HCI CW2 Group Report

Group 87

1 Course chosen

Machine Learning Practical

2 Personas

Persona 1: Cameron Jones
Persona 6: Niki Ivanov/Ivanova

3 Problem Definition

Verbatim from the CW1 team's report:
After reviewing the previous observations, we can summarize the focus of problems are mainly divided into two parts: 1. The design content must be closely combined with user requirements, because the main users of our design are students, so we need to pay attention to the actual needs of students, such as course summary information, assessment details, schedule of course activities and so on. 2. Simplify the process of users to meet their needs to the greatest extent, each user hopes to quickly solve their needs, especially for students with heavy homework tasks. Therefore, we need to pay attention to simplify the operation steps, reduce the number of clicks to the destination and make some functions or prompts as conspicuous as possible.

4 Mock-up Design Modifications

None

5 Link (URL) to the Mockup

Link to the mockup

6 Heuristic Evaluation Outcome

After reviewing the negative usability aspect reports (UARs), there were three that stood out as the most important aspects that needed reconsideration through further evaluation:

1. Unintuitive navigation to the 'Quick Access' section
2. Inconsistencies and unclear elements in the sidebar
3. Ambiguities in the 'Personalised Function' page

Additionally, there was one positive UAR that stood out as a unique feature that should be evaluated further:

4. Progress indicators for the recorded lecture videos

6.1 Unintuitive navigation to the 'Quick Access' section

The 'Quick Access' section was a key feature of the redesign, being highlighted in the CW1 Report by Group 75, allowing "students to quickly access some important information". However, the only method of accessing this section was through a bell-shaped button in the upper-right of the system (see Figure 1). There were no links to the section from other pages, nor was it linked from the sidebar.

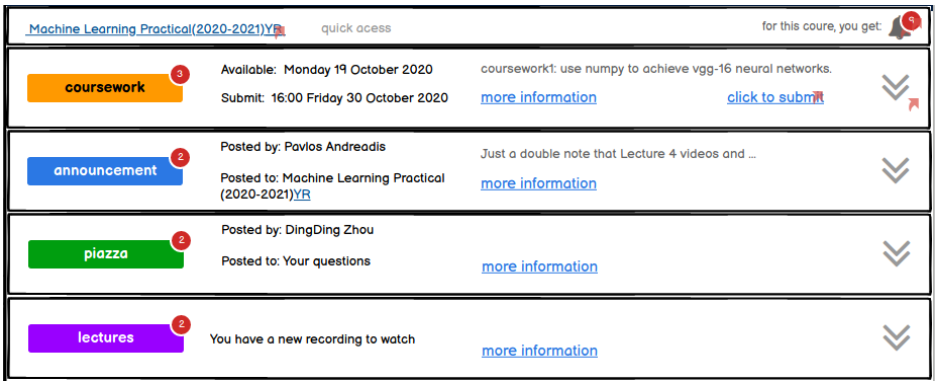

Figure 1: The Quick Access Section, with the bell-shaped button in the top-right used to access it from any page.

This interface design breaks Heuristic #6: Recognition rather than recall, because users should not need to first learn how to use the system in order to be able to navigate around it. This is a particularly critical issue due to the key importance of the section and the danger that some users may never use it.

6.2 Inconsistencies and unclear elements in the sidebar

Items in the navigation sidebar (see Figure 2) are inconsistent and unclear. The three types of items in the sidebar (headings, links and external links) all have the same styling, and the placement of some items seems arbitrary. This breaks Heuristic #4: Consistency and standards. This is an important issue because the sidebar is the primary method of navigation, hence it will very likely be used regularly by all users.

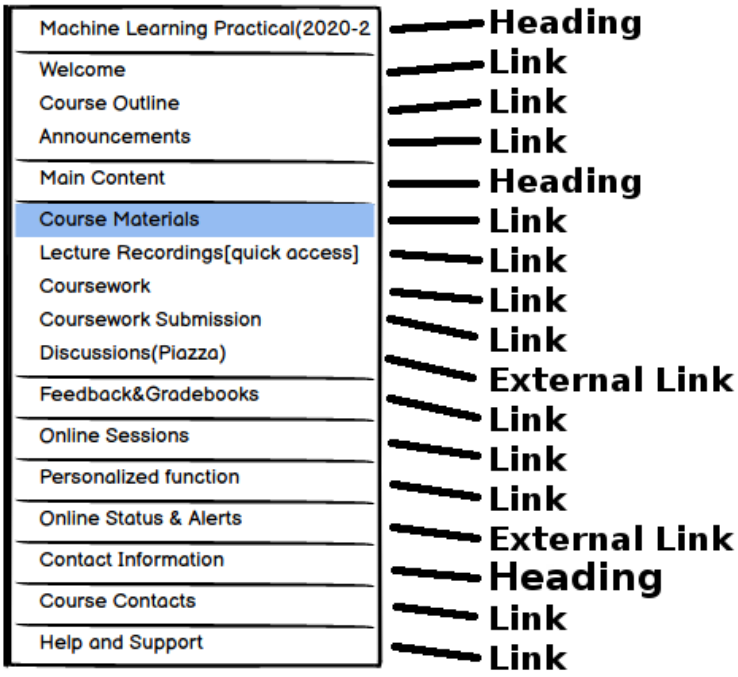

Figure 2: Inconsistency in the Sidebar Items

6.3 Ambiguities in the 'Personalised Function' page

The title of the "Personalised Function" page (see Figure 3) does not clearly describe its contents, nor are the contents contained in the page (a calendar for course events and a feedback section) closely related to each other. This breaks Heuristic: #2: Match between system and the real world, because the concept of a "Personalised Function" is not one that users are expected to know, nor does the page adequately explain what its function is.

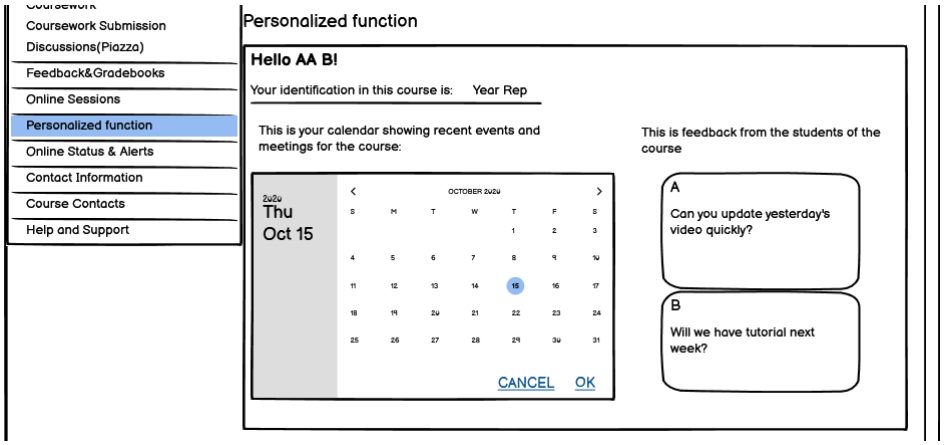

Figure 3: The Personalised Function Page

6.4 Progress indicators for the recorded lecture videos

The "Lecture Recordings" page (see Figure 4) shows the users current time-progress in each of the available lecture recordings. This was highlighted in the CW1 Report by Group 75, and addresses pain points felt by both Persona 1 ("time management" issues) and Persona 6 (struggles with catching up on lectures), which was the reason it was chosen as an important issue to investigate further. This satisfies both Heuristic #1: Visibility of system status, #2: Match between system and the real world because it clearly displays the status of lectures (watched, in progress, need to watch) as well as displaying this status in a familiar way with a progress bar, which is very common on user interfaces.

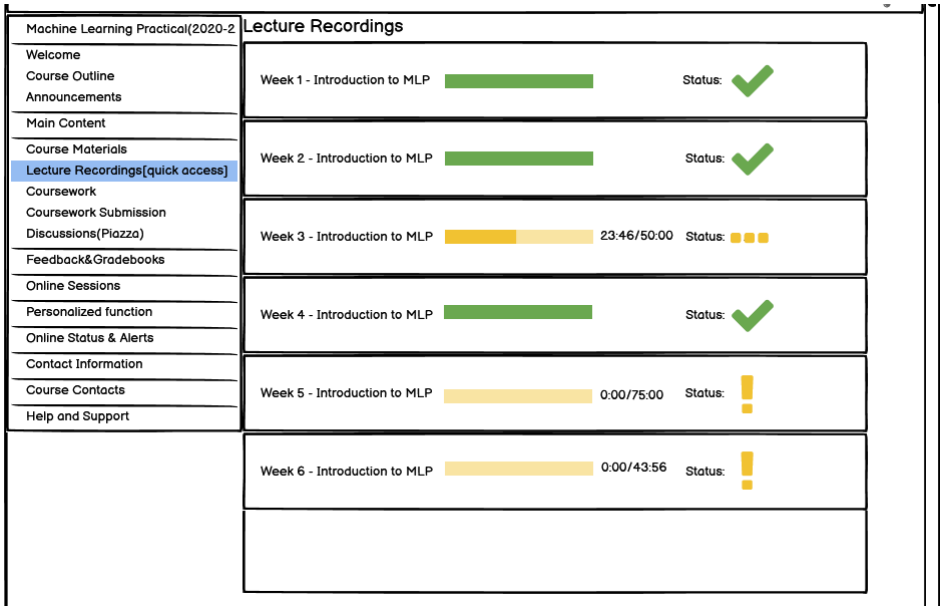

Figure 4: The Lecture Recordings Page

7 Methodology Introduction

7.1 The Problem

We evaluated different aspects of the design to figure out which parts worked well and which parts did not. Specifically, we wanted to evaluate the following observations, which we decided on through the heuristic evaluation (see section 6).

- The 'Quick Access' page is not quick to access in any capacity. We wanted to evaluate how easy it would be for users to find this page.
- The side menu on the left of the page is cluttered and it is not easy to tell which parts of it are non-clickable headings and which parts are clickable links to other pages. For this part of the design, we wanted to evaluate the ease of use.
- The 'Personalised Function' link in the side menu is ambiguous. We wanted to evaluate how users would interact with this page and what they thought 'Personalised Function' meant.
- The progress bars on the lecture page allow users to quickly see the content they have and have not looked at yet. We wanted to evaluate how easy it was to find which lectures a user still needed to watch.

7.2 Evaluation Strategy

We decided on a Task Design study for our evaluation.

For each participant, we started by briefly reiterating what would happen in the study, and they were then asked to get the mock-up on their screen and share their screen with us. The participant was explicitly asked not to explore the mock-up beforehand as that might have invalidated the challenge of some of the tasks. We asked them to do five tasks in a specific order and after each task we asked them about their thoughts on the task and how it went. We did this immediately after the task so we could get the participant's thoughts while it was fresh in their mind. The participant was asked to return to the landing page after each task as to perform the tasks from the same starting point. After all five tasks were completed, we did a post-study interview where we asked the participant their general thoughts on the usability on the mock-up as well as how it compared to the current solution offered by the university. Extensive notes where taken during the sessions, and all sessions except one (due to technical issues) were recorded.

8 Methodology

8.1 Participants and advertisement

For our study, we sent text invites to friends, acquaintances and family members who were not Human Computer Interaction (HCI) students at the University of Edinburgh. This was done via Facebook Messenger and Discord. No specific age range was considered. We chose University of Edinburgh students because they are the targeted users of the system. We considered a range of students from various schools and degrees. We chose non-HCI and non-Informatics students so that they they would not be familiar with the course and to represent people with less technical skill. This allowed the interface to be tested with perspectives different from our own. We invited 12 people total and 6 people agreed to participate in the study.

Before they agreed or disagreed to participate in the study, we explained that the purpose of the study was to evaluate a new mock-up design for Learn. We explained the structure of the study which involved completing tasks and a post-interview. A consent form and the participant information sheet were also sent to each user. We made sure that the completed consent forms were returned through a university service such as Outlook or Teams.

8.2 Protocol

To begin the study, we invited the participant to a Microsoft Teams group call. When the interviewer from our team, the note-taker from our team and the participant joined, we re-iterated that the purpose of the study was to evaluate an alternate Learn design as part of the Human-Computer Interaction course. We reminded them that their screen and audio would be recorded given their prior consent, mentioned the post-interview, and the approximate completion time of 25 minutes.

We said that their opinions were valued, that there were no wrong answers and to encourage them to share their thoughts. This was done so that participants would be less hesitant to share information and so that their feedback would be more reflective of their experiences.

Afterwards, we sent the participant the link to the Balsamiq mock-up and asked them to open it. We instructed them on how to launch the mock-up in user testing mode. We informed them that we would begin recording, waited a few seconds and then began recording. We then went through each task in order: for each task, the same group member shared the task with the participant with their voice. We then waited for the participant to complete the task or for 120 seconds to pass, at which point we gave them a hint - if a total of 180 seconds passed, we considered it not completed. We set a time limit so that the study would not go past the allotted time. If at any point the participant wanted the task to be repeated, this was repeated by voice. Either of the two group members present could then ask questions to the participant related to the specific task.

At the end of all the tasks, we asked the participant if they wanted to do a post-interview. If they consented, we continued recording and told the participant that we were still doing so. No participants declined the offer. We kept recording so that we could refer back to the exact wording of their answers if necessary and to keep a more precise record of recording time. We asked each participant, in the specified order:

1. What they thought of the sidebar.
2. Any specific issues that arose with the sidebar.
3. If they preferred the mockup design or the current Learn pages and why.
4. Any other questions not in the script a group member may have thought of.
5. If they had any further comments.

At the end of the post-interview, we thanked the participant for their time and left the call.

8.3 Tasks

The tasks were given in this order:

1. Find which lectures you are in the progress of watching.
2. Find the feedback of your fellow classmates.
3. Add the page that contains links to live classrooms to your phone.
4. Find when CW2 is due.
5. Find the lecture slides for week 1.

Tasks 1-3 were chosen because they involved features present in the mockup design that were not present in the Learn format currently used by the University of Edinburgh. These features would therefore be unused by the participants previously. Tasks 4 and 5 were tasks that would likely be familiar to students and these tasks would test if the new format allowed for them to be completed faster, mentioned in the

problem definition. This would be useful when we later asked participants to compare the mockup design to the current Learn pages. Tasks 1 and 5 are related to "schedule of course activities" and task 4 is related to "assessment details", also mentioned in the problem definition.

We started with an easy task followed by three harder ones with an easy task ending the study. This was done to ease the participant in, and to prevent them from feeling frustrated after finishing.

8.4 Facts from running the study and data

Two group members were present for each session – one person presented the tasks and one person took notes. Bullet point notes were taken, summarising the actions and comments of the participant, along with the time taken to complete each task. Either of the two group members present could ask questions to the participant related to the task after it had finished. The average study length was 25 minutes – some lasted slightly longer than 25 minutes while some lasted slightly shorter. One of the studies was accidentally not recorded, so out of 6 studies there was about a total of 5 * 25 = 125 minutes of recorded footage. The unrecorded session was also therefore unable to analysed to the same depth as the others.

There were a total of 6 participants. The full protocol was run for every session, but the amount of people who completed each task differed. In addition, in one of the sessions the tasks were accidentally presented in the wrong order. In terms of the number of participants who completed each task:

- All 6 participants completed tasks 1 and 5.
- 3 of 6 participants completed task 2.
- 5 of 6 participants completed task 3
- 2 of 6 participants completed task 4.

8.5 Analysis

Both quantitative and qualitative analysis was used. For quantitative analysis, we timed how long it took each participant to complete each task. This would show us how easy or difficult a task is to complete, as well as the level of difficulty by looking at the variance in time taken to complete it. For example, if most people took a very long time to complete a task, it is more difficult than a task that only one participant took a long time to finish compared to the rest. If a participant took at least 180 seconds to complete a task, they were stopped - the task was considered a DNF and the time recorded was 180 seconds.

For qualitative analysis, content coding was used. The most relevant parts of the recordings were transcribed, summarised and then distilled into the common aspects between participants' actions and comments. From the transcripts, codes were developed which give an idea of the main issues with and positive reactions to the design.

The results of these analyses are shown in the next section.

9 Results

9.1 Quantitative analysis

9.1.1 Timing

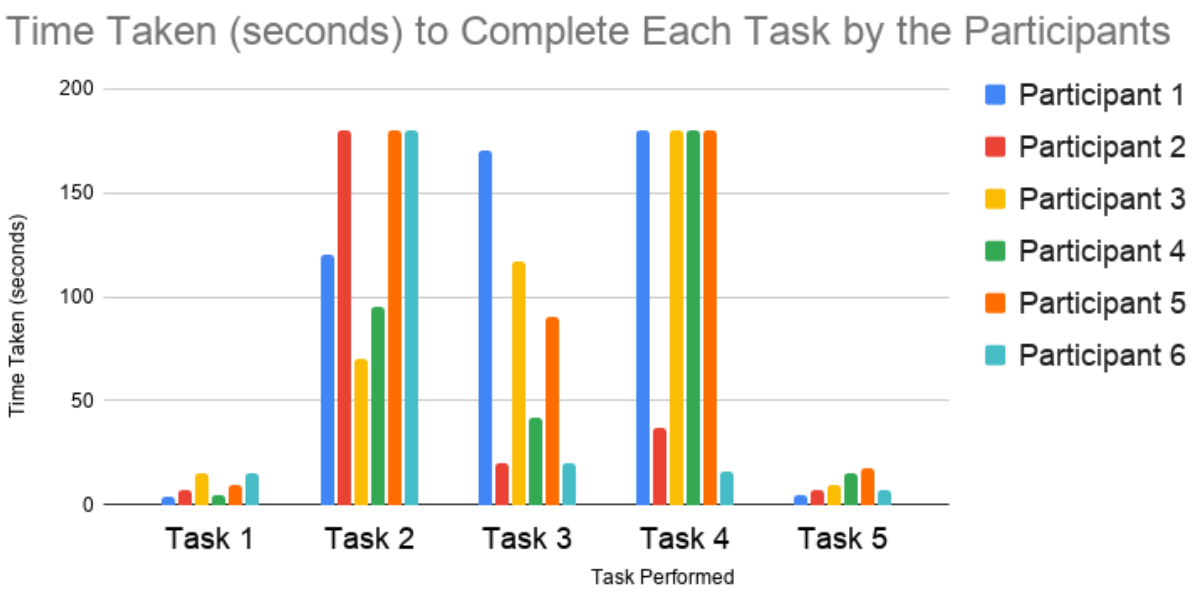

Figure 5: Times taken by the participants to complete the given tasks. (180 seconds means the participant gave up)

	Task 1	Task 2	Task 3	Task 4	Task 5
SD	4.84	49.17	60.23	70.54	5.13
Mean	9.33	137.50	76.50	128.83	10.33

Table 1: Table of standard deviations and means in time in seconds taken to complete each task by the six participants.

Tasks 1 and 5 were clearly very easy, as seen from the low variance and mean. Tasks 2, 3, and 4 had a lot of variance. These were both quite extreme ends of the possible spectrum of results, so this shows that we could have included some moderately difficult tasks that are not too easy but also not especially difficult.

The sequentially rising variance in Tasks 2, 3, and 4 could be explained by the different amounts of exploration that participants did in previous tasks. Those participants who explored more of the prototype site had noticed things which would help them complete the upcoming difficult tasks.

9.1.2 Common occurrences

6 out of 6 participants went to the 'Coursework' page first in Task 4 (finding the deadline for CW2) — 4 out of 6 participants visited the 'Coursework Submission' page next. Two participants tried clicking on 'Main Content' thinking it was a link.

9.2 Qualitative analysis

9.2.1 Content coding

The recording transcripts were broken into short paragraphs and coded with descriptive, in-vivo, process, and emotion codes.

Using past experience to:

- narrow their search for content down
- ignore certain elements on the page

Confusion over:

- Meaning of 'Personalised Function'
- Why the calendar and student feedback are in the same place (on the 'Personalised Function' page)
- Which entries in the sidebar are headings and which are links
- The quick access page being only accessible through the bell icon

Expecting:

- The bell icon to only show notifications (instead of also including information not available anywhere else)
- Live classroom links to be in 'Course Materials'
- 'Online Status & Alerts' to mean announcements and/or notifications

Preferring this design over the current Learn because:

- The discrete separate link to lecture recordings in the sidebar
- The quick access page is intuitive and well-organised
- The 'Feedback & Grades' section is convenient

Ignoring elements because:

- They are used to ignoring them in current Learn
- They blend into the background
- They assumed at a glance that they meant something else

9.2.2 Common thoughts and claims among participants

- 4 out of 6 participants said they completely ignore Learn notifications. The remaining two mentioned issues they have with Learn notifications, but did not specify explicitly whether they use them, or how much. P4 mentioned how they like the fact that this prototype design displays the number of notifications, seemingly unaware that currently Learn also displays the number of notifications in a very similar way.
- P5 and P6 were convinced that 'Online Status & Alerts' meant the same thing as announcements and/or notifications. Even after expressing mild surprise at this, they did not seem to doubt themselves. (The link actually goes to the UoE page which details which online university services are down or at risk.) This violates UI design heuristic #2 - 'Match between the system and the real world' - which we did not think of during the initial heuristic evaluation phase.

- 6 out of 6 participants made comments during Task 2 and/or in the post-interview about the 'Personalised Function' page title, expressing confusion and dissatisfaction.
- 4 out of 6 participants showed confusion regarding which entries in the sidebar are links and which are headings.
- 4 out of 6 participants thought the layout of the quick access notifications page was good, explicitly comparing it to the current Learn notifications page. P2 said *"this one seems a lot more intuitive"*. P6 said *"[the prototype is] more elegant that it [Learn] is right now. "*.
- 2 out of 6 participants thought the bell icon which leads to the quick access notifications page is out of place on the right side of the window, as all the rest of the navigation links are in the sidebar on the left side of the page. Their specific issue was only being able to access certain information through the bell icon, and not begin able to navigate to it using the links in the sidebar. MORE QUOTES HERE

9.2.3 Tasks

(General points are bulleted with ⊙, problematic aspects of the design are bulleted with ⊖, and positive aspects of the design are bulleted with ⊕.)

Task 1 - Find which lectures you are in the progress of watching

- ⊙ Nobody had problems with navigation in this task as it was an easy one.
- ⊕ P2 and P3 commented that it's better to have a discrete link in the sidebar to lecture recordings, unlike in their current Learn pages where they are only accessible through Course Materials.
- ⊖ One person thought '!' meant in progress, then realised the '...' means in progress and '!' means unwatched. (This is possibly due to hastiness to finish tasks in a lab environment.)

Task 2 - Find the feedback of your fellow classmates

- ⊙ P2, P5, and P6 gave up even after being given a hint. This task was difficult because many participants did not fully understand what exactly they were tasked with finding, and the hint of telling them they should imagine themselves as a course or year rep helped a bit but not a lot.
- ⊙ P1, P2, P4, and P5 found the correct page but did not notice the content they had been tasked with finding on it.
- ⊙ P2, P3, and P4 expressed that they would have expected the feedback they were tasked with finding to be in the class discussions/Piazza. This is reasonable because students do use those to express course feedback, so the participants were probably recalling a time either they or one of their classmates posted feedback to a class forum and using that to guide their search after their first choice failed.
- ⊖ P2 first assumed the things to the right of the calendar on the 'Personalised Function' page were related to the calendar - *"I just thought it was something concerning the calendar and I didn't read the whole thing ... the 5^{th} was selected so I thought on the right it was just saying what you had on the 5^{th}."*

Task 3 - Add the page that contains links to live classrooms to your phone

- ⊙ P1 noticed the mobile phone icon, but didn't know what it was so ignored it.
- ⊙ P1 also mentioned that they do not like using their phone in general, and especially so for uni work.
- ⊙ P3 and P5 tried looking in 'Course Materials' first. P5 said *"It's where everything else relating to the actual work in the course you have to do, so it's kinda weird that the online sessions would be in a separate tab."*

Task 4 - Find when CW2 is due

- ⊙ P1 was the only participant who gave up, after three minutes. They found the quick access page but did not think to expand the coursework section, saying it is *"not intuitive at all"*.
- ⊙ P6 thought finding the deadline in the quick access page made some sense, but believed the most sensible place for all deadlines to be is the 'Coursework' or 'Coursework Submission' pages.
- ⊖ P1 and P4 mentioned how they expected the bell icon to lead only to announcements and/or notifications, not exclusive information that is not visible in any pages linked to from the sidebar.P4 said *"I wasn't expecting a due date to be in a notif, I was expecting it to be posted in an actual place and kept there."*

Task 5 - Find the lecture slides for week 1

- ⊙ All participants found this task easy - nobody had any real difficulties with it.
- ⊕ P2 and P4 mentioned that it made sense to them that lecture slides and recordings are on separate pages.

10 Recommendations

Below is a list of recommendations we would make to anyone developing this design:

- Change the name of online status and alerts to something similar to 'learn service status' or 'service status alerts' or anything that clearly differentiates it from course alerts, notifications, and announcements.
- Avoid information (e.g. cw deadlines) only being accessible in the quick access menu
- Pick a different icon for the quick access page. In popular designs a bell is used for "announcements" or "notifications", basically something the user needs to pay attention to right now, which is not the point of the quick access page. Additionally some study participants ignored it completely and as such could not access certain information.
- Following on from the previous point: clarify the purpose of the quick access page. Currently it is used as a shortcut to things and as an announcement page. Some users had trouble understanding what this page was for so try and clarify its place in the design.
- Use different styles or different colours for the headings in the side bar, currently it is impossible to tell them apart at a glance and this lead to frustration among the participants
- The Informatics department heading takes up a lot of space on the page and is repeated on every page. This is redundant is is a waste of space. If this branding needs to be kept for whatever reason then make it more subtle.

Participant number:_____

Participant Consent Form

Project title:	Evaluating a new potential design for Learn
Principal investigator (PI):	Dr Kami Vaniea (kvaniea@inf.ed.ac.uk) Dr Aurora Constantin (Aurora.Constantin@ed.ac.uk)
Researcher:	Silver Campbell, Greig Huth, Andrew Ferguson, Matt Shostak

By participating in the study you agree that:

- I have read and understood the Participant Information Sheet for the above study, that I have had the opportunity to ask questions, and that any questions I had were answered to my satisfaction.
- My participation is voluntary, and that I can withdraw at any time without giving a reason. Withdrawing will not affect any of my rights.
- I consent to my anonymised data being used in academic publications and presentations.
- I understand that my anonymised data will be stored for the duration outlined in the Participant Information Sheet.

Please tick yes or no for each of these statements.

1.	I agree to being audio recorded.	☐ **Yes**	☐ **No**
2.	I agree to the screen in this session being video recorded by the researchers.	☐ **Yes**	☐ **No**
3.	I agree to take part in this study.	☐ **Yes**	☐ **No**

Name of person giving consent	Date dd/mm/yy	Signature (ok to type it)

Name of person taking consent	Date dd/mm/yy	Signature (ok to type it)

THE UNIVERSITY of EDINBURGH informatics

Participant Information Sheet

Project title:	Improving the usability of courses and Learn
Principal investigator:	Dr Kami Vaniea and Dr Aurora Constantin
Researcher collecting data:	Silver Campbell, Greig Huth, Andrew Ferguson, Matt Shostak

This study was certified according to the Informatics Research Ethics Process, RT number 1432. Please take time to read the following information carefully. You should keep this page for your records.

Who are the researchers?

The research is being carried out as part of the Human-Computer Interaction course at the University of Edinburgh. The course is taught by Dr Kami Vaniea and Dr Aurora Constantin. Today's study is designed and run by Silver Campbell, Greig Huth, Andrew Ferguson, and Matt Shostak who are all students in the course.

What is the purpose of the study?

The purpose of this study is to explore alternative ways to present course content on Learn. The University has the goal of creating a more consistent educational experience for students by putting most courses onto Learn. The goal of this research is to look at different ways Learn and the courses on Learn can be best presented to students to create a usable and educational experience.

Why have I been asked to take part?

We are looking for people who have experience with University courses and possibly also Learn. You have been asked to participate because we believe that you have this type of experience.

Do I have to take part?

No – participation in this study is entirely up to you. You can withdraw from the study at any time, up until 11 November 2020 without giving a reason. After this point, personal data will be deleted and anonymised data will be combined such that it is impossible to remove individual information from the analysis. Your rights will not be

affected. If you wish to withdraw, contact the PI. We will keep copies of your original consent, and of your withdrawal request.

What will happen if I decide to take part?

You will be interacting with a design prototype of an Informatics Learn course. The session should take about 25 minutes. We will ask you to do some normal student-type activities such as trying to find information about assessment deadlines and where to find lecture recordings. During the session we will ask you to share your screen with us so that we can watch you interact with the prototype. If you agree, we will video record the session so that we can review it in more detail later. There will also be a short follow-up interview at the end of the session. Our goal is to understand how well the prototype supports students, so seeing you interact with the prototype will greatly help us understand where it supports you well and where it can be improved.

Are there any risks associated with taking part?

There are no significant risks associated with participation.

Are there any benefits associated with taking part?

There are no direct benefits from taking part in this study other than the knowledge that you have helped us complete our coursework and possibly also helped the University better understand student's needs around course website design.

What will happen to the results of this study?

The results of this study may be summarised in published articles, reports and presentations. Quotes or key findings will be anonymized: We will remove any information that could, in our assessment, allow anyone to identify you. With your consent, information can also be used for future research. Your data may be archived for a maximum of 1 year. All potentially identifiable data including consent forms will be deleted within this timeframe if it has not already been deleted as part of anonymization.

Data protection and confidentiality.

Your data will be processed in accordance with Data Protection Law. All information collected about you will be kept strictly confidential. Your data will be referred to by a unique participant number rather than by name. Your data will only be viewed by the researcher/research team Silver Campbell, Greig Huth, Andrew Ferguson, and Matt Shostak.

All electronic data will be stored on a password-protected encrypted computer, on the School of Informatics' secure file servers, or on the University's secure encrypted cloud storage services (DataShare, ownCloud, Microsoft Office365, or Sharepoint).

What are my data protection rights?

The University of Edinburgh is a Data Controller for the information you provide. You have the right to access information held about you. Your right of access can be exercised in accordance Data Protection Law. You also have other rights including rights of correction, erasure and objection. For more details, including the right to lodge a complaint with the Information Commissioner's Office, please visit www.ico.org.uk. Questions, comments and requests about your personal data can also be sent to the University Data Protection Officer at dpo@ed.ac.uk.

Who can I contact?

If you have any further questions about the study, please contact the lead researcher, Silver Campbell <s1610745@ed.ac.uk>. Or the Human-Computer Interaction course instructors Dr. Kami Vaniea <kvaniea@inf.ed.ac.uk> and Dr. Aurora Constantin <Aurora.Constantin@ed.ac.uk>.

If you wish to make a complaint about the study, please contact Silver Campbell <s1610745@ed.ac.uk>, Greig Huth <s1532620@ed.ac.uk>, Andrew Ferguson <s1703695@ed.ac.uk>, or Matt Shostak <s1734194@sms.ed.ac.uk>. inf-ethics@inf.ed.ac.uk. When you contact us, please provide the study title and detail the nature of your complaint.

Updated information.

If the research project changes in any way, an updated Participant Information Sheet will be made available on https://web.inf.ed.ac.uk/infweb/research/study-updates.

Alternative formats.

To request this document in an alternative format, such as large print or on coloured paper, please contact Silver Campbell s1610745@ed.ac.uk.

General information.

For general information about how we use your data, go to: edin.ac/privacy-research

Lab Study Script

1. We are carrying out this research as part of the Human-Computer Interaction course at the University of Edinburgh.

2. and we are researching alternative designs to UoE's blackboard learn webpage with the use of a prototype mockup design.

3. As mentioned in the consent form, we will be recording screen and audio

4. There will also be a post-interview

5. Please remember that your opinions are valued, and that there are no wrong answers. Say whatever comes to your mind.

6. Please open a new browser window and open the link to the design we have just sent you

7. Press the present button, and make sure to select user test mode

8. We will begin recording now

9. I will send you the task in the chat/read the task aloud for you.(If you would like me to read it aloud just let me know.) Please say 'done' when you think you've finished.

    1. (repeat)

TASKS:

1. Find which lectures you are in the progress of watching.

2. Find the feedback of your fellow classmates.

    1. Where would you have expected to find this information?

    2. Tell them it is under "Personalised Function". What would you expect to find in the "Personalised function" page?

3. Add the page that contains links to live classrooms to your phone.

4. Find when CW2 is due.

5. Find the lecture slides for week 1.

10. That was the last task! Are you happy to do the post-interview too? We have just a few additional questions.

Post-Interview Script

1. We will continue recording audio but not the screen

2. What did you think of the sidebar? Did you have any issues with it?

3. Do you prefer the current Learn interface, or this prototype interface more?

    1. Why? (if they didn't already)

4. Do you have any further comments about your experience with this prototype design?

5. That's it! Thank you very much for your time. We'll end the call now. Bye!