Abertay University

USABILITY EVALUATION

HERIOT-WATT UNIVERSITY WEBSITE

Table of Contents

Introduction

A university landing page can sometimes be the deciding factor of a student enrolling or not. It is for this reason that usability should be at the heart of the design to provide an enjoyable user experience.

As part of the work for forming this report, a comprehensive heuristic analysis was undertaken for the Heriot-Watt University website. After completing this analysis the findings were then used as a basis for a usability test plan. This report examines these exercises noting reflections on the processes and finally providing some speculative recommendations for design changes.

Heuristic Analysis

A heuristic analysis for the Heriot-Watt University website was undertaken. This analysis was undertaken using Jakob Nielsen's 10 Usability Heuristics for User Interface Design (Nielsen, 1994).

This section will present the main findings and reflections on the process with the full analysis viewable in the appendix (Appendix A).

Main Improvement Areas

User Control and Freedom

User exit points are provided for most of the web page features. This is not executed well when users navigate to the course description pages where no exit is available without the use of the browser's back button. The lack of exit points for the user might discourage them from exploring the feature and other features on the site if they feel "stuck" in it.

Consistency and Standards

UI elements are well designed with high contrast which makes them accessible to more users. Consistency is lacking in the design of clickable cards on the page though. This could lead to confusion/frustration for the user when navigating the website.

Help and Documentation

No documentation is provided for the website which is to be expected but the implementation of a chatbot on the page which could provide useful tips would enhance the user experience. It could help users navigate around the website if they are unsure and provide useful tips. Interestingly this is implemented on the Dubai section of the website and not any other.

Reflective Analysis

When reflecting on the undertaking of the heuristic evaluation for the website there were several key points which came to mind that were particularly informative.

Firstly, it was difficult to get into the mindset of the target audience initially which is understandable given the website's domain and my current life goals. Because of this initially, I struggled with pinpointing the most important parts of the website to evaluate. Eventually, I was able to get in the mindset of a prospective student for the university which helped my critical thinking and the ability to identify usability issues in the user experience. This can prove to be highly useful in the design process as it ensures that not only the design but also the testing process starts from a user-centred perspective which lends itself to making the design more user-centric.

Another problem I faced during the testing was trying to keep an open mind and not allow bias to influence my judgment. This must be done to ensure a true user focus for the evaluation. Again, this is one thing that putting myself in the target audience mindset helped to alleviate. It helped keep my perspective centred on the user which enabled me to remove my personal bias. As an afterthought, it might have been prudent to undertake this heuristic evaluation using more than one evaluator. This would ensure that the evaluation would reach a group consensus which helps to eliminate bias, but it would also hopefully capture a wider set of design issues.

Usability Test Plan

For this design mission, a usability test plan was developed based on the findings from the heuristic evaluation of the website. The usability test plan along with the draft test script can be found in the appendices.

Reflective Analysis

One of the main challenges that was faced during the formation of the usability plan was having great attention to detail for every aspect. This will not only ensure that the users have an enjoyable relaxed testing experience but also that testing runs smoothly and there are no logistical issues. This can be accomplished through a methodical approach when planning which ensures all details are picked up in testing. You can also have your test plan peer-reviewed or conduct pilot testing to validate your plan or identify any changes that need to be made before test day.

Another challenge faced when planning a usability test is getting the right participants for the testing. It is essential that the participants in the testing adequately represent the user base otherwise you risk the results of the testing not being useful as it doesn't apply to your actual target audience. This is a key aspect which can aid in making your later design iterations more user-centric. One way to combat this is to recruit participants from locations where your target audience is known to frequent. In the instance of the usability testing for the University website a good idea would be to get your participants from high schools or online forums which might have a great deal of prospective students in them.

Recommendations

Ideally, design recommendations would be made following from the usability testing, in this case though since the plan was not implemented these recommendations are proposed based on the robust heuristic evaluation of the website.

It is recommended that each of the features on the website has well-defined exit points. The provision of plentiful exit points for the user allows these to exit processes at any time which encourages user exploration in the user experience. This also helps give users a greater sense of control and ownership over their user experience interacting with the website, this enhances user trust in the website and increases their likelihood of fond reflection and future reuse of the website (Dewra, 2023).

Improvements can also be made to the consistency of design for the UI elements. Creating consistency across the website will allow users to intuit the functionality of certain UI elements and build trust between the website and the user as they can form cognitive links and exhibit predictable behaviour (Tandon, 2023). Consistency can also go a long way to helping to reduce user frustration by exposing users to the same designs they will be able to navigate and use the website easily and quickly.

The final recommendation is the implementation of a chat assistant for the webpage. This type of feature can be particularly helpful for users who don't have much experience on the web to navigate and use the website using plain English prompts for the assistant. The assistant can then provide useful tips and links for the user to help them on their journey. This can lead to overall reduced user frustration and increased user engagement when compared to something like reading through an onboarding page.

Some preliminary sketches for the design recommendations can be found in the appendix (Appendix D).

References

Dewan, P. (2015). Words Versus Pictures: Leveraging the Research on Visual Communication. *Partnership: The Canadian Journal of Library and Information Practice and Research*, [online] 10(1). doi:https://doi.org/10.21083/partnership.v10i1.3137.

Dewra, H. (2023). *Goodbye Frustration, Hello Freedom: The Benefits of Exit Points*. [online] Medium. Available at: https://bootcamp.uxdesign.cc/goodbye-frustration-hello-freedom-the-benefits-of-exit-points-87fd8ffca060#:~:text=Exit%20points%20provide%20users%20with [Accessed 9 Dec. 2023].

Harley, A. (2020). *Proximity Principle in Visual Design*. [online] Nielsen Norman Group. Available at: https://www.nngroup.com/articles/gestalt-proximity/.

Nielsen, J. (1994). *10 Heuristics for User Interface Design*. [online] Nielsen Norman Group. Available at: https://www.nngroup.com/articles/ten-usability-heuristics/.

Tandon, A. (2023). *Consistency and standards in UX/UI design: The key to success*. [online] Medium. Available at: https://bootcamp.uxdesign.cc/consistency-and-standards-in-ux-ui-design-the-key-to-success-8392d5d56336#:~:text=Consistency%20in%20design%20reinforces%20your [Accessed 9 Dec. 2023].

Team, T. oboloo (2023). *The Power of Understanding Context: How It Can Improve Your Communication*. [online] oboloo. Available at: https://oboloo.com/blog/the-power-of-understanding-context-how-it-can-improve-your-communication-skills/.

Appendix A – Heuristic Evaluation

Heuristic Evaluation

The heuristic evaluation was carried out using Jakob Nielsen's Ten general principles for interaction design as a basis (Nielsen, 1994). Commentary will be given for each section with what success the website accomplishes each of the principals.

Visibility of System Status

Displaying the system status to the user is essential to letting a user know what action they are currently doing or which page they are on and what to do next.

The website achieves this well in its various UI elements with clear indicators such as highlights and underlines to visually indicate to the user what page they are on. UI elements act predictably when clicked or highlighted. All these facets combine to keep the user adequately informed and give them a degree of trust that the system will react in an expected way when they perform actions. This can inform them what steps they need to take next to progress their experience.

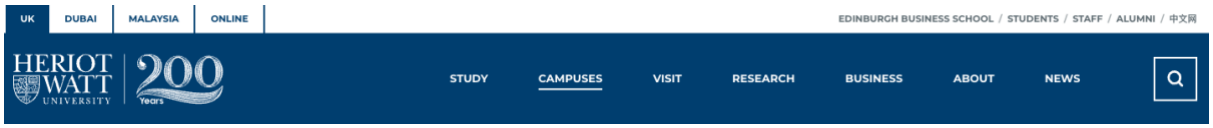


Figure 1.1 - Underlines and highlighting for active tabs

Figure 1.2 - Focus around text input when active

Match Between System and The Real World

Making a product or application feel like the real world is key to establishing a good level of comfort and familiarity for the user experience.

Navigation for the website primarily uses simple understandable “real-world” terms that most users would be familiar with outside of their knowledge of the website’s domain. This helps further the users’ sense of comfort when using the website and allows them to intuit the meanings of functions on the website for greater ease of use. Technical jargon is reserved for the sections detailing course-specific information where a user might find more use for it and no impact is felt through the generic user experience.

User Control and Freedom

User control in design allows the user to explore and use the features of the product or service freely without the thought that they are going to be stuck in some process for a long time with no way to escape. It is essential to provide the user with plentiful exit points throughout the user experience to combat this.

For the most part, the website offers users a good way to control their experience and exit from actions when they need/want to. The user can use the option on the navigations to return to pages at any time with the nav bar being persistent throughout website navigation.

The search button on the navigation bar is a good example of this. When the user clicks to search the search icon is replaced by an “X” which indicates to the user they can exit the search by clicking it. This helps positively reinforce exploring the website as the user knows they are only a click or so away from getting back to where they were before.

Figure 3.1 - Exit option for navigation bar search option

One area where it does not perform as well is when viewing the programmes on offer at the university. Once the user clicks on one of these it is quite obtuse to get back to the previous page without the use of the browser's inbuilt back button. Without the use of this, the user would need to navigate back to the home page and then back into the programme directory.

Consistency and Standards

Consistency and standards for a key part of building trust and familiarity within the user experience. This can help build valuable confidence in the user if they see familiar UI elements and know vaguely what purpose these can accomplish for them.

In terms of consistency and standards across the website, there are several noteworthy areas. Buttons have a high degree of contrast between the button colour and the surrounding background which makes these easy to identify for the user at a glance. There is a particular lack of consistency when I come to button colours, and these being linked to functions.

We can see here a white button that takes the user to learn more about a particular area on the COP28 section, which is great, the high contrast shown on the button to the background makes it stand out.

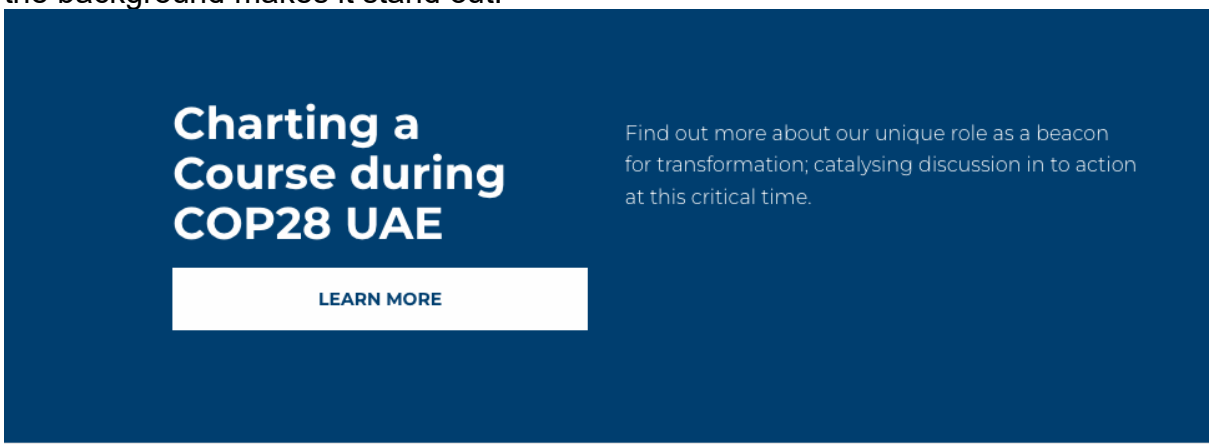


Figure 4.1 - Good Example of Button Design

If we go further down the page, however, we can see a button which accomplishes a similar function with “view more” under the news section. The button text tells the user what it does but from a quick glance, the user wouldn’t immediately associate this with this function.

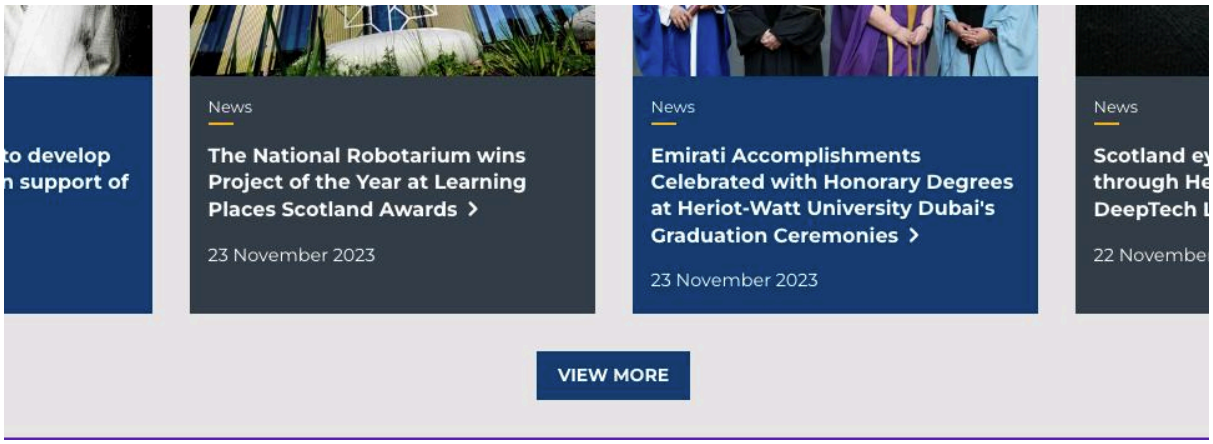


Figure 4.2 – Different Button Design on the Same Page

Another issue with button consistency comes with the button for the programme search. This is a consistent yellow colour for the UK and Malaysia pages but when the user switches to the Dubai and Online page this changes to blue. A quick glance from the user would not be able to identify that these accomplish the same action on the website.

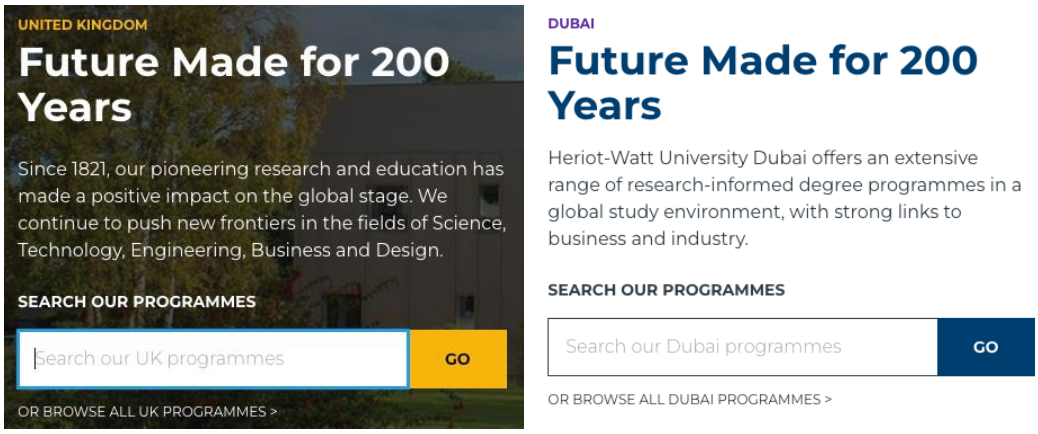


Figure 4.3 - Different Designs for Different Sections

The website also presents an inconsistent design when it comes to the clickable cards. Some of these have arrows on the left-hand side with an underscore and some don't. Some have no arrow next to the card title until the user hovers over it. This lack of consistency can lead to the user being confused and unsure of which cards are clickable and which cards aren't.

Figure 4.4 - Inconsistent Interactive Card Design

There is a Contact section located at the bottom of the page with a purple colour, whilst this does stand out and draws the user's attention the colour doesn't feature anywhere else on the website and thus the user will struggle to draw a link to this any of the other content.

The lack of consistency across the webpage can lead to a significantly increased cognitive load on the user making them unsure how to complete certain actions and possibly leading to an overall negative user experience which users might not wish to revisit.

Error Prevention

Error prevention can play a key factor in preventing or stifling user frustration with a system leading to a better experience for the user.

Due to the relative severity of an error for users on the university page, there are only a handful of error prevention measures that assist the user. These are primarily related to the programme search function. When the user begins to enter a course title, they wish to search there is an autofill suggestion box which appears below showing the users a list of the courses which contain what the user has already typed into the search box. This is good as it gives the user a glance at the university courses and lets them know they are on the right track encouraging them to explore.

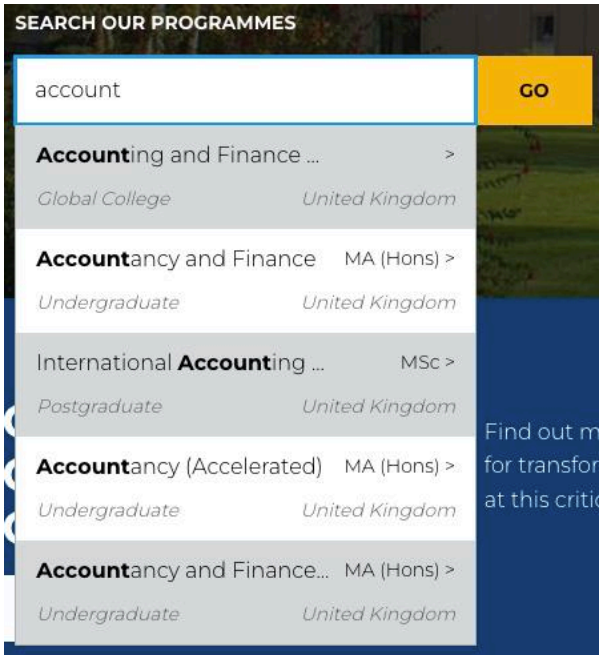


Figure 5.1 - Search Autocomplete Function

A similar suggestion bar appears when the user enters a phrase which isn't related to a course title the university offers, it clearly indicates to the user that there are no courses related to this subject offered by the university.

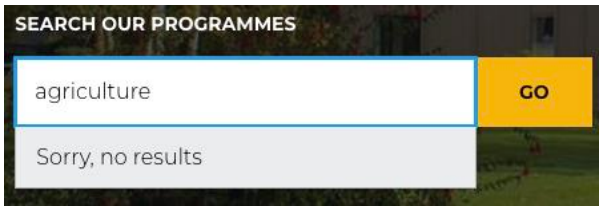


Figure 5.2 - Error Messaging for Search Bar

Recognition Rather Than Recall

This is one of the areas in which the website design does well through its use of the navigation bar and menus. Each section heading provides clear information to the user about the subject area that it will provide information on. Let's take the "Study" section of the navigation menu for example. For a prospective student looking for sections on studying at the University, this section jumps out as recognisable and probably something that one should interact with. Hovering over it brings up several options which on their own might seem confusing but with the context of the provided navigation item, these make more sense to the user and allow them to navigate to the page they want a lot easier.

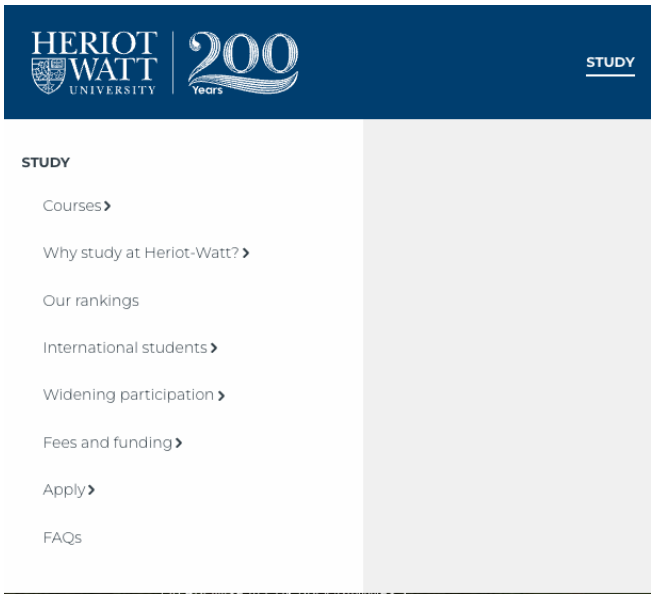


Figure 6.1 - Navigation Menu Drop-down

This is replicated throughout the navigation menu and helps to provide useful context to the user to enhance their user experience and leads to less confusion (Team, 2023). This could be furthered across the design using icons to compliment the headings, these are often easier to users to remember and recognise if they see them again (Dewan, 2015). This principle is already well implemented with the icons for the social media accounts on the webpage footer.

Flexibility and Efficiency of Use

The search function for programmes presents some flexibility and efficiency through its design. As previously mentioned, the autocomplete functions allow users to find courses quickly even with a partial entry of the course title. This provides an effective shortcut to get to course information quicker for the user. This makes the process of finding courses trivial for an experienced website user and achievable for a novice who doesn't want to find a course by reading through all the pages of courses.

One of the areas where the webpage does fail in terms of flexibility is the accessibility and language options. Other than the apparent option in the top right of the screen for the Chinese website the page does not offer any other native language translation options for the page which might be off-putting to some international prospective students looking to study at the university. There are also a few issues with the visual media on the website (no video captions or alt text for some images) which can make the user experience for someone who requires a screen reader or has audio impairment less than ideal and result in them being put off the idea of attending the University.

Aesthetic and Minimalist Design

For the most part, the website has quite a minimalist and aesthetic design with mostly relevant images and text used to convey information to the user. The colour palette is consistent across all the pages giving the website an identity which aligns with the University itself. Visuals provided relate to and strengthen the accompanying text with sections on each page evenly spaced to clearly distinguish related pieces of information on the page. This clearly illustrates to the user which parts are directly related and which are not (Harley, 2020).

Help Users Recognise, Diagnose and Recover from Errors

When the user enters an erroneous search term into the search programme feature, they are met with an error stating there are no search results and provide a suggestion. This helps keep the user informed of the error status and helps them to recover from this with a suggestion. However, it is worth noting that it is not clear that the suggestion is an interactable element for the user to click.

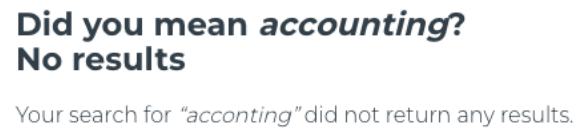


Figure 9.1 - Error Message from Search Function

Error recognition is also very well designed in the Contact Us form. If the user does not enter into any necessary fields and tries to proceed, they will be met with an error message noting the fields that are missing information as well as having a highlighted message adjacent to the field which requires user action. This aids in helping to keep the user informed of what errors have occurred and where so they can remedy them without causing added frustration to the experience.

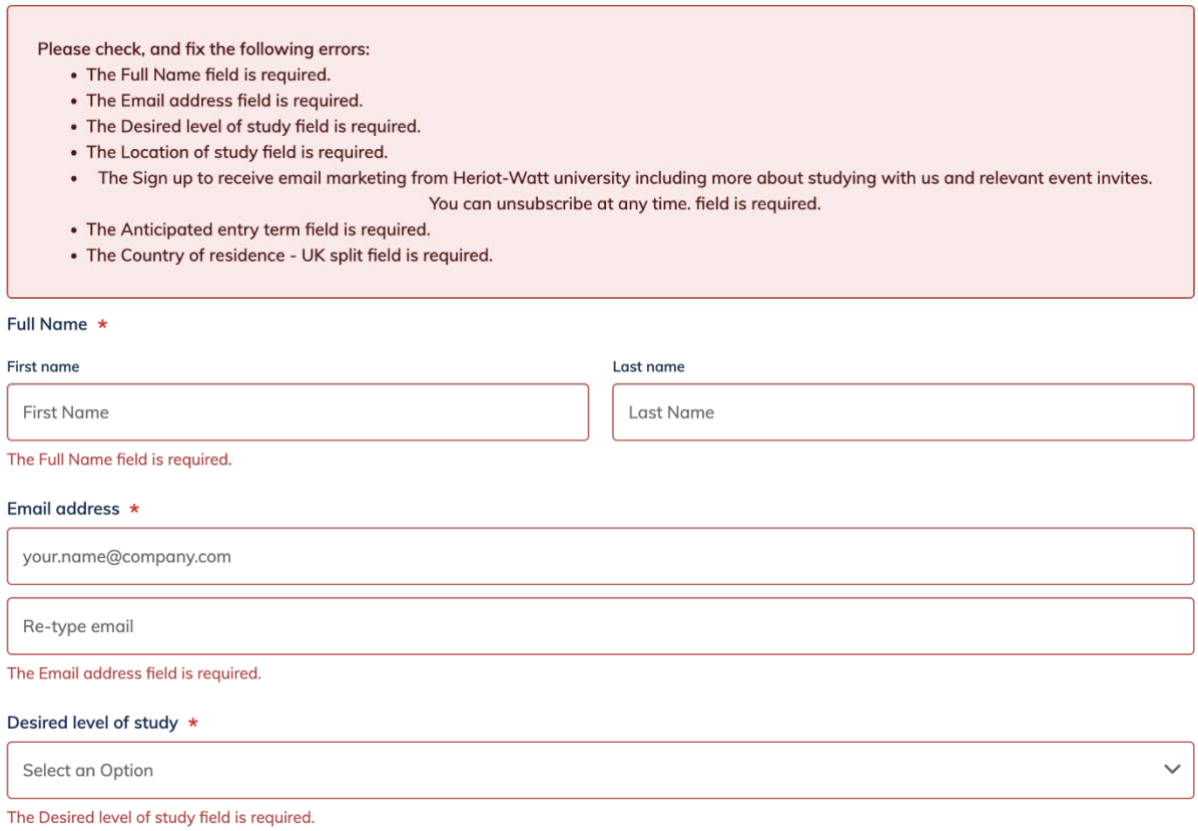


Figure 9.2 - Contact Form Error Messages

Help and Documentation

There is very little handholding is given to the user and quite a lot of responsibility for navigation and use of the site. There are no obvious “help” sections on the main site to assist users with their experience.

Interestingly the Dubai website has a chat assistant feature which can provides vital help to users in their website journey. This is a feature which allows the user to speak to an agent or chatbot in plain English to help get them to the information you need.

Appendix B – Usability Testing Plan

Usability Test Plan

This plan comprises the design of usability testing for the Heriot-Watt University website. The plan will consider the comprehensive heuristic evaluation of the website to establish the website's main target audience, set a clear objective for the testing and form a design for the usability test.

Introduction

The goal of the usability testing is to determine any insights for prospective students using the website to apply to study at the university as this was identified as the target audience in the initial heuristic evaluation.

To accomplish this the test will look to examine the ease of navigation for users, users' ability to search for courses and the accessibility for international users.

Test participants will comprise participants from the target audience as this is the group that is believed to give the most useful data from the usability testing. This data from the testing can then be used by the design team to formulate new designs to test until it is sufficiently refined to be taken into the implementation stage.

Test Methodology

The usability test itself will comprise a summative assessment which will look to gauge the usability of the website when participants undertake a set of tasks. Tests will be approximately 15-20 minutes in length though no actual strict time limit will be implemented for the participants.

The testing will focus on a few key performance indicators (KPIs):

- Task Success Rate
- Time on Task
- User Satisfaction
- Error Rate

These areas are felt to be the key areas which will give the most useful insight into the user experience.

For this testing, the user will be monitored and required to complete the testing at a designated testing facility provided by the tester. All hardware and software will be provided for the participants.

Participants

Selection Criteria

Participant selection will be aimed to be from the target audience where possible, which will allow for greater insight into the target user experience of the product. This target audience would be centred around a user persona which will have been developed during an initial research phase.

Participant Recruitment

Recruitment for the testing process will largely take place through advertisements online and attendance at high school higher education events. The aim is to have around 5 participants. This adheres to industry rules of thumb on the size of participant group for usability studies.

Testing Incentives

Liaison with the University has indicated that currently no incentives are planned for participation in the usability testing however depending on the success of the initial round of testing this might change.

Test Scenarios

Task List and Sequence

During the testing, the participants will be asked to complete the following tasks:

- Task 1 - Search for a University Programme of their choice to get some more information about it (including course description, entry requirements, fees, funding etc.)
- Task 2 - Find out when the next university open day is.
- Task 3 - Find out the term dates for the next academic year.
- Task 4 – Change the webpage language
- Task 5 - Fill out a contact form to be sent to the university for more information.

Effort has been made to keep these tasks focused on the needs of the participants but also keep them simple enough to not induce additional stress during testing. These tasks are to be completed sequentially as they appear in the list above.

Success Criteria

Successful completion of each task will be determined if the following success conditions are met:

- Task 1 – The participant successfully navigates to their chosen course page.
- Task 2 - The participant is able to see the date for the next university open day on the webpage.
- Task 3 – The participant is able to see the term dates for the next academic year on the webpage.
- Task 4 – The participant is able to successfully change the language of the webpage.
- Task 5 – The participant successfully completes the contact form and sends it.

Test Schedule

Test Timeline

The following indicative dates have been determined for each of the phases of testing:

- Preparation Phase – 12/12/2023 – 15/12/2023
- Execution Phase – 16/12/2023
- Analysis Phase – 17/12/2023 – 24/12/2023

It should be noted after the analysis phase that a further assessment as it pertains to further usability testing and design iteration is to be undertaken. After which the timelines for further testing will be established.

Test Location

The testing is to take place at the designated testing facility located at:

1 Testing Way, Testingville, T35 T1NG, UK

Pilot Testing

Pilot testing is to be undertaken during the previously mentioned Preparation Phase to ensure that the execution phase does not encounter any unexpected issues on the day.

Data Analysis Plan

Data Types

Data gathered from the usability testing will be as follows:

- Task Success Rate (Quantitative)
- Time on Task (Quantitative)
- User Satisfaction (Quantitative)
- Error Rate (Quantitative)

Data Handling

The data is to be stored by the tester securely to ensure that sensitive user data is not at risk of a breach. The data will then be accessed by a dedicated data analyst to analyse the data to determine any salient trends in the data. This data can then be used to compare to subsequent testing cycles to tangibly measure the usability performance of designs.

Reporting

Once analysed the data will then be presented in a report format to the relevant stakeholders within the design team to adequately inform the next iterations of the design. Non-technical language must be used by the reporter to ensure the analysis findings are understood by all parties.

Risks and Contingencies

Potential Risks

As with any project, there will be several risks that should be considered, and stakeholders should be aware of:

- Suitable participants are not able to be recruited.
- Hardware/Software failure during testing

Contingency Plans

To adequately deal with the risks mentioned above the following contingencies are put in place:

- In the event that suitable participants are not able to be sourced for the proposed testing date, testing should still be carried out on the day for the suitable participants sourced for the test with a secondary date proposed for additional testing. This will mean that the preliminary dates for the analysis phase will need to be adjusted to suit.
- In the event that there is a hardware or software failure during testing, it should be ensured that there is a least 2 no. free testing stations to allow participants to transfer over to if needed. If a major failure occurs (i.e. more that 2 testing stations fail) testing will be rescheduled to suit.

Appendix C – Draft Usability Test Script

General Welcome

Hello all I would like to welcome you all for coming to participate in the usability testing today. We would like you to know that we appreciate your time and energy today and hope that everyone has a great time.

Just a few housekeeping things to run over before we begin the testing.

1. Firstly, your safety and well-being are a high priority for us here so if you have any issues at all please let one of the staff know and we will try and help.
2. Secondly, we have made a note of any special requirements from the application forms if there are any that weren't noted that we should be aware of can you please make these known to your observer.
3. Lastly, there is no pressure on these tests at all, so please don't feel like you need to behave in a certain way or interact with in any way. I would like to ask all of you if you are willing to participate to fill out the consent forms provided, and your observer will then direct you over to your testing station.

Good Luck and Have Fun!

****Participants who sign the consent form are then directed to their designated testing station, those who don't consent are escorted from the testing centre****

Observer Script

The observer should ensure that the participant is comfortable and ready before proceeding with the testing once they have arrived at the testing station.

Key Advice for Observers:

- **Try to not interrupt the participants**
- **Try to not ask any leading questions**
- **Try to not give the participant any advice**
- **Note as much as possible**
- **Note time on task.**
- **Record Task Success Rate, Time on Task, Error Rate, User Satisfaction**

Thank you again very much for choosing to participate in the testing today. You will be taking the role of a prospective student who is looking to enrol at Heriot-Watt University in Edinburgh and wishes to find out more information about the course on offer and the university from their website.

You will be asked to complete a series of tasks during the test in your role as a prospective student and you should try and complete these to the best of your ability. There will be no imposed time limit on you to complete these tasks so take as long as you need to complete them.

Are you ready to begin?

Ok, for first task we would like you to complete is to choose a course title that you are interested in and use the university webpage to navigate to find out more information about the course. If you cannot find the course or cannot think of one you can ask me to give you suggestions for courses to search.

****User Completes Task 1****

Thank you for completing the task, I will now ask you a few short questions about your experience with the task before we move on.

1. On a scale of 1 to 10 (1 being difficult and 10 being easy) how did you find the navigation to complete the task?
2. On a scale of 1 to 10 (1 being not useful at all and 10 being very useful) how helpful did you find the design of the UI in completing the task?
3. On a scale of 1 to 10 (1 being impossible and 10 being very easily) how well do you think you could describe to a new user how to complete the task?

For task 2 we would like you to use the website to find out when the next university open day is?

****User Completes Task 2****

Thank you for completing the task, I will now ask you a few short questions about your experience with the task before we move on.

1. On a scale of 1 to 10 (1 being difficult and 10 being easy) how did you find the navigation to complete the task?
2. On a scale of 1 to 10 (1 being not useful at all and 10 being very useful) how helpful did you find the design of the UI in completing the task?
3. On a scale of 1 to 10 (1 being impossible and 10 being very easily) how well do you think you could describe to a new user how to complete the task?

For task 3 we would like you to use the website to find out the term dates for the next academic year?

****User Completes Task 3****

Thank you for completing the task, I will now ask you a few short questions about your experience with the task before we move on.

1. On a scale of 1 to 10 (1 being difficult and 10 being easy) how did you find the navigation to complete the task?
2. On a scale of 1 to 10 (1 being not useful at all and 10 being very useful) how helpful did you find the design of the UI in completing the task?
3. On a scale of 1 to 10 (1 being impossible and 10 being very easily) how well do you think you could describe to a new user how to complete the task?

For task 4 we would like you to use change the language settings for the website?

****User Completes Task 4****

Thank you for completing the task, I will now ask you a few short questions about your experience with the task before we move on.

1. On a scale of 1 to 10 (1 being difficult and 10 being easy) how did you find the navigation to complete the task?
2. On a scale of 1 to 10 (1 being not useful at all and 10 being very useful) how helpful did you find the design of the UI in completing the task?
3. On a scale of 1 to 10 (1 being impossible and 10 being very easily) how well do you think you could describe to a new user how to complete the task?

For task 5 we would like you to use the website to fill out a contact form with questions about additional information and send it to the university?

****User Completes Task 5****

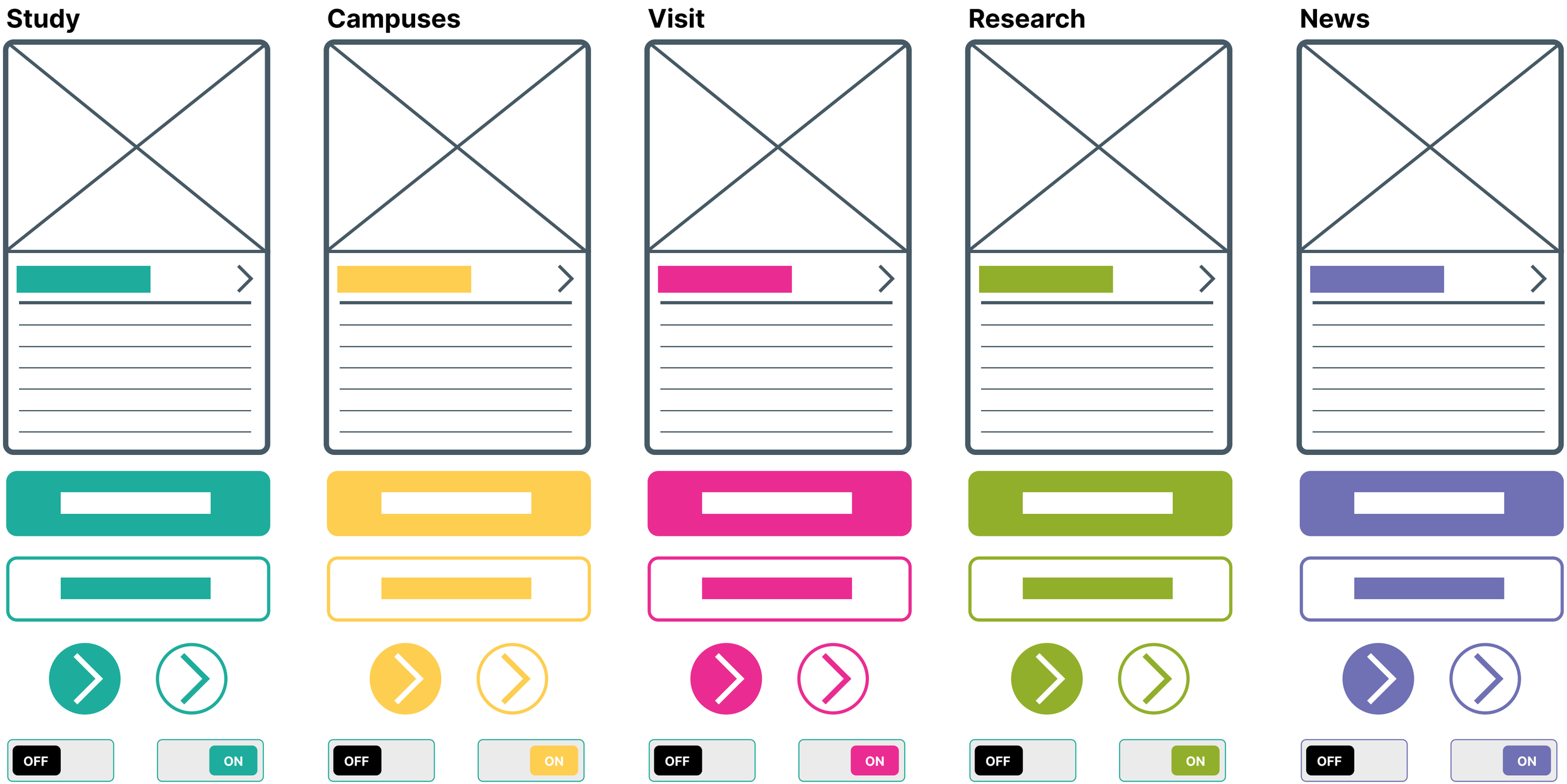
Thank you for completing the task, I will now ask you a few short questions about your experience with the task before we move on.

1. On a scale of 1 to 10 (1 being difficult and 10 being easy) how did you find the navigation to complete the task?
2. On a scale of 1 to 10 (1 being not useful at all and 10 being very useful) how helpful did you find the design of the UI in completing the task?
3. On a scale of 1 to 10 (1 being impossible and 10 being very easily) how well do you think you could describe to a new user how to complete the task?

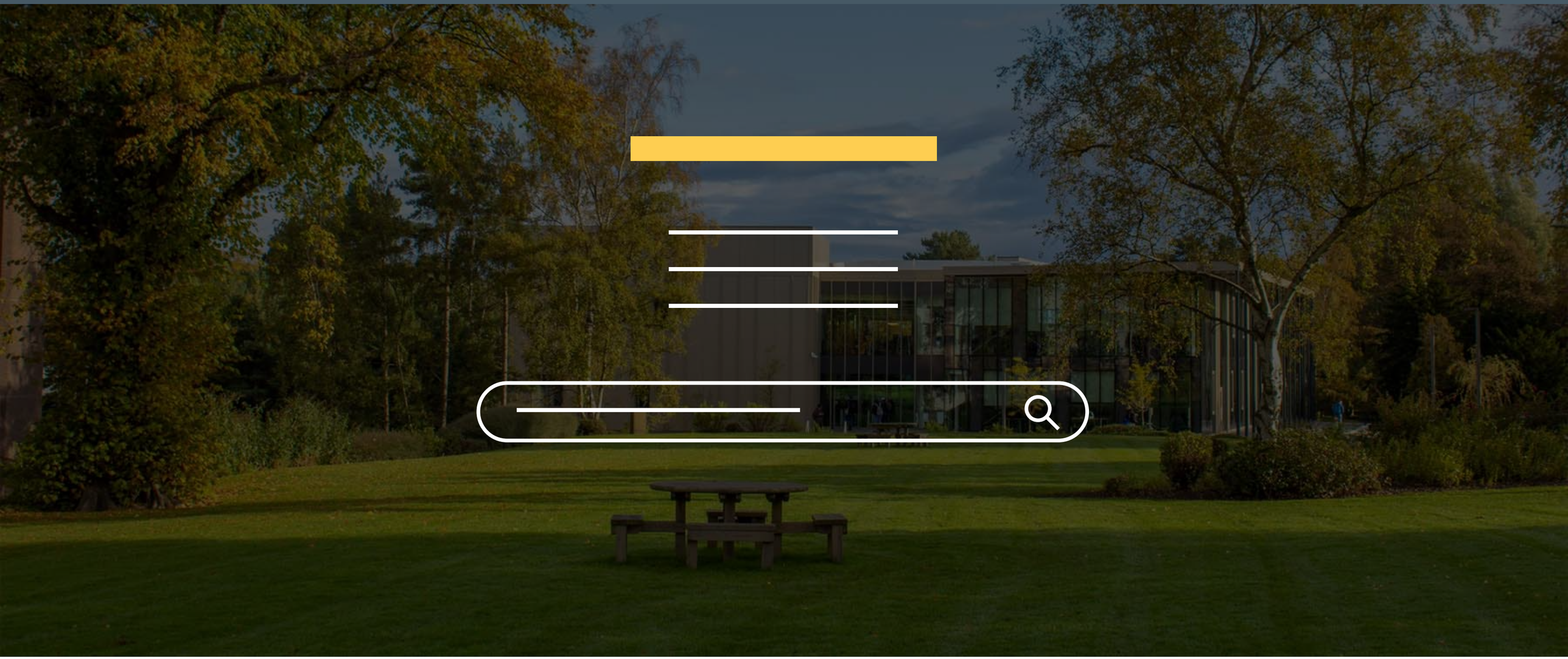
Once all of the tasks have been completed, you can thank the participant for their time and inform the participant that the testing is now finished and they are free to leave the testing centre.

Appendix D – Low Fidelity Prototype Designs

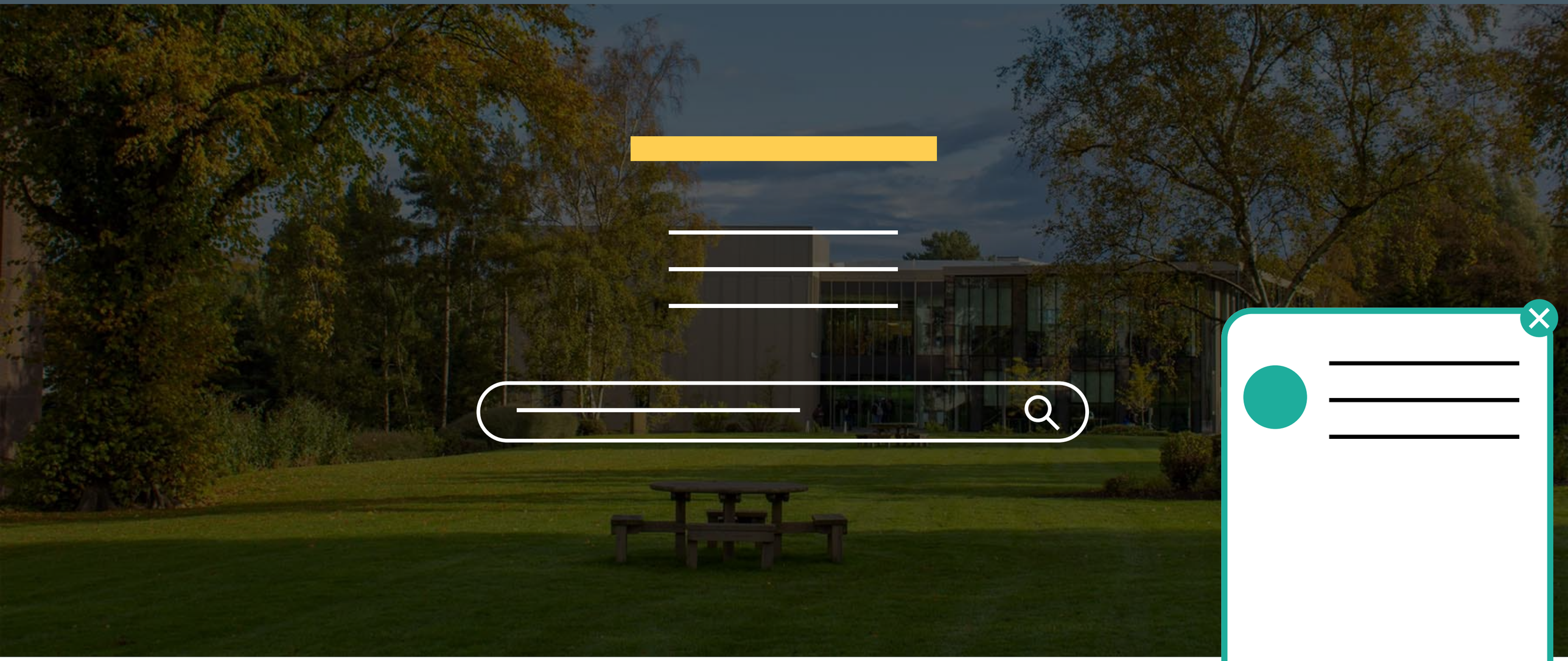
Clickable Card Designs



HERIOT WATT UNIVERSITY



HERIOT WATT UNIVERSITY



HERIOT WATT UNIVERSITY