

User Experience Design: Updating Initial Wireframe Application Designs

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III. INTRODUCTION

It is widely documented that the usability and user-experience testing process associated with new software is highly protracted. In the previous report the developer produced a series of initial designs for campus 'companion application' for the FACE faculty – the testing of which raised several structural and cognitive discrepancies. This report aims to fix these issues and demonstrate the application interface suitability by performing a second round of user-based testing. Having completed this process, the product can then be evaluated to understand how suitable the refined product can be considered and offer how, by means of further data collection, the application interface or information architecture could be further developed.

IV. COMPLETED WIREFRAME DESIGNS AND STORYBOARDS

This section of the report will re-iterate the main errors highlighted by test participants in the first round of greyscale screen mock-up testing and how they have influenced the guided the authors development of this second set of interface designs. **Section B** then illustrates the key alterations made by the UX designer and the reasoning behind these changes.

A. Recapping required changes

A table format has been used to reiterate the feedback attained from the first prototype that has been used to direct the designer in the creation of full-colour mock-up application views. Such a structure allows a designer

to quickly and easily understand the problems raised by each test participant and easily offer suggestions as to how they occurred and methods for correction. This form of formal test documentation, produced at the end of user-testing process, can be seen below in *Table 1*.

Table 1: Formal documentation of the issues experienced by users during the wireframe testing activity

Participant(s)	Concern Raised	Developer Notes	Correction Options
C	Participants were struggling to understand the difference between the buttons for internal library resource and external subject databases.	- Not a clear enough distinction between internal library journals and external sources (IEEE, Business Journals etc.) - The labelling is misleading and does not state ‘internal’ or ‘external’ resource.	- Create a separate sub-menu for internal and external library resources. - Revise button text or adjacency to provide clearer distinction.
B, C	Overlooking the “Search” option throughout the application when starting new paths of interaction.	- It might be that the control itself is clear and usable – but that it doesn’t provide the desired action. - Search function is still a useful and expected feature.	- Revise the pinned footer buttons by retaining “Search” and adding in a “Home” option. - Reduce controls to icons by removing text.
B, C	Users did not understand the “Quick Request” option to rapidly request/reserve a library resource	- Users clearly identified button but were unsure as to its functionality or any constraints. - Further testing required to understand if it is the concept of a quick resource request option.	- Perform targeted user-based discussions to understand if the concept of a fast resource request feature is desirable. - Provide a tool-tip or single-line description dialogue box.
B	The use of button icons in screens throughout the app received mixed response. Particularly for requesting library resources.	- Button icons were inconsistently placed on screen controls - Icons unsuitably illustrate the purpose of the control.	Ensure icons are appropriate for the button and applied in a consistently clear manner.

Having written up these key findings the developer can then go back to extend and modify the formative wireframe designs in order to perform a second round of testing with participants from the same representative user groups.

B. Discussing Key Storyboard Changes

During the development of full wireframe designs the developer has made some changes to the designs to attempt to correct the issues identified by the first round of user testing. The concern raised during *section V. C)* was that users were unsure as to the purpose and any pre-requisites of the “Quick Request” button on the library page, as shown below in *Figure 1*.

“Do I already need to have a book saved in order to quickly request it?” [Test User C]

“What’s Quick Request?” [Test User B]

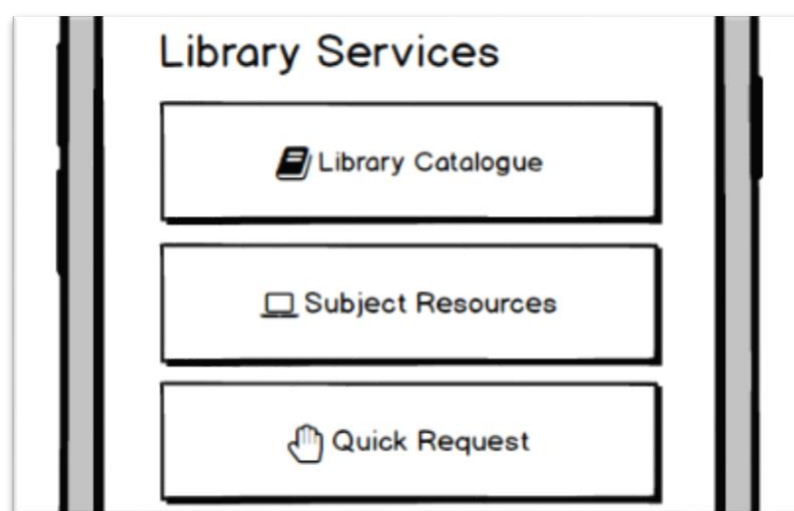


Figure 1: This button (and icon) caused confusion

To correct this issue the developer believes that it was the word “*Quick*” that caused users to mistake the action of requesting a book for a fast, easier way of taking out a resource. For the second round of tests the developer would like to see how users respond to a “Request Book” button instead – it is expected that users will understand that this allows them to take out a library resource that they have already added to their list of saved resources by contacting their academic librarian. The revised text and icon; designed to more clearly represent a user ‘clicking’ to request is illustrated below in *Figure 2*.

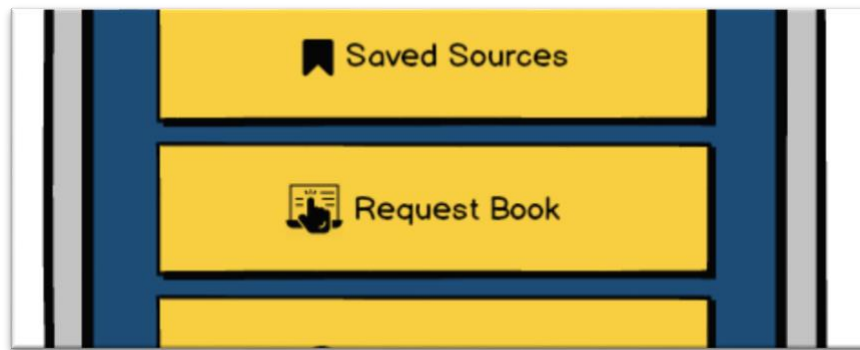


Figure 2: Revised icon and text

Further to button purpose, the library menu also confused users when they were asked to perform tasks associated with the Universities internal library catalogue and link to external subject-specific database repositories. To ease understanding the original button layout, shown below in *Figure 3*, has been altered (as shown in *Figure 4*) to state “UWTSD” and “External” subject databases. It is expected that adaptation will more clearly convey the controls “*clarity of purpose*” [1] in regards to the service this button is offering.

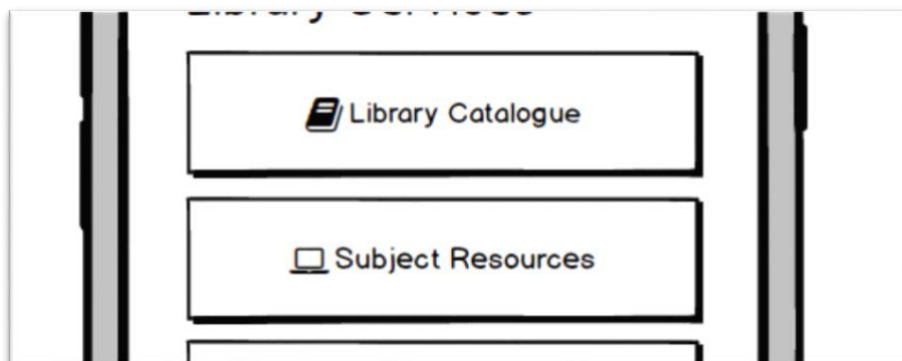


Figure 3: Unclear labelling

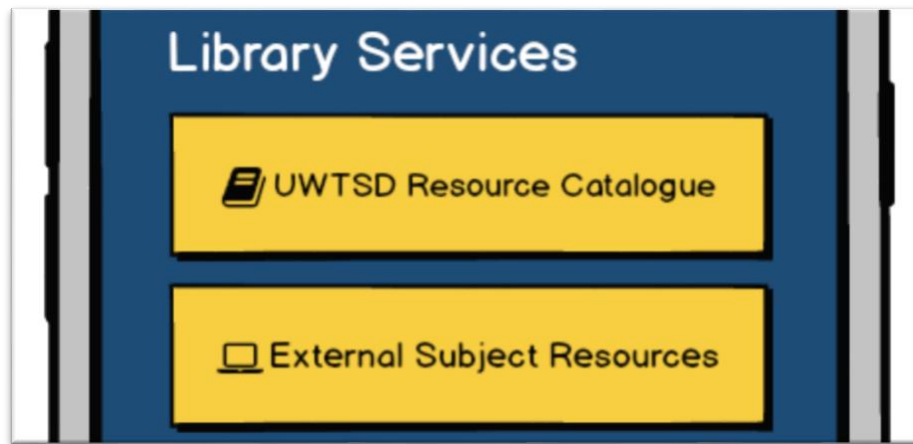


Figure 4: Revised, clearly distinguished libraries

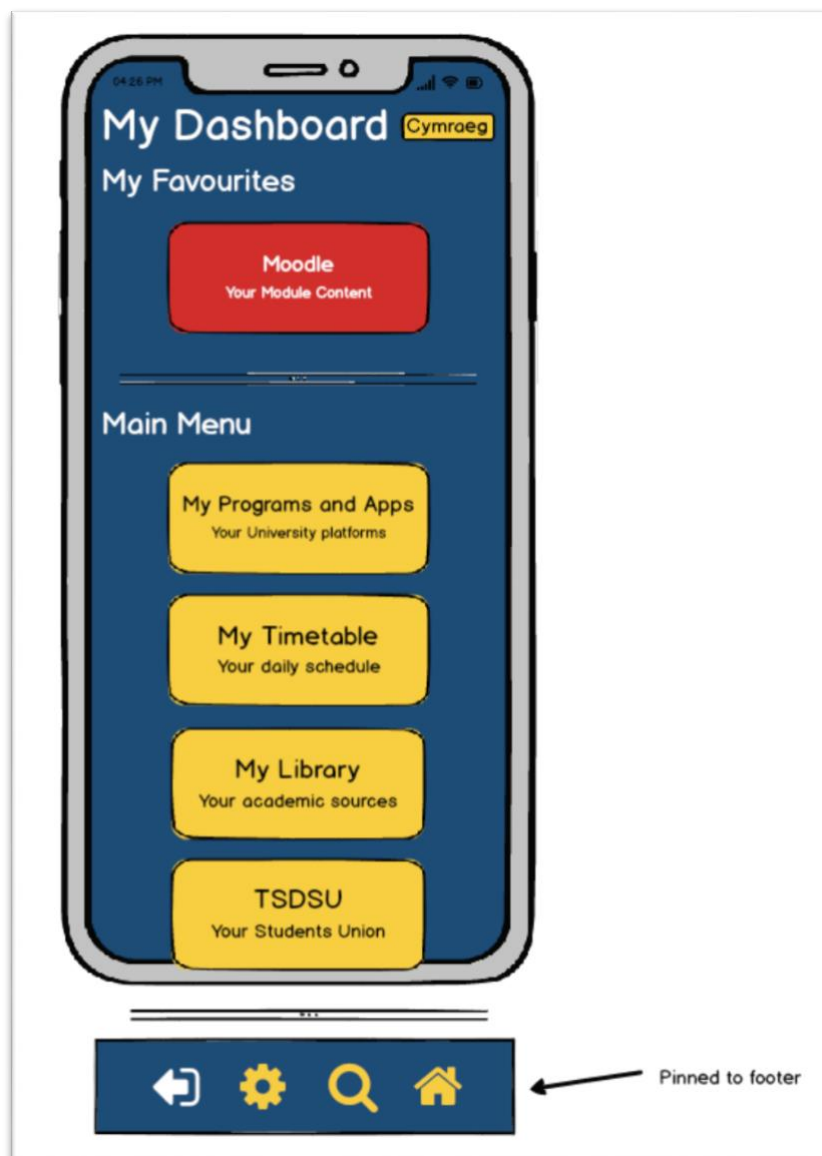


Figure 5: The revised Dashboard Menu

Figure 5 (above) shows a full-colour mock-up of the main menu screen with the revised footer buttons and the addition of a “faved” menu item. During tasks that involved users to move between paths of interaction participants were looking for a “*Home*” button. This new version of the page has removed the footer button text so that the user has the option to both “*Search*” and return “*Home*”. The changes made by the developer can be more clearly seen in the footer before and after screen views (*Figure 6* and *Figure 7* respectively).

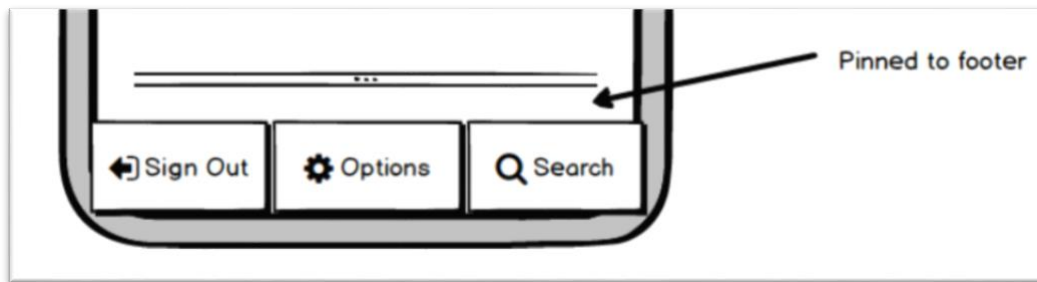


Figure 6: The initial application footer

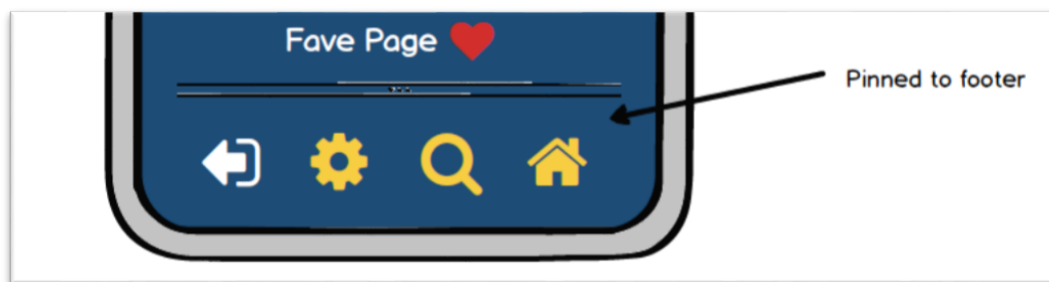


Figure 7: An improved colour footer

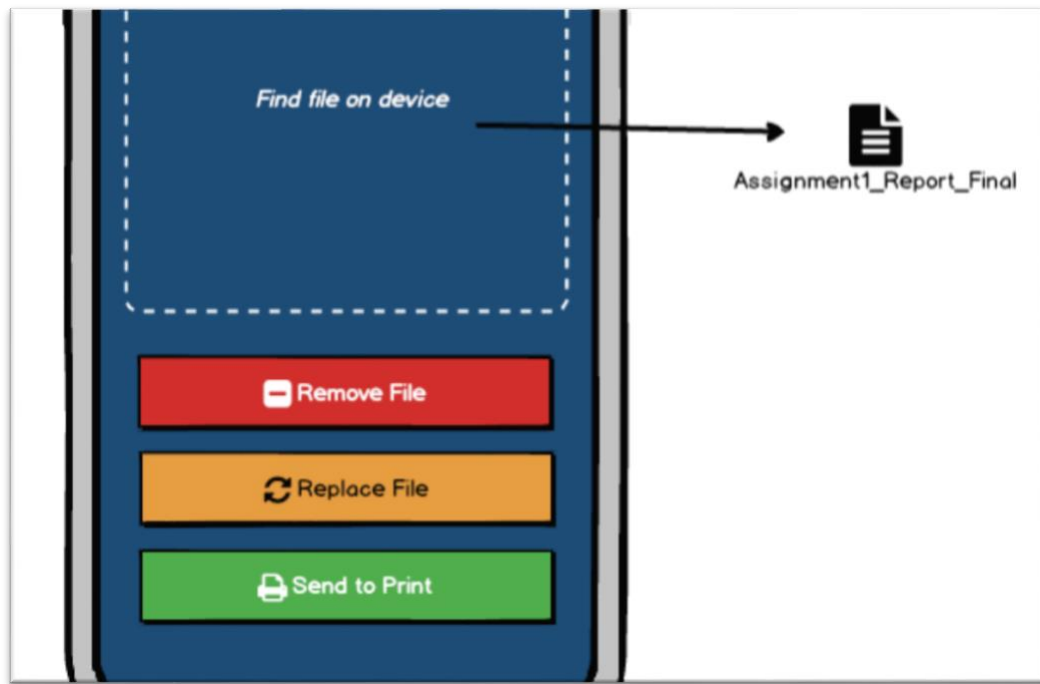


Figure 8: The document print feature

The background colour selected is the FACE blue (#194772), text and secondary button control text in white and primary controls in the UWTSD yellow (#6FCB3D). Whilst there are minor exceptions to this theme the most notable change can be seen in the print screen. To allow users to select, remove and print files from their smartphone the screen comprises various action buttons. To ensure that these controls are universally recognisable, to precise colour schemes endorsed by the Bootstrap's web usability guidelines [2]. This convention provides single shade colours for controls that represent different types of user action ranging from basic or standard system control through to "success", "warning" and "danger" [2]. The primary yellow control colour is a different, darker shade to that of a button of "btn-warning" (hex value #E59A3D)

V. STORYBOARD FEEDBACK AND USABILITY TESTING

A. Identifying Usability Testing Setting

In order to collect valuable feedback, the second round of summative evaluation must be conducted with representative system users, similar those asked during the initial testing process [3]. The following key statements reiterate the core user groups and those for which app use represents an everyday task within University; this process also re-states the features that requirements elicitation raised as most important as a way of seeing if this prototype application meets them and can:

- The application is not just to be used by students on computing courses
- The engineering faculty is as large a student base as that of computing

- Architecture students also need to be considered, though they do represent a smaller population percentage.
- The age and IT skillset range in some faculties in the SA1 campus is broad – the first round of testing attempted to bridge this gap
- The developer is aware of the needs of part-time students and post-graduate students.

As large and as varied a sample size will be used as possible within the development timeframe to produce a broad set of test results and observation material. Turner, Lewis and Nielsen [4], based on previous works, assert that a large proportion of usability inconsistencies will be picked up by as few as three to five test subjects – as many as can be reasonably carried out in this usability analysis. Whilst time and financial capacity are considerable factors in selecting and executing user-testing activities, system-related dynamics have contributed to the testing of these full-colour digital interface mock-ups. A series of software-related factors are presented by Nielsen and Landauer [5] of which several are briefly highlighted below:

- The composition of the subject application. Given the lightweight, but concentrated features, this application demands extensive testing and evaluation in order to comprehensively understand its usefulness
- “*Stage in the usability lifecycle the application is tested in*” – “*whether early in the design phase or after several iterations of test and redesign*” [4]. This report documents the second development iteration and attempts to rectify known system issues.
- “*The skills of the evaluator*” [4]. This is key. The evaluator in this development is not a fully experienced or qualified UX professional but has acquired a skillset to allow ample scope for testing and system evaluation.

B. Outlining Testing Methods

The methods used to test and evaluate a software product can be broken down into three broad areas that, whilst ensuring task rigidity and timely session progression, allows for additional evaluator exploration. To provide as comprehensive a set of test results as possible a combination of “*inquiry*” [6] and “*formal usability testing*” [6] will be used. This structure provides a mixed balance of qualitative and quantitative methods results respectively by means of interpretive opinion-based exploration and specific user tasks.

As a means of system evaluation, a comprehensive test script will be used that can provide these data collection and analysis methods. For the preceding wireframe evaluation process the industry-grade Krug [7] format was referenced and adapted to more capture scenario-specific data from the test participants – such as altering the initial set of user questions to understand student use of university software. Beyond gaining an understanding of user’s university software use, questions asked by the developer during the first set of testing can also now be further refined to understand the user’s perception of software aspects that have been removed, re-worked or added as a result of the previous preliminary wireframe assessment.

3. **Test 1:** *"You have been into the library and have found a book you would like to take out and it is saved in your library sources, you now want to reserve it in the app". [checks change on resource request]*

To ensure such key points are not missed additional, highly precise questions have been added to the test itinerary, as illustrated below:

6.7. *(if not directly answered: Did you clearly understand the library resource access buttons?)*

Whilst an adapted Krug [7] script is useful for understanding the general trends of system improvement a system evaluator cannot rely solely on such subjective personal experiences. Like that of the wireframe testing, a LIKERT scale will be used – though for this stage of development the author has explored the use of the ‘UX Questionnaire’ [8],[9]. This 26-question framework asks test users questions about the system that provides a view of five aspects of system usability:

- **Attractiveness:** To what degree do test users express their like or dislike of the subject prototype system? [8],[9]. This is broad gauge of system usability - but one of considerable significance.
- **Perspicuity:** Aims to understand the ‘learnability’ of the product. *"Is it easy to get familiar with"?* [8]
- **Efficiency:** Covers the broad area of a test users goal fulfilment. *"Can users solve their tasks without unnecessary effort?"* [8],[9]
- **Dependability:** Dependability describes the extent of system rigidity and predictability. *"Does the user feel in control of the [given] interaction?"* [8]
- **Stimulation:** This metric aims to understand the subjective feelings of enjoyment when using a prototype system – is the software *"exciting and motivating?"* [8]
- **Novelty:** This is a metric of mixed value, and so its importance is likely to vary between testing and development projects. It is of value in this scenario however because it is critical that the new application is fresh and has a good chance of *"catch[ing] the interest of users"* [8].

A method that involves ticking a box and carrying forward its ‘score value’ to the final calculation, as illustrated in **Figure 9**

Please assess the product now by ticking one circle per line.

	1	2	3	4	5	6	7	
annoying	☐	☐	☐	☐	☒	☐	☐	enjoyable
not understandable	☐	☐	☐	☐	☐	☒	☐	understandable

Figure 9: User Experience Questionnaire

These usability facets were selected by the authors to provide both a goal-centric (or pragmatic perspective) and non-goal centred (or hedonic system value) – as illustrated below in *Figure 10* [10].

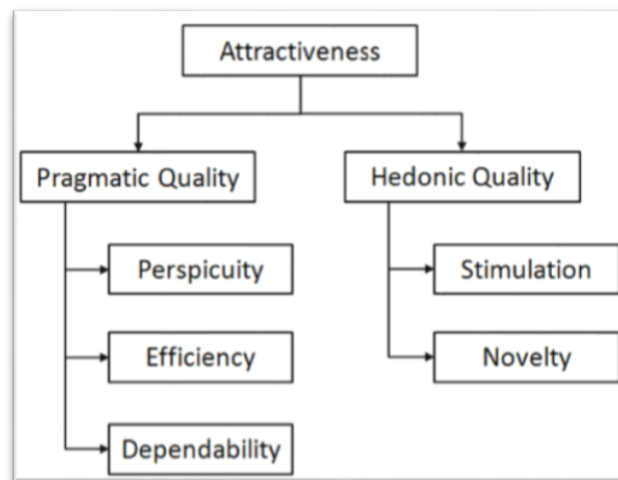


Figure 10: Categorizing framework evaluation aspects [10]

C. Discussing Feedback Elicited

Having selected a formal test script and adapted it to reflect this second round of testing, the testing process can take place. This section documents the key findings of the test process in terms of softer task fulfilment and opinions and the more direct questionnaire framework.

i. Summary of User Test Tasks

Three users took part in the testing process – two students from the Computing faculty and one Architecture 3rd year student. Of the computing constituent, one student was a 3rd year Games undergraduate and the other a postgraduate PhD and part-time module lecturer. Whilst the author is aware of the need to consult automotive students the tight time constraints often applied to usability testing – this was not possible. As such it is identified as a primary concern of the developer beyond the scope of this article. Given the more focused aims of this test script the findings can be concentrated, and subsequently discussed – as deliberated in the key points:

1. **The addition of a “Home” button proved valuable.** During this round of testing no participant attempted to use the “*Search*” icon in the screen footer. From this test it can be concluded that, at least these users, preferred to start at the application “*Home*” screen when moving between different areas and sub-menus of the main application homepage. It seems this change has had a positive effect and has seen users speed up between sub-menu navigation though it is of note that the developer believes it worthwhile to retain the “*Search*” icon. Its degree of use will need to be evaluated in further user testing but the option to search for a menu or page is still a useful feature.
2. **Library resource and subject databases is still causing confusion.** Out of the three participants two users expressed no discomfort [or complete task failure] when asked to navigate to the internal and external library screens. However, this section of the application is still of concern owing to one user’s inability to clearly differentiate between library pages. It is of note that this user (User 3) stated they had little experience of searching for academic material owing to their particular course stream. Despite the clear failure to complete this task, the change in the system cannot be clearly stated as a failure and is the primary screen of the application that needs further attention.
3. **Printing from the application was clear and obvious.** One particular feature that the developer wanted to understand from this activity was the suitability of the print page colour-scheme. All users consulted clearly understood the steps involved with selecting printing and optionally replacing device files on the print page itself – but users struggled to locate the precise page. Unclear as to which menu this functionality was likely to be found users were torn between ‘*My Programs and Apps*’ and ‘*Library Services*’. This structure caused the developer some confusion as document printing is an everyday task and must be quickly accessible - but it comes under the library umbrella within the University website and operational structure.
4. **Colour and control layout received positive comments – but requires further evaluation.** Alongside some tweaks to button text, icon use and navigational structure the most visible change is the addition of colour. On reflection no precise question was asked by the interviewer about the use of colour – instead leaving *Question 8.* of the survey itinerary blank for any additional comments. Despite this evident lack of consideration, the application received no negative comments about the existing use of colour. Whilst one comment read “[*this system*] looks like something students would use” [Test User 3] it is difficult to understand the premise or foundations of this statements and again, in retrospect, the interviewer needed to ask additional follow up questions to understand why these views were expressed.

However, these opinions are just that and are not statistically founded. It is important that the developer understands how these perspectives influence a user’s response to single line statements when forced to express precise feelings on a scale. As such, *section ii.* will record and understand feedback received by the User Experience Feedback Questionnaire.

ii. *Summary of User Experience Questionnaire*

The Usability Experience Scale [8],[9] results have been placed into a spreadsheet tool provided by Hinderks [8]. This template offers a range of statistical and graphical conclusions to be drawn from the original questionnaire that aims to understand an applications relative success in each facet of application usability. **Table 2** shows the average scores of each participant calculated from their responses to questions associated with each usability and then the overall average derived from the score from each user.

Table 2: User Experience Questionnaire Facet Mean Scores [8],[9]

Participant	Scale Means Per Test Participant					
	<i>“Attractiveness”</i>	<i>“Perspicuity”</i>	<i>“Efficiency”</i>	<i>“Dependability”</i>	<i>“Stimulation”</i>	<i>“Novelty”</i>
<i>A</i>	1.83	2.25	2.50	2.00	1.25	1.25
<i>B</i>	1.17	1.75	2.00	2.00	1.50	0.75
<i>C</i>	1.00	1.75	1.75	2.00	1.25	0.50
Total	1.3	1.91	2.08	2.00	1.3	0.83

A greater understanding of these scores can be gained when the statistics are displayed graphically. From **Figure 11** it can be clearly seen that in all areas of usability the application is “Above Average”. For a campus app for students it can be suggested that the most valuable metrics are those of activity efficiency and user dependability and familiarity – both areas of which the overall scores for the application are said to be “Excellent”. The next most valuable, especially in as varied a student landscape as University is learnability – a trait implied to be borderline “Good” to “Excellent”.

Alongside these valuable system and contextual factors there are facets that have reduced significance. The issue of system “Novelty”, whilst of value in terms of drawing users in, is of reduced importance for some application contents; such as Moodle where continuity is of more importance than innovative design.

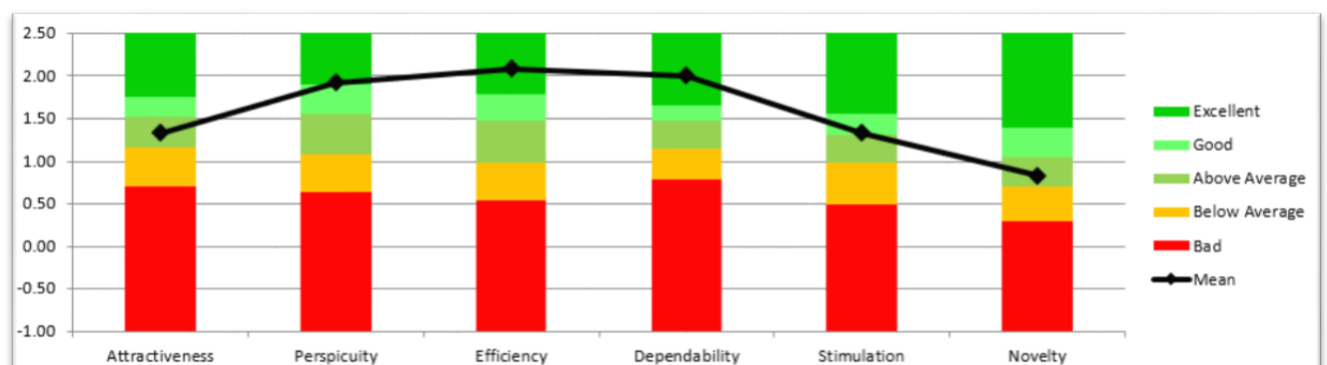


Figure 11: Facets of System User Experience [8],[9]

VI. GATHERING USER APPLICATION DATA

At several points during this user experience analysis the developer has noted the need for future study and potential future improvements. Whilst some areas for future consideration have already been identified the developer must gather more information about student use to see how students are using the application.

A large study is group is advised that covers as broad a user-base as possible. By defining a data collection period of a set number of months – possibly up to 3 months – the developer can gather valuable application data. However, despite the widespread use of data collection and analysis tools for the web platform (such as ‘Web Static Analyser Tool’ [WebSAT] [11] or ‘Web Category Analysis Tool’ [WebCAT] [11]) an equivalent toolbox for mobile, at least as late as 2003 had not yet been constructed [11]. Since 2003, a range of generic device (and application) usage statistics can be gathered such a network location usage, and a variety of user “*behavioural data*” [12]. Contextual studies of application and software use are also of value; one such method ‘Reality Mining’ [13],[14] strategy to understand when, where and how products are used.

Whilst data is being collected on a study user group it is important to consider the predictions that the development team (or sole developer) can make on how their product will be used by the software’ target users. The graph illustrated in **Figure 12** (below) shows how the developer predicts students will use the various sub-menus within a student’s ‘My Programs and Apps’ section of the new companion app. Whilst several screens should be quickly accessible because they represent low level tasks (even if these tasks do not represent ‘everyday’ use) certain power user groups for these features can be identified. It can be insinuated that students enrolled on Computing and Engineering courses with a need to download highly specialist software – commonly for personal laptops or smartphones will boost the number of users accessing the ‘Microsoft DreamSpark’ links in the application. Whilst such thoughts aided the development of the initial information architecture the degree of page use can only be seen when formed of data from a varied user base.

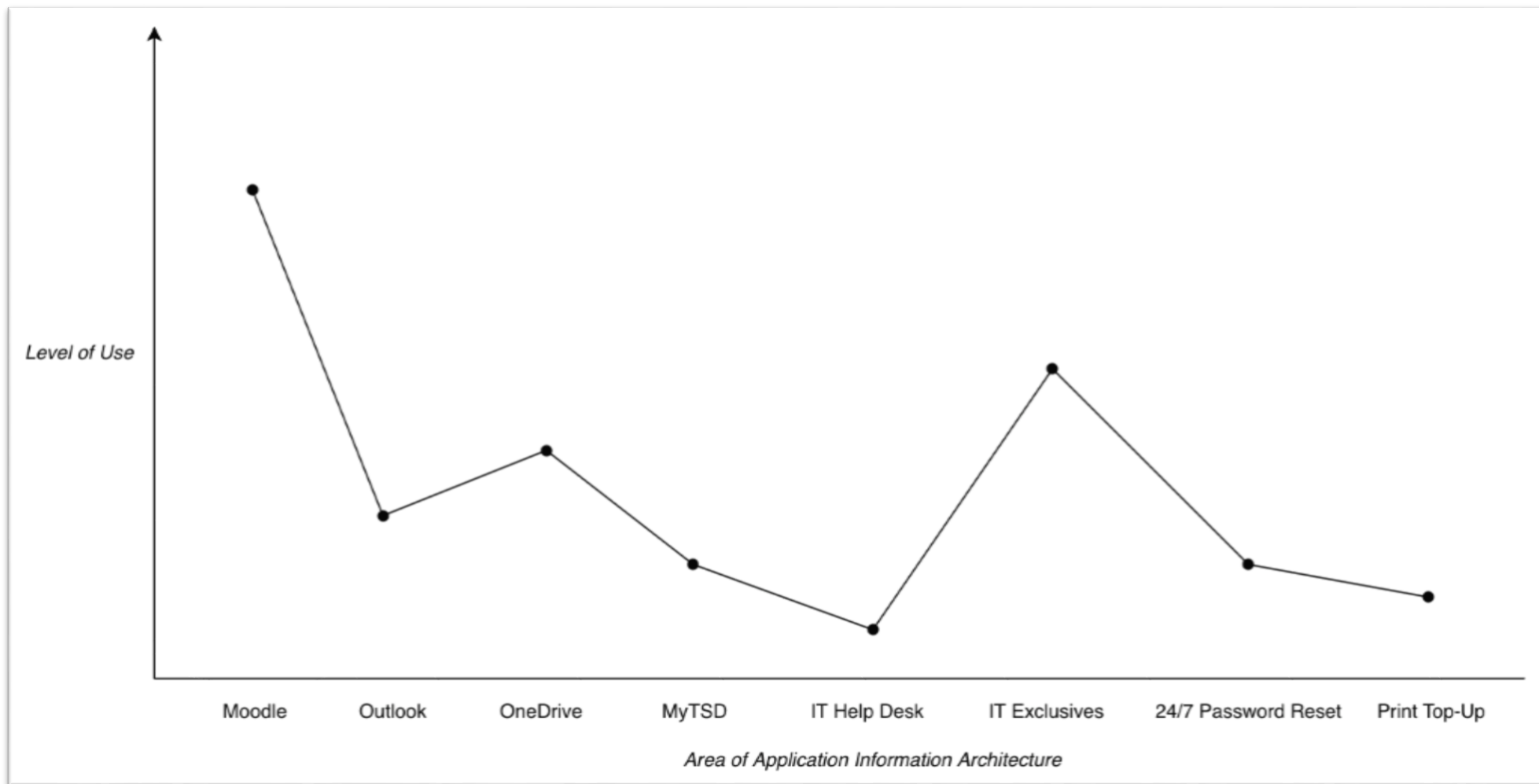


Figure 12: A predicted structured behaviour graph showing activity inside the 'My Programs and Apps' menu of the mobile application

VII. CONCLUSION: UX VS. USABILITY

Overall, testing with this number of users cannot find all the system discrepancies. “*Testing for ease of use but not usefulness*” [15] means that further evaluation with more users is the next logical step to provide the developer with an insight into the system actual usefulness for students as well as interface usability. Despite this, the testing’s superficial nature this design process can only offer an answer as to the extent to which a software product works [15] and at some point in the future a widely available platform, open to students of SA1, should be released.

The difference between Usability and User Experience can be clearly seen in this case study scenario. Whilst an application to efficiently and effectively provide students with their core digital platforms and services is a task most closely associated with interface design, mock-up, development creating a valuable mobile app goes beyond purely graphical and interface modelling. For such an application to be successful it must meet the wider needs of the user in terms of providing campus services in an enhanced format. Where the field of Usability, particularly visible in the development of a web-based version of the dice game “*DinoHunt*” aims to create and validate the suitability of an application interface the broader concept of User Experience considers the users, in this case campus students, and how their daily University routine influences how they use a new software tool.

VIII. REFERENCES AND CITED WORK(S)

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IX. APPENDICES

A. Full Set of Colour Interface Designs

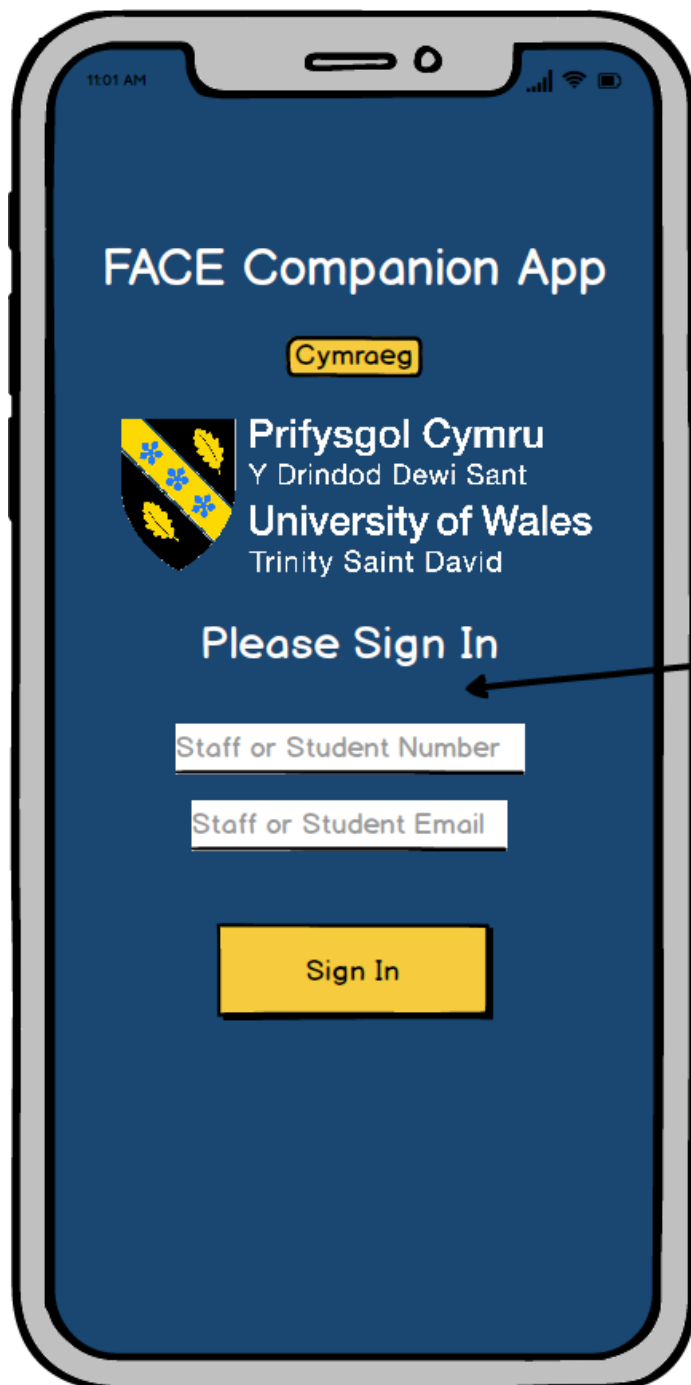


'Splasher' screen is white to show logo

App logo on iPhone app screen



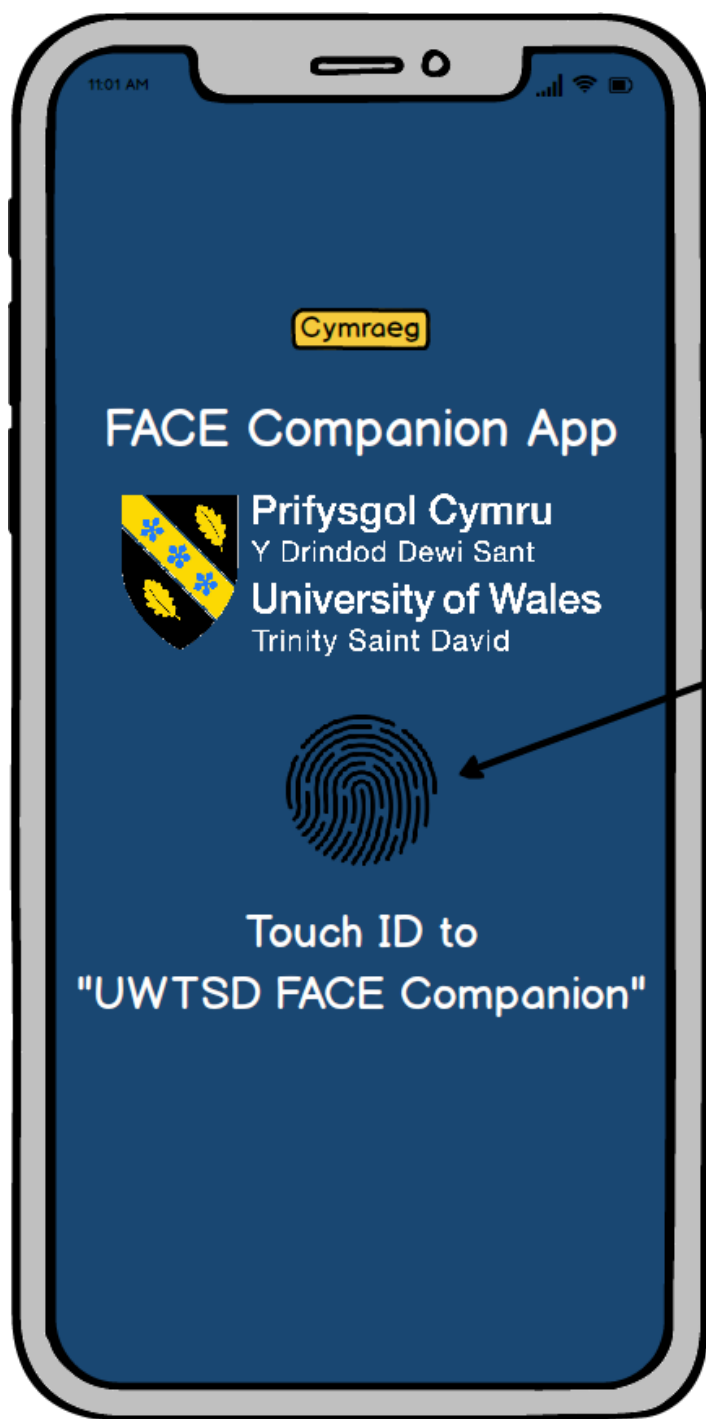
UWTSD FACE



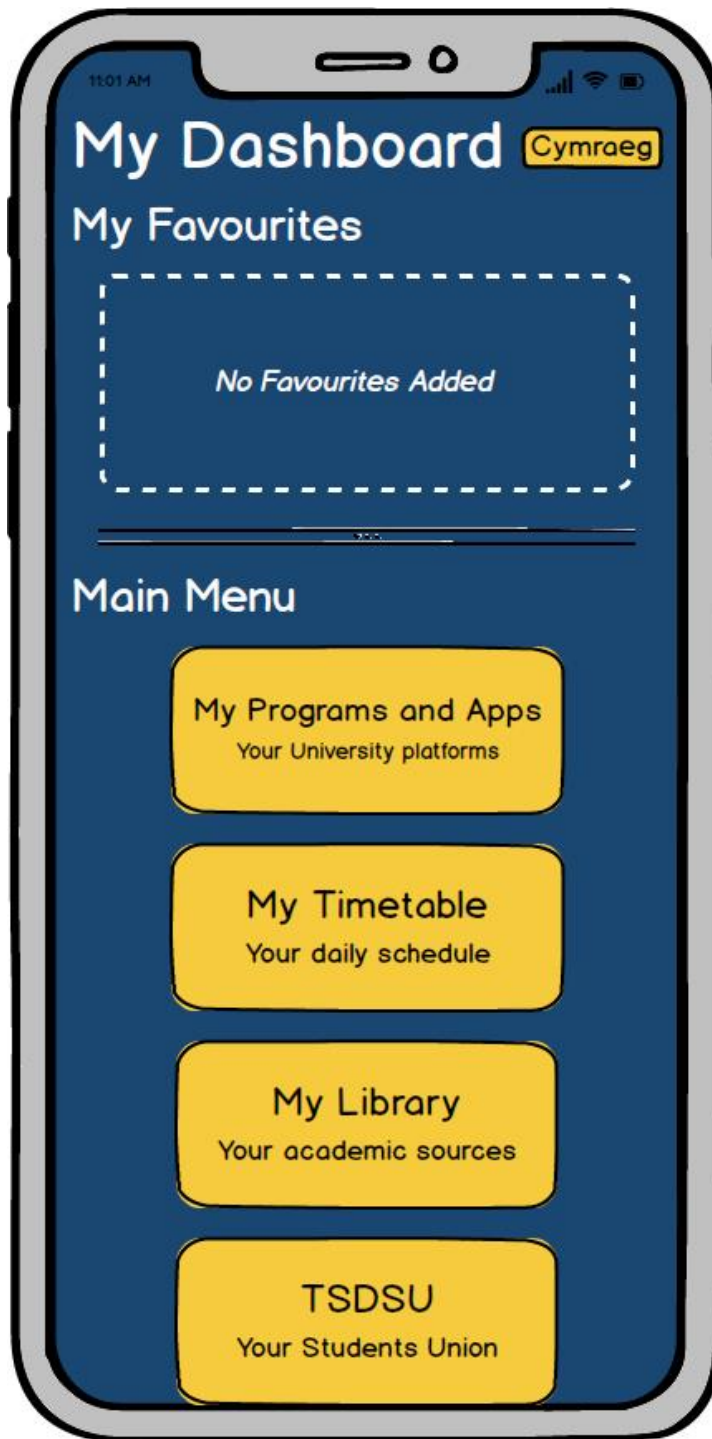
Enter University Account to Sign In to App



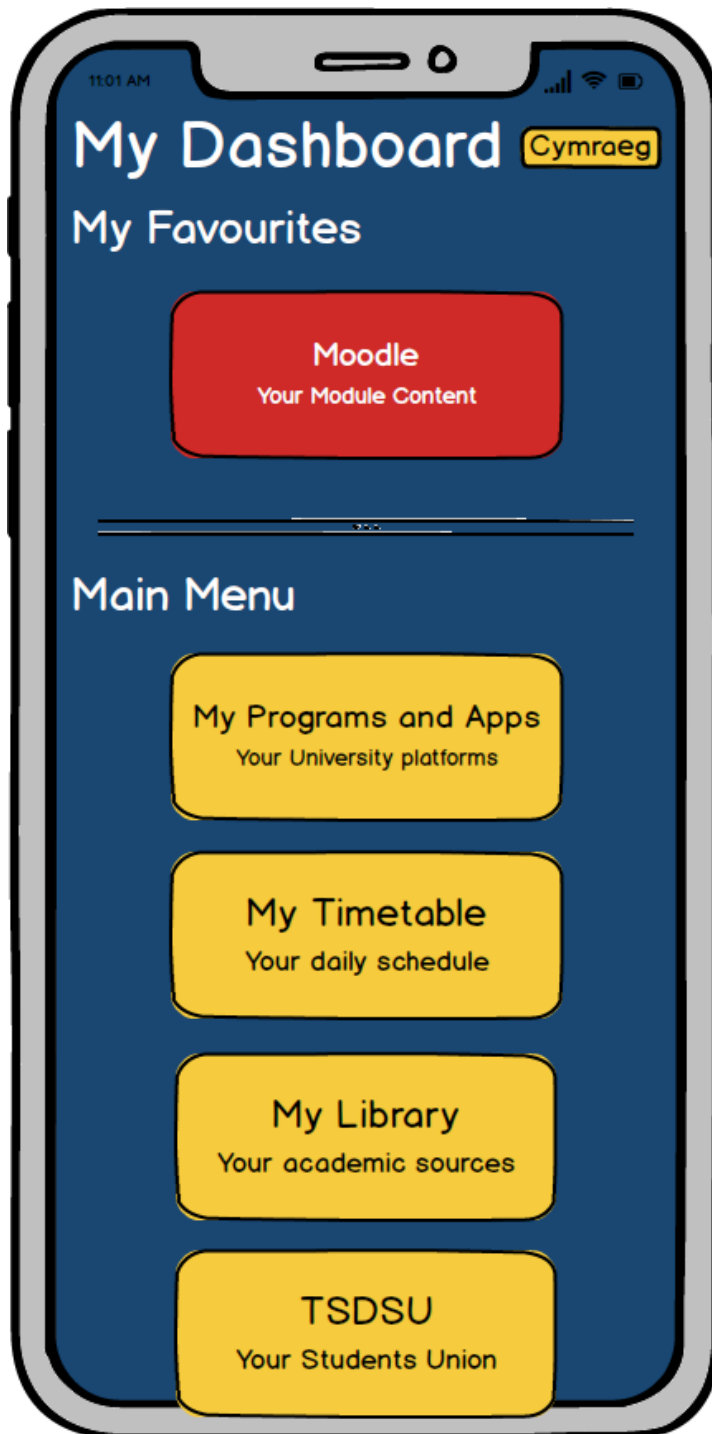
Enter University Account to Sign In to App



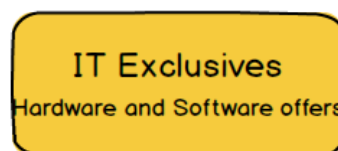
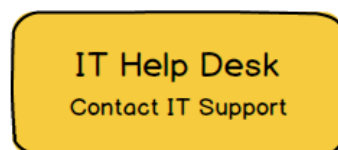
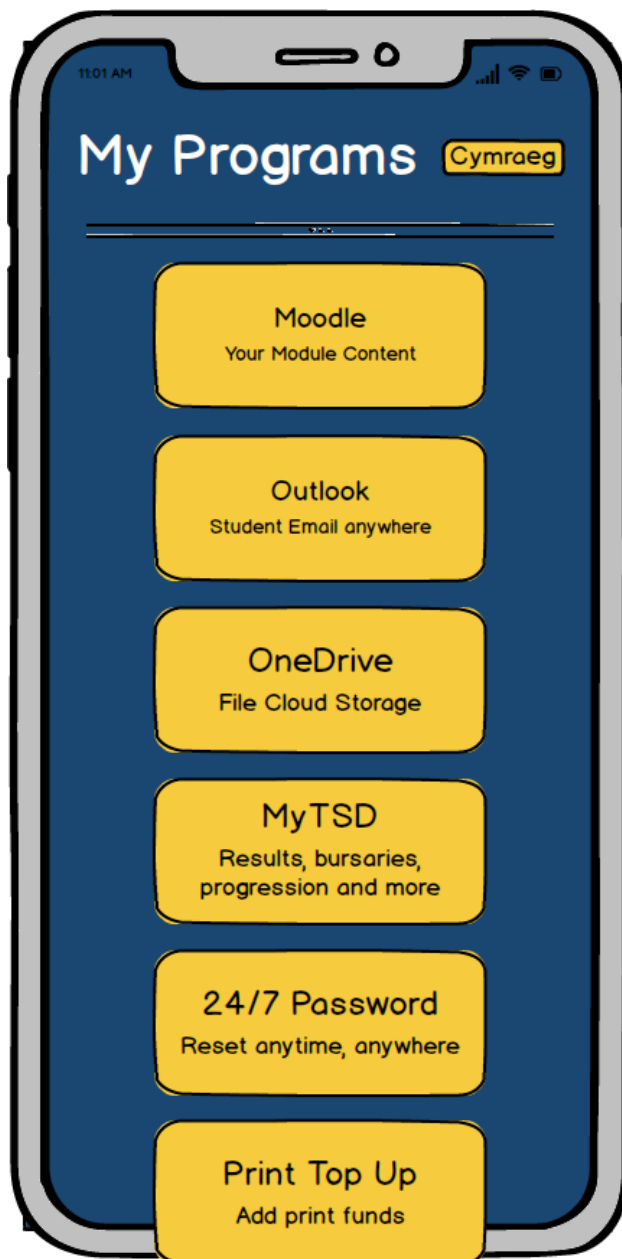
Place finger on Touch ID to scan



← Pinned to footer



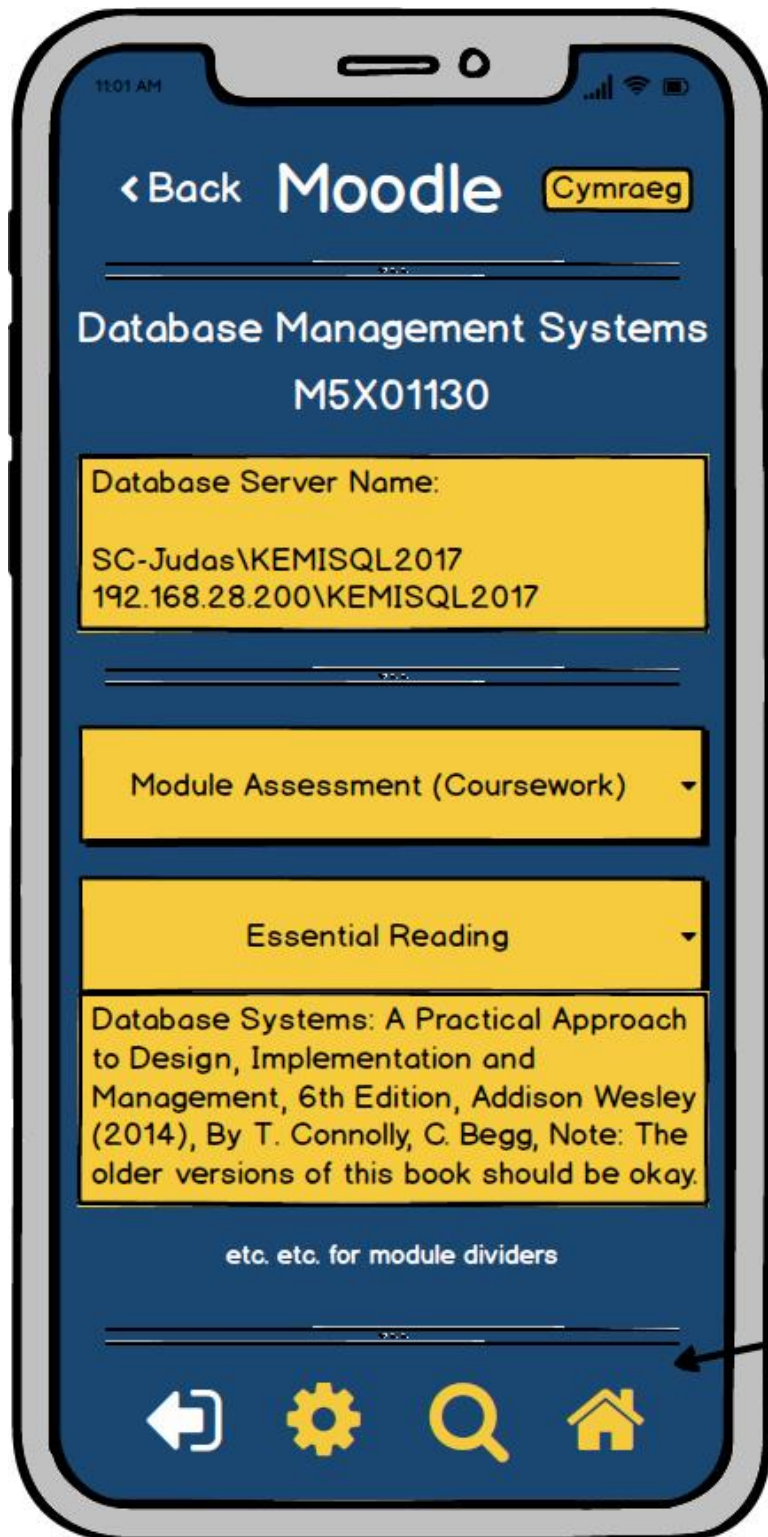
← Pinned to footer



← Pinned to footer



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< Back

Moodle

Cymraeg

Database Management Systems M5X01130

Database Server Name:

SC-Judas\KEMISQL2017
192.168.28.200\KEMISQL2017

Module Assessment (Coursework) ▼

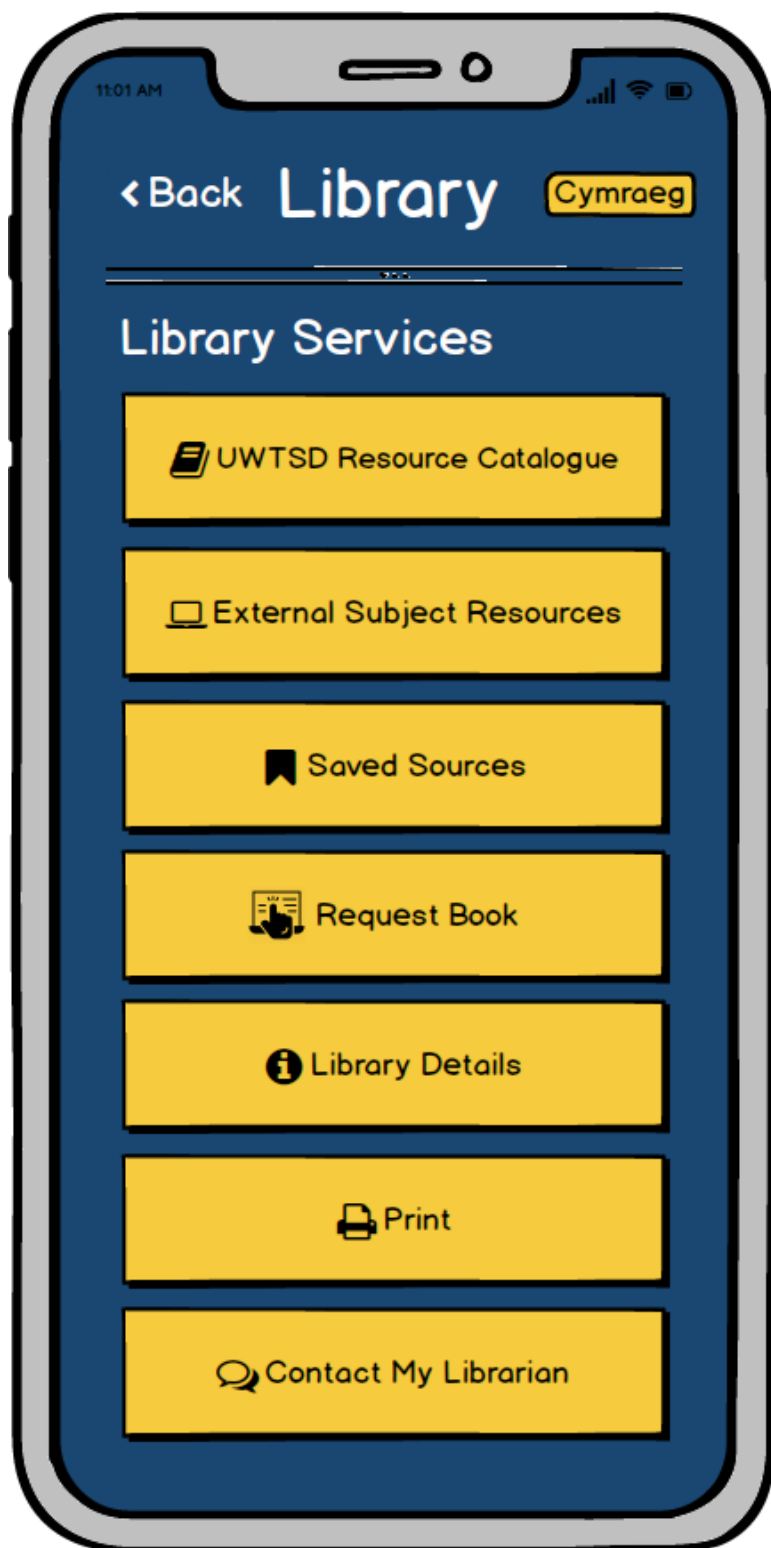
Essential Reading ▼

Database Systems: A Practical Approach to Design, Implementation and Management, 6th Edition, Addison Wesley (2014), By T. Connolly, C. Begg, Note: The older versions of this book should be okay.

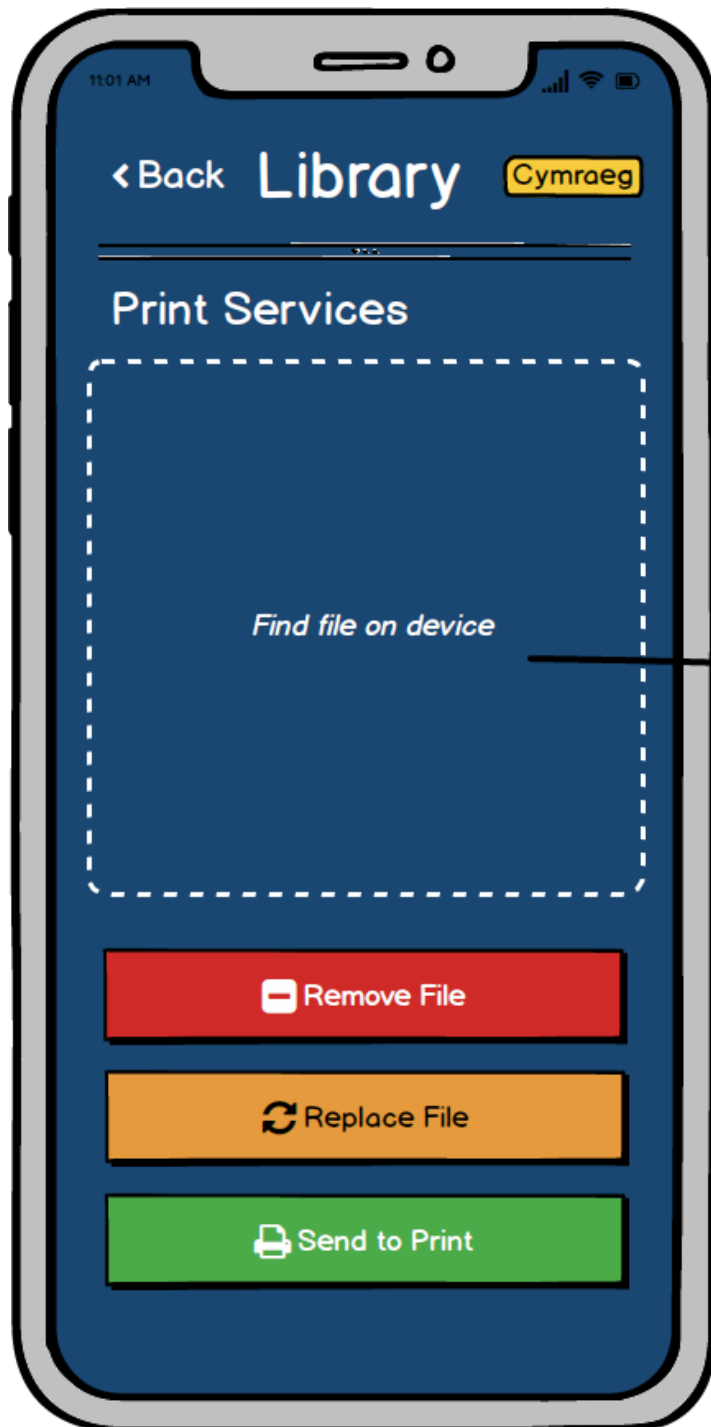
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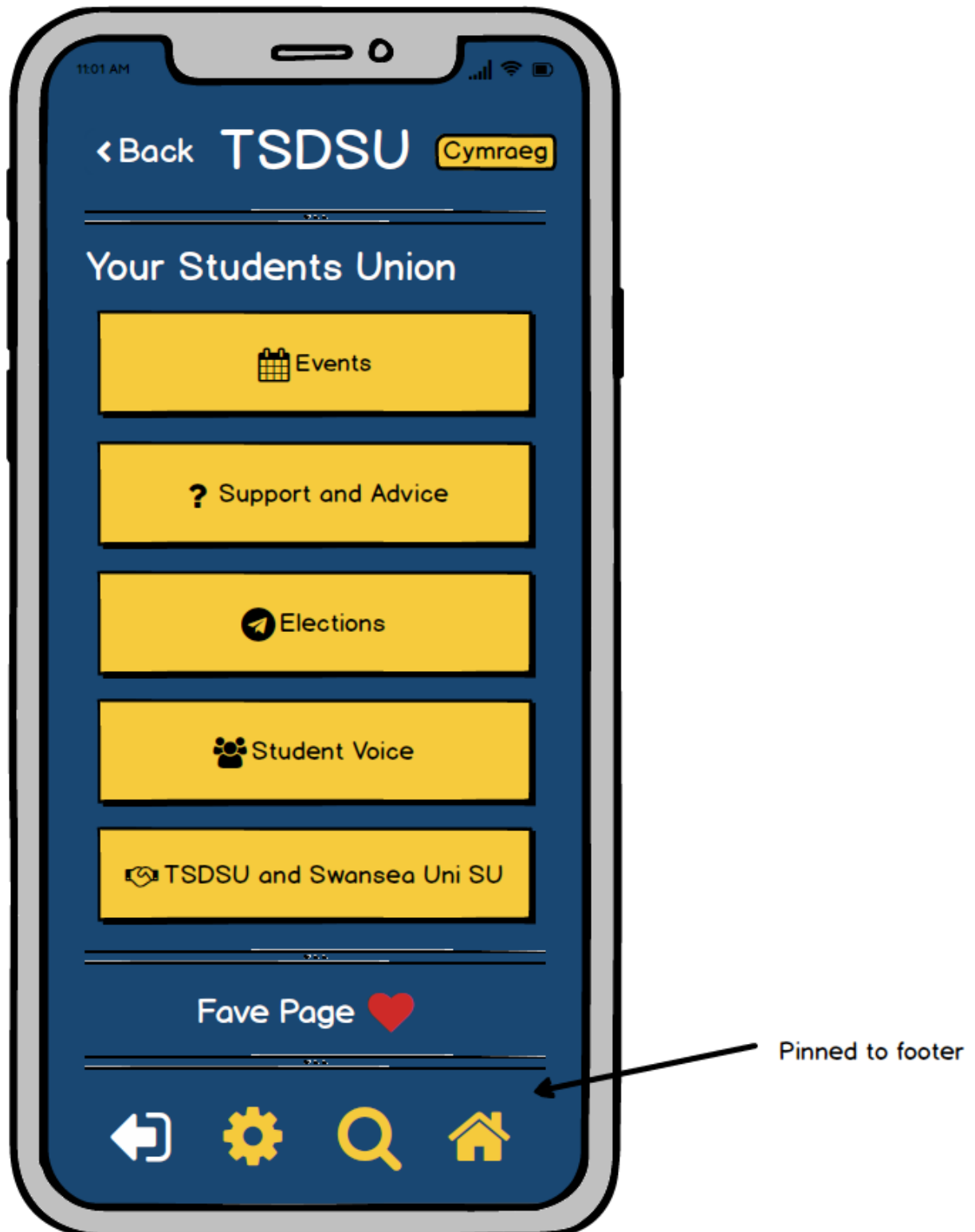
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Assignment1_Report_Final



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PARTICIPANT 1: 15/65/19.

Student University Companion App – Usability Testing Itinerary

1. Understanding the Usability Testing Participant

1.1. Demographic

1.1.1. Age: 25

1.1.2. Course of Study / Faculty: GAMES DEV / 3RD.

1.1.3. Full-time / Part-time Study

1.1.4. Time: 17:15

1.2. Current University Software Usage

1.2.1. What applications would you say that you use most often for your University studies?

UNITY, MOODLE, EMAIL, STACKOVERFLOW.

1.2.2. What of these is your favourite [or you most like] and why?

MOODLE – VIEW LECTURE SLIDES AND UPLOAD/VIEW ASSIGNMENTS.

1.2.3. How many hours during a typical University day / week would you say that you use these software platforms?

3 HOURS PER DAY / ROUGHLY 15 HRS WEEK

2. Outlining the Test/Evaluation Process

2.1. ~~Outline~~ reasons for testing and what the test will involve

✓

2.2. I am not here to influence you or any response to any of the questions that I ask. There are no right or wrong answers to any of the tests that follow

✓

2.3. There are no right or wrong answers. I am testing the system we [the development team] have designed, and not you.

✓

2.4. Do you have any questions about this test at this point?

NO.

3. Test 1: "You have been into the library and have found a book you would like to take out and it is saved in your library sources, you now want to reserve it in the app". [checks change on resource request]

3.1. Test Processes, Outcomes and Interaction Comments

- 1) EASY TO UNDERSTAND "SIGN IN"
2) CLICKED ON "MY LIBRARY" TO OPEN LIBRARY MENU.
3) "REQUEST BOOK" TO ASK TO TAKE BOOK OUT. 4) PAGE OPEN OK.

3.2. Was the text:

3.2.1. Size suitable?

YES.

3.2.2. Neatly and clearly positioned?

"NICE AND CLEAR"

3.2.3. Was the terminology used familiar?

YES, EASY TO IDENTIFY.

3.3. Were the buttons suitable?

CLEAR + VISIBLE.

3.4. Did anything not work spatially?

NO, NEATLY POSITIONED

3.5. Is there any part of this task you were unsure about or pages that made you think twice?

NO - SHORT / FEW CLICKS.

3.6. Any other comments?

NO - EASY TASK.

4. Test 2: "View Student Union events happening on the Swansea campus, but get distracted and instead must quickly forward an urgent email you receive to another student" [Tests

"Home"/"Search" change]

- 1) CLICKED "HOME" BUT DID SEE / IDENTIFY "SEARCH"
2) BACK AT HOME
3) QUICKLY WENT TO "TSU"
4) AGAIN USED "HOME" WITHOUT ANY OTHER CONSIDERATION
5) "MY PROGRAMS AND APPS"
6) THEN TO "CREDrive"
7) COMPLETE.

4.1. Test Processes, Outcomes and Interaction Comments

4.2. Was the text:

4.2.1. Size suitable?

YES

4.2.2. Neatly and clearly positioned?

YES

4.2.3. Was the terminology used familiar?

YES

4.3. Were the buttons suitable?

EASY TO UNDERSTAND.

4.4. Did anything not work spatially?

ALL WORKED NICELY.

4.5. Is there any part of this task you were unsure about or pages that made you think twice?

NO - ALL CLEAR.

4.6. Any other comments?

NONE FOR TASK.

5. Test 3: "You want to send an assignment specification to the printer". [checks printer page clarity]

1) ASKED QUESTION REGARDING THEY DIDN'T KNOW THIS COULD BE DONE FROM PHONE AT ALL.

5.1. Test Processes, Outcomes and Interaction Comments

2) FIRSTLY TRY "MY PROGRAMS AND MENU" - NO CONTROL/ FEATURE HERE.

3) THEN WENT TO LIBRARY, SAW IT HERE. - "PRINT"

5.2. Was the text:

4) TAPPED INSIDE SQUADRE BOX AND THEN "SEND TO PRINT."

5) TASK COMPLETE.

5.2.1. Size suitable?

YES

5.2.2. Neatly and clearly positioned?

✓

5.2.3. Was the terminology used familiar?

YES - AS UNI.

5.3. Were the buttons suitable?

YES

5.4. Did anything not work spatially?

NONE

5.5. Is there any part of this task you were unsure about or pages that made you think twice?

~~APART~~ APART FROM THE PAGE BEING A LIBRARY SERVICE THEN YES.

MORE TO CORE STUDENT SERVICE?

5.6. Any other comments?

NONE

6. Test 4: "Find an academic article from the subject resource library before continuing the search on the internal UWTSO article search" [checks internal/external library differentiation]

- 1) KNEW TO GO STRAIGHT TO THE LIBRARY SCREEN FROM MYTH MENU VIEW.
- 2) NEED TO CHECK "UWTSO RESOURCE" SO STARTED BY GOING TO THIS PAGE.
- 3) EMULATE RESOURCE SEARCH BEFORE RETURNING TO THE LIBRARY PAGE - THEN WENT "EXTERNAL RESOURCE"

6.1. Test Processes, Outcomes and Interaction Comments

6.2.1. Size suitable?

YES

6.2.2. Neatly and clearly positioned?

YES

6.2.3. Was the terminology used familiar?

YES - "GOOD LIBRARY DISTINCTION."

6.3. Were the buttons suitable?

YES - NO ISSUES.

6.4. Did anything not work spatially?

ALL GOOD NO ISSUES.

6.5. Is there any part of this task you were unsure about or pages that made you think twice?

NO - "IT WAS STRAIGHTFORWARD!"

6.6. Any other comments?

NO ISSUES NAVIGATING LIBRARIES.

6.7. (If not directly answered: Did you clearly understand the library resource access buttons?)

* YES ~~STUDENT~~ CLEARLY STUDENT HAD NO ISSUES. *

7. Test 5: "Check to see if a lecturer has uploaded a file to the Database Management Systems module that you have requested them to add".

- 1) START AT "HOME"
- 2) WENT TO "MY PROGRAMS AND APPS"
- 3) MOODLE IS OBVIOUS CHOICE FROM THIS MENU.
- 4) SHOWS COURSE MODULES. - CLICKS ON DBMS ICON.
- 5) OPENS MOODLE MODULE.

7.1. Test Processes, Outcomes and Interaction Comments

7.2. Was the text:

7.2.1. Size suitable?

YES

7.2.2. Neatly and clearly positioned?

YES

7.2.3. Was the terminology used familiar?

VERY COMMON

7.3. Were the buttons suitable?

YES - OBVIOUS

7.4. Did anything not work spatially?

NO, NICE AND NEAT.

7.5. Is there any part of this task you were unsure about or pages that made you think twice?

APART FROM PRINT OPTION SUBMENU - NO.

7.6. Any other comments?

NOTHING TO ADD APART FROM "ATTRACTIVE" BUT NOT TOO BOLD COLOUR SCHEME.

8. Across all the tasks at any point did you feel you didn't understand or was not raised in any of the test scenarios that you experienced while using the app?

9. Having looked and explored a prototype companion app are there any additional features you feel would also be useful?

"LOOKS AND FEELS COMPREHENSIVE". WOULDN'T SUGGEST ANYTHING ELSE/ NEW.

Thank you for participating. End of User Test.

Please assess the product now by ticking one circle per line.

	1	2	3	4	5	6	7		
annoying	☐	☐	☐	☐	☒	☐	☐	enjoyable	1
not understandable	☐	☐	☐	☐	☐	☒	☐	understandable	2
creative	☐	☐	☒	☐	☐	☐	☐	dull	3
easy to learn	☐	☒	☐	☐	☐	☐	☐	difficult to learn	4
valuable	☐	☒	☐	☐	☐	☐	☐	inferior	5
boring	☐	☐	☐	☒	☐	☐	☐	exciting	6
not interesting	☐	☐	☐	☐	☒	☐	☐	interesting	7
unpredictable	☐	☐	☐	☐	☒	☐	☐	predictable	8
fast	☐	☒	☐	☐	☐	☐	☐	slow	9
inventive	☐	☒	☐	☐	☐	☐	☐	conventional	10
obstructive	☐	☐	☐	☐	☐	☒	☐	supportive	11
good	☐	☐	☒	☐	☐	☐	☐	bad	12
complicated	☐	☐	☐	☐	☐	☒	☐	easy	13
unlikable	☐	☐	☐	☐	☐	☒	☐	pleasing	14
usual	☐	☐	☐	☐	☒	☐	☐	leading edge	15
unpleasant	☐	☐	☐	☐	☐	☒	☐	pleasant	16
secure	☐	☒	☐	☐	☐	☐	☐	not secure	17
motivating	☐	☒	☐	☐	☐	☐	☐	demotivating	18
meets expectations	☒	☐	☐	☐	☐	☐	☐	does not meet expectations	19
inefficient	☐	☐	☐	☐	☐	☐	☒	efficient	20
clear	☒	☐	☐	☐	☐	☐	☐	confusing	21
impractical	☐	☐	☐	☐	☐	☒	☐	practical	22
organized	☒	☐	☐	☐	☐	☐	☐	cluttered	23
attractive	☒	☐	☐	☐	☐	☐	☐	unattractive	24
friendly	☐	☒	☐	☐	☐	☐	☐	unfriendly	25
conservative	☐	☐	☐	☐	☒	☐	☐	innovative	26

B. Test Participant 2: Testing Script

Student University Companion App – Usability Testing Itinerary

1. Understanding the Usability Testing Participant

1.1. Demographic

1.1.1. Age: 34

1.1.2. Course of Study / Faculty: PHD / PART-TIME LECTURER.
(COMPUTER NETWORKS)

1.1.3. Full-time / Part-time Study

1.1.4. Time: 08:55.

1.2. Current University Software Usage

1.2.1. What applications would you say that you use most often for your University studies?

ONEDRIVE, MOODLE, EMAIL, MENDLEY, LIBRARY CATALOGUE, IEEE, ACM, TURNITIN.

1.2.2. What of these is your favourite [or you most like] and why?

ONEDRIVE AND EMAIL ARE "FLUID AND FAST."

1.2.3. How many hours during a typical University day / week would you say that you use these software platforms?

5 HRS AT LEAST PER DAY ON UNI NETWORK

2. Outlining the Test/Evaluation Process

2.1. Outline reasons for testing and what the test will involve

✓

2.2. I am not here to influence you or any response to any of the questions that I ask. There are no right or wrong answers to any of the tests that follow

✓

2.3. There are no right or wrong answers. I am testing the system we [the development team] have designed, and not you.

✓

2.4. Do you have any questions about this test at this point?

No.

3. Test 1: "You have been into the library and have found a book you would like to take out and it is saved in your library sources, you now want to reserve it in the app". [checks change on resource request]

- 1) START AT MAIN MENU.
2) WENT TO THE LIBRARY SECTION OF APP.
3.1. Test Processes, Outcomes and Interaction Comments
3) WENT TO LIBRARY "REQUEST BOOK" SAID THAT THEY HAD SAVED A BOOK AND WOULD SEE IT UNDER "SAVED SOURCES".
3.2. Was the text:

3.2.1. Size suitable?

YES.

3.2.2. Neatly and clearly positioned?

✓

3.2.3. Was the terminology used familiar?

YES

3.3. Were the buttons suitable?

FAMILIAR ✓

3.4. Did anything not work spatially?

NO - ALL ~~CLAR~~ CLEAR + OBVIOUS

3.5. Is there any part of this task you were unsure about or pages that made you think twice?

NO - CLEAR GOAL AND FORWARD PATH.

3.6. Any other comments?

NONE.

4. Test 2: "View Student Union events happening on the Swansea campus, but get distracted and instead must quickly forward an urgent email you receive to another student" [Tests "Home"/"Search" change]

- 1) ASKED USER TO GO TO MAIN MENU. WENT STRAIGHT TO "HOME" BUTTON.
4.1. Test Processes, Outcomes and Interaction Comments
2) WENT TO "TSOSU" TO IDENTIFY EVENTS BEING RUN BY THE UWTSD.SU.

4.2. Was the text:

- 3) CLEARLY THEN USED "HOME" ICON TO GO BACK TO FRONT PAGE OF THE APPLICATION.
4) SAW "YOUR UNIVERSITY PLATFORMS" AND WENT THERE.

- 5). CLICKED ON OUTLOOK AFTER VERY SHORT TIME.
6). COMPLETED TASK EFFICIENTLY.

4.2.1. Size suitable?

YES

4.2.2. Neatly and clearly positioned?

YES

4.2.3. Was the terminology used familiar?

YES - VERY

4.3. Were the buttons suitable?

NICE AND CLEAR. "GOOD SIZE!"

4.4. Did anything not work spatially?

NO - ALL WORKED NICELY. AND VERY STRAIGHTFORWARD.

4.5. Is there any part of this task you were unsure about or pages that made you think twice?

NO. NAVIGATION HOME CAUSED NO ISSUES.

4.6. Any other comments?

NONE.

5. Test 3: "You want to send an assignment specification to the printer". [checks printer page clarity]

- 1) STATED PRINTING WAS A LIBRARY SERVICE AND WENT TO LIBRARY MENU FROM MAIN MENU.

5.1. Test Processes, Outcomes and Interaction Comments

- 2) EASILY IDENTIFIED PRINT BUTTON AND TAPPED IT.

- 3). STATED THAT FILES WOULD BE AVAILABLE WHEN CLICKED ON OUTLINED BOX.

5.2. Was the text:

- 4). STATED THAT "REPLACE FILE" + "PRINT" ARE BOTH PERFECTLY CLEAR.

5.2.1. Size suitable?

YES.

5.2.2. Neatly and clearly positioned?

YES.

5.2.3. Was the terminology used familiar?

YES.

5.3. Were the buttons suitable?

YES. "NICE BIG BUTTONS + COLOURS" ON THE

5.4. Did anything not work spatially? PRINT BUTTONS.

NO. ALL CLEAR.

5.5. Is there any part of this task you were unsure about or pages that made you think twice?

NONE. PROGRESSION WAS CLEAR AND LOGICAL.

5.6. Any other comments?

NONE. COMPLETED FINE.

6. Test 4: "Find an academic article from the subject resource library before continuing the search on the internal UWTSD article search" [checks internal/external library differentiation]

- 1). GOES HOME USING "HOME" TO START TASK.
- 2). WANTS LIBRARY RESOURCE SO GOES TO LIBRARY.
- 6.1. Test Processes, Outcomes and Interaction Comments
- 3). INTERNAL SO STATES USER WOULD GO TO "UNITS" RESOURCES.
- 4). GOES "BACK" TO LIBRARY MENU TO VIEW THE
- 6.2. Was the text:
EXTERNAL SUBJECT D.B. LIST.

6.2.1. Size suitable?

YES

6.2.2. Neatly and clearly positioned?

YES. MADE SENSE.

6.2.3. Was the terminology used familiar?

FAMILIAR.

6.3. Were the buttons suitable?

YES

6.4. Did anything not work spatially?

CLEAR.

6.5. Is there any part of this task you were unsure about or pages that made you think twice?

NOT AT ALL.

6.6. Any other comments?

NONE. NO COMMENTS.

6.7. (if not directly answered: Did you clearly understand the library resource access buttons?)

*USER HAD NO ISSUE DIFFERENTIATING BETWEEN INTERNAL AND EXTERNAL LIBRARIES.

7. Test 5: "Check to see if a lecturer has uploaded a file to the Database Management Systems module that you have requested them to add".

- 1) START BACK AT SYSTEM HOME
- 2) HAD NO ISSUES GOING TO "MY PLATFORMS AND APPS"
- 7.1. Test Processes, Outcomes and Interaction Comments
- 3). MOODLE IS SHOWN IN THE LIST. USER IDENTIFIES AND CLICKS THERE.
- 4). MODULE LIST IS RETURNED → USER CLICKS ON THE DBMS MODULE TO CLEARLY COMPLETE TASK.

7.2. Was the text:

7.2.1. Size suitable?

YES.

7.2.2. Neatly and clearly positioned?

YES.

7.2.3. Was the terminology used familiar?

YES. SAME AS MOODLE.

7.3. Were the buttons suitable?

YES.

7.4. Did anything not work spatially?

NOPE. PROGRESSION AND LOGIC WAS AS EXPECTED / DESIRED.

7.5. Is there any part of this task you were unsure about or pages that made you think twice?

NO. NOT ALL.

7.6. Any other comments?

NONE.

8. Across all the tasks at any point did you feel you didn't understand or was not raised in any of the test scenarios that you experienced while using the app?

ALL MADE LOGICAL SENSE. "LABELS AND ICONS LOOK PROFESSIONAL THROUGHOUT."

9. Having looked and explored a prototype companion app are there any additional features you feel would also be useful?

* USER HAS ADDITIONAL EXPLORE.*
/ NO. THEY THINK IT CONTAINS EVERYTHING THEY
WOULD NEED FOR UNIVERSITY DAY.

Thank you for participating. End of User Test. ✓

PARTICIPANT 3: 15/CAS/19.

Student University Companion App – Usability Testing Itinerary

1. Understanding the Usability Testing Participant

1.1. Demographic

1.1.1. Age: 22

1.1.2. Course of Study / Faculty: Architecture IN SAT
(BSC DEGREE). 3RD YEAR.

1.1.3. Full-time / Part-time Study

1.1.4. Time: 10:13.

1.2. Current University Software Usage

1.2.1. What applications would you say that you use most often for your University studies?

MOODLE, EMAIL. USE TURNITIN FOR ASSIGNMENTS. DOESN'T USE LIBRAR

1.2.2. What of these is your favourite [or you most like] and why?

MOODLE. VIEW AND UPLOAD ASSIGNMENTS.

1.2.3. How many hours during a typical University day / week would you say that you use these software platforms?

COUPLE OF HOURS PER DAY. MAINLY USE PRACTICAL WORK SOFTWARE.

2. Outlining the Test/Evaluation Process

2.1. Outline reasons for testing and what the test will involve

2.2. I am not here to influence you or any response to any of the questions that I ask. There are no right or wrong answers to any of the tests that follow

2.3. There are no right or wrong answers. I am testing the system we [the development team] have designed, and not you.

2.4. Do you have any questions about this test at this point?

NO.

3. Test 1: "You have been into the library and have found a book you would like to take out and it is saved in your library sources, you now want to reserve it in the app". [checks change on resource request]

- 1) SIGNED IN OK.
- 2) LOOKING FOR LIBRARY SO CLICKED LIBRARY.
3.1. Test Processes, Outcomes and Interaction Comments
- 3) COULD SEE BUTTON TO REQUEST BOOK. TAPS ON IT.
- 4) NO DIFFICULTIES COMPLETING TASK AT ALL.

3.2. Was the text:

3.2.1. Size suitable?

YES.

3.2.2. Neatly and clearly positioned?

YES.

3.2.3. Was the terminology used familiar?

YES. EASY TO FOLLOW

3.3. Were the buttons suitable?

YES.

3.4. Did anything not work spatially?

NO - IT WAS ALL OK.

3.5. Is there any part of this task you were unsure about or pages that made you think twice?

NO - CLEAR NAVIGATION.

3.6. Any other comments?

NONE AT ALL.

4. Test 2: "View Student Union events happening on the Swansea campus, but get distracted and instead must quickly forward an urgent email you receive to another student" [Tests

"Home"/"Search" change]

- 1) SAYS SHE USES THIS A LOT!
- 2) GOES "HOME" WITH HOME ICON.
4.1. Test Processes, Outcomes and Interaction Comments
- 3) SEES LARGE TSDSU BUTTON ON HOME PAGE. CLICKS ON IT.
- 4) AGAIN USES HOME TO GO "HOME".
4.2. Was the text:
- 5) THEN CLICKS "TSDSU" TO OPEN PAGE SUBMENU.

4.2.1. Size suitable?

YES.

4.2.2. Neatly and clearly positioned?

YES.

4.2.3. Was the terminology used familiar?

SHE HAD NO ISSUES WITH THIS.

4.3. Were the buttons suitable?

YES.

4.4. Did anything not work spatially?

NO, 'GOOD SPACING'.

4.5. Is there any part of this task you were unsure about or pages that made you think twice?

NO - "EASY TO FIND TSDSU EVENTS"

4.6. Any other comments?

NONE.

5. Test 3: "You want to send an assignment specification to the printer". [checks printer page clarity]

1). STARTS TASK FROM CURRENT PAGE AND USER GOES "HOME" TO BEGIN.

5.1. Test Processes, Outcomes and Interaction Comments

2). WRONGLY CLICKS "MY PROGRAMS AND APPS." BUT IT IS NOT VISIBLE HERE.

3). GOES BACK AND TRIES LIBRARY - THIS SHOWS A PRINT OPTION.

5.2. Was the text:

4). USER CLICKS AND THEN SELECTS "PRINT" GREEN BUTTON

5.2.1. Size suitable?

YES.

5.2.2. Neatly and clearly positioned?

YES. NEAT.

5.2.3. Was the terminology used familiar?

YES. SAME AS LIBRARY.

5.3. Were the buttons suitable?

YES.

5.4. Did anything not work spatially?

NO.

5.5. Is there any part of this task you were unsure about or pages that made you think twice?

~~YES~~ YES - ISSUE WITH WHERE 'PRINT-FROM-PHONE' OPTION COULD BE FOUND.

5.6. Any other comments?

NONE.

6. Test 4: "Find an academic article from the subject resource library before continuing the search on the internal UWTSD article search" [checks internal/external library differentiation]

1). STARTS BY GOING "NONE" WITH HOUSE ICON IN FOOTER.

6.1. Test Processes, Outcomes and Interaction Comments

2). WANTS TO GO TO LIBRARY BUT A LITTLE RELUCTANT HERE.

3). SEES THEY MADE CORRECT SELECTION.

6.2. Was the text:

4). WENT TO "UWTSD" BUT UNSURE.

5). STATED THEY WERE NOT SURE ABOUT OTHER OPTION. THOUGHT THEY HAD COMPLETED TASK.

6.2.1. Size suitable?

YES.

6.2.2. Neatly and clearly positioned?

YES.

6.2.3. Was the terminology used familiar?

NOT ENTIRELY. STRUGGLED TO MAKE SENSE OF TWO LIBRARY OPTIONS.

6.3. Were the buttons suitable?

YES.

6.4. Did anything not work spatially?

NO.

6.5. Is there any part of this task you were unsure about or pages that made you think twice?

YES. SEVERE DOUBT.

6.6. Any other comments?

NO

6.7. (If not directly answered: Did you clearly understand the library resource access buttons?)

NOT AT ALL. → TASK INCOMPLETE!

7. Test 5: "Check to see if a lecturer has uploaded a file to the Database Management Systems module that you have requested them to add".

1). NOT THEIR COURSE BUT REASSURED THEM.

2). LITTLE BIT OF DOUBT BUT WENT TO "MY PROGRAMS AND APPS".

7.1. Test Processes, Outcomes and Interaction Comments

3). CLICKED ON MOODLE NO ISSUES.

4). CLICKED ON MODULE INTERVIEWER ASKED.

5). TASK COMPLETE.

7.2. Was the text:

7.2.1. Size suitable?

YES.

7.2.2. Neatly and clearly positioned?

YES.

7.2.3. Was the terminology used familiar?

YES. MOODLE TERMINOLOGY.

7.3. Were the buttons suitable?

YES.

7.4. Did anything not work spatially?

NO CONCERNS.

7.5. Is there any part of this task you were unsure about or pages that made you think twice?

YES. SHE SAID IT WAS BECAUSE OF MOODLE

7.6. Any other comments? NAMES TESTED.

NONE.

8. Across all the tasks at any point did you feel you didn't understand or was not raised in any of the test scenarios that you experienced while using the app?

"LOOK LIKE SOMETHING STUDENTS COULD USE."

9. Having looked and explored a prototype companion app are there any additional features you feel would also be useful?

NONE SUGGESTED BY INTERVIEWEE.

Thank you for participating. End of User Test. ✓

Please assess the product now by ticking one circle per line.

	1	2	3	4	5	6	7		
annoying	☐	☐	☐	☒	☐	☐	☐	enjoyable	1
not understandable	☐	☐	☐	☐	☐	☒	☐	understandable	2
creative	☐	☐	☒	☐	☐	☐	☐	dull	3
easy to learn	☐	☒	☐	☐	☐	☐	☐	difficult to learn	4
valuable	☐	☒	☐	☐	☐	☐	☐	inferior	5
boring	☐	☐	☐	☐	☒	☐	☐	exciting	6
not interesting	☐	☐	☐	☐	☒	☐	☐	interesting	7
unpredictable	☐	☐	☐	☐	☐	☒	☐	predictable	8
fast	☐	☒	☐	☐	☐	☐	☐	slow	9
inventive	☐	☐	☒	☐	☐	☐	☐	conventional	10
obstructive	☐	☐	☐	☐	☐	☒	☐	supportive	11
good	☐	☐	☒	☐	☐	☐	☐	bad	12
complicated	☐	☐	☐	☐	☐	☒	☐	easy	13
unlikable	☐	☐	☐	☐	☒	☐	☐	pleasing	14
usual	☐	☐	☐	☒	☐	☐	☐	leading edge	15
unpleasant	☐	☐	☐	☐	☒	☐	☐	pleasant	16
secure	☐	☒	☐	☐	☐	☐	☐	not secure	17
motivating	☐	☐	☒	☐	☐	☐	☐	demotivating	18
meets expectations	☐	☒	☐	☐	☐	☐	☐	does not meet expectations	19
inefficient	☐	☐	☐	☐	☐	☒	☐	efficient	20
clear	☐	☐	☒	☐	☐	☐	☐	confusing	21
impractical	☐	☐	☐	☐	☐	☒	☐	practical	22
organized	☐	☐	☒	☐	☐	☐	☐	cluttered	23
attractive	☐	☒	☐	☐	☐	☐	☐	unattractive	24
friendly	☐	☐	☒	☐	☐	☐	☐	unfriendly	25
conservative	☐	☐	☐	☒	☐	☐	☐	innovative	26