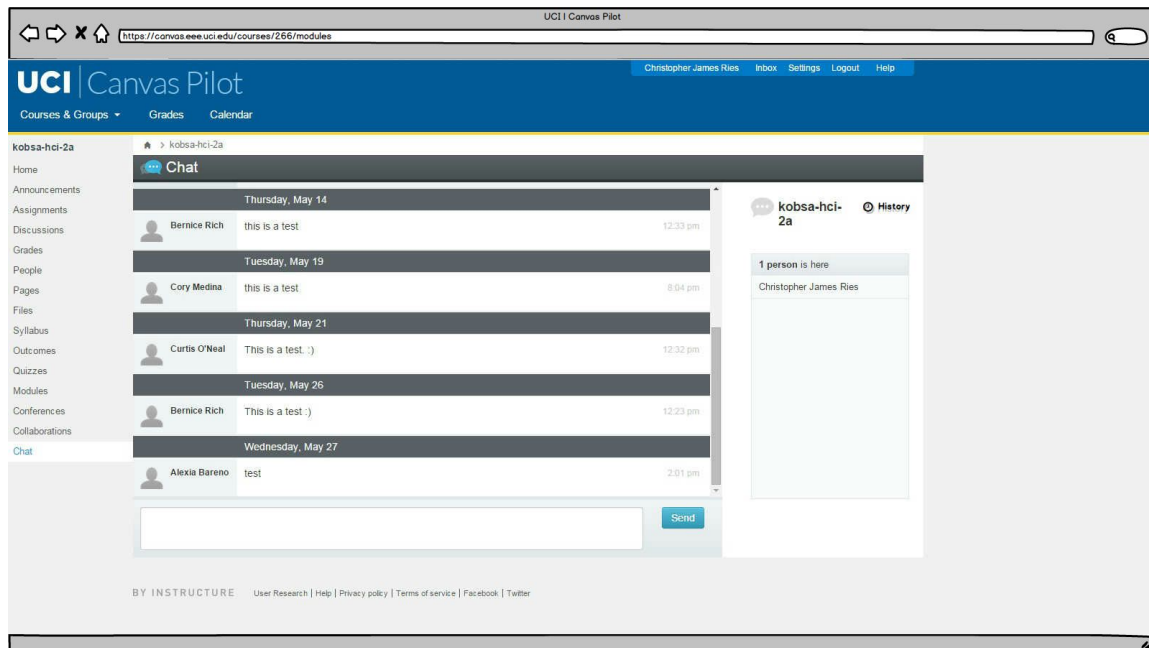


Image 1.2 ChatHistory_New

- Image 2.2 fixes the issue of navigating through the Modules page. By introducing a tab bar at the top of the page, a user can search for their item of interest based on classification (ex: page, assignment, or quiz), due date, or week number. This filter option eliminates the need to scroll throughout the page which users found inefficient. Image 2.3 demonstrates what it would look like should a user be searching by week number.

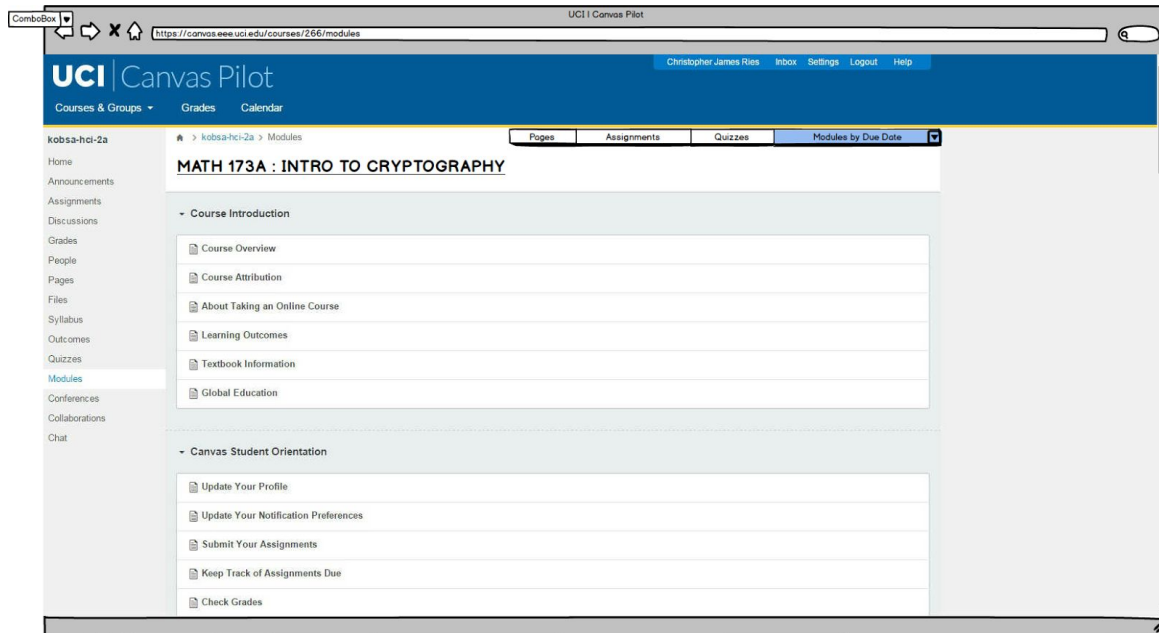


Image 2.2 ModulesWithTabBar_New

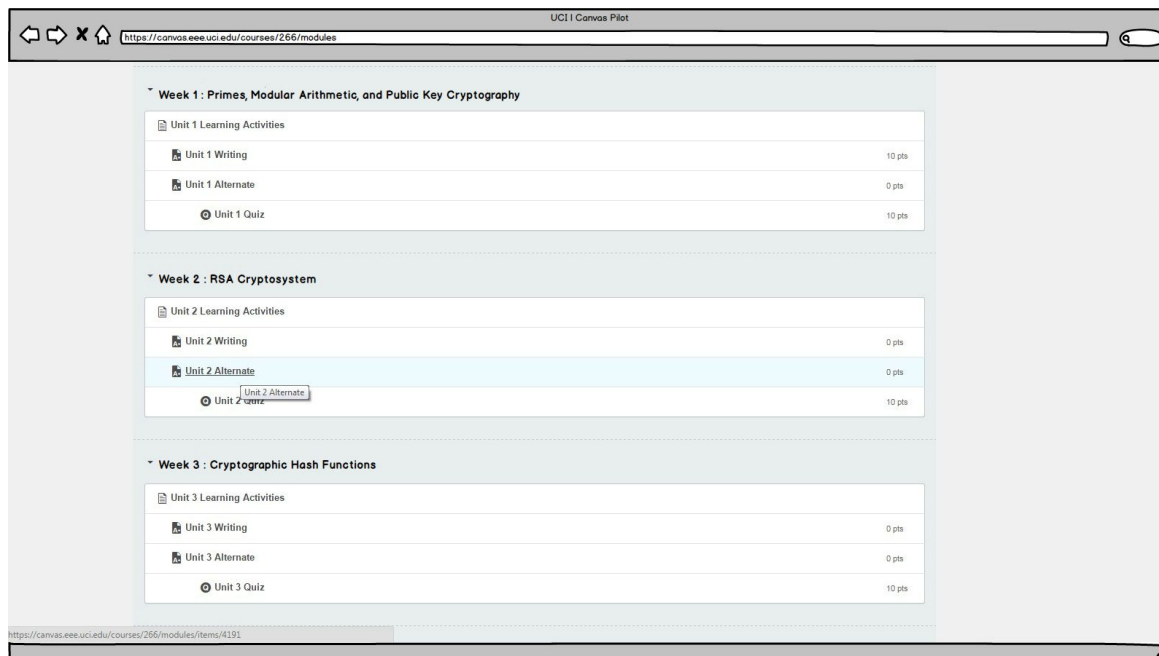


Image 2.3 ModulesSortByWeekNumber_New

- Image 3.3 allows the user to embed an image from the tool editor by adding a “Browse” tab in between the URL and Canvas tabs. Image 3.4 add the option of searching through images on Canvas or typing in the file name in the added search bar.

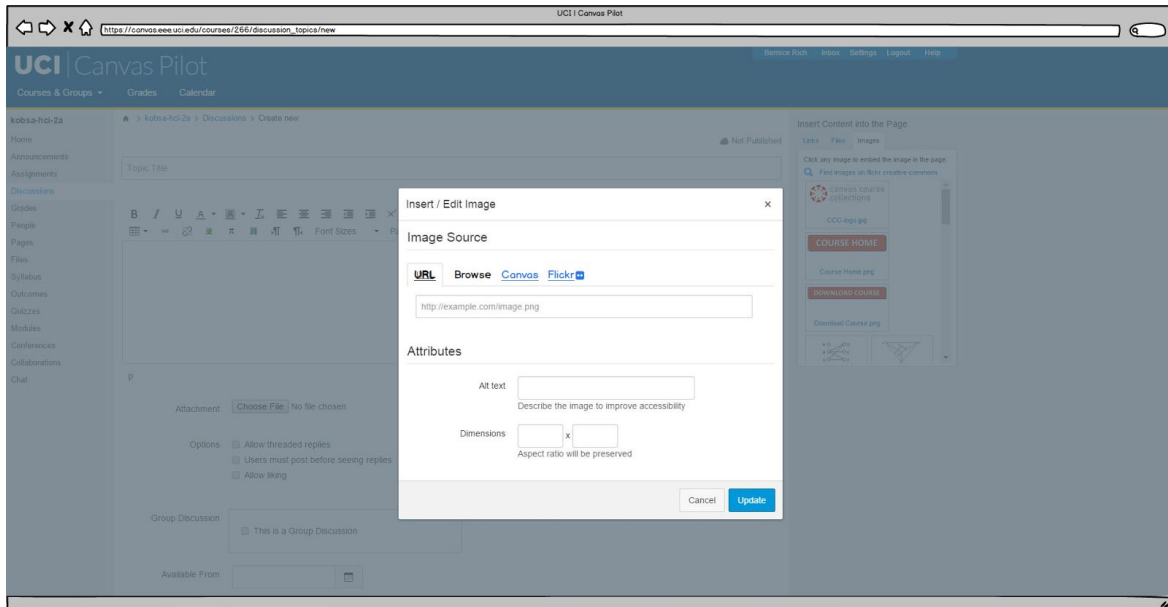


Image 3.3 EmbedImageFromToolEditor_New

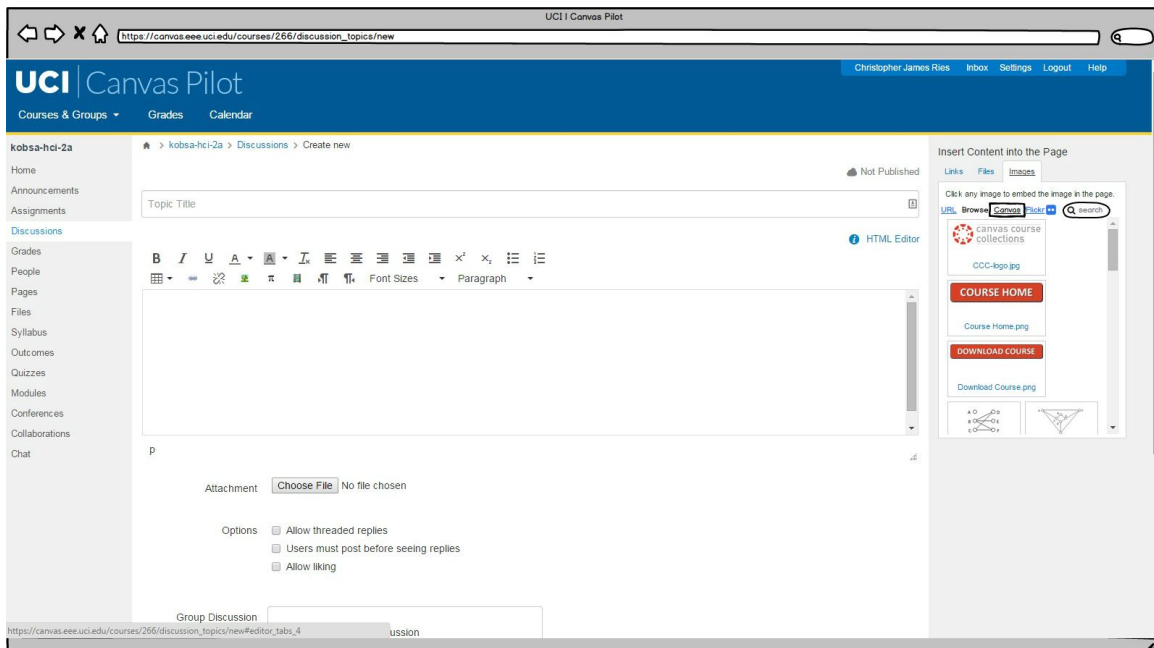


Image 3.4 EmbedImageFromRightPanel_New

- Image 4.2 adds a text description next to the zip file icon, helping users identify what it's for.

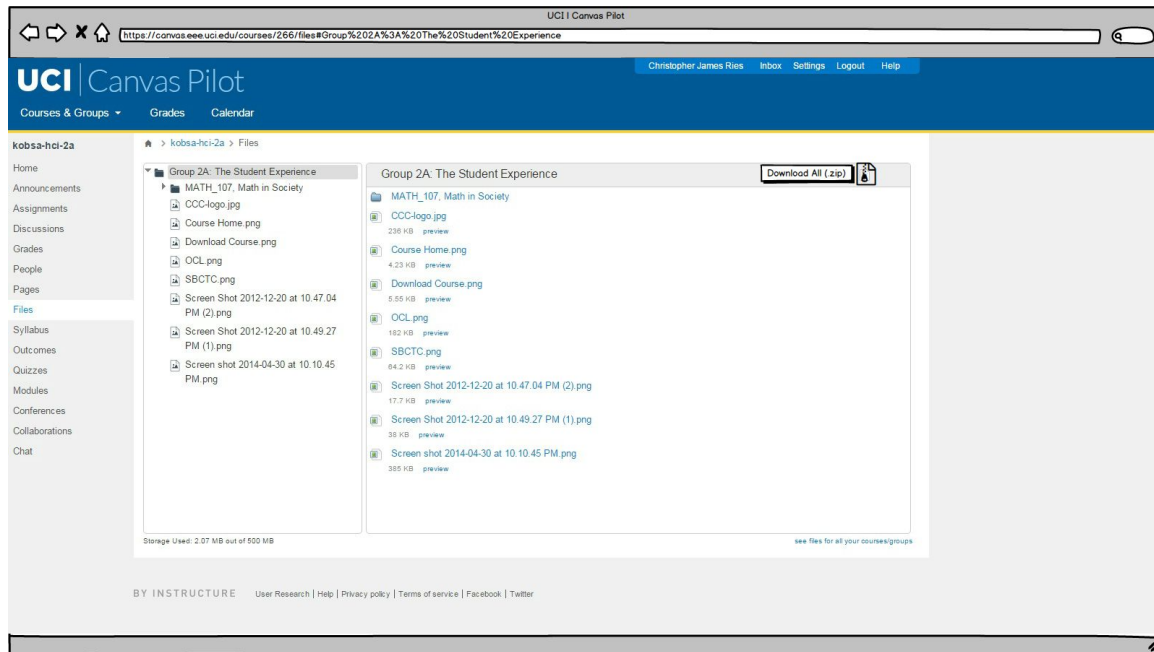
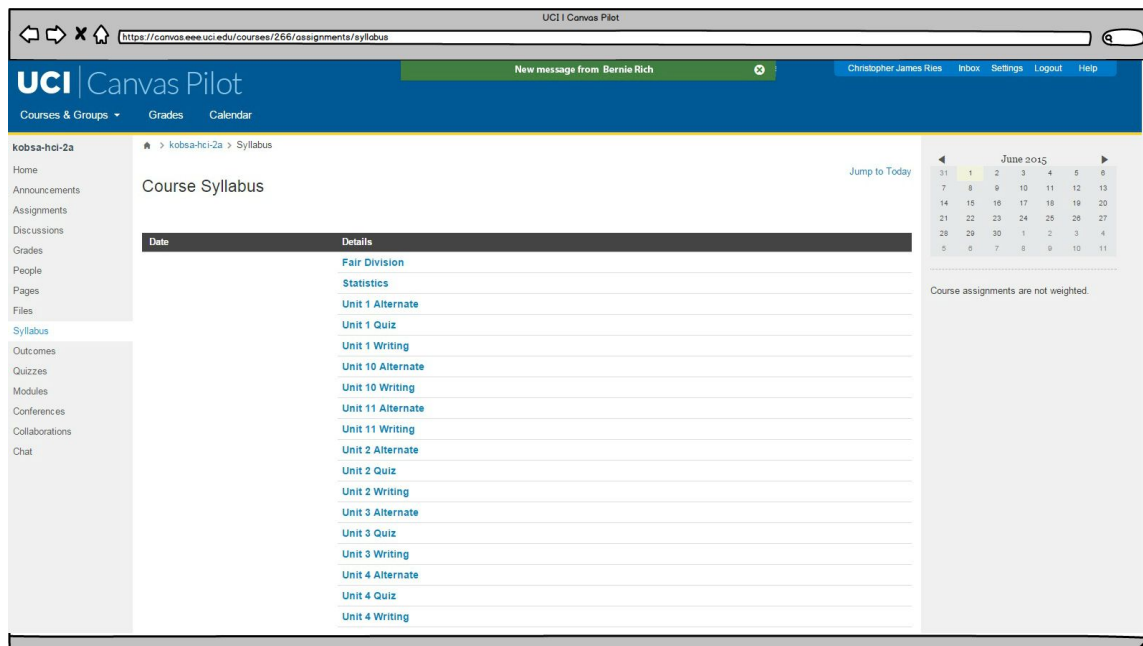


Image 4.2 ZipFiles_New

- Image 5.1 is a redesign that our group believed would be beneficial for a user to have. While the user is on Canvas, they don't have to be on the Chat page to know a new post has been made. Instead, a notification will appear whenever another user makes sends a message regardless of which page a user is on.



SECOND GENERATION TESTING

Our first generation user testing allowed us insight into much of Canvas' current limitations. We sought to fix the concerns of our interviewees as well as ourselves in the prototype mockups shown above. The second generation testing allows us to really assess if our ability to create viable solutions for the average student via Balsamiq fixed such problems. Our group conclusively agreed that our mockups were a realistic and feasible solution for most of the problems with the existing Canvas infrastructure that we observed or learned about from our user testing participants. Our second generation testing process continues to be such a powerful tool because it allows us to introspectively discern whether our solutions derived from groupthink methods addressed the concerns.

After catching up with UserA, we had already created several mockups of what a feasible solution may be for some of usability problems that we had encountered. I have listed the areas in which we had addressed existing problems and have added UserA's input for our new variations that are supposed to address all of the problems that we encountered with Canvas through the entirety of the quarter.

1. History Link in Chat
2. Modules
3. Error Handling
4. Embedding an Image
5. Downloading Zipped Files

UserA in particular thought our solution to the History Link in Chat was simple and solved the problem at large; he understood the merit behind our decision and had no objections to what we implemented. The Modules prototype though was what we found to be the best solution to what he felt was a huge limitation of the user interface. He felt that with granular control, the user would be able to sort and access the modules that are most pertinent to him or her at that particular point in time; he was a huge supporter of this mockup in particular. Looking at our solution to some of the errors that we had encountered during the heuristic evaluation of the Canvas Learning Platform, UserA also thought that our

proposed solution was one that solved the problem. There was one minute detail that UserA disagreed with though. UserA believed that a single error message should persist for a single fixed amount of time. He didn't agree with an error message that was populated for x number of seconds based on the number of errors that the user invoked over time. UserA found our prototype that addressed the limitation that most users experienced while attempting to embed an image was a great solution. He found that users would be more likely to understand how to embed an image if they were in fact more conscious of that particular functionality. Lastly, he appreciated the new button that we created with text indicating that its sole function was to download a zipped file with specific course content; he thought that our take on that was simple, yet solved the underlying problem.

UserA thought that our mockups did a fantastic job to solving the underlying Canvas problems in a very simple, but elegant way. He enjoyed our take on limiting the complexity of using the Canvas Learning Platform.

CONCLUSION

As a group we have worked together to find the problems that lie in the Canvas Course Management that has great potential to be used by the students at UCI. By understanding the system ourselves initially, through heuristic evaluations and cognitive walkthroughs, we were able to then proceed to the next step of our tasks, which was by conducting interviews and think-alouds with the participants. Although the turnout of the people who volunteered was low from our expectations, we were still able to gain very insightful and satisfying data. After the collection of our data, we then created the mockups based on the problems that were described and used it in our next round of interviews.

As we come to a close with this project, as a team, we also had our final recommendations when it comes to Canvas. As a group, we propose a full switch from MyEEE to Canvas based on the data that we have gathered from ourselves and from the participants. Our recommendation is based off of our findings from the participants who mentioned that Canvas is very convenient to have, especially when it comes to taking quizzes and working in a group because it has exquisite features such as: the calendar feature, the chat feature, and the Google-Drive like interface feature. We also would like

to recommend to have a “help” documentation on the side as a reference to students who are still not used to the system. These are our final thoughts as a group from working with Canvas this quarter. We hope that our findings from the participants were helpful towards building a great course management system for the future students to use.