

JARVIS - Final Report

Title

JARVIS

Team

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Problem and Solution Overview

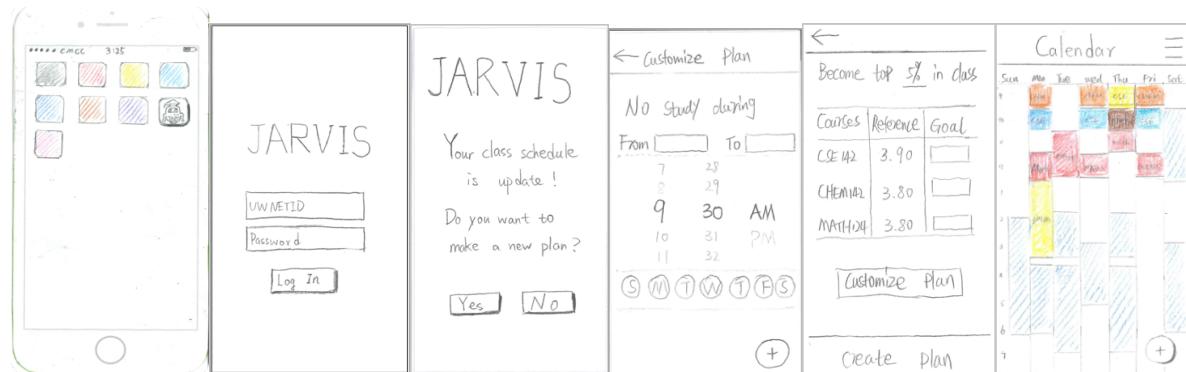
Academic research results have shown that higher-achievers in college are more goal-motivated and able to better organize study. However, due to the fact that students have diverse backgrounds and experiences, a universal study plan might not be applicable. Our project aims to solve such problems and help students better understand their own study habits and develop individual study approaches. Our solution enables students to set their academic goals and track their daily study behaviors and academic performances. Based on the individual information, our design can generate a dynamic and personalized study plan.

Initial Paper Prototype

The first version of paper prototype completes two tasks.

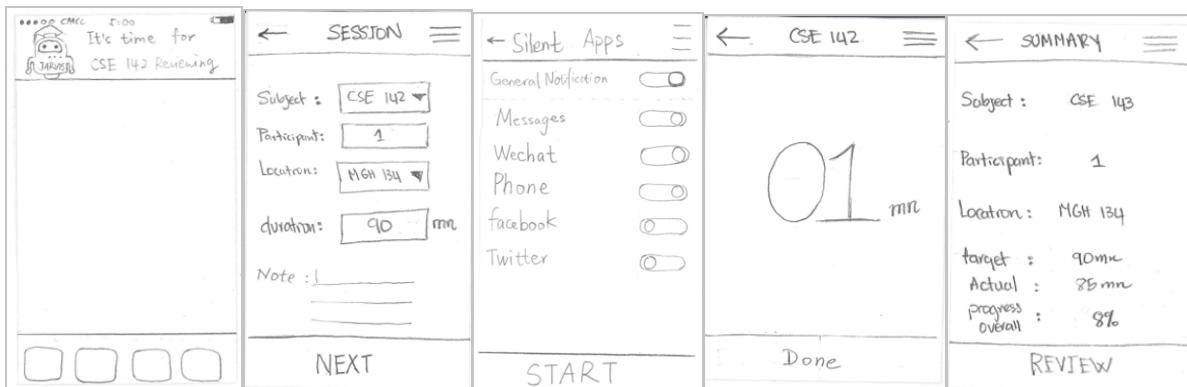
Task I: Make study plan

Upon first interaction with the app, user needs to log in with UWNetID in order for Jarvis to acquire essential information from MyUW. Jarvis will be able to detect new schedule from MyUW and ask user to make a new study plan. User can customize the plan and set goals. The app can help user with goal setting by providing recommended goal GPAs based on past class GPA data and the user's ambition of reaching a certain class percentile. Based on MyUW course schedule, the user's goal and history of study habits and performance, a new personalized study schedule is made available.

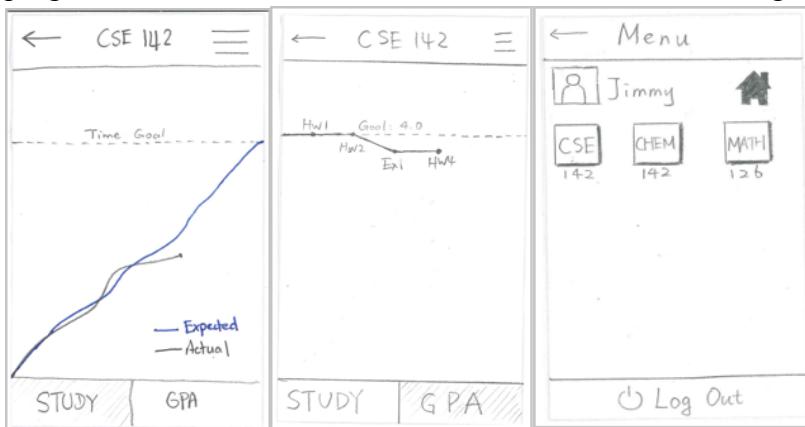


Task II: Record Study Session

A friendly notification will be sent from Jarvis when there is a study session coming up. User can follow up with the notification to start a session page. The app will bring the user to the next step regarding anti-distraction, where social media apps can be blocked during the study session. While the study session is in progress, there is a timer which displays how long user has been studying in this session. User can stop the session at anytime and Jarvis will provide a brief summary of this session.



If the user clicks on the REVIEW button on the summary page, Jarvis will show the user the progress charts, which indicate how far the user is from the goal.



Testing Process

In our usability test, we want to have a diverse set of participants in order to make up a closer representation of the real UW student population. We conducted our first usability test with Calina at the Research Commons. To simulate the test, Gary played as a computer, Senghuot and Hang were notetakers, and Field was the facilitator. To avoid any bias, we gave Calina the minimum amount of instructions as she went through all the tasks. However, during the testing process, we provide too much detailed instruction which give away some of the data which we could have measured. Also, this mistake lowered the learning curve of the app, which gave us a false interpretation of Jarvis usability.

From this usability test, we learned that, during the testing process, only providing brief and necessary introductions is important because it allows us to measure user's initial learning curve of the app. Also, without being told about every specific function in detail, users could test out the app themselves and provide more objective feedbacks on whether the design is logical and useful. Second, we learned that we should not have too much emotional attachment to our design. Otherwise, our instruction or explanation during the testing process can mislead the user. Lastly, some of the immature features will confuse the user and increase the user's cognitive load. We made the improvements on the next two usability tests.

Stephanie was our second tester who was studying alone in the Suzzallo library. She is an Accounting major. Before we start the testing, we gave her enough background information regarding our app and the tasks assigned for her to be accomplished. We also asked her to talk about her thoughts when she was using the app. During the testing, Hang was the note taker, Jiayang acted as the "computer", and Senghuot and Yepingzhi were the speakers who introduced the app.

Ben was our last tester. We found him studying alone in the Suzzallo library. Ben is Geography major. Similar to previous testing, we start off by giving him some background information of our app and the tasks he is going to accomplish. We also asked him to talk aloud what he thought he was doing every time he saw a new screen. However, we switched our roles around, as we understand the strength between ourselves. For example, Hang was good at communicating and we decided that she was best fit as a speaker. Senghuot and Jiayang took notes while Yepingzhi simulate the app.

As we conducting more tests, we began to understand the process better and realized the strength of each team member. We were able to gathered data true to mean and began the process of iterating our designs accordingly.

Testing Results

Heuristic Evaluation

The initial heuristic evaluation revealed many issues. First, once a user signs in, the first page of the app asks whether the user wants to update the calendar to a new schedule. Once the user clicks "yes", there is no way for the user to go back to the previous quarter's study plan. This setting violates the heuristic - "user control and freedom". Also, for a first-time user, asking such a question at the beginning can make the user confused about what the app is trying to do. To solve the issue, we made the following changes. Instead of asking the question right after the user signs in, the app will go to the calendar first. If there is a new course schedule available at MyUW, the app will pop out a small window that asks if the user wants a new study plan. If the user chooses yes, the course schedule will be imported first, and the calendar will be updated; otherwise, the app will remain the old study plan. The user can update the study plan at anytime, simply by going to the setting page and clicking on "check for calendar update". If there is a new course schedule at MyUW, the app will pop out the small window again.

Another design that violates the “user control and freedom” is that once the user makes a change to the plan - add or remove study sessions in the study plan, the user is not able to recover the old study plan. Last, the timer for a study session was not in the form of a normal timer, which makes it hard to read. This violates the heuristic - “match between system and the real world”. We revised the app to allow the user to access the activities in the past two weeks. User is able to recover any of these past activities by going to the Activity Log page through the Menu page. We also change the timer to be a more common type and include the total time planned to study, so the user can have a quick understand about the study progress.

First Usability Test

In first usability test, Calina was a little bit confused when she entered the goal setting page because the page was not well organized. She also didn't see the “customize plan” button when she went through the set goal page. This also happened to the two users from heuristic evaluation. As a result, we first added a header “Set Goals” to make the task of the page clearer. In addition, we deleted the default text for the “top __ %” and made the input box more like a text box. We renamed the “Reference” to be “Top __ % GPA” to show that this column of the table is related to the input of the section above. Finally, to fix the problem that user always ignore the Customizing part, we decide to make it as part of the flow when the user is setting the goal. After setting the GPA goal, Jarvis will lead user to the Time Customizing section.

Second Usability Test

During the second usability test, Stephanie missed to click on the popup notification from Jarvis. As a result, she didn't remember to follow the study plan and record a study session. When she entered the app again, she couldn't find the session she missed.

We also asked Stephanie to interact with the Menu button and observed her behaviour. We learned that she went through each button in the manner from top to bottom. She noticed the buttons with titles of CSE, CHEM, and MATH but was not sure what is the purpose of each button. We noticed Stephanie spent most time in the center of screen. Hence, we want to pay more attention on area where user might tend to pay more attention.

After this test, we made three revisions to our prototype. First, if the user doesn't finish a scheduled study session, the session will be shown in black on the calendar. Second, we added a brief description of the purpose of each button and group them together as one entity. At last, we rearranged the order of the button according to frequent usage. We moved “Import Social Network Calendar” to the bottom because we think users will only need to import Social Network Calendar once while moving all frequent activity toward the center of the screen.

Third Usability Test

In the third test, our participant, Ben, was prompted to set his goal GPA. He felt very confident to walk through each step. He thought each section on the page was easy to understand and the instruction was very straightforward. He also thought the reference GPA was helpful to him when he input the goal GPA. When Ben entered the Menu page, he was confused about what the “Check Calendar Update” button does. When he pressed on the button, nothing happened. This confused him a lot. In response, we renamed the button to be “Check Course Schedule Update” because this is what the button actually does. In addition, we added a dialog box, which gives an immediate feedback that tells the user whether there is an update for his schedule.

Final Paper Prototype

From our usability tests, we were informed that users would like to balance between school and social life. Jarvis is only there to help users create an ideal study plan while not trying to get the users to evolve their lives around the app. we decided to included a button in both Customize Study Time page and the Menu page to import calendars from different social media accounts such as, Google and Facebook. Moreover, users can further customize their calendar manually by removing or adding study sessions.

We made changes to the Menu page according to participant’s feedbacks. First, we added the “Import Social Network Calendar” button. Users will be asked to import other calendars when they customize the study plan. The extra button at the Menu page allows the user to import calendars at anytime. Second, we renamed the button “Check Calendar Update” to “Check the Course Schedule Update” and added a title for the performance of each class. Also, we moved “Check the Course Schedule Update” button to the top of the list. Menu can be accessed from anywhere within the app, we want students to have access these features to view important information, easy navigation, and change setting anytime.

JARVIS

Calendar

Sun	Mon	Tue	Wed	Thu	Fri	Sat
8	CHEM				CHEM	
9	CSE		CSE	CSE	CSE	
10		math		math		
11		math	math			
12						
1	CHEM					
2						
3						
4						
5						
6						

You have a new schedule!
Do you want to make
a new plan for it?

Yes
No

← Set Goals

Become top % in class

Courses	Top-%	GPA	Goal
CSE 142			
CHEM 142			
MATH 124			

Customize Time →

← Customize Plan

No Study during

From To

7	28
8	29
9	30 AM
10	31 PM
11	32

(S) (M) (T) (W) (T) (F) (S)

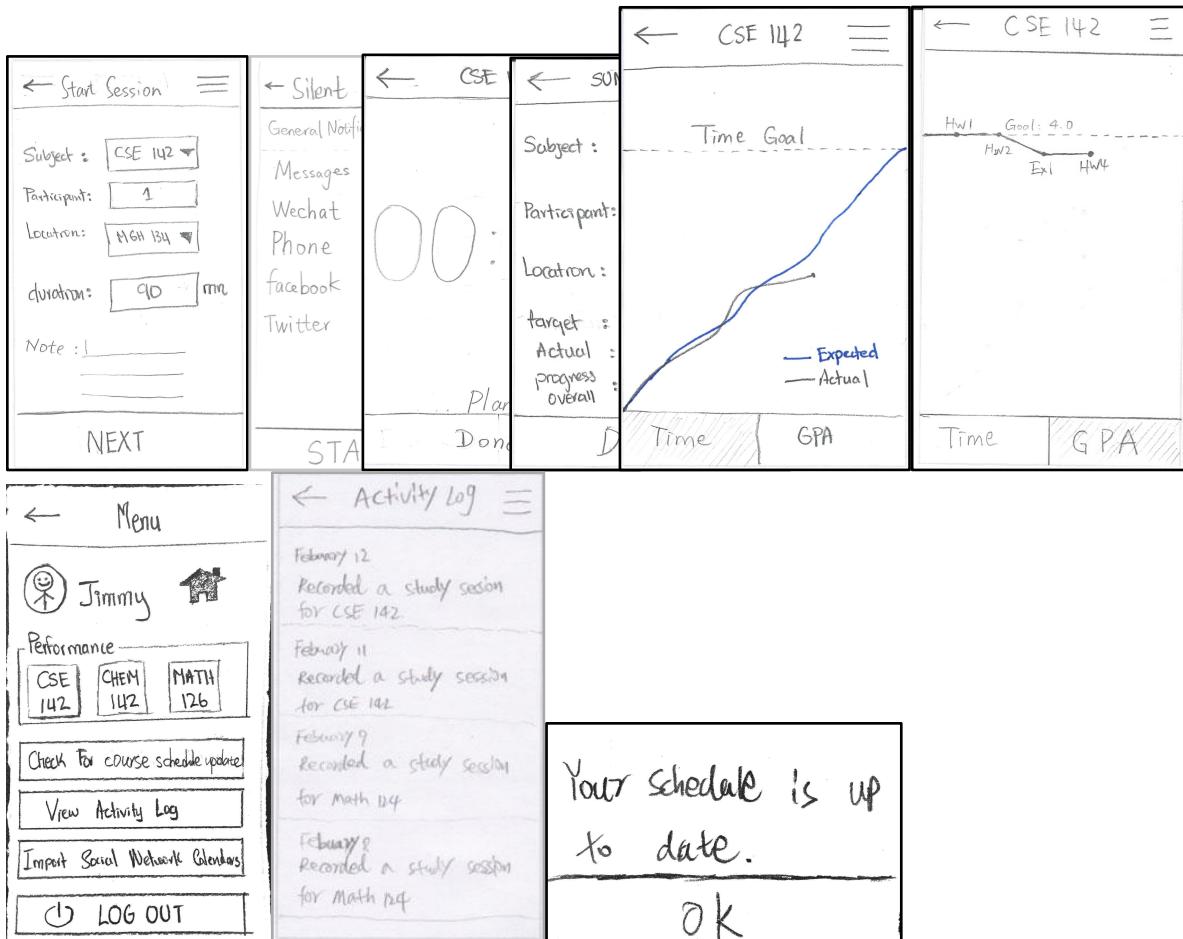
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Calendar

Sun	Mon	Tue	Wed	Thu	Fri	Sat
9	CHEM		CHEM	CSE	CHEM	
10	CSE		CSE	CSE	CSE	
11		math	math	math		
12		math	math			
1						
2						
3						
4						
5						
6						

It's time for
CSE 142 Reviewing

⊕



Digital Mockup

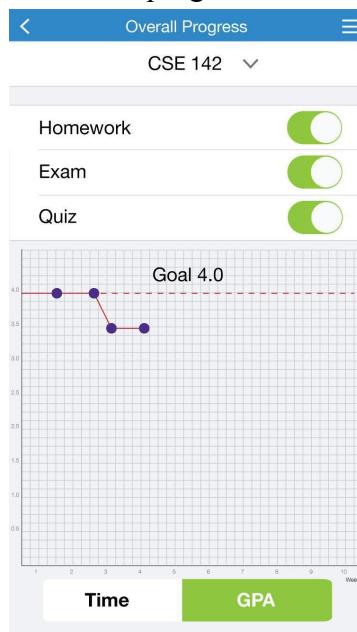
Changes made by digital tools

1. We added colors for the app. The main color of the app is blue. To maintain consistency, we set the menu bar of each page to be blue. The courses are shown in different colors in the calendar. All additional study sessions are shown in blue so the users could distinguish them from the course schedule (figure 2.4).
2. We added additional graph icons for some pages, such as the “Study Session Summary” (figure 1.2). The graph icons help vividly illustrate the menus.

Changes made in response to critique

1. GPA Overall Progress (figure 1.0) helps students narrow down the exact cause to their current GPA projection. We decided to let participants toggle between each feature and Jarvis will provide real time rendering of the GPA graph.

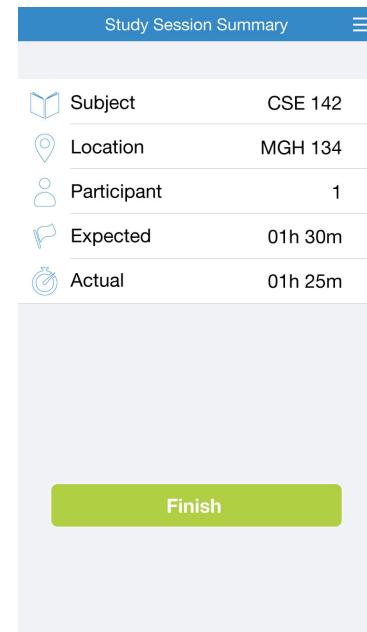
2. Time Goal overall progress (figure 1.1) chart was not very clear for users because there are no axis titles. So we added descriptive titles on both axes to make it clearer. Based on the titles, user will know that the chart is describing the progress of his time goal in this quarter.
 3. The Summary page (figure 1.2) displays a summary of a particular study session while the Overall Progress demonstrates the user's progress of a class. Therefore, We decided to remove the "Overall Progress" button on the Summary. Users can still access to the overall progress for each class at the Menu page.



(figure 1.0)



(figure 1.1)



(figure 1.2)

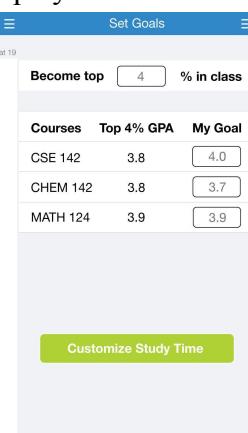
Task I: Login into Jarvis (figure 2.0) and import class schedule (figure 2.1) then Jarvis will generate study plan based on historical data, personal preferences and academic goals (figure 2.2, figure 2.3). Optimal study plan will display on the calendar (figure 2.4).



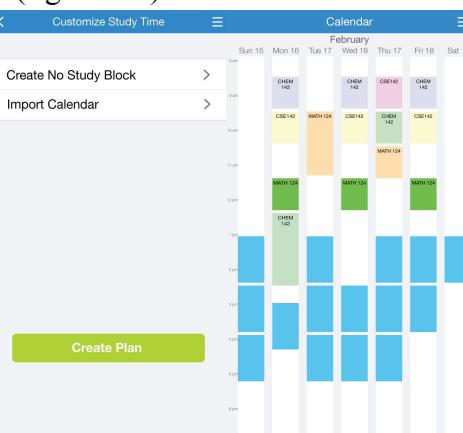
(figure 2.0)



(figure 2.1)

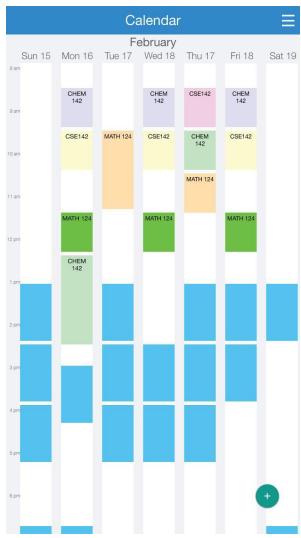


(figure 2.2)

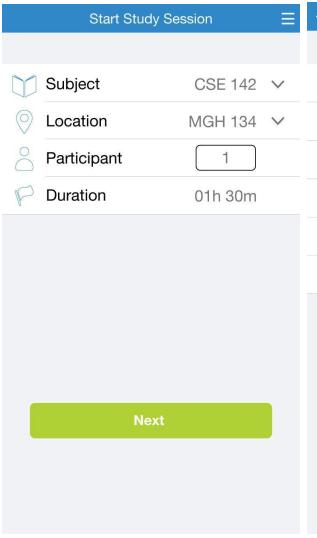


(figure 2.3)

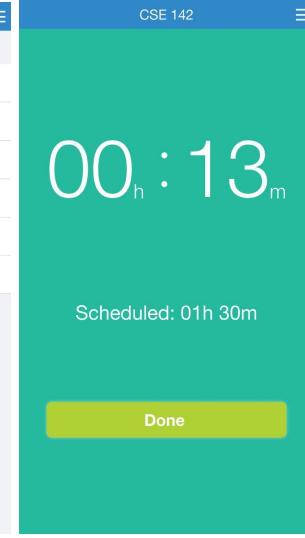
Task II: Press the plus button on the right bottom of the calendar to track study session (figure 3.0). Set preference (figure 3.1) and disable social apps' notification (figure 3.2) and then start tracking (figure 3.3). A study session summary will be given to the user after each session (figure 3.4). Students can evaluate course progress against their study time (figure 3.5) and GPA (figure 3.6).



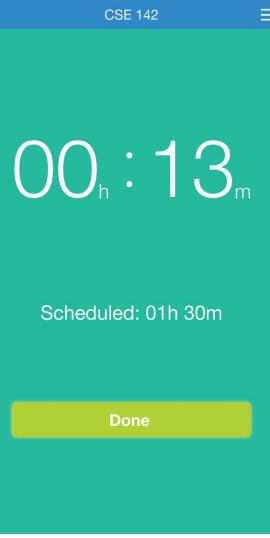
(figure 3.0)



(figure 3.1)



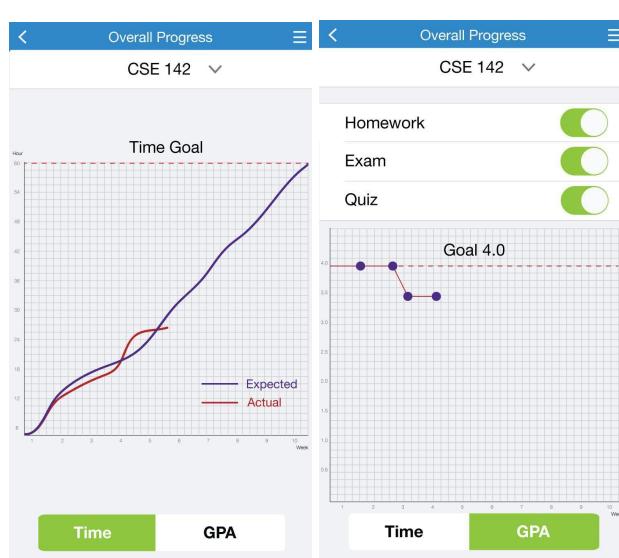
(figure 3.2)



(figure 3.3)



(figure 3.4)



(figure 3.5)

(figure 3.6)

(figure 3.6)

Discussion

What did we learn from the process of iterative design?

The iterative design method really helped us to make our design better and better. We find test users to test our design every time we finished a new version of prototype and we can get a lot of useful advices and feedback from these tests. Based on the feedback, we make our design even

better. One of things we've learned from iterative design is that something in design that is clear for us might not be clear for users. Since different people have different conceptual model about a system, some of our design may seem confusing for some users. By using the iterative design, we can always detect these confusions early and get them fixed.

How did the process shape our final design?

We learned a lot during our usability tests. We became very accustomed to our designs where we think all aspects were intuitive. It was very helpful to present our designs through paper prototype to fresh perspective our participants. After presenting the prototype to multiple participants, we recognized common misconceptions and had to change accordingly. For example, we learned that most students think "Making a new study schedule" message is equivalent to drop current classes then re-register for a new schedule. We decided to change the word "Schedule" to "Plan" to avoid any further confusion.

How have our tasks changed as a result of our usability tests?

We remain our tasks unchanged through all of our usability tests. The two tasks we chose, generate personalized study plan based on usage diagnosis data and track study session, assignment and exam performances to give out overall course performance, perfectly expressed our basic ideas and goals of our tool. In addition, after reading some research papers related to our project, we became more confident about these two tasks. We also get a lot of good feedbacks from test users saying that these features are useful and can actually help them study better. While keeping the same tasks, we did make a lot changes to our design in order to make our tasks clearer and the users can accomplish them easier.

Do we think we could have used more, or fewer, iterations upon our design?

Our group chose to conduct five interviews because we believe there is a diverse set of tasks students can deploy to help them become more successful in college. It is important take every feedback seriously by testing each feedback by changing our prototype and present to another participants. By doing so, we can see immediately if the feedback was a true positive. Ideally, we would like to change our prototype in response to our participant's feedbacks but we have to avoid caving into specific demand. For example, Ethan prefers to not have a timer while studying. We think more iteration would benefit the design but we would like to avoid bias.

Appendix

Introduction of Jarvis for Usability Test Participants

Jarvis is a mobile app that helps you better organize your study. There are two main features in Jarvis. First, you can log in to Jarvis with your UW NETID and Jarvis will automatically import your class schedule, homework scores and exam scores. Based on your GPA goal and the time preferences, Jarvis will make a personalized study plan for you, which tells you when you should study for each course. Jarvis also tracks your study sessions and gives feedback to you. Then, based on the study session feedback, imported exam, homework scores and grading policies, Jarvis will evaluate your progress on each course. Please feel free to play around with it. You can try to click on any button at any time. Please feel free to talk about any opinions about Jarvis.

Incidents during usability testing:

The image shows two side-by-side hand-drawn wireframes of a mobile application's 'Set Goals' screen. Both screens have a header with a left arrow and the text 'Set Goals'. Below the header is a label 'Become top % in class'. Underneath this label is a table with three columns: 'Courses', 'Reference', and 'Goal'. The table contains three rows of data: CSE 142 (3.90), CHEM 142 (3.80), and MATH 124 (3.80). Below the table is a button labeled 'Customize Plan'. At the bottom of the screen is a button labeled 'Create plan'.

(figure 4.1) Before

(figure 4.2) After

1.

Description: When Calina reached the "Set Goals" page (figure 4.1), she was confused. In this page, user can choose which overall class performance bracelet they want to fit in, for example, if user enter 5%, in response Jarvis will give reference GPAs. After a while of thinking she figured out that the "Become top % in class" and "Reference" are related and understanding what she was doing.

Severity Ranking: #1

Since Calina figured out the purpose of this page after a short while, we think this is just a wording problem and we can fix it easily by changing the wording.

2.

Description: Calina didn't see the "customize plan" button during the testing. Actually when we were doing the heuristic evaluation, this button was also ignored by the two tester in class. So we

think that if we want the user to use this feature, we need to redesign its appearance and make it more noticeable.

Severity Ranking: #3

This problem occurs very frequently and persistently and users cannot fix it because they didn't even notice it. We have to fix it now.

Revision (figure 4.2)

First, we added a header "Set Goals" to make the task of the page clearer. In addition, we deleted the default text for the "top __%" and made the input box more like a text box. We renamed the "Reference" to be "Top __% GPA" to show that this column of the table is related to the input of the section above. Finally, to fix the problem that user always ignore the Customizing part, we decide to make it as part of the flow when the user is setting the goal. After setting the GPA goal, Jarvis will lead user to the Time Customizing section.

3.

Description: When Calina reached the "Set Goals" page (figure 4.3), she was confused. In this page, user can choose which overall class performance bracelet they want to fit in, for example, if user enter 5%, in response Jarvis will give reference GPAs. After a while of thinking she figured out that the "Become top __% in class" and "Reference" are related and understanding what she was doing.

Severity: 1

Since Calina figured out the purpose of this page after a short while, we think this is just a wording problem and we can fix it easily by changing the wording.

4. (figure 4.3)

Description: Calina didn't see the "customize plan" button during the testing. Actually when we were doing the heuristic evaluation, this button was also ignored by the two tester in class. So we think that if we want the user to use this feature, we need to redesign its appearance and make it more noticeable.

Severity: 3

This problem occurs very frequently and persistently and users cannot fix it because they didn't even notice it. We have to fix it now.

←

Become top 5% in class

Courses	Reference	Goal
CSE 142	3.90	<input type="text"/>
CHEM142	3.80	<input type="text"/>
MATH124	3.80	<input type="text"/>

Customize Plan

Create Plan

figure (4.3) Before

← Set Goals

Become top % in class

Courses	Top-% GPA	Goal
CSE 142	<input type="text"/>	<input type="text"/>
CHEM142	<input type="text"/>	<input type="text"/>
MATH124	<input type="text"/>	<input type="text"/>

Customize Time →

figure (4.4) After

Revision (figure 4.4)

First, we added a header “Set Goals” to make the task of the page clearer. In addition, we deleted the default text for the “top __%” and made the input box more like a text box. We renamed the “Reference” to be “Top __% GPA” to show that this column of the table is related to the input of the section above. Finally, to fix the problem that user always ignore the Customizing part, we decide to make it as part of the flow when the user is setting the goal. After setting the GPA goal, Jarvis will lead user to the Time Customizing section.

5.

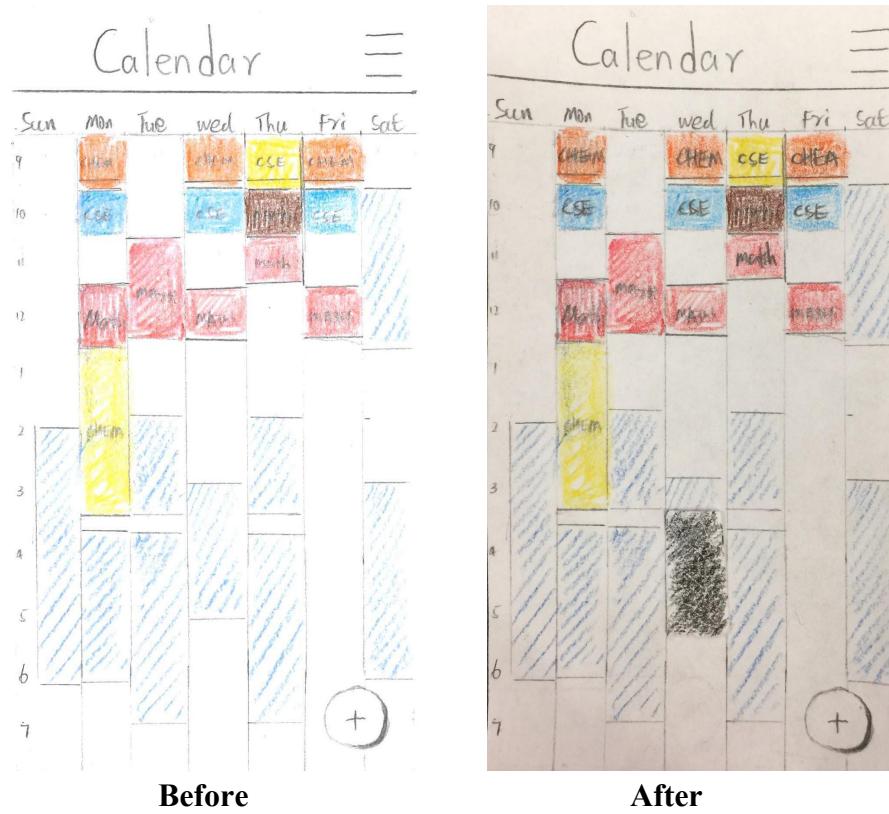
Description:

During the usability test, Stephanie missed to click on the popup notification from Jarvis. As a result, she didn’t remember to follow the study plan and record a study session. When she entered the app again, she couldn’t find the session she missed.

Severity: 3

Revision:

We labeled the session that the user misses in black to help the user quickly find which session the user just missed.



6.

Description:

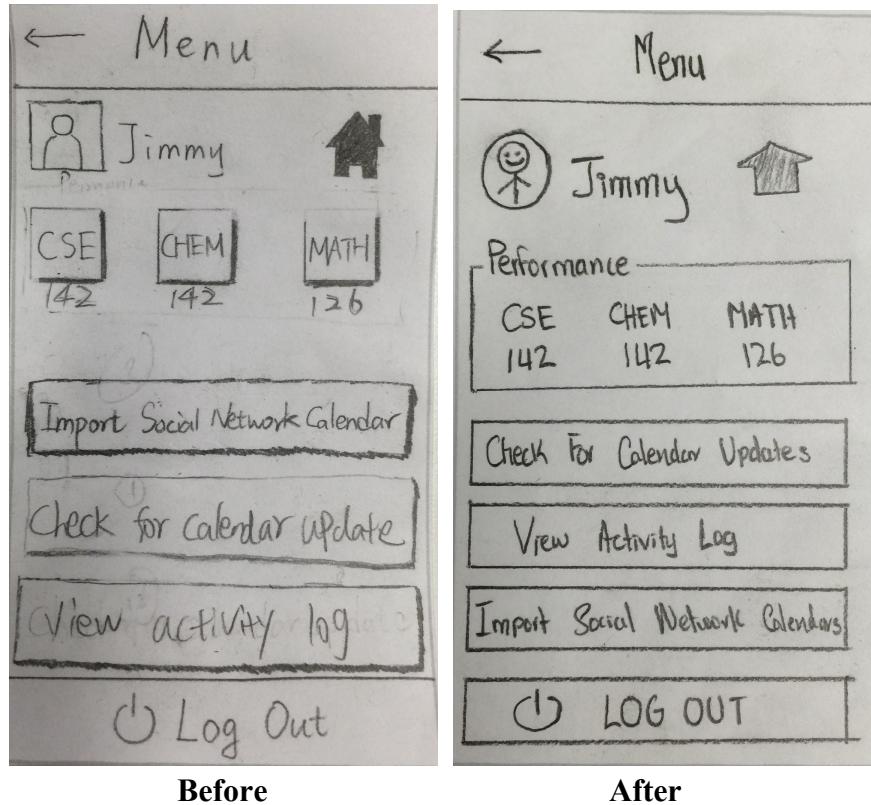
We asked Stephanie to interact with the Menu button and observed her behavior. I learned that she went through each button in the manner from top to bottom. She noticed the buttons with titles of CSE, CHEM, and MATH but was not sure what is the purpose of each button. We noticed Stephanie spent most time in the center of screen. Hence, we want to pay more attention on area where user might tend to pay more attention

Severity: 2

Stephanie eventually learned the purpose of each button, however, we would like to help future participants to understand the system faster.

Revision:

We added a brief description of the purpose of each classes button and group them together as one entity. We rearranged the order of the button according to frequent usage. We moved “Import Social Network Calendar” to the bottom because we think users will only need to import Social Network Calendar once while moving all frequent activity toward the center of the screen.



7. Positive Incident

Description:

Ben was comfortable with the idea of importing calendars from social network such as Facebook and Google. Furthermore, he told us that he had encountered many apps asking for social media logins. In fact, he prefers to have Jarvis sync all the calendar for him instead of manually enter all the data. Here, we learned that user prefers system integration to fragmentation.

8. Positive Incident

Description:

When Ben was prompted to set his goal GPA, he felt very confident to walk through each step. He thought each section on the page was easy to understand and the instruction was very straightforward. He also thought the reference GPA was helpful to him when he input the goal GPA.

9. Negative Incident

Description: When Ben entered the Menu page, he was confused about what the “Check Calendar Update” button does. When he pressed on the button, nothing happened. This confused him a lot.

Severity: 1

The lack of notifying users after checking the calendar does not block the usability of the app. Ideally, we would like to keep user inform throughout the process.

Revision: We renamed the button to be “Check the Course Schedule Update” since this is what the button actually does. In addition, we added a dialog box, which tells the user whether there is an update for his schedule.

