

Optimising the Regents University Mobile App to Enhance Student Engagement, Satisfaction and Overall Student Experience

UED 707: Major Project Report

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Table of Contents

Author’s Declaration of Originality	4
Executive Summary.....	5
1. Introduction	6
1.1. Introduction of the Topic and Research Issue	6
1.2. Client Context and Problem to be Addressed	6
1.3. Context and Relevant Literature.....	6
1.4. Aim of the Project.....	7
1.5. Research Questions and Objectives	7
1.6. Report Overview	7
2. Literature Review.....	8
2.1. Student Experience in Higher Education.....	8
2.2. Student Expectations in Higher Education.....	8
2.3. Considerations for Inclusivity	10
2.4. Innovation and Trends in Designing for Higher Education	10
3. Methodology	12
3.1. Research Aim	12
3.3. Research Philosophy.....	12
3.4. Data Collection.....	12
3.5. Research Limitations	15
3.6. Ethical Considerations	15
4. UX Development.....	16
4.1. Empathise	16
4.2. Define	16
4.3. Ideate.....	18
4.4. Prototype.....	18
4.5. Test.....	25
5. Analysis and Findings	27
5.1. Phase 1 – Empathising: Interviews and Questionnaires	27
5.2. Phase 2 – Testing: Usability Tests	36
6. Recommendations	38
6.1. Key Findings and Recommendations	38
6.2. Project Contribution.....	39
6.3. Limitations and Future Study Recommendations	40

6.4. Conclusion	40
References	42
Appendices	60

List of Figures

Figure 1: Home, Calendar Overview and Shortcuts Screens	21
Figure 2: Academics Section Screens	22
Figure 3: Community Section Screens	23
Figure 4: Time Sensitive Notifications Feature, Notifications and Explore Screens .	24
Figure 5: Experience using the app (satisfaction level)	27
Figure 6: Experience using the app (engagement level)	28
Figure 7: Barriers to Overall User Experience	29
Figure 8: Drivers for overall engagement level	29
Figure 9: Desired Features Ranked	30
Figure 10: Relevance of information provided	31
Figure 11: Satisfaction with Timeliness of Information	32
Figure 12: Purpose of Using Regents App	33
Figure 13: Ranking of Relevant Information	33
Figure 14: Measurement of Overall Usability	34

List of Tables

Table 1: Prioritisation Matrix Justifications	17
Table 2: Colours - Their Uses and Justifications	20
Table 3: Additional Features and their Justifications	25
Table 4: Usability Test Objectives and Success Criteria	26
Table 5: Themes identified across Interviews and Questionnaires	31

List of Appendices

Appendix I: Research Documentation	60
I.1. Questionnaire Documentation	60
I.2. Interview Documentation	62
I.3. User Testing Documentation	65
Appendix II: Research and Data Analysis Tools	69
II.1. Data Analysis	69
II.2. User Personas	71
II.3. User Journey Maps	73
II.4. Prioritisation Matrix	75
II.5. Problem Statements	76
II.6. User Stories	76
Appendix III: Design and Development	77
III.1. Ideation	77
III.2. Wireframing and Prototyping	81
Appendix IV: Project Management and Timeline	85
IV.1. Project Gantt Chart	85

Author's Declaration of Originality

I hereby certify that I am the sole author of this Project Report and that the intellectual content of this project is the product of my own work, except to the extent that assistance from others in the conception or in style, presentation and linguistic expression is acknowledged (where applicable).

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Executive Summary

This academic report presents the process, findings, and recommendations for a client consultancy project conducted as part of the Master's in User Experience Design course at Regent's University London.

Regent's University London, founded in 1984, launched an intranet and mobile application in 2022, to address challenges students face in accessing information from multiple platforms. However, low engagement rates with the mobile application raised concerns about its effectiveness. This report adopted a user-centred approach to identify and enhance factors of the Regent's University app that influence student engagement, satisfaction, and student overall experience. The research methodology used, involved a mixed methods approach. Both quantitative and qualitative data was collected to identify application key drivers, barriers, and additionally to evaluate the impact of design elements on student outcomes. The data collection methods included questionnaires, semi-structured interviews, and usability tests. It was observed that the university mobile application had significant issues, namely a lack of timely and relevant information, difficulties with navigation, and technical reliability concerns. These were identified as key barriers affecting students' ability to engage and benefit from the application.

These findings facilitated improvements to the app's information display and architecture. Following the design thinking process, a restructured navigation system was proposed. This system prioritised essential features to improve the clarity and relevance of information displayed. Additionally, time-sensitive notifications were incorporated to show important updates immediately. Testing these improvements with participants provided mostly positive feedback. Almost all testers completed the moderated tasks without assistance. Some areas, however, were highlighted for further improvements. It was recommended to explore how notifications and secondary features could be better organised. For future studies, it is also important to consider the value of seamless integration with multiple university platforms to ensure a better student experience.

This report contributes to UX design and educational technology through its approach to navigation, notifications, academic and social features into educational apps. It also shows the value of user-centred, adaptive design in improving engagement and satisfaction across fields in healthcare, business, and other personalised learning environments.

1. Introduction

1.1. Introduction of the Topic and Research Issue

The use of digital tools in modern day higher education environments is increasingly becoming crucial to improving the overall student experience (Selwyn, 2016; Krause, 2005). Regents University London, known for its high student satisfaction (Regents University London, 2023b), aimed to achieve these goals by centralising access to administrative and academic information, through their latest mobile app launched in 2022 (Regents University London, 2021). However, the app engagement levels remain low. This research project seeks to understand the gap between the app's intended purpose and its actual impact, giving insight into the decreased engagement.

1.2. Client Context and Problem to be Addressed

Regents University London, was established in 1984, located in Regent's Park, London. The university prides itself on delivering personalised education through interactive classes, workshops, and industry placements (Regents University London, 2023a), maintaining high levels of student satisfaction as a core element of its operational strategy (Regents University London, 2023b). Like in many other universities around the world, Regent's students have to find and access information from multiple sources to manage and conduct tasks that are required for their academic responsibilities. This is challenging for students, as they are often not aware of some of the platforms available, let alone knowing where to find them (Regents university, 2021). Having understood this issue, Regents conducted research on what students needed to optimise their student experience.

As a result of their research, in 2022, the intranet was created as a central communication hub and link to all the different platforms available to students. Along with this, the current mobile app was launched, giving students convenient mobile access to important information, including access to the intranet. Despite these efforts, the university noticed low engagement levels on the intranet through the app. This raised questions about the effectiveness of the app in meeting student needs and expectations. Initial observations suggested that there was a disconnect between the university's intended use of the app and student's expectations and experience. To improve the app's ability to fulfil its intended role as a convenient communication and information retrieval tool, it is necessary to understand why students use the app and what they would want to use it for.

1.3. Context and Relevant Literature

The growing significance of digital platforms in higher education frames the context of this study. Student life is significantly impacted by the diverse academic, social, and cultural aspects within the university (Ciobanu, 2013). It requires students to be independent and make decisions in an environment that often seems unstructured (Kember, 2004). Research shows that students struggle to meet university expectations for handling administrative tasks while managing information from various sources. This often leads to increased stress and decreased engagement. (Pechenkina et al., 2017; Chen & Denoyelles, 2013). Upon further investigation, it is seen some of these negative effects can be mitigated by the effective use of mobile

applications. Literature shows how digital tools positively impact student engagement. By providing easier access to learning materials, enabling real-time communication, and supporting collaborative learning practices, the experience and satisfaction of students are greatly improved (Krause, 2005; Pechenkina et al., 2017). Additionally, challenges such as information and cognitive load must also be addressed to further enhance usability and satisfaction (Sweller, 1988; Leroy, 2011). To improve the student experience, innovative trends in educational app design such as gamification, AI-driven customised learning, and social elements are essential to consider (Deterding et al., 2011; Junco, 2012). To meet the different needs of the student body, it is important that app designers also prioritise inclusivity, accessibility, and ethical considerations in their work (Clarkson et al., 2013).

1.4. Aim of the Project

The primary aim of this project is to identify and enhance the factors influencing the Regents University mobile app to improve student engagement, satisfaction, and overall experience. By optimising the app's features and functions, the project aims to transform it into an effective central tool for communication and information retrieval, thereby enhancing the overall student experience at Regents University.

1.5. Research Questions and Objectives

This project seeks to answer the following research questions and objectives:

RQ 1: What factors of the Regents University app effect engagement, satisfaction, and student experience?

RQ 2: How can the Regents University app be optimised to improve engagement, satisfaction, and student experience?

To help answer the research question, the following research objectives were created:

RO1: Identify key drivers for app usage.

RO2: Identify and address barriers to app usage.

RO3: Assess the app's impact on engagement and satisfaction.

RO4: Assess the app's role and design in the overall student experience.

1.6. Report Overview

The report begins with literature review which establishes the role of digital tools in higher education. A methodology section follows, outlining the research approach. The UX Development section then explains each stage of the design thinking process, outlining how they informed the app's redesign. Primary research findings and analysis are then presented, alongside a discussion of their implications to the UX development process. Finally, the conclusion provides a summary of valuable insights and recommendations observed throughout the project, suggesting future study areas.

2. Literature Review

2.1. Student Experience in Higher Education

Improving the student experience has become very important for higher education institutions. This importance is driven by the development of rankings, informed by student experience, performance and quality metrics. (Buultjens & Robinson, 2011; Shah & Richardson, 2016). The term "student experience" in higher education has a broad range of definitions. However, it is generally understood as the totality of a student's interactions with their institution, both online and offline (Jones, 2018; Callender et al., 2014; Crane et al., 2016; Henry, 202). It extends beyond purely academic learning to include all facets of campus life (National Survey of Student Engagement, 2015; Tan, Muskat & Zehrer, 2016).

The student experience in higher education is multifaceted. It covers academic learning methods, organisation, and quality (Divaris et al., 2008; Lapina et al., 2016); interactions within the university community (Henry, 2021; Wallace, 2003); student support services (Buultjens & Robinson, 2011; Hill et al., 2003); identity, personal and professional development (Daniels & Brooker, 2014; Barbarà-i-Molinero, Cascón-Pereira, & Hernández-Lara, 2017); and extracurricular activities (Buckley & Lee, 2021). Additionally, it is dependent on student satisfaction and engagement, which are crucial in shaping how students perceive their time at university (Matus, Rusu, & Cano, 2021). All these factors make the difference between student retention and withdrawal (Croxon & Maginnis, 2006; Kantanis, 2000; Lawrence, 2002).

Student satisfaction is the fulfilment of outcomes throughout the student experience based on expectations (Weerasinghe & Fernanfo, 2017). Student engagement, defined as the depth and quality of students' active involvement with their educational environment (Krause & Coates, 2008), significantly influences their satisfaction. Studies show a strong positive relationship between engagement and satisfaction, irrespective of the direction of causation (Kandiko & Matos, 2021). Each aspect of the student experience crucially shapes student engagement, satisfaction and perception of their educational journey (Jones, 2018) Studies have shown that 'satisfaction had a greater influence on [academic] performance than performance had on satisfaction' (Bean & Bradley, 1986).

2.2. Student Expectations in Higher Education

Students desire a supportive and engaging higher education experience that prepares them for future careers while accommodating personal needs. They expect value for money, quality learning environments, effective teaching, a sense of community, and access to necessary facilities and resources. (Voss, Gruber & Szmigin, 2007; Kandiko & Mawer, 2013) Additionally, variations in gender, socioeconomic background, age, prior education, ethnicity, and student status: such as being part-time or full-time, undergraduate or postgraduate, significantly influence these expectations and experiences (Crane et al., 2016; Edwards, 2011; Levine 1993; Shank, Walker & Hayes, 1996), affecting how they value different aspects of university life (Palmer, 2010).

To attract students, better serve their needs, and retain them, Institutions must proactively understand students' higher education expectations and perceptions of service quality. They often need to adapt techniques for measuring the quality of their services just like in the business sector (Nadiri, Kandampully & Hussain, 2009) Some studies have put forward frameworks for creating teaching and learning curriculum factoring students' course expectations. These frameworks encourage students to be more interested in learning, promoting feelings of ownership and collaboration in the learning experience (Stevenson, Sander, & Naylor, 1996; Stevenson, Sander, & Naylor, 1997).

2.2.1 Challenges of the Student Experience

As higher education students increasingly rely on digital tools that support their experiences. Managing information from multiple sources can overwhelm their cognitive capabilities. This leads to decreased engagement, increased stress, and diminished performance and mental health (Chen & Denoyelles, 2013; Eppler & Mengis, 2008). Applying Cognitive Load Theory (CLT) principles help identify and minimise these unnecessary cognitive burdens, thus enhancing usability, engagement, and satisfaction (Sweller, 1988). There is debate about whether educational apps should offer comprehensive solutions or be purpose-specific based on the simplicity of the experience (Lee & Sloan, 2015; Chen, 2022). While introducing centralised platforms can improve satisfaction and performance (Johnson et al., 2014), The quality of the user experience is critical. 96% of students find a high-quality digital experience important to their digital satisfaction (Accenture, 2021). Studies show that well-designed apps enhance user experience and reduce anxiety, whereas poorly designed ones can increase stress and hinder achievement (Bakker et al., 2016; Lee & Xiong, 2022). Models such as SERVQUAL could be adapted to measure whether the quality of an educational app's features is satisfactory (Krsmanovic, et al., 2014). SERVQUAL assesses dimensions such as reliability, assurance, tangibles, empathy, and responsiveness, all of which are important in evaluating the effectiveness and satisfaction of a quality service delivery (Parasuraman et al., 1988).

New generations of students expect highly personalised experiences with seamless integration with tools from other educational platforms (Seemiller & Grace, 2015; Educause, 2020). There are key factors that influence how student adopt and use mobile apps. They include the perceived usefulness, ease of use, and the relevance of the app's features to their academic needs (Cheon, Lee, Crooks, & Song, 2012; Davis, 1989). We also need to consider the more hedonic, Impulsive mindset adopted on mobile phones compared to the more focused and rational mindset associated with laptop use (Brasel & Gips, 2014; Lin & Huang, 2016, Park & Gretzel, 2010). On mobile phones, users are more likely to be distracted by notifications, which can impact their ability to process information deeply (Leroy, 2009). Additionally, users experiencing heightened emotions are less likely to perform tasks better on mobile devices than on laptops. This decreased performance can negatively affect their level of trust in mobile devices. (Neerincx & Streefkerk, 2003) Understanding these behavioural differences is crucial for designing educational apps that cater to students' specific contexts and usage patterns.

2.3. Considerations for Inclusivity

Inclusivity and accessibility are important to accommodate the diverse needs and expectations of all student groups (Lister et al., 2022). Inclusivity in higher education means creating a learning environment where all students, regardless of their backgrounds or abilities, can participate fully and equally (Gale & Mills, 2013; Clarkson et al., 2013; Coleman, Keates & Lebbon, C., 2003). Creating flexible interfaces that can be customised to individual learning styles and providing multilingual content are good steps to take (Shneiderman, 2000). To avoid excluding any student groups studies suggest that there should be deeper integration of accessibility into the software development lifecycle (Burgstahler, 2010). While accessibility standards like the Web Content Accessibility Guidelines (WCAG) help make learning platforms usable to various users (Bocevaska et al., 2018), some researchers think they often fail to keep pace with technological advancements and diverse user needs (Lazar et al., 2015). Frameworks such as the Universal Design for Learning (UDL), which support the creation of educational environments that accommodate individual learning differences. This is so that learning materials are accessible and appropriate for students with diverse neurological profiles and cultural backgrounds (Meyer, Rose, & Gordon, 2014; Gay, 2010; Armstrong, 2012).

Additionally, ethical considerations need to be considered in educational institutions app design. With the increasing use of digital tools, there is a more concern about how student data is collected, stored, and used (Kyritsi et al., 2019). Any usage of student data other than for their educational needs can lead to a violation of privacy which breaks student's confidence and trust in digital tools (Sabourin et al., 2015). Developers need to ensure data privacy, address concerns about data misuse (Cavoukian, Taylor & Abrams, 2010) and possibly reduce how much they rely on digital platforms to maintain students' safety (Selwyn, 2016). These considerations show the complexity of designing educational apps that are not only functional and engaging but also ethical and inclusive of all learners.

2.4. Innovation and Trends in Designing for Higher Education

As the field of educational app design evolves, new innovative trends promising to improve the learning experience continuously emerge. Gamification has become a popular way to engage users (Darejeh & Salim, 2016). By including game elements such as points, badges, and leaderboards, learning activities become more enjoyable and rewarding enhancing engagement (Deterding et al., 2011). Studies show that students who engaged in gamified learning activities showed higher levels of motivation, participation, collaboration, and performance (Antonaci et al., 2019). However, when these external rewards are emphasised too heavily, they may undermine the intrinsic enjoyment and satisfaction that comes from learning itself (Deci, Koestner & Ryan, 1999).

In addition, emerging technologies are also making significant impacts; AI (Artificial Intelligence) and data analytics enhance personalisation by adjusting content and challenges in real time based on feedback to boost learning efficacy (Gligorea et al., 2023; Luckin, 2016; Murtaza et al., 2022). Augmented Reality (AR) and Virtual Reality (VR) technologies are also revolutionising the way students interact with educational content. They create immersive experiences that improve understanding and engagement in complex subjects like medicine and engineering. (Radianti et al.,

2020). However, it is important to consider the high costs and technical challenges associated with AR and VR implementation, as this can be problematic for institutions (Akçayır & Akçayır, 2017; Gasteiger et al., 2022). Regardless, these trends will continue to evolve as the need for immersive, engaging and readily available education rapidly grows (Janssen et al., 2016).

Educational apps are also integrating social features such as forums and peer feedback to promote collaborative learning (Blau & Shamir-Inbal, 2018). They have been found to encourage feelings of connectedness and overall well-being among students, positively impacting academic performance and social interactions (Junco, 2012). Nevertheless, while digital interactions are great additions, they should not replace the importance of face-to-face interactions, as students still prefer the latter (Turkle, 2015; Dziuban et al., 2018). Additionally, stress management and mindfulness tools are becoming popular to address the holistic needs of students (Firth et al., 2019; Bakker et al., 2016). These tools help reduce stress and anxiety, improving student engagement, academic performance, and resilience (Baumgartner & Schneider, 2023). These trends and developments show a shift towards more supportive educational platforms that are interactive and personalised, catering to the diverse needs and well-being of students.

3. Methodology

3.1. Research Aim

The aim of this research is to gather and analyse data to understand and optimise the Regents University mobile app. This section outlines the approaches used to achieve the overarching goal of the project. By using a combination of qualitative and quantitative research methods, the research can provide a better understanding of student needs and app usage (Almalki, 2016).

To achieve the research aim, the following research questions will be explored:

- What factors of the Regents University app effect engagement, satisfaction, and student experience?
- How can the Regents University app be optimised to improve engagement, satisfaction, and student experience?

These research questions will guide the research and was created to achieve the following objectives:

- Identify key drivers for app usage.
- Identify and address barriers to app usage.
- Assess the app's impact on engagement and satisfaction.
- Assess the app's role and design in the overall student experience.

3.3. Research Philosophy

This research project uses an Interpretivism philosophy, as it emphasises understanding the context in which people operate from their point of view (Schwandt, 1994; Hudson & Ozanne, 1988). Interpretivism uses qualitative methods, which will help with the project goal and is ideal for exploring how students interact with and perceive the mobile app within their educational environment (Myers, 2013). This allows for a deeper understanding of the distinct factors influencing student engagement and satisfaction, which are important for developing improvements to the app, thus tailoring the app to better meet student needs (Orlikowski & Baroudi, 1991; Schwandt, 1994).

Given our interpretivist philosophy and goal, a mixed methods approach of inductive and deductive approaches is used. The inductive approach usually involves qualitative research where new theories, themes and patterns are generated based on observed data (Gabriel, 2013; Fu, 2011; Denzin & Lincoln, 1996). While the deductive approach typically involves quantitative research, which aims to test existing theories, and hypotheses or answer research questions (Gabriel, 2013; Maher, Markey, & Ebert-May 2013). By using a mixed methods approach, the research can benefit from the strengths of both qualitative and quantitative data, providing a comprehensive understanding of the research problem.

3.4. Data Collection

Data Collection was done in two phases. Phase 1) the empathising phase, which included Questionnaires and Interviews, and Phase 2) the testing phase, which

focused on collecting data through usability testing. Additionally, the research looks at a diverse group of students at Regents University so that the insights across all segments of the student population are applicable (Baxter & Sommerville, 2011; VanVoorhis & Morgan, 2007). The target group includes undergraduate and Postgraduate Students, as well as considering:

- All Ages
- All Genders
- International and Domestic Students
- Full-time and Part-time Students

3.4.1. Questionnaires

Questionnaires were shared in student chat groups to collect primary quantitative data on app usage patterns, satisfaction levels, and perceived usability. This method was chosen for its efficiency in gathering broad and statistically significant data from a large sample of students (VanVoorhis & Morgan, 2007), providing a comprehensive overview of how the app is currently being used across the student body (Mertens, 2014; Marczyk et al., 2005).

A stratified random sampling method was used to ensure that the sample accurately represents the diverse student population, covering the various demographics mentioned previously (Etikan & Bala, 2017). This approach improves the generalisability of the findings by ensuring that all subgroups within the student body are properly represented (Aoyama, 1954). The aim is to collect responses from at least 50 students, which is considered sufficient to provide statistically significant data (VanVoorhis & Morgan, 2007; Mertens, 2014).

The questionnaires were designed (Appendix I.1.1.) based on literature (Section 2) and best practices in survey design to avoid biases (Draugalis et al., 2008), including social desirability bias (Chung & Monroe, 2003), ensuring accurate responses. The questions help determine the frequency of app use, rank specific features, measure overall satisfaction, and collect suggestions for improvement. This design addresses our research questions and objectives by focusing on the target group's experience with the app, ultimately ensuring the identification and enhancement of the most important features for students.

The questionnaires were sent using Qualtrics (Qualtrics, 2024), which is also where the data was collected and stored. The data analysis involved statistical methods to identify trends, correlations, and significant differences within the collected data (Appendix II.1.1.). Qualtrics has a built-in data analysis tool which was used for this purpose (Qualtrics, 2024), allowing for detailed analysis and interpretation of the quantitative data (Section 5).

3.4.2. Semi-structured Interviews

Semi-structured interviews were conducted to gather primary qualitative data (Magaldi & Berler, 2020), and a deeper understanding of the quantitative data collected from the questionnaires (Creswell & Clark, 2017). Therefore, the questions are partly designed based on the responses received from the questionnaire (Appendix I.2.1). They focus on understanding the "how" and "why" behind students' responses, providing deeper insights into their experiences, expectations, needs,

and pain points (Rubin & Rubin, 2011). Additionally, this method is chosen for its flexibility, allowing the exploration of new topics as they arise during the conversation (Kvale & Brinkmann, 2009), allowing for richer and detailed insights into the factors influencing student engagement, satisfaction, and overall app usage (Bryman & Bell, 2007).

A purposive sampling method is used to select a diverse range of students (Appendix I.2.2.), ensuring representation across the chosen target group (Palinkas et al., 2015). This approach aims for data saturation, typically achieved with about 6-10 participants (Bryman & Bell, 2011), to ensure enough coverage of perspectives and experiences. As the interviews were conducted online, the research materials and all interactions during the interviews with participants is documented through audio recordings, along with transcriptions (Appendix I.2.3), to ensure accuracy and reliability in data collection.

Data from the interviews was analysed using thematic analysis (Appendix II.1.2.), which involves coding the data and categorising themes, this helps identify and interpreting patterns (Braun & Clarke, 2006). This process helped draw new insights and connections to the research questions and objectives in a simple and flexible manner (Section 5). However, we must consider that this approach might overlook specific responses in favour of identifying generalised themes.

3.4.3. Moderated usability Testing

Moderated usability tests were conducted to validate insights from Phase 1 (Nielsen, 1994; Dumas & Redish, 1993). This involved testing and observing students interacting with an iterated high-fidelity prototype (Appendix III.2. and Section 4.4.), created based on insights and conclusions (Section 5). Usability testing was also important for identifying specific usability issues and getting feedback on the whole user experience. This allowed improvements based on observed interactions and user responses (Nielsen, 1994; Dumas & Redish, 1993).

The usability tests were done through task designed to mirror typical interactions students could have with the app (Dumas & Redish, 1993; Nielsen, 1993). These tasks were created based on insights identified in previous research, ensuring they are relevant to everyday student activities and the research objectives (Rubin & Chisnell, 2011). This approach allows for optimisation based on actual user needs and behaviours, leading to a more satisfactory and engaging app (Norman, 2013).

To ensure a comprehensive understanding of user experience challenges across the chosen target group, usability sessions were originally planned to be conducted with six participants. This number is considered sufficient to identify approximately 85% of usability problems (Nielsen & Landauer, 1993). Though, due to time constraints only four participants were tested.

Research materials used for the test include participant information sheets and detailed task instructions (Appendix I.3.1. and I.3.2.). During the interactions with participants, video and audio recordings were made, along notetaking, to ensure accurate and comprehensive data collection (Appendix I.3.3. and I.3.4.).

Data analysis of the usability tests will involve both quantitative and qualitative methods (Creswell & Clark, 2017). Quantitative metrics such as error rates will be

recorded, while qualitative feedback will be gathered through user comments and observations (Nielsen, 1993). This mixed-methods approach will provide a detailed understanding of usability issues (Creswell & Clark, 2017).

3.5. Research Limitations

Research limitations were considered such as reliance on self-reported data in interviews and questionnaires, as there might be biases, such as social desirability bias (Nederhof, 1985). Additionally, the qualitative data can't be generalised because of the smaller, purposive sample (Etikan & Bala, 2017; Mertens, 2014). Participants might also not elaborate as much in online interviews, affecting the depth of insights gathered (Janghorban, Roudsari & Taghipour, 2014). Conducting the usability test is not the same as the real world, so it cannot capture real-world app usage (Barnum, 2010). Additionally, using a mix methods approach might make it difficult to combine qualitative and quantitative data in a way that makes sense (Creswell & Clark, 2017). Because of the small sample size for usability tests, there's a chance of missing less common usability issues (Nielsen & Landauer, 1993). Lastly, time constraints and participant availability could affect the breadth and depth of data collected (Tracy, 2019). Considering these limitations, it is important to interpret the finds and suggestions for further research carefully.

3.6. Ethical Considerations

Ethical considerations were addressed by getting consent from all participants and making sure that they understand their right to stop at any time. Ethical approval for the study was obtained through Regents University's ethics committee.

4. UX Development

The UX development process undertaken is grounded in the design thinking lifecycle. Design thinking is a human-centred approach to design that combines the needs of people, what technology is capable of, and the requirements for a business to be successful (Brown, 2008). This iterative process consists of five phases: Empathise, Define, Ideate, Prototype, and Test (Interaction Design Foundation et al., 2021). This approach ensures that the development process remains focused on the user's needs and allows for continuous feedback and improvement (Gould & Lewis 1985.). Throughout this section of the report, each life cycle phase will be explained, including what they are, what was done, and how they were used to assist with the project.

4.1. Empathise

The empathise phase centred around gaining a deep understanding of users' experiences and motivations through direct interaction and observation (Kujala, 2003). Here the focus was on understanding student needs and challenges through both qualitative and quantitative data, which was sourced from primary or secondary research (Creswell & Plano Clark, 2011; Saunders et al., 2009), forming the basis for informed design decisions (Kolko, 2010).

Secondary research was conducted by reviewing existing literature (Section 2), which provided context, current trends, and gaps in existing studies (Randolph, 2009). This helped guide and develop our methodology (Section 3) for primary research. Primary research data was then analysed (Section 5) and used to create detailed user personas and user journey maps.

User personas were created to represent different user types that might use a service or product in a similar way (Pruitt & Adlin, 2010). They helped in making informed design decisions by focusing on the needs, goals, and observed behaviour patterns of students (Adlin et al., 2006; Cooper et al., 2014). Two user persona groups were created (Appendix II.2.), one for undergraduates and another for postgraduates, as our data analysis showed the most significant differences between these two groups.

User journey maps are a visualisation of the steps a user takes to accomplish a specific goal (Richardson, 2010). They are helpful in recognising pain points and opportunities for improving the overall user experience (Howard, 2014). Following the creation of personas, user journey maps were developed for each persona (Appendix II.3.), to capture the different experiences and challenges faced by each group (Walter, 2022).

4.2. Define

The Define phase is where insights from the empathise phase were used to pinpoint core problems (Interaction Design Foundation et al., 2021; Liedtka, 2015). This phase helps to keep the project on track and focused on the most relevant issues, that way effective and user-centric solutions are created (Brown, 2008).

Many insights were identified during data analysis, so it was necessary to prioritise the most critical issues due to time and technical constraints. A prioritisation matrix was used for ranking these insights based on their impact on students and the ability to implement them within the project's scope and time (Appendix II.4. and Table 1) (Plattner, Meinel, & Leifer, 2011). Doing this allowed for informed decisions to be made about the most pressing needs, ensuring that user satisfaction and engagement are a priority (Kujala, 2003).

Feature/Element	Justification for Prioritisation	Impact	Effort
Navigation (Ease of Use)	High usage requires efficient navigation, as navigation directly influences the frequency and ease with which students can access information (Nielsen, 1999.).	High Impact	Low Effort
Information Display (Clarity)	Clear information display enhances usability and supports the understanding of important content, improving the overall user experience (Tufte, 1991).	High Impact	Low Effort
Relevance of Information	Relevant information is important for student engagement (Saeed, Yang, and Sinnappan, 2009). However, personalised features are complicated and require more time to create.	High Impact	High Effort
Technical Issues - Frequent Logouts	Frequent logouts are a significant technical issue that disrupts the user experience for students. While critical, it is beyond the project's scope to resolve technical issues.	High Impact	High Effort
Important Updates	Ensuring timely updates is vital for student satisfaction (Chickering, and Gamson, 1987), and it is less complex to implement in the prototype, thus given priority for quick wins.	Low Impact	Low Effort
Platform Integration	Integrating with other platforms is a much requested feature and important for academic support but involves significant development work, making it a high-effort task.	High Impact	High Effort
External Links and Web Responsiveness	While external links are necessary for comprehensive access, their importance is lower than core app features, and responsiveness is challenging to address.	Low Impact	High Effort
Student Support Features	These features are valuable for improving student quality of life but are not critical. They are nice-to-haves that were suggested and enhance the experience but aren't essential.	Low Impact	Low Effort

Table 1: Prioritisation Matrix Justifications

Problem statements (Appendix II.5.) were created using insights from the prioritisation matrix, user personas, and journey maps. Problem statements are short descriptions of the issues needing to be addressed, so that the design solutions are relevant to users (Howard, 2014; Kolko, 2010). The main issues faced by undergraduate and postgraduate students are difficulties in navigating the app and the need for clear and relevant academic and social information.

User stories (Appendix II.6.) were created to convert the problem statements and findings into actionable requirements. They are simple descriptions of a feature or functionality from the perspective of the end user (Cohn, 2004). These stories were

helpful in guiding the next phases, so that the solutions created were directly aligned with user needs (Cohn, 2004; Pruitt & Adlin, 2010).

4.3. Ideate

The Ideation phase encourages creativity and generates a large number of ideas to address the problems defined in the define phase (Brown, 2008). This phase involved coming up with creative solutions and ideating on the app's information architecture. This ensured that the final solutions were user-centric, laying the groundwork for the prototyping phase (Brown, 2008; Tschimmel, 2012).

Ideation began with the formulation of "How Might We" (HMW) questions based on the problem statements and user stories (Appendix III.1.1.). HMW questions are short prompts that helped reframe the project's problems into opportunities for improvement during ideation exercises (Siemon et al., 2018). They were helpful with coming up with creative solutions and directing the brainstorming process (Brown, 2008). These HMW questions were grouped into themes and rapid brainstorming was conducted to generate as many ideas as possible in a 5-minute timeframe per theme (Appendix III.1.2.), encouraging quick thinking and creativity (Osborn, 1953). This technique helped the team cover a wide range of potential solutions, which were narrowed down through voting, ensuring a democratic selection process for the best solutions (Osborn, 1953).

Finally, the last activity conducted during the ideation phase was site mapping (Appendix III.1.3.). A site map is a visual representation of an app's information architecture, showing how different pages and features are organised and interlinked (Rosenfeld & Morville, 2002). Considering that the analysis revealed poorly labelled and non-prioritised layers of navigation, creating a site map of the current app was assisted in identifying these layers of navigation and all existing functionalities. To address these issues, the site map was restructured to enhance the app's usability by ensuring that essential features, such as academics and community information, were easily accessible and logically organised according to user needs and priorities.

4.4. Prototype

The prototyping phase focused on translating the ideas created into visual representations for all stakeholders involved (Kocsis, 2020). This involves using both low-fidelity and high-fidelity prototypes, such as wireframes and mock-ups, in different stages of the development lifecycle (Houde & Hill, 1997). The quality and ability to implement of the proposed solutions are then evaluated, ensuring they match business objectives and solve user needs (Baulmer et al., 1996).

The wireframes (Appendix III.2.1) were designed to address the basic layout and functionality of the solution (Garrett et al., 2011). When presented to the clients, no revisions were made, but they emphasised the importance of the final prototype aligning with the university's branding. The mock-ups (Appendix III.2.2) were then created to provide a comprehensive end-to-end flow, allowing the features to be tested with users (Schrage, 1999).

4.4.1. Navigational Changes and Information Architecture

To address the poorly organised information and features in the original app (Appendix II.5), the navigation system was redone. This was done by giving easy access to information relevant to students, using primary and secondary navigation bars (Appendix III.1.3). The primary navigation bar, located at the bottom of the screen, has quick access to the most important sections of the app: Home, Academics, Community, and Explore. The biggest additions to the primary navigation being “Academic” and “Community” (Figure 1). These categories were made based on research findings showing that post-graduate students prioritise easy access to academic information, while undergraduates frequently seek community-building features (Section 5.1.4, Appendix II.1.2). By making both sections easy to find and accessible, we addressed the specific needs of both groups, enhancing their engagement and satisfaction (Kim, Kim & Wachter, 2013; Hu, Hu & Fang, 017).

The secondary bar, located at the top of the screen, provides context-specific options relevant to the section the user is navigating. The clear hierarchy of information in the navigation, makes sure that users are not overwhelmed with options, aligning with Jakob’s Law (Geven, Sefelin & Tscheligi, 2006). Additionally, using the principle of Information Scent, allows users to follow familiar navigational patterns and labelling (Pirolli & Card, 1999). This reduces cognitive load, making it easier for students to find and engage with all parts of the app (Nielsen, 1999)

4.4.2. Look and feel of the app

The design focused on the visual look and usability of the app, using Gestalt principles, specifically the laws of proximity and similarity (Wong, 2010). Elements that were similar or related were grouped together, because users are more likely to understand and navigate an interface successfully (Wong, 2010; Todorovic, 2008). This can help increase engagement, as users are more likely to explore and use the app’s features when they can easily find what they need (Garett et al., 2016).

It was also important to ensure the screens were simple to understand. By using Hick’s law, the number of choices available on the screens were simplified, reducing cognitive load, making it easier for users to make quick and efficient decisions (Hick, 1952; Sweller, 1988). These laws help improve user satisfaction by allowing students to focus on their academic and social tasks without feeling overwhelmed with options (Hick, 1952).

In addition, the use of brand colours to colour code information (Table 2) conditions users to process information quickly and effectively (Zhang et al., 2022), further reducing cognitive load (Sweller, 1988). A visually accessible and intuitive interface, caters to a broader range of users by making them feel confident and satisfied, improving their overall experience with the app (Norman, 2013).

Screen	Features	Color	Color Justification, Meaning, and Usage
Academic Screen (Figure Figure 2)	- Good grades - Attended classes	Light green	Light green is associated with growth, positivity, and success, reflecting academic achievement and regular class attendance. (Madden, Hewett and Roth, 2000; Elliot and Maier, 2012).
	- Lowest grade - Missed classes	Light red	Red is recognised as signalling caution, warning, or failure, making it suitable for indicating poor performance or missed attendance. (Elliot et al, 2007; Wiedemann and Schütz, 2011)
	- Passing Classes	Yellow	Yellow is used as a cautionary colour, indicating that while things are okay, attention is still needed (Madden, Hewett and Roth, 2000; Kaya and Epps, 2004)
	- Upcoming deadlines	Grey	Grey is a neutral colour often used to highlight deadlines or important dates without invoking stress. (Grieve, 1991; Boyatzis and Varghese, 1994)
Community (Figure 3)	- Sports events	Blue	Blue is associated with trust, stability, and calmness, making it an appropriate colour for promoting participation in sports events. (Boyatzis and Varghese, 1994; Elliot and Maier, 2012)
	- Academic events	Peach	Warm colours like peach are inviting and help create an open and inclusive environment for academic events (Grieve, 1991; Kaya and Epps, 2004)
	- Social events	Purple	Purple is associated with creativity and community, making it a suitable choice for social events. (Madden, Hewett and Roth, 2000; Elliot and Maier, 2012).
Calendar (Figure 1, Calendar Overview)	- Classes scheduled	Dark green	Dark green is associated with stability and reliability, making it an ideal color for scheduling and organizing classes. (Madden, Hewett and Roth, 2000; Elliot and Maier, 2012).

Table 2: Colours - Their Uses and Justifications

4.4.3. Individual Screens and their additions

The Prototype was developed with the following features: Calendar, time sensitive notifications, Events, Shortcuts, Academic dashboard, and student support features. These features are categorised under different sections: Home, Academics, Community, Explore and Notifications

The “Home” section (Figure 1, Home) was designed to address the needs of students who want to find relevant and important information immediately (Appendix II.5). Students are greeted with an overview that includes their daily schedule including classes and upcoming events as these are information they value (Figure 9 and 13). Editable shortcuts were added (Figure 1, Shortcuts) to allow students to quickly access information that was important to them. This element of customisation provides a sense of control and ownership over their app experience. This aligns with Self-Determination Theory, which emphasises autonomy as a key driver of engagement (Deci & Ryan, 2000).

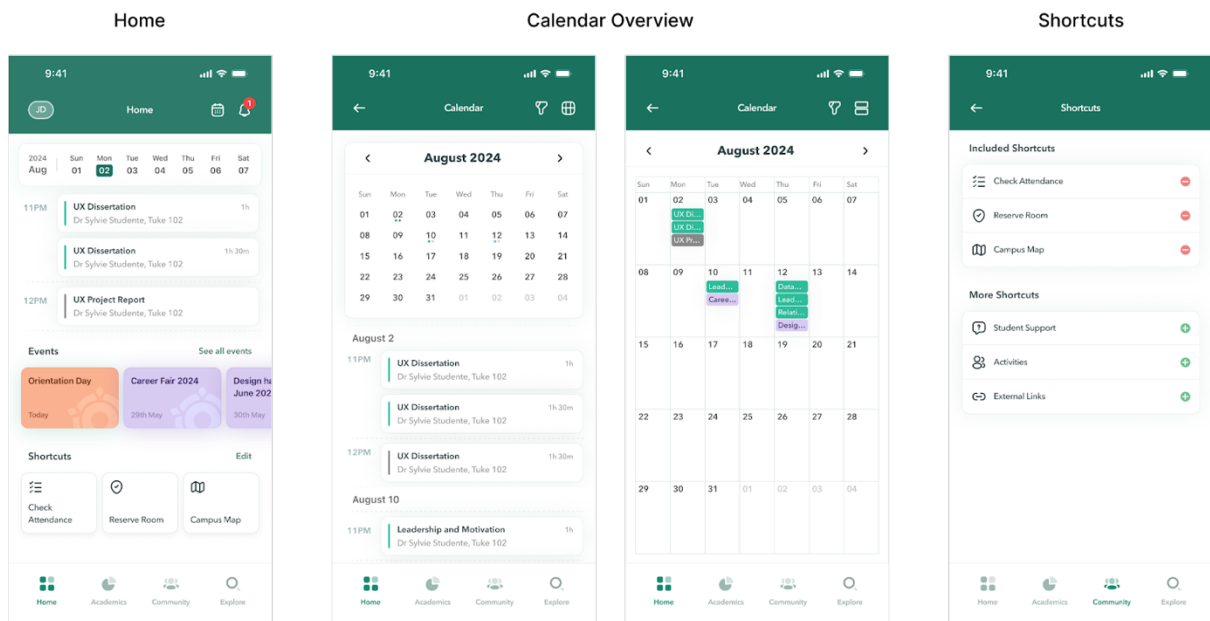


Figure 1: Home, Calendar Overview and Shortcuts Screens

The “Academics” section (Figure 2) was created because of a clear need for all students to easily access academic information, especially for post-graduates (Section 5.1.4). This section provides a clear overview of relevant information for students such as attendance and grades. By using the von restorff effect which states distinctive items are more likely to be remembered (Hunt, 1995), relevant metrics and information are displayed with charts, progress bars and emboldened colour coded text (Table 2) to stand out, capture user attention and help them stay on top of academic responsibility without being overwhelmed with data. Other relevant information within the academic section such as deadlines for assessment and links to academic support and platforms are displayed making it easier for students to manage their studies easily.

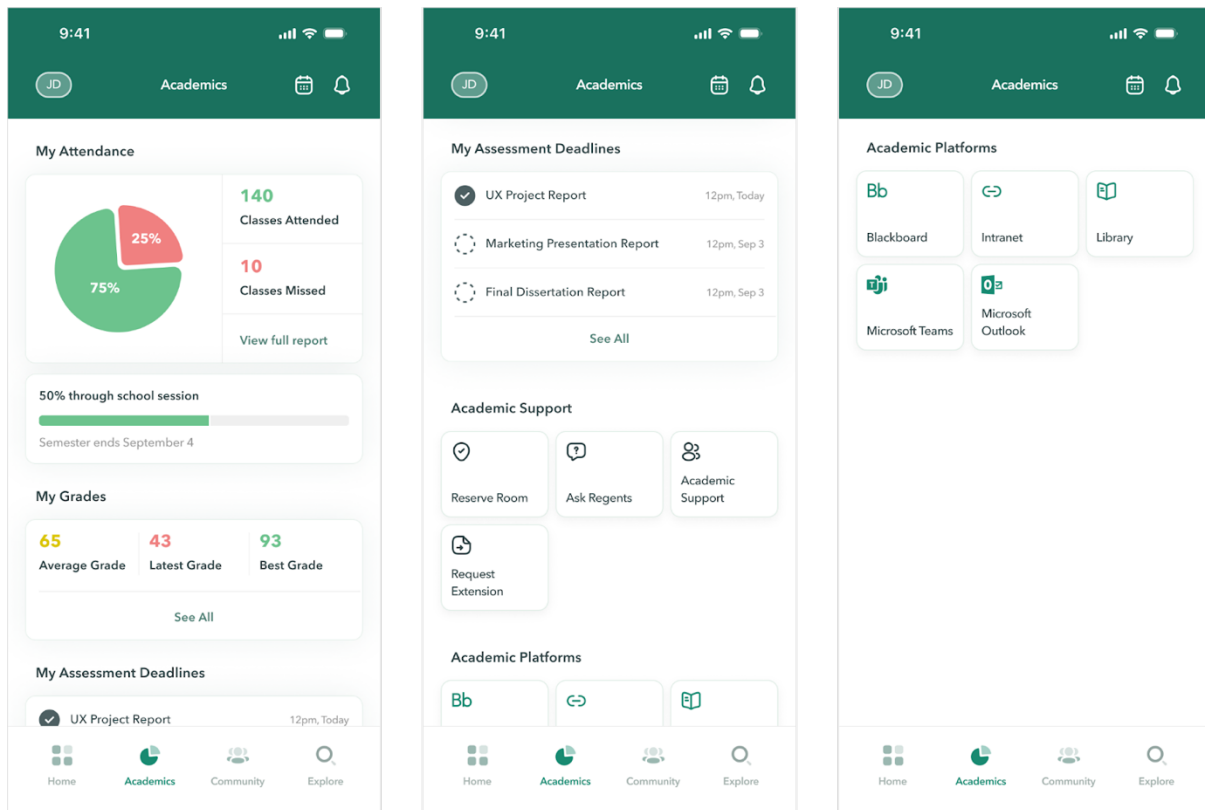


Figure 2: Academics Section Screens

The community section (Figure 3) was introduced to because of the need for community and events especially from undergraduates (Section 5.1.4), reflecting the importance of community engagement as part of the overall student experience (Tinto, 2012). This section serves as a central hub for students to access social information, join clubs and societies, and register for events. By incorporating the Social Identity Theory, which suggests that belonging to a group enhances individual satisfaction and motivation (Tajfel & Turner, 1979). Providing students with easy access to these social groups and activities in the university encourages participation, significantly improving their overall experience.

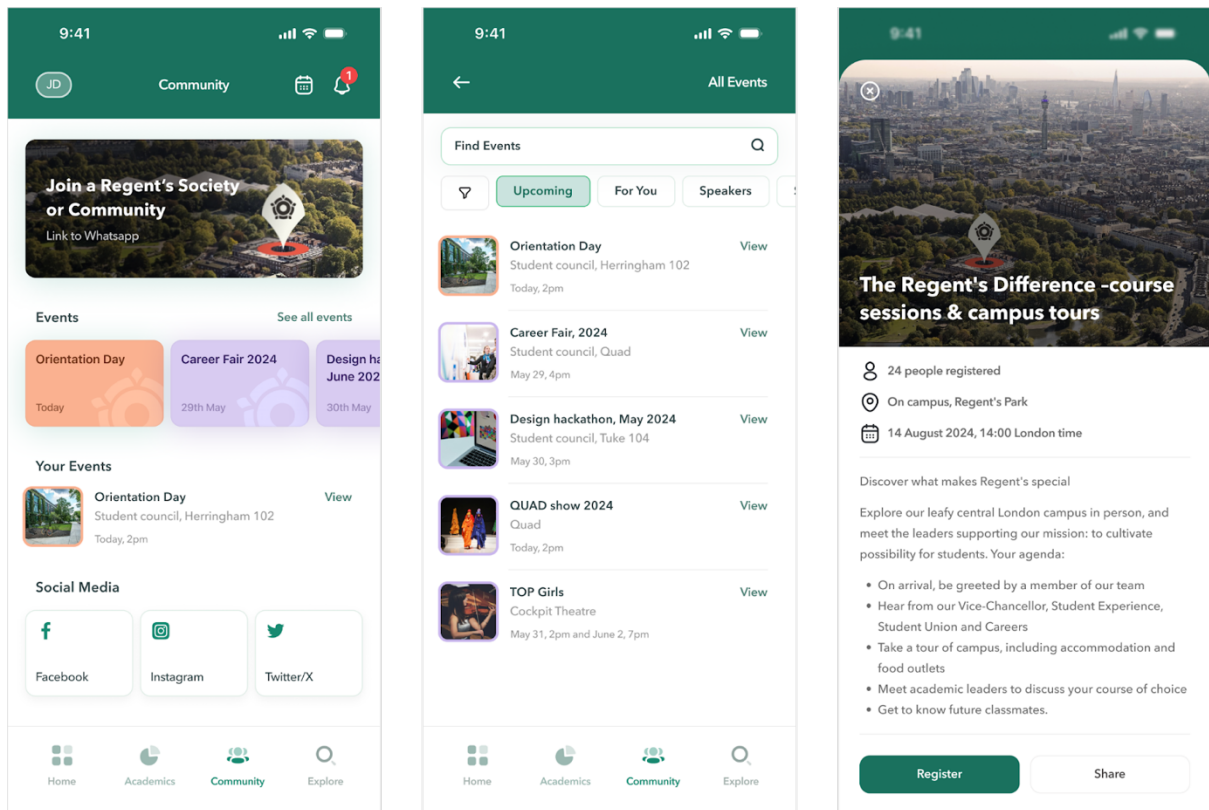


Figure 3: Community Section Screens

Additionally, to address the lack of clear and timely notifications (Appendix II.5). Time sensitive notifications (Figure 4, Screen 2) were introduced to allow students to see important updates persistently, anywhere on the prototype. This was to ensure students are aware of important updates and are prompted to engage with them (Pham et al., 2016). All notifications are categorised according to the context of relevance for students enabling them prioritise information important to them. This approach increases student satisfaction, as they can rely on the app to remind them of key information, reducing the cognitive burden of keeping track themselves (Sweller, 1988).

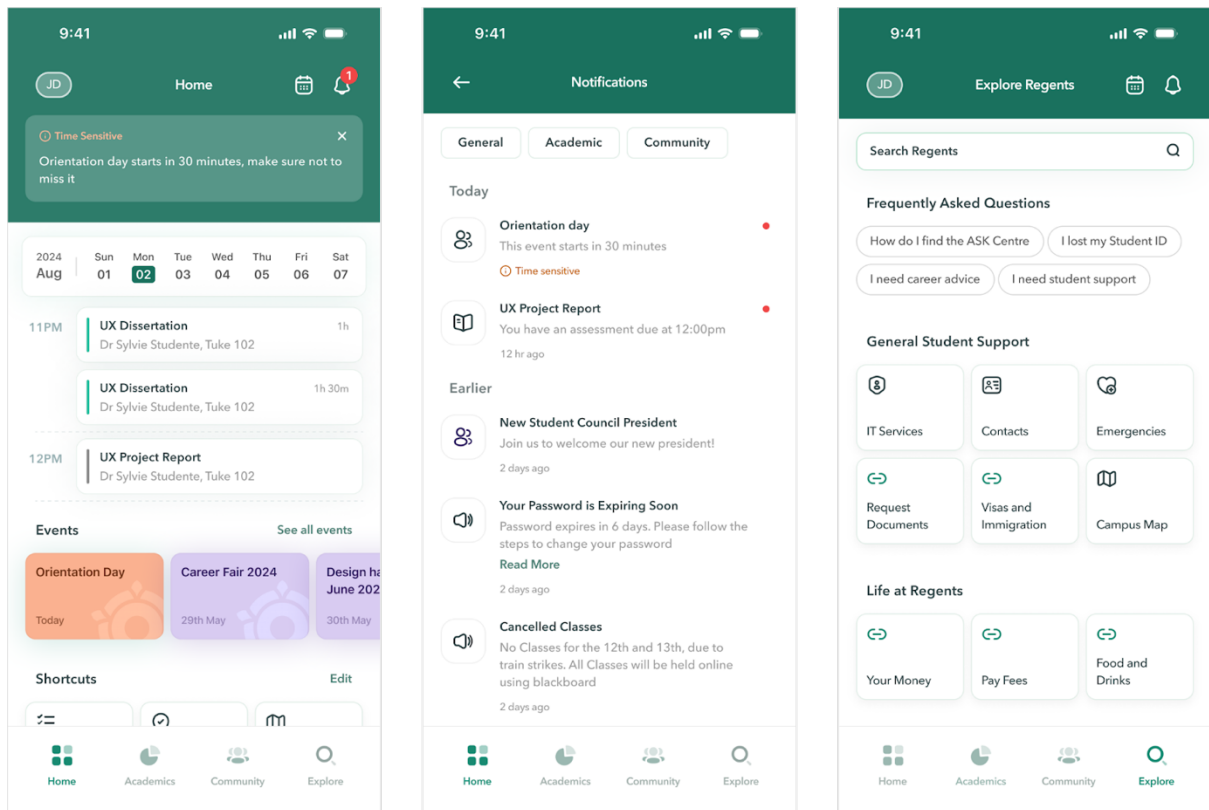


Figure 4: Time Sensitive Notifications Feature, Notifications and Explore Screens

Finally, an explore page (Figure 4, Screen 3) was introduced to provide support for all information students might need. By providing a search function with recommendations of question frequently asked, the app anticipates student needs, providing quick access to support resources. Additionally, clearly organised support categories help student navigate through information and services easily contributing to an overall positive experience (Pirolli & Card, 1999).

All additional features added in the prototype related to the research questions and objectives but not directly related to our problem statements and scope in the project are listed in (Table 3).

Feature	Location	Description	Rationale	References
Registering for event (Figure 3, Screens 2 and 3)	Community Page	Users can view upcoming events and register for them	Platform integration/convenience: Students want more community focused features with a seamless experience including an easy way to see and register for events without having to exit the app.	Prioritisation Matrix (Appendix II.4) Ideation (Appendix III.1.2) Findings and Analysis (Section 5.1.4.) Research Objective 1 and 3.
Reserving a Room (Figure 2, Screen 2)	Academics Page	Students can book rooms for study sessions or group meetings through the application	Platform integration/convenience: This removes the need to physically scan QR codes in the library and without the need to exit the app.	Prioritisation Matrix (Appendix II.4) Ideation (Appendix III.1.2) Findings and Analysis (Section 5.1.4.) Research Objective 1 and 3.
My Grades (Figure 2, Screen 1)	Academics Page	Provides students with access to their grades and academic performance data in a visually engaging format	Platform integration/convenience: Compliments other academic information, helping students stay on top of their academic responsibilities with clear, concise information without having to exit the app.	Ideation (Appendix III.1.2) Findings and Analysis (Section 5.1.2) Research Objective 1, 3, and 4.
My Assessment deadline (Figure 2, Screen 2)	Academics Page	Displays upcoming assessment deadlines and links to related academic resources	Platform integration/convenience: Addresses the need for timely and relevant academic information to reduce stress and improve focus without having to exit the app.	Ideation (Appendix III.1.2) Findings and Analysis (Section 5.1.2) Research Objective 1, 3, and 4.
Requesting Documents and/or extensions (Figure 2, Screen 2)	Academics Page	Allows Students to request documents and or extensions directly in the app	Platform integration/convenience: Students will not need to ask for documents or extensions physically or by email. This is especially helpful for neurodivergent students who have to apply often.	Prioritisation Matrix (Appendix II.4) Ideation (Appendix III.1.2) Findings and Analysis (Section 5.1.4.) Research Objective 1 and 3.

Table 3: Additional Features and their Justifications

4.5. Test

The final phase conducted in this project was the testing phase, where important feedback from users on the prototype is collected (Nielsen, 1993). This is necessary to ensure the solution proposed aligns with the users and objectives of the project (Dumas & Redish, 1993). For this project, moderated usability tests were conducted online with a sample of four students, two of which were undergraduates and two postgraduates. Table 4 shows objectives and success criteria for each task. It was created as a framework for evaluating the usability tests' results, using metrics such as student engagement, satisfaction, and overall user experience. Audio and screen recordings, with Testing sheets (Appendix I.3.4 and I.3.5) were used to record observations, and user feedback during the testing sessions. The results of these findings (Section 5.2.) were important in providing recommendations for improving the prototype for any future iterations.

Task ID	Scenerio/Task	Objectives	Success criteria
1	Navigating to the Calendar	Assess ease of navigation, visibility, and accessibility of time-sensitive updates and events.	Participants can find the calendar and navigate through different dates/events with ease using the Figma prototype.
2	Accessing Communities and Events	Evaluate the ease of access to community-related information, such as societies and events.	Participant successfully accesses the student union section, explores societies, and checks out upcoming events on the Figma prototype.
3	Managing Notifications	Assess if users understand the time sensitive notification and how easily users can locate notifications in the app.	Participants can quickly find and act on the most recent time-sensitive notification without confusion.
4	Checking Academic Performance and Requesting Academic Support	Test the intuitiveness of accessing and understanding academic performance data, Test the accessibility and clarity of the academic support functions, particularly the request extension feature.	Participant locates and reviews their grades and attendance without significant difficulty on the Figma prototype. Participant locates the academic support section and successfully finds the extension request feature on the Figma prototype.
5	Exploring Additional Functionalities	Assess the functionality and efficiency of the search feature within the prototype.	Participant successfully uses the search function to find visa and immigration information on the Figma prototype.
6	Short cuts	To assess the ease and intuitiveness of customising the home screen by adding shortcuts to essential services, specifically the "Student Support" section.	The participant is able to locate the feature to edit shortcuts and successfully add the "Student Support" shortcut to the home screen with minimal difficulty.

Table 4: Usability Test Objectives and Success Criteria

5. Analysis and Findings

This section presents the most significant findings and analysis from our primary research, which is split into two phases. 1) The empathising phase includes data collected through 6 interviews and 36 questionnaire responses. 2) The testing phase includes data collected through 4 usability tests. The analysis partly explores differences in demographic behaviour, as well as key aspects that affect engagement, satisfaction and overall student experience.

5.1. Phase 1 – Empathising: Interviews and Questionnaires

5.1.1. Demographics

To begin the data analysis, all data was explored (Appendix II.1.1.). Then the focus turned into answering our research objectives, starting with the general student engagement and satisfaction (See Figures 5 and 6). The data shows that undergraduates are more satisfied with the app, with 34.8% “Somewhat satisfied” compared to only 4.3% of postgraduates. Postgraduates generally show higher dissatisfaction, with 17.4% “Somewhat dissatisfied” and another 17.4% “Extremely dissatisfied”. However, both groups have similar engagement, with the majority using the app 2-3 times a week (26.1% of undergraduates and 21.7% of postgraduates). Although daily usage is low and only reported by undergraduates (8.7%), this might suggest that the higher satisfaction among undergraduates is possibly associated with more frequent usage. However, interview data on general satisfaction and engagement levels revealed that undergraduates had as much criticism as postgraduates, often having similar issues (Sections 5.1.2 – 5.1.4).

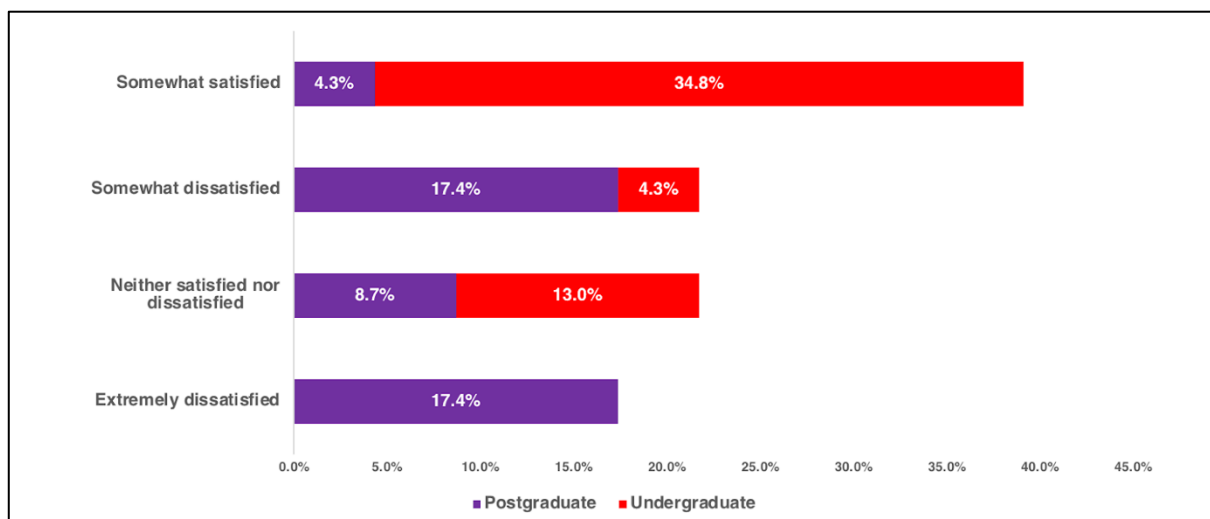


Figure 5: Experience using the app (satisfaction level)

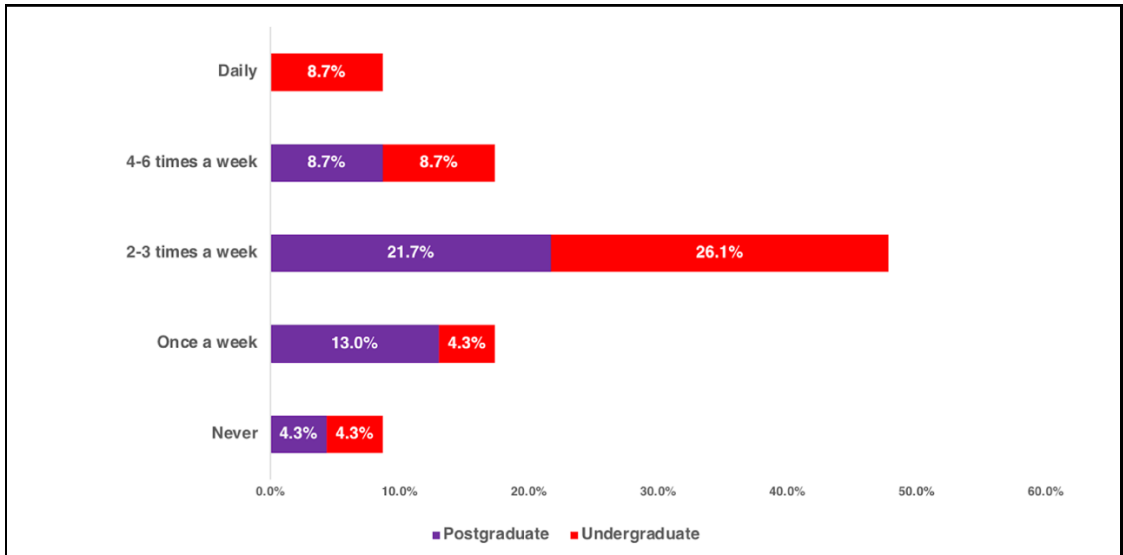


Figure 6: Experience using the app (engagement level)

The barriers (Figure 7) and drivers (Figure 8) for app usage were looked at to better understand engagement levels. The biggest driver for both postgraduate's (10%) and undergraduate's students' (16%) were "convenience and easy access". The most common barrier was "lack of needed features", with 13% of postgraduates and 10% of undergraduates choosing it. There were mixed feelings among undergraduates, where some of them find it easy to access information (12%) while others struggle with it (6%). Postgraduates have more issues with "missing features" and "unreliability", showing they have higher expectations. These differences show that postgraduates expect more useful and reliable features, while undergraduates value user-friendly and accessible design.

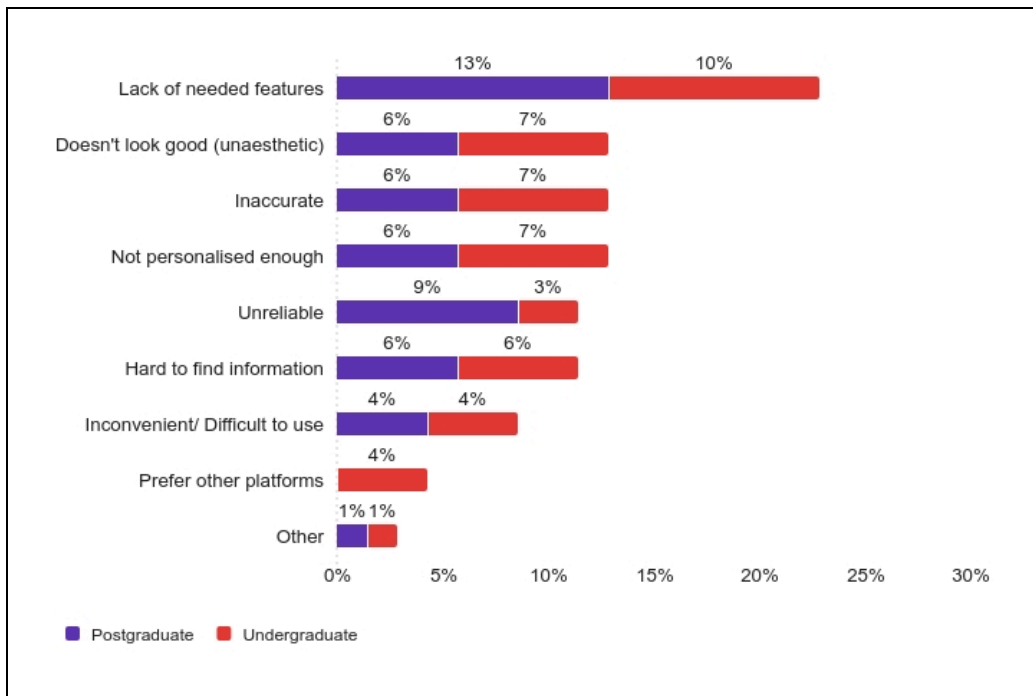


Figure 7: Barriers to Overall User Experience

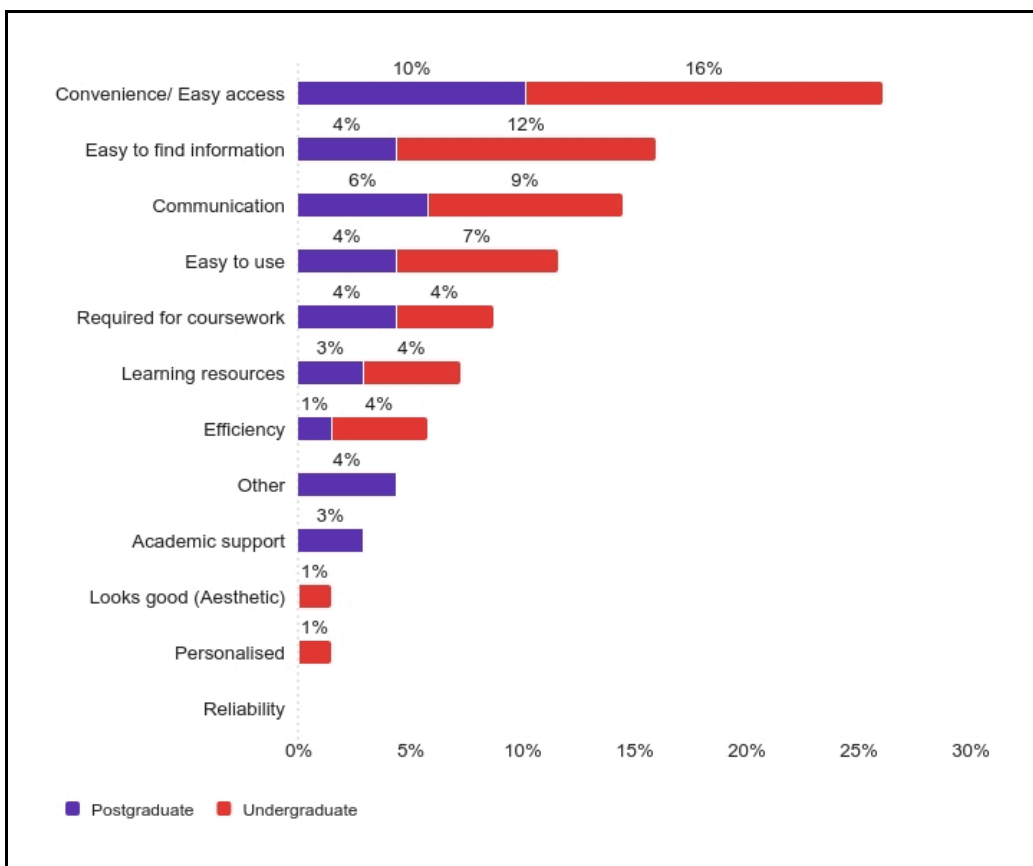


Figure 8: Drivers for overall engagement level

To get a better idea of what students want and need the most, they were asked to write 3 features that could be improved the most and to rank them (Figure 9). The

responses were calculated based on the weight of the ranking and the frequency of similar responses. This helped define the most important and specific areas for improvement. The data showed that the most pressing issues for students are login/logout reliability (22.9%), access to event information (21.3%), and improvements to the attendance (18%) and timetable features (15.7%).

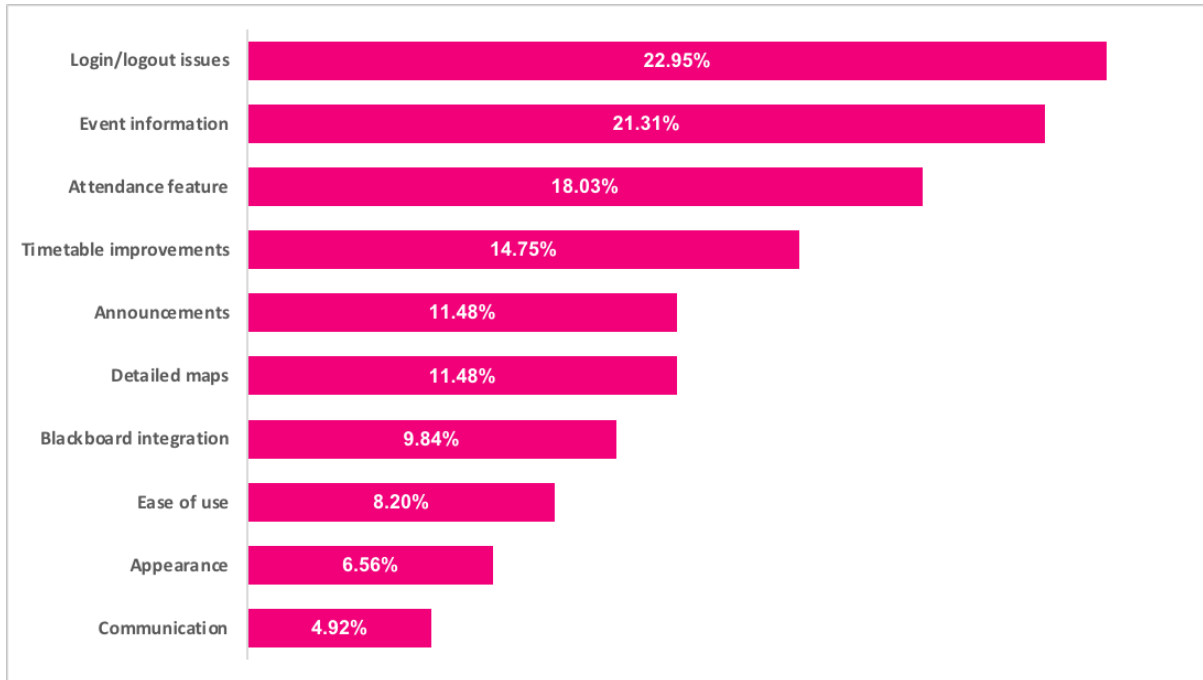


Figure 9: Desired Features Ranked

The interviews (Appendix I.2.3.) gave deeper understanding of the answers received from the questionnaires. Using thematic analysis, the interview responses were categorised into many themes for each participant (Appendix II.1.2.). These interview findings together with the rest of the questionnaire findings were categorised into three main themes: Relevance of Information, Ease of Use, and Desired Functionality (Table 5). These themes encompass the primary pain points mentioned by all students for both quantitative and qualitative research.

Theme	Description	Code	Description
Relevance, Timeliness and clarity of Information	The extent to which the app provides current, relevant, and necessary information for students.	Outdated Information	Information in the app is often outdated or missing, reducing its usefulness.
		Missing Critical Information	The app lacks important academic and social information needed by students.
		Timeliness of Notifications	Notifications are not delivered in a timely manner, causing students to miss important updates.
		Information Display	Information is not presented in a clear, concise, or visually appealing manner (e.g. visual formats like charts and lists for better understanding.)
Ease of Use	The overall usability of the app, including navigation, information retrieval, and technical issues.	Navigation	The app has a confusing layout that makes it difficult for users to find information.
		Information Retrieval	Users face barriers in accessing the information they need efficiently.
		Technical Issues and Usability	Technical problems like frequent logouts and crashes disrupt the user experience.
Desired Functionalities	Features and capabilities that users want to see in the app to enhance its usefulness and their experience.	Community building/Connecting	Students, especially undergraduates, desire functionalities that help them build community, similar to social media.
		Integration with Other Apps	Students desire integration with other apps (e.g., Blackboard) for submitting assignments and communicating with teachers.
		Booking Functionalities	Students want the ability to book events, spaces, and sports rooms directly through the app.

Table 5: Themes identified across Interviews and Questionnaires

The following sections provide a deeper analysis of each of these themes, supported by literature, statistics and direct quotes from participants.

5.1.2. Timeliness, Relevance, and Clarity of Information

Looking at the questionnaire responses on relevancy (Figure 10) and satisfaction with the timeliness of information (Figure 11), we see that most users are neutral about the relevance and timeliness of the information provided by the app. However, a significant portion (36%) expressed dissatisfaction with timeliness.

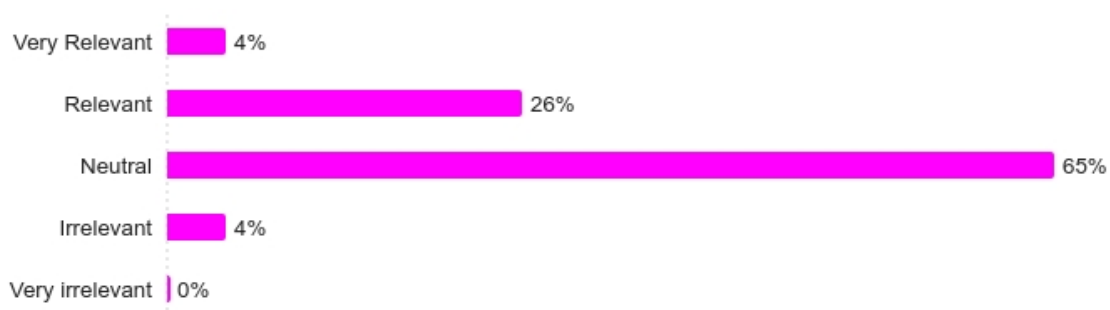


Figure 10: Relevance of information provided

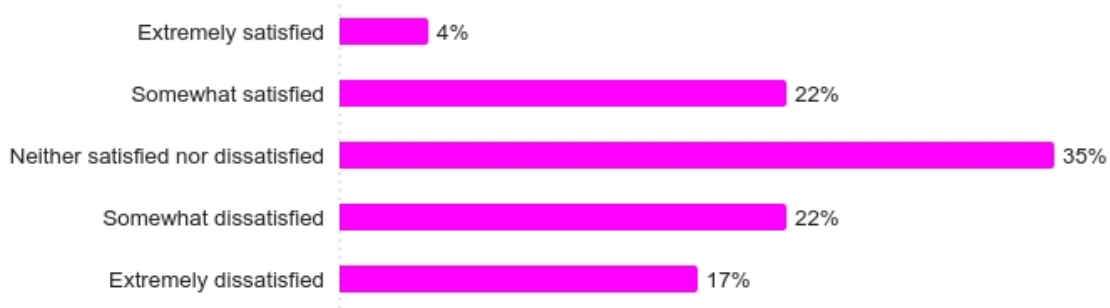


Figure 11: Satisfaction with Timeliness of Information

During interviews, both undergrad and postgrad students really wanted more personalised timely information (e.g. events and academic information), most expecting this in the form of notifications.

“If it's for your course, you get it as a notification and if it's not for your course, you get it as like an e-mail.” (personalisation - notification) - Participant 1

“Timetable [...] and schedule changes [...] would be helpful if they were notified on time.” (timeliness - notification) - Participant 2

Literature supports that personalised digital tools enhance the student experience by providing timely and relevant information, which reduces stress and increases engagement (Pechenkina et al., 2017; Krause, 2005).

Although Figure 11 indicates neutrality towards the relevance of information, Figure 10 and interviews suggests that students think the app lacks important academic and social information. They said that important updates are frequently outdated or missing. During interviews post-graduates were found to more often focus on issues they had finding academic information (Appendix II.1.2).

“[when] I'm on the app I can't find it or it's missing or it's wrong” - Participant 5

“I can see for example, what classes I did not attend... even though it doesn't update for me for some reason, which is annoying” - Participant 6

Studies show that the holistic student experience, encompassing academic and social facets, relies on the accessibility of relevant and up-to-date information (Selwyn, N., 2016; Callender & Wilkinson, 2013). The quotes from participants 5 and 6 also suggest that there needs to be a bigger focus within the app on information students care about to drive engagement and satisfaction. Figure 12 indicates that students are mostly using the app to check their attendance and schedules.

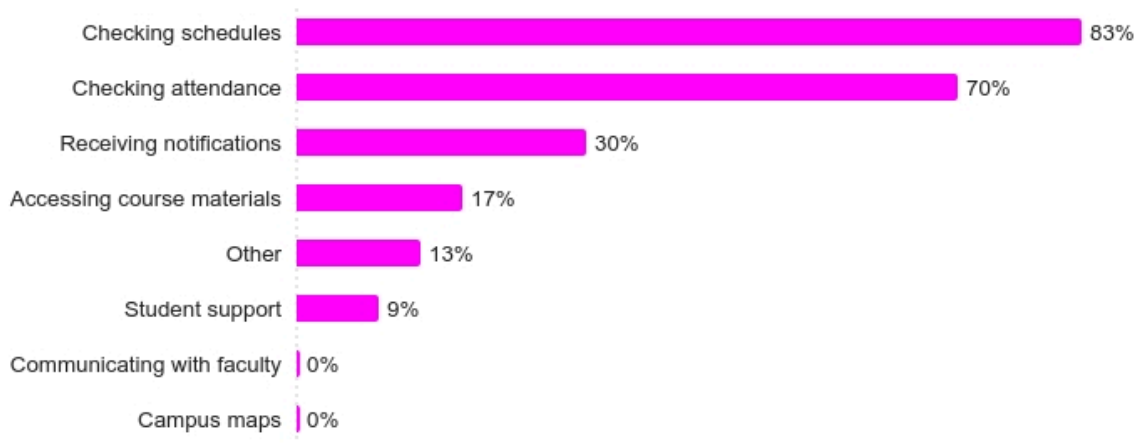


Figure 12: Purpose of Using Regents App

Additionally, there's a lack of needed features and information availability as indicated by Figure 7. This goes to show that there needs to be a bigger focus on class-related information (e.g. attendance, timetables, grades), event information and announcements as seen in Figure 13.

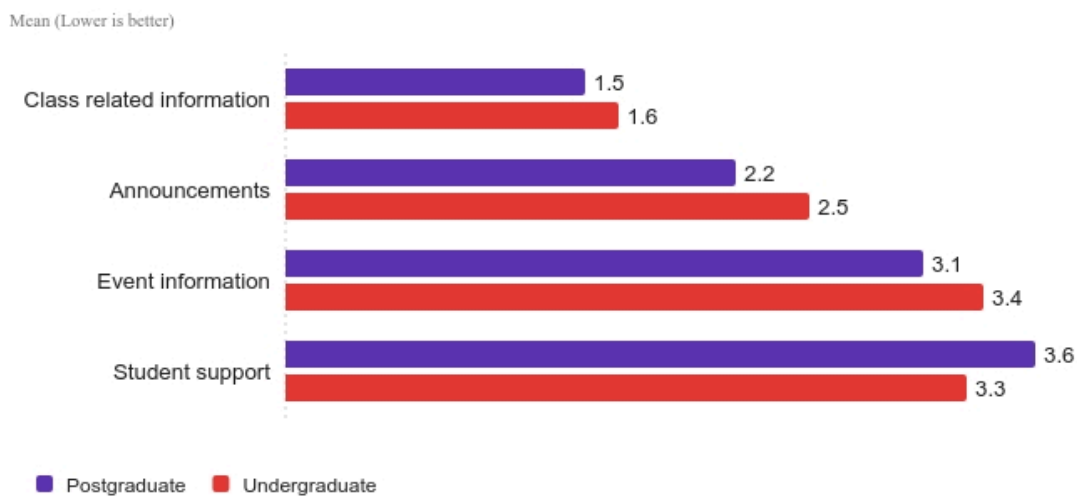


Figure 13: Ranking of Relevant Information

How this information is displayed also affects the app's usability. This is also supported by previous research done by the university where students indicated that they prefer information to be displayed as, for example, bullet points (Regents University, 2021). To support student needs, information should be displayed in a clear, concise, and visually appealing manner (Henderson et al., 2015).

“...attendance [used to be] displayed as a pie chart. I thought that made it much easier to understand how much class you really missed. Although it was hard to find the chart” - Participant 1

“The layout [of the app] does not seem very professional.” - Participant 3

5.1.3. Ease of Use

Considering the importance of the mobile app in students' university life is shown by more than 45% of respondents using the app at least 2 to 3 times a week (Figure 6), usability can significantly impact overall satisfaction (Lewis, 2014).

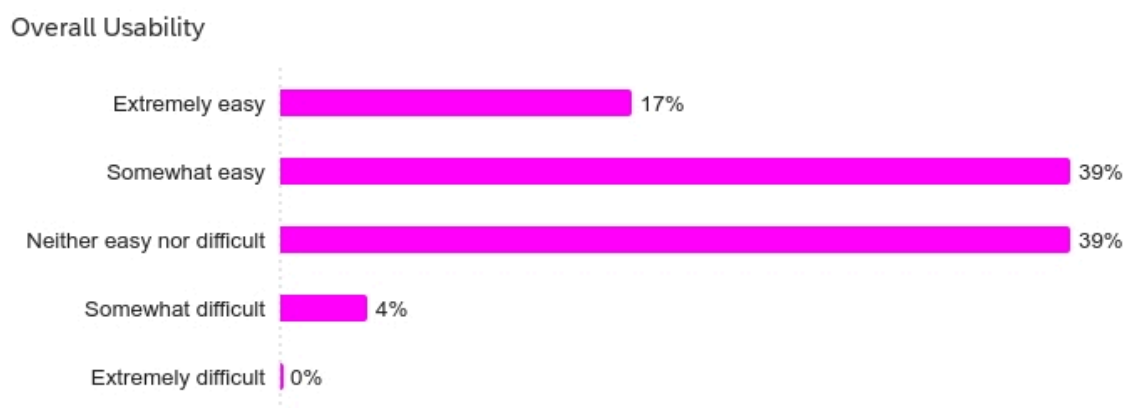


Figure 14: Measurement of Overall Usability

The questionnaires, show that the app is simple and easy to use (Figure 14). Though, in the interviews students said that navigating the app was not intuitive. Important features such as timetables and attendance were easily accessible. But other important information like student support services and specific academic resources were hidden under several layers of navigation or needed to be accessed through a mobile browser.

"It is somewhat difficult to find information only because it is all segregated into folders." "You have to kind of go deep into it." - Participant 3

"I often have to switch to a browser to find what I need, which is frustrating." - Participant 3

While it can be argued that the app should prioritise the type of information students find most relevant (Figures 12 and 13), this does not disregard any other information students may want and need to access (Nielsen, 1994). Improving the overall usability of the app by making information easily accessible can enhance the experience of all student groups of varying aptitudes (Petrie & Bevan, 2009). Students also reported having to rely on other platforms to find necessary information, undermining the convenience of using a mobile app. This issue reflects

a broader trend in information retrieval preferences, where users often favour computers over mobile devices due to perceived usability and reduced cognitive load (Davis, 1989).

We also saw participants had recurring issues with the app's technical limitations. Frequent logouts were a big pain point mentioned by all interview participants and was the most common suggested improvement for the app in the questionnaire (Figure 9).

"The application [keeps logging] me out, [so] I don't get notifications of these events..." - Participant 3

Technical instability can significantly make the user experience frustrating, leading to lower satisfaction and engagement (Chen & Denoyelles 2013). While security is important, it should be balanced with convenience and seamless usage across platforms (Sasse, Brostoff & Weirich, 2001).

5.1.4. Desired Functionalities

Students said they didn't really like the features on the Regent app (Figure 7), and requested features that would improve their university experience (Figure 9). For example, improvements to existing features and adding new ones that support different aspects of student life. Some suggestions were making tasks easier such as reserving rooms and getting tickets for events and asking for deadline extensions. It should also be mentioned that some students weren't aware that certain requested features, like campus maps, were already in the app.

"[I prefer] If there is a page or a section dedicated to just contact info and the different departments." "[Additionally], a campus map would be helpful." - Participant 6

A significant concern that negatively impacted students experience with the app was the lack of seamless integration with other platforms. Students disliked having to switch between multiple platforms to find the information they needed. Partly to avoid the inconvenience of relogging in whenever accessing external links, but also because they preferred the app to be a centralised platform for accessing all information. This was notably in contrast to the university's stance for the intranet to be the central source of information for students. Research supports how smooth operations across platforms are vital, for keeping users satisfied and engaged (Chen & Denoyelles, 2013).

"The app should integrate better with our email and other tools." "I have to use multiple platforms to get all my information." - Participant 6

"The app should [combine] the key things [I need] instead of having five different platforms." "A centralised place for information would make it much easier to use." - Participant 2

Additionally, students often said they missed events, an important part of university life crucial for community building (Kuh & Love, 2000). This was mostly seen with undergraduates, who wanted more community building compared to postgraduates who were more interested in their academic. Both groups wanted events to be more

visible and easier to be registered for. They also wanted the opportunity to connect with people of similar interests, through clubs and social networking events. The importance of these features shows how social integration and community engagement can improve student involvement and satisfaction (Astin, 1993; Tinto, 1998).

"There's no section for upcoming activities or events." "I never know what events are happening on campus." - Participant 3

"If we could connect to like peers through the app itself, I think that would be helpful." - Participant 2

5.2. Phase 2 – Testing: Usability Tests

During the usability tests, participants went through the app and completed most tasks successfully. Although, in some areas the user experience could be improved. The following Analysis explores participants' overall performance on each task using Table 4 as a benchmark. Detailed analyses of individual participant feedback (Appendix II.1.3) and notes (Appendix I.3.5) can be found in Appendix.

5.2.1. Individual Task Analysis

Task 1: Navigating to the Calendar

Participants were asked to navigate to their calendar to check for upcoming classes and events. While some initially found the location of the full calendar unclear, all participants were able to use the calendar without difficulty once located. The information displayed was found to be clear, although one participant indicated they did not understand the purpose of the colour-coded activities (Appendix II.1.3). This suggests that while commonly understood symbols like icons are helpful, other visual cues like colour must be consistent to enhance user interpretation and prevent confusion (Tufte, 1991). It must also be considered that the benefits of colour coding often operate subconsciously (Ware, 2019), so they may not be fully recognised or reported by participants during self-reported testing (Norman, 2013).

Task 2: Accessing and Registering for Events

While looking for the events page, the varied routes participants took to access events highlight potential inconsistencies in the app's information architecture. Initially, some participants experienced confusion about where events were located with some participants looking under the 'Explore' section (Appendix II.1.3). This might suggest a discrepancy between the app's organisation, specifically the labelling of sections and user semantic expectations of those labels. This misalignment can affect the value the information architecture provides to the user experience (Hotzkow, 2017). Additionally, while all participants easily and successfully registered for events, suggesting that this reduction of friction would provide a noticeable increase in user engagement (Nielsen, 1993), two participants were interested in connecting with peers directly on the app, suggesting a need for more integrated social features.

Task 3: Managing Notifications

The notification system was generally well-received. Participants appreciated being notified of time-sensitive updates and found all notifications easy to access and filter. Participants found that the information was presented clearly and is easily understood, however, one participant suggested a different hierarchy within the notifications allowing more important academic information to be prominently displayed (Appendix II.1.3). This prioritisation suggests users want to see important information quickly and prominently which promptly improves their experience and satisfaction (Kim & Lim, 2001)

Task 4: Checking Academic Performance and Attendance

The design of the 'Academics' section was praised for its clarity and organisation, with all necessary academic information specifically grades and attendance, easily accessible by participants. However, some participants overlooked certain details such as the academic support features, due to the large number of options in this area (Appendix II.1.3). This suggests that providing all information upfront can lead to cognitive overload and progressively disclosing features would be more effective, as users typically access specific features only when needed (Nielsen, 2006). Adjusting the features displayed to accommodate students' needs can ensure the app is inclusive, accessible and satisfactory to all users (Newell & Gregor, 2000).

Task 5: Searching for Functionalities

Participants generally performed well when searching for specific functionality although it took a bit of wandering to get there. It was observed that expectations of where functionalities should be doing not match where they were located (Appendix II.1.3). Similar to task 2, it is important to make sure the organisation of the information architecture and its labelling is clear and relevant to user expectations (Norman, 2013).

Task 6: Adding Shortcuts

The process of adding shortcuts to the home screen was straightforward once participants located the option to edit shortcuts. The ability to customise the home screen with frequently used functions was highly appreciated providing an element of customisation which improves user experience and satisfaction (Hui & See, 2015). It is important to note that users need time to use the app to train themselves to become familiar with an app. Consistency is needed to ensure behaviours are properly built to improve their experience (Nielsen, 1989)

6. Recommendations

6.1. Key Findings and Recommendations

The analysis of both Phase 1 and Phase 2 of data analysis and findings shows various areas for optimising the Regents University mobile app to enhance student engagement, satisfaction, and overall experience. These recommendations not only address the findings from the research but also provide business cases for implementation and potential benefits.

Both research phases showed how students expressed frustration with outdated, unclear or missing academic updates (Section 5.1.2), which directly impacts engagement (Krause, 2005; Chen & Denoyelles, 2013). The improved features resolving these frustrations (Section 4.4.3., Figures 2 and 4) show higher satisfaction by ensuring that students found the most current information at a glance (Section 5.1.2). Additionally, it gives the faculty and staff less work as they are the ones who currently handle these tasks manually (Krause, 2005). This also aligns with current trends in higher education, where institutions are becoming more reliant on digital tools to improve operations and communication (Selwyn, 2012; Pechenkina, & Aeschliman, 2017). Implementing these changes can also enhance the university's reputation for technological innovation, an area which is becoming important to new students and their families (Krause, 2005).

The app's navigation was found to be a large barrier, where students found it difficult to access key features (Section 5.1.3), directly affecting their engagement and overall experience (Kujala, 2003). While the prototype made the navigation more intuitive (Section 5.2.1, Task 1), improving the apps navigation further can keep reducing cognitive load and supporting better academic outcomes (Sweller, 1988). This can enhance retention rates (Norman, 2013), which boosts the university's rankings and reputation (Tinto, 1998). Additionally, by making the app easier to use, the university can differentiate itself from competitors, many of whom struggle with similar digital challenges (Norman, 2013).

Issues such as frequent logouts and poor integration with other university systems were repeatedly cited as pain points across primary research (Section 5.1.3). Consistent technical reliability is important for maintaining student trust and satisfaction, otherwise it can lead to frustration and disengagement, negatively impacting student retention (Chen & Denoyelles, 2013). Addressing these challenges by implementing Single Sign-On (SSO) technology, could enhance user satisfaction (Yusuf et al., 2024). SSO might also support the university's goal of operational efficiency and data security (Hope & Zhang, 2015; Sasse, Brostoff & Weirich, 2001), enhancing the university's reputation and attractiveness to new students (Steiner, Sundström, & Sammalisto, 2013).

Interviews and usability tests showed that students want more control over the content and notifications they receive (Section 5.1.4). Creating more personalised experiences, as shown in the prototype (Figure 1, Shortcuts), aligns with the Self-Determination Theory, which says that autonomy is a key driver of engagement and satisfaction (Deci & Ryan, 2000). Additionally, implementing this kind of student-centred technology can make the university stand out in the market, while keeping up with the new generation of students (Diana et al., 2005).

All students brought us how important social integration and community-building features are, particularly undergraduates (Section 5.1.4). Good integration of social features into academic platforms can often create a stronger sense of belonging (Junco, 2012). These additions can bring higher levels of student engagement and satisfaction (Astin, 1999; Tinto, 2012). Additionally, it can also lead to positive a stronger alumni network, which is valuable for any institution (Junco, 2012).

During tests, students responded very well to the simplified access to academic information (Section 5.1.4), but more needs to be done to fully support student needs. For Example, reducing multiple logins and making sure that all relevant information is easy to access through a single platform, can reduce the administrative workload and improve communication between students, faculty, and administration (Chen & Denoyelles, 2013). Having everything on one platform can also be interesting for data collection and analysis, allowing the university to better understand student behaviours and preferences (Wang, 2017), which can inform future decisions (Sasse, Brostoff, & Weirich, 2001; Sundar, & Marathe, 2010).

6.2. Project Contribution

This project contributes to the field of user experience (UX) design and educational technology by using user-centred solutions that look at the gaps in current academic app design.

Academic apps don't use notification systems often enough, focusing instead on static information (McLoughlin & Lee, 2010). This project has shown the value of real-time, personalised notifications in improving user engagement (Pham, 2016). The introduction of this new standard aligns more closely with students' cognitive needs and behavioural patterns (Sweller, 1988; Deci & Ryan, 2000). This shows a shift in the way that educational apps can be used by students as active tools in their daily lives, instead of passive ones (Kuh, 2009).

This study also shows how the use of cognitive load theory creates easier navigation, positively effecting user engagement and satisfaction (Paas, Renkl, & Sweller, 2003). The new navigation system was not just a usability improvement, but also serves as a framework to avoiding cognitive overload (Sweller, 1988). This framework may be applicable not only in academic settings, but possibly in fields that require complicated information management, such as healthcare or business training (Mayer & Moreno 2003).

By integrating academic and social features inside a single platform, the project also contributes to the discussion around personalised learning environments (Dabbagh & Kitsantas, 2012). This integration goes outside the typical separation of academic and social tools (Selwyn, 2007), creating a more holistic approach. This could change how future apps in educational contexts cater to student life management (Kuh, 2009; Siemens 2005). Including both features provides a better view of student needs, enhancing student retention and satisfaction (Astin, 1999; Tinto, 2012).

Finally, the iterative design process and user feedback, show how important adaptive and responsive design practices can be in educational technology (Brown, 2009; Nielsen, 1993). These practices could be used in other fields where user

needs are more complicated, like customer engagement platforms and healthcare apps (Schön, 1917; Gould & Lewis, 1985).

6.3. Limitations and Future Study Recommendations

While this project provides valuable insights and practical recommendations for optimising the Regents University mobile application. There are important limitations within this report that must be acknowledged. One significant limitation of this study was the relatively small sample size used during qualitative research, which when subjected to biases from self-reported data provides fewer comprehensive data affecting the accuracy of findings (Nederhof, 1985; Etikan & Bala, 2017; Mertens, 2014; Janghorban, Roudsari & Taghipour, 2014). Studies shows that a larger, diverse range of participants from different demographics help provide larger and more accurate insights for the demographic studied (Subedi, 2021). In addition, incorporating more objective data collection methods to track usage patterns over a significant period can also provide more detailed insights into the application's long-term effects on student engagement and satisfaction (Scater, Peasgood, & Mullan, 2016; Creswell & Plano Clark, 2011).

Another limitation highlighted was the scope of the prototype development. While these prototypes addressed significant challenges observed through research related to navigation, information hierarchy and relevance. Additional integration features, performance and authentication improvements were either only partially explored or not addressed at all due to time and technical constraints. Future studies should investigate these additional areas deeper, especially the incorporation and impact more advanced technology such as AI driven personalisation on user experience as this has the potential to improve the apps effectiveness (Gligorea et al., 2023). This in addition to testing application features to ensure it the expectations of its user base without compromising on speed or reliability (Wimalasooriya et al., 2022).

Future studies need to consider looking at the effect of specific design elements such as colour, typography, icons, and space on human psychology. This can give more insight into how the effects of perceived usefulness and ease of use impacts user engagement and satisfaction (Davis, 1989; Karahanna & Straub, 1999). In addition, it would be valuable to further research the impact of social features in applications on student behaviour. Understanding the dynamics of peer interactions and community building could give clearer insights into how they might improve student engagement and satisfaction (Junco, 2012; Astin, 1999)

6.4. Conclusion

With the increasing focus on student experience as a measure of higher education quality and rank (Buultjens & Robinson, 2011; Shah & Richardson, 2016), the value of understanding the gap between student expectations and perceptions of higher education has never been more important (Ibrahim, Wang & Hassan, 2013; Gorgodze, Macharashvili & Kamladze, 2020; Makoe & Nsamba, 2019). This study addresses this by examining the role of digital platforms, specifically key factors that affect students' engagement, satisfaction, and overall experience with the regent's university app. By identifying and resolving key issues related to navigation,

information clarity, relevance, and reliability, the proposed solution better satisfies the needs of the regent students.

The conclusion of this project extends beyond only improvements for Regents university. With insights highlighting broader trends among newer generations, who expect seamless, personalised, and socially integrated digital experiences (Seemiller & Grace, 2015; Educause, 2020). It is important to continuously adopt user centred design practices to monitor how students will adapt to the use of advancing technology to meet their evolving expectations (Kraft, 2012). From AI driven personalisation, Augmented and Virtual reality experiences (Luckin, 2016; Murtaza et al., 2022; Radianti et al., 2020), educational institutions can position themselves to be more relevant, better engaging these demographics to deliver an unparalleled student experience

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Appendices

Appendix I: Research Documentation

I.1. Questionnaire Documentation

I.1.1. Questionnaire Questions

Statement of Consent	If you proceed in completing the questionnaire/survey you are giving consent in the data being used for the research, and if you do not complete the questionnaire and decide not to proceed at any stage with the questionnaire, you can opt to withdraw from the process, and any data will be destroyed and not used.
Theme	Questions
Demographic Information	<p>1.How old are you?</p> <p>2.How do you identify?</p> <p>3.Are you an international or domestic student?</p> <p>4.What is your current academic level? (Undergraduate/Postgraduate)</p> <p>5.What is your current academic year? (just for undergraduates - 1st, 2nd, 3rd)</p> <p>6.Are you a full-time or part time student?</p>
Drivers & Barriers	<p>7.Which platforms do you use to get university related information and resources relevant to you? Rank from most to least relevant. (Intranet, Blackboard, Mobile app, Social media, Emails, Microsoft Teams, WhatsApp)</p> <p>8.What type of information do you look for? (Rank in order of importance or frequency)</p> <p>9.Which features do you think could be improved the most in the app? Rank in order of importance for improvement.</p> <p>10.What motivates you to use the Regents University mobile app? (Select all that apply: Convenience, Recommendations, Required for coursework, Other [fill in])</p> <p>11.What discourages you from using the Regents University mobile app? (Select all that apply: Poor usability, Lack of needed features, Prefer other platforms, Other [fill in])</p>
General Student Experience	<p>12.What features in terms of student support are important to you? (Select all that apply: Learning/personal development/mental wellbeing/career development/other [fill in])</p> <p>13.Where do you feel you're not supported enough as a student? (Select all that apply: Learning/personal development/mental wellbeing/career development/other [fill in])</p> <p>14.How much of an influence has the app had on your social interactions? Rate from (No Influence/Some Influence/Heavy Influence)</p> <p>15.If the app has influenced your social interactions, how would you describe this influence? (Very Negative / Negative / Neutral / Positive / Very Positive)</p> <p>16.How much of an influence has the app had on your academic performance? Rate from (No Influence/Some Influence/Heavy Influence)</p> <p>17.If the app has influenced your academic performance, how would you describe this influence? (Very Negative / Negative / Neutral / Positive / Very Positive)</p>

<p>Overall Engagement</p>	<p>18.How often do you use the Regents University mobile app? (Daily/Weekly/Monthly/Rarely/Never) Why? (Please fill in)</p> <p>19.For what purposes do you typically use the mobile app? (Select all that apply: Checking schedules, Notifications, Campus maps, Receiving notifications, Accessing course materials, Communicating with faculty, Other [fill in]) (Rank from most used to least used)</p> <p>20.How important is the mobile app in your daily university life? (Very Important/Important/Neutral/Unimportant/Very Unimportant)</p> <p>21.How frequently do you check for updates on the mobile app? (Multiple times a day/Daily/Weekly/Monthly/Rarely)</p>
<p>Satisfaction</p>	<p>22.How would you rate the overall usability (how easy/difficult it is to use) of the mobile app? (Very Easy/Easy/Neutral/Difficult/Very Difficult)</p> <p>23.Which communication channel do you prefer for receiving important university updates? And why? (Rank them: Mobile App/Email/Website/Social Media/Other [fill in])</p> <p>24.How would you rate the relevance of the information provided by the app? (Very Relevant /Relevant/Neutral/Irrelevant/Very Irrelevant)</p> <p>25.How satisfied are you with the timeliness of information provided by the mobile app? (Very Satisfied/Satisfied/Neutral/Dissatisfied/Very Dissatisfied)</p> <p>26.How often do you expect to receive updates from the university?</p> <p>27.How satisfied are you with the overall experience of using the Regents University mobile app? (Very Satisfied/Satisfied/Neutral/Dissatisfied/Very Dissatisfied)</p> <p>28.Would you recommend the mobile app to other students? (Yes/No) Why or why not? (Please fill in)</p> <p>29.Do you have any additional comments or suggestions regarding the Regents mobile app?(Please fill in)</p>

I.2. Interview Documentation

I.2.1. Interview Questions

Statement of Consent	<p>[Just so you know, I have now started recording our conversation.]</p> <p>Hello and thank you for joining me on this interview today, my name is [your name] and with your consent I will be interviewing you on your experience with the Regents University app. It will only take 20-30 minutes of your time and the data will be completely anonymous. If you proceed in taking part in the interview you are giving consent in the data being used for our research. The aim of our research is to learn and understand how you use the Regents University mobile app so that we can optimise it. Feel free to ask me to repeat any questions at any point. If you agree to proceed, shall we start with the interview?</p>
Theme	Questions
Introduction and General App Usage	<p>First I'd like to just get oriented on what you like in general when looking at apps. For example:</p> <ol style="list-style-type: none"> 1. Could you give me examples of apps you frequently use (This can be anything e.g., Duolingo, shopping apps)? What features do you like about them? Why or what do you like about those features? Can you think of any other features or apps? 2. What features and qualities do you think make a mobile app good and enjoyable to use?
App Experience	<p>Now I'd like to start talking your experience with the regents app, so:</p> <ol style="list-style-type: none"> 3. Can you describe your overall experience with the Regents University app? Could you elaborate? 4. How easy or difficult is it to find information on the app? Can you provide specific examples? 5. What features or sections do you find easy to use? What makes it easy to use? 6. What features or sections do you find difficult to use? What makes it difficult to use? 7. Can you describe any challenges you face while using the app? How did these issues impact your use of the app?
Drivers and Barriers	<ol style="list-style-type: none"> 8. What makes you want to use the app? Elaborate (e.g., convenience, recommendations, required for coursework) Why or why not? 9. What makes you not want to use the app? (e.g., poor usability, lack of needed features) 10. How often do you use the app? and for what purposes? (e.g., checking schedules, notifications, accessing course materials)

<p>Specific Features and Improvements</p>	<p>11.(based on answer from previous question) Would you say those are the features you use the most often? Are there any other features/which other features do you use often? 12.Are there any features you wish the app had? Why are these features important to you? How would these features improve your experience? 13.Engagement and Satisfaction 14.What do you consider an important update? 15.An important part of the app is to give students important university updates. What has been your experience with this so far? 16.Are there any other ways you get important updates from? Which ones do you prefer or work better for you? Why?</p>
<p>Impact on Student Life</p>	<p>17.How has using the app influenced your social interactions at the university? Provide examples. How could the app support you better in these areas? 18.How has the app affected your academic performance? Provide examples. How could the app support you better in these areas? 19.Do you feel you have been sufficiently supported enough as a student? How could the app support you better in these areas?</p>
<p>Future Improvements and Engagement</p>	<p>20.What specific changes or additions would make the app more engaging for you and others? 21.If you could design the app experience, what would it look like? What elements would you include to make the app more enjoyable and useful? 22.Would you be interested in seeing gamification features such as rewards, badges, and streaks in the Regents app? If so, how? If not, why? 23.What features or elements from other apps you use regularly do you think could be added to the university app to improve your experience?</p>
<p>Closing</p>	<p>24.Do you have any additional comments or suggestions for improving the Regents University app?</p> <p>[Thank them for joining the interview]</p>

1.2.2. Interview Demographics

	Count (percentage)	
	(n = 8)	
<hr/>		
Gender		
Female	3	50%
Male	3	50%
<hr/>		
Nationality		
Indian	2	33,3%
Nigerian	2	33,3%
German	1	16,7%
South African	1	16,7%
<hr/>		
Age		
18 - 25	4	66,7%
26 - 35	2	33,3%
<hr/>		
Academic Level		
Undergrad	3	50%
Postgrad	3	50%
<hr/>		
Residency Status		
International	6	100%
Domestic	0	0%

1.2.3. Interview Transcripts and Audio Recordings

[Interview Transcripts Google Drive Folder](#)

[Audio Recordings Google Drive Folder](#)

I.3. User Testing Documentation

Link to Excel File: https://rul-my.sharepoint.com/:x/g/personal/s23000441_regents_ac_uk/EZWRpqrwnZBOpl2jopPmQgcBxijTnX6HRZoJU3_tNq0i6g?e=nrg0yD

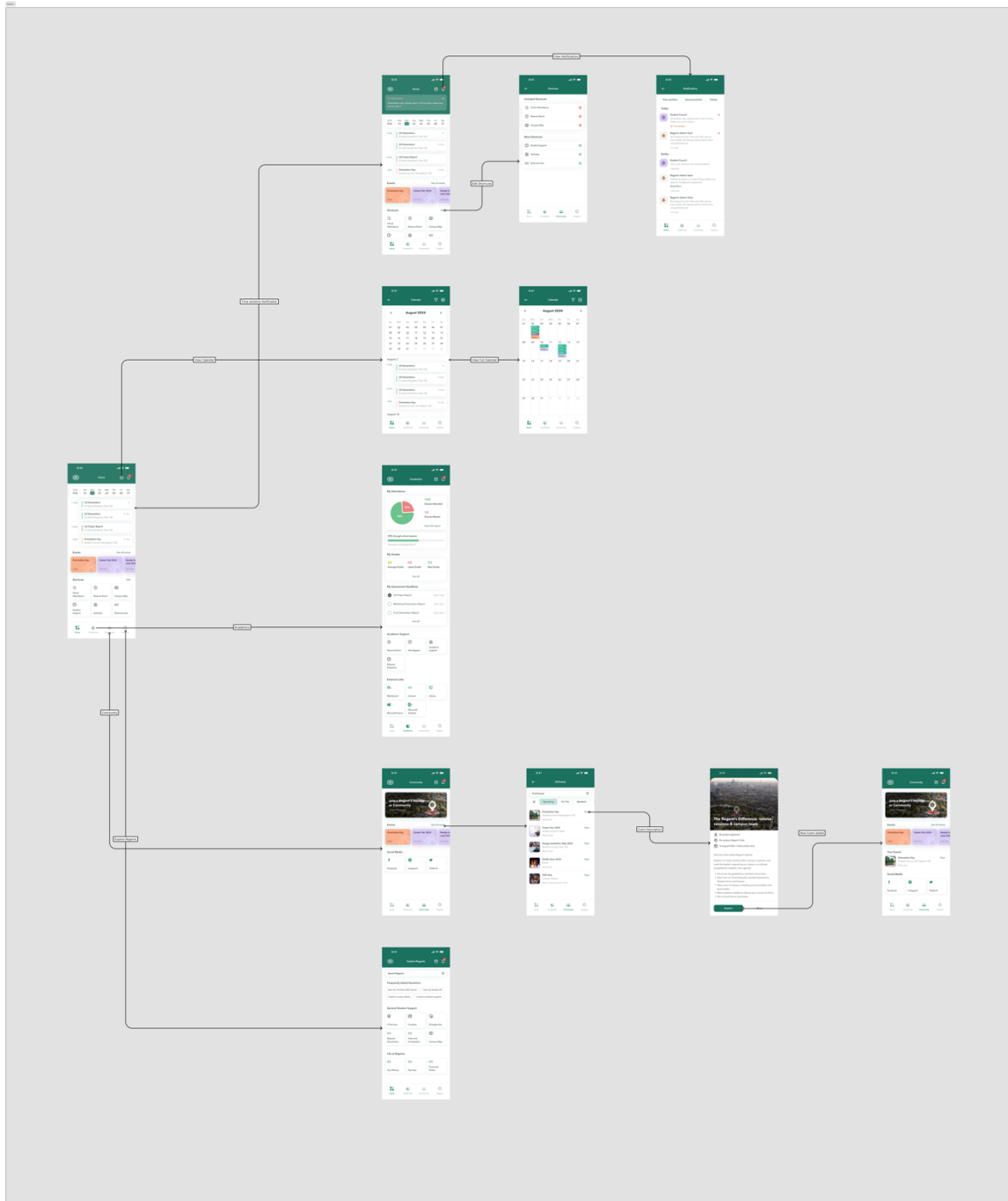
I.3.1. User Testing Tasks Objectives and Success Criteria

Task ID	Scenerio/Task	Objectives	Success criteria
1	Navigating to the Calendar	Assess ease of navigation, visibility, and accessibility of time-sensitive updates and events.	Participants can find the calendar and navigate through different dates/events with ease using the Figma prototype.
2	Accessing Communities and Events	Evaluate the ease of access to community-related information, such as societies and events.	Participant successfully accesses the student union section, explores societies, and checks out upcoming events on the Figma prototype.
3	Managing Notifications	Assess if users understand the time sensitive notification and how easily users can locate notifications in the app.	Participants can quickly find and act on the most recent time-sensitive notification without confusion.
4	Checking Academic Performance and Requesting Academic Support	Test the intuitiveness of accessing and understanding academic performance data, Test the accessibility and clarity of the academic support functions, particularly the request extension feature.	Participant locates and reviews their grades and attendance without significant difficulty on the Figma prototype. Participant locates the academic support section and successfully finds the extension request feature on the Figma prototype.
5	Exploring Additional Functionalities	Assess the functionality and efficiency of the search feature within the prototype.	Participant successfully uses the search function to find visa and immigration information on the Figma prototype.
6	Short cuts	To assess the ease and intuitiveness of customising the home screen by adding shortcuts to essential services, specifically the "Student Support" section.	The participant is able to locate the feature to edit shortcuts and successfully add the "Student Support" shortcut to the home screen with minimal difficulty.

I.3.2. User Testing Script

Interview Section	Script	Questions
Introduction	"Hello and welcome! Thank you for taking the time to participate in this usability test today." "My name is [Your Name], and I'll be guiding you through the session. The purpose of this test is to gather feedback on the Regents University mobile app prototype. Please remember, this is a test of the app, not of you, so there are no right or wrong answers. We're here to learn from your experience."	-
Statement of Consent	"Before we begin, I'd like to remind you that this session will be recorded, both screen and audio, to help us with the analysis later." "I'd like to ask for your consent to proceed with this session. Your responses will remain confidential, and you can withdraw from the session at any time without any consequences. Do you consent to continue?"	-
Overview of the Test	"During this session, you'll be interacting with the app prototype on Figma through a series of tasks designed to simulate typical user interactions." "As you go through the tasks, please think aloud and share any thoughts, confusions, or feedback that come to mind. I'll be observing your interactions, but I won't be able to assist you unless you're completely stuck."	-
Introduction to Figma Prototype	"If you're not familiar, Figma is a design tool that allows us to create interactive prototypes. You'll be clicking through screens as you would in a real app, but keep in mind that some actions might be limited by what has been designed in the prototype."	-
Task 1	You need to check your class schedule and any upcoming events. Please find the calendar and navigate through it." "Can you check what is on your schedule on the 10th of August?" "Can you tell if you have any other classes this week?"	How easy or difficult was it to find the calendar? Is the information presented in the calendar clear and relevant to you?
Task 2	"You are interested in checking out upcoming events and how to connect with people. Where are you go?" "Now that you're here, how would you register for an event?"	How easy was it to find and navigate through the societies and events? Was the information about the societies and events sufficient and clear?
Task 3	"You just received a time sensitive notification." "How would you find all the notifications and updates you've gotten so far?"	"Was it easy to find your notifications?" "How do you feel about how the notifications are displayed to you?"
Task 4	"You want to check your attendance records. Please locate where you can find this information." "You have an assignment deadline approaching and need to request an extension. Where would you find out how you would do this?"	How straightforward was it to access your grades and attendance? Is there anything you would change about how this information is presented? What else are you missing in this section?
Task 5	"Can you search for the map?" "You are looking for specific resources on visa and immigration. Where would you find this?"	How effective was the search function in helping you find what you were looking for? Did the search results meet your expectations?
Task 6	"Now that you've navigated the whole app, there are certain functionality you want to quickly have access to. One of which is Student support. Go to your home screen and add this shortcut"	How easy or difficult was it to find the option to add shortcuts? Would you use this feature regularly to customise your home screen? Why or why not?
General Impressions:	-	"How would you describe your overall experience using the prototype?" "What did you like most about the app?" "What did you find most frustrating or difficult?"
Feedback on Specific Features:	-	"Are there any features you feel are missing or could be improved in the prototype?" "How do you think this prototype compares to other educational apps you've used?" Would you recommend this app to someone? How does this version of the app compare to the current version? Would you use it more? How do you think this app could impact your overall student experience at regents?
Final Thoughts:	-	"If you could change one thing about the app prototype, what would it be?" "Would you use this app regularly based on your experience today? Why or why not?"
Conclusion	-	"Thank you so much for your time and valuable feedback today. Your insights will be instrumental in helping us improve the app." "Before we end, do you have any questions or additional thoughts you'd like to share?" "Thanks again, and have a great day!"

I.3.3. User Testing Flow Chart



I.3.4. User Testing Transcripts and Recordings

[Transcripts Google Drive Folder](#)

[Audio Recordings Google Drive Folder](#)

I.3.5. User Testing Notes

Appendix II: Research and Data Analysis Tools

Attention: if you copy and paste links make sure they are copied correctly.

II.1. Data Analysis

Link to Miro Board:

https://miro.com/app/board/uXjVKtRI1aM=?share_link_id=507192037062

II.1.1. Questionnaire - General Analysis and Insights:

Link to File:

https://docs.google.com/document/d/1r443jQ0FZ8NSvp8-7QnshLcbiQa5KDM68cJRbPTplA4/edit?usp=share_link

II.1.2. Interviews – Thematic Analysis

Link to Excel File:

https://docs.google.com/spreadsheets/d/1-oJOMS9PzMkfHyPIoY5ILQ0mEDOeGjen/edit?usp=share_link&oid=116264896456297291489&rtpof=true&sd=true

II.1.3. Usability Testing – Findings and Analysis

Link to Excel File: <https://rul->


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Task Performance by Participant


Task	Participant 1	Participant 2	Participant 3	Participant 4
Navigating to the Calendar	Initially found it challenging but appreciated the shortcut icon to the calendar once he found it.	Easily navigated to the calendar and found the information clear and relevant.	Found it easy to navigate but suggested a more intuitive way to access detailed views.	Found the calendar easily but was unsure about the meaning of color codes representing events.
Accessing Communities and Events	Found events but was unsure about how to connect with people directly through the app.	Easily found and registered for events through the homepage.	Easily accessed and registered for events, appreciated the reminders.	Initially confused about where events were located but found them through the homepage eventually.
Managing Notifications	Found it extremely easy to locate notifications and appreciated the feature for managing assessment deadlines.	Found notifications easily and liked that past notifications were accessible.	Suggested prioritising notifications based on importance, such as making class cancellations more prominent.	Found notifications and appreciated that they were clear and accessible.
Checking Academic Performance and Requesting Academic Support	Suggested adding a feature for Student Support Agreements (SSA) and found the academic section very nice and fun to look at but had an issue with some terminology.	Praised the clear presentation of academic records and found it easy to request extensions.	Found the academic section well-organised but suggested improvements for academic support links.	Found academic information straightforward but noticed some confusion around requesting extensions.
Exploring Additional Functionalities	Located the campus map on home screen but mentioned that the original app's map feature was not very effective. Looked for the visa and immigration resources under academic support.	Found the campus map easily through the shortcuts. He also successfully located visa and immigration information through the Explore page, noting that the placement made sense.	Located the campus map on the homepage and explored the visa and immigration resources through the Explore page. He mentioned that the Explore page made sense and was effective in helping him find what he needed.	Found the campus map under Explore and also accessed visa and immigration resources there. She found the process straightforward and appreciated that the information was centralised in one place.
Short cuts	Initially was confused with task but after understanding he knew exactly for to add the shortcuts and was very excited with the	Found adding shortcuts easy and believed it made the app more user-friendly.	Suggested that the option to add shortcuts could be made more intuitive with clearer labels or icons.	Found it easy to add shortcuts and appreciated the ability to customise the home screen.

II.2. User Personas

II.2.1. Undergraduate User Personas

Persona: Undergraduate	Quote
	<ol style="list-style-type: none"> 1. "It would be helpful if timetable changes and schedule updates were notified on time." 2. "I never know what events are happening on campus."
Demographic	Goals
<p>Name: Emily Carter Age: 20 Degree Program: Bachelor of Arts in Communications Year: Second Year Demographics:</p> <ol style="list-style-type: none"> 1. International Student 2. Full-time 3. Active in campus clubs and social events 	<ol style="list-style-type: none"> 1. Stay updated on campus events and activities 2. Easily access class schedules and attendance records 3. Find academic resources quickly and efficiently
Motivations	Frustrations
<ol style="list-style-type: none"> 1. Desire for a seamless and reliable app experience that integrates all necessary academic and social information 2. Preference for a visually appealing and intuitive app interface 3. Need for timely and relevant notifications about course-related updates and events 	<ol style="list-style-type: none"> 1. Difficulty finding important academic information 2. Inconsistent notifications about schedule changes and events 3. Frequent logouts from the app causing missed notifications 4. Confusing navigation and hidden information layers
Technical Proficiency	Usage patterns
<ol style="list-style-type: none"> 1. Comfortable with technology and mobile apps 2. Regular user of social media and other digital tools 	<ol style="list-style-type: none"> 1. Uses the app 2-3 times a week primarily to check schedules, attendance, and campus events 2. Prefers receiving updates through notifications rather than emails

II.2.2. Postgraduate User Personas







Persona: Postgraduate	Quote
	<ol style="list-style-type: none"> 1. "The app should integrate better with our email and other tools." 2. "I have to use multiple platforms to get all my information."
Demographic	Goals
<p>Name: David Zhang Age: 26 Degree Program: Master of Business Administration (MBA) Year: First Year Demographics:</p> <ol style="list-style-type: none"> 1. International Student 2. Full-time 3. Balances studies with a side hustle 	<ol style="list-style-type: none"> 1. Efficiently manage academic commitments and deadlines 2. Access reliable information about course materials and schedules 3. Integrate academic updates with professional commitments
Motivations	Frustrations
<ol style="list-style-type: none"> 1. Requires an app that provides seamless access to both academic and administrative information 2. Prefers a centralised platform for managing all university-related tasks 3. Values features that help balance academic and personal life 	<ol style="list-style-type: none"> 1. Limited functionality and lack of integration with other platforms 2. Frequent logouts and unreliable app performance 3. Inability to find necessary academic information quickly 4. Over reliance on the intranet which is inconvenient to access via the app
Technical Proficiency	Usage patterns
<ol style="list-style-type: none"> 1. Highly proficient with technology, relies on digital tools for both work and study 2. Utilizes various productivity apps and tools 	<ol style="list-style-type: none"> 1. Uses the app less frequently, about once a week, mainly to check specific academic updates 2. Prefers accessing detailed information through a web browser when necessary

II.3. User Journey Maps

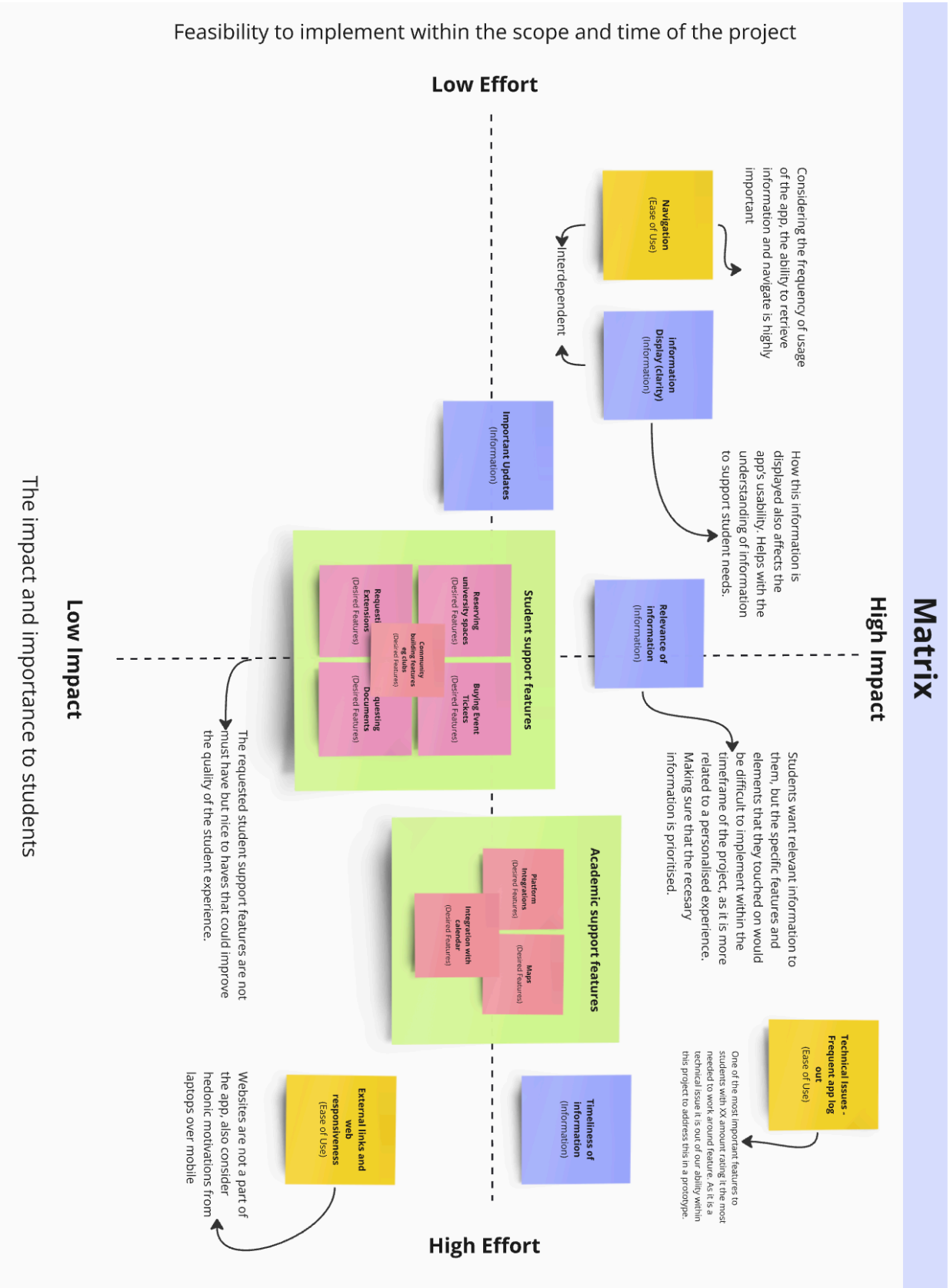
II.3.1. Undergraduate User Journey Map

User Journey: Undergraduate	Persona	Scenario	Expectations		
	Emily Carter	Emily wants to check her daily class schedule, attendance, and find upcoming campus events	Easy navigation, clear and relevant information		
Journey Steps Which step of the experience are you describing?	Phase 1	Phase 2	Phase 4	Phase 5	
Doing What does the user do? What information do they look for? What is their context?	Opens the app	Checks class schedule	Views attendance records	Looks for upcoming campus events	Finds an event, happening that day that she would have liked to go to
Thinking What is the user thinking during each phase? What are their questions, doubts, or concerns?	"I hope I don't have to log in again."	"Where is my schedule?"	"Why are my attendance records not updating?"	"What events are there available?"	"Why do they not tell us about these things?"
Saying What is the user saying to themselves or out loud? What comments or verbal expressions are they making?	"Finally, logged in."	"Why is it so hard to find this?"	"I don't understand which classes I've missed and how many I haven't."	"I can't find any events."	"I can't believe I missed another cool event."
Emotions What emotions is the user feeling during each phase? How does their emotional state change throughout the journey?	Relieved 	Annoyed 	Confused 	Disappointed 	Annoyed 

II.3.2. Postgraduate User Journey Map

User Journey: Postgraduate	Persona	Scenario	Expectations		
 <p>Journey Steps Which step of the experience are you describing?</p>	David Zhang	David is trying to manage his academic commitments by accessing course materials and information	Efficient access to academic updates and materials, integrated tools, reliable notifications		
	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5
<p>Doing What does the user do? What information do they look for? What is their context?</p>	Opens the app	Logs into the app	Views course updates and deadlines	Searches for course materials	Checks and updates personal and academic schedules
<p>Thinking What is the user thinking during each phase? What are their questions, doubts, or concerns?</p>	"I really need to get information about my class today"	"Why? Is it always logging me out?"	"Do I have any upcoming deadlines?"	"Where can I find the blackboard for the lecture notes?"	"How can I balance my personal and educational schedules?"
<p>Saying What is the user saying to themselves or out loud? What comments or verbal expressions are they making?</p>	"Why does it always log me out?"	"Rather do this on my computer but I need the info now"	"I need to stay on top of my deadlines."	"This is hard to find."	"Why can't I download my schedules in a personal calendar?"
<p>Emotions What emotions is the user feeling during each phase? How does their emotional state change throughout the journey?</p>	 <p>Angry</p>	 <p>Annoyed</p>	 <p>Focused</p>	 <p>Frustrated but Determined</p>	 <p>Relieved but still Concerned</p>

II.4. Prioritisation Matrix



II.5. Problem Statements

Problem Statements

PS1: Students struggle with navigating the app due to poor design and information architecture, leading to difficulties in finding important information.

PS2: The app lacks clear and relevant academic and social information, resulting in difficulties for students to efficiently access and understand critical updates, schedules, and event information.

II.6. User Stories

User stories

1. **As a student, I want an intuitive way to navigate the app**, so that I can easily find important academic resources like timetables, attendance records, and class schedules without getting lost in multiple layers of the app.
2. **As a student, I want a consistent and intuitive user interface**, so that I can understand and predict where to find the information I need, improving my overall experience with the app.
3. **As a student, I want a central location summarising all important information to me** so that I can quickly review my academic and social commitments at a glance.
4. **As a student, I want personalised content based on my courses and interests**, so that the information displayed to me is relevant and useful for my specific needs.
5. **As a student, I want to quickly access features i use often**, so that I can save time on repetitive tasks
6. **As a student, I want to receive clear, relevant updates about academic information and social events**, so that I can stay informed about important changes and networking opportunities
7. **As a student, I want the app to provide accurate and up-to-date information**, so that I can rely on it for planning my academic and social activities without having to cross-check other sources.

III.1. Ideation

III.1.1. “How Might We” (HMW) Questions

HMW Questions

1. **How might we simplify the app's navigation to help students find academic resources without getting lost or feeling overwhelmed**
2. **How might we organise similar information to make it more intuitive for users to predictably find information they need**
3. **How might we create a consistent and intuitive user interface that allows students to understand and predict where to find the information they need?**
4. **How might we display information that provides an at-a-glance view of a student's commitments?**
5. **How might we use data about students' courses and interests to tailor the app's content to their needs?**
6. **How might we create customisable interfaces that allow students to choose what information is most relevant to them?**
7. **How might we categorise and present updates to ensure students can easily filter and find relevant information?**
8. **How might we design a notification system that ensures students receive relevant updates about academic information and social events?**
9. **How might we incorporate interactive elements that encourage students to engage more with the app?**
10. **How might we use gamification to make the app experience more engaging and rewarding for students?**
11. **How might we gather and analyse student feedback to continuously improve the app's usability and engagement features?**

III.1.2. Rapid Brainstorming Results

Brainstorming information

Objectives

1. Generate innovative ideas to simplify navigation, organize information, and enhance usability.
2. Prioritise ideas for further development and prototyping.
3. Identify key features that align with student needs and expectations.

Constraints

⌚ Timer

5 mins

5 Minutes per Theme

Start

Participant information and Tools

Participants	Tools	Voting
Tomisin	Julietta	

Theme 1: Navigation and Organisation

- How might we simplify the app's navigation to help students find academic resources without getting lost or feeling overwhelmed?
- How might we organize similar information to make it more intuitive for users to predictably find information they need?
- How might we create a consistent and intuitive user interface that allows students to understand and predict where to find the information they need?

Theme 2: Information Display and Management

- How might we display information that provides an at-a-glance view of a student's commitments?
- How might we use data about students' courses and interests to tailor the app's content to their needs?
- How might we create customisable interfaces that allow students to choose what information is most relevant to them?
- How might we categorise and present updates to ensure students can easily filter and find relevant information?

Theme 3: Engagement and Interaction

- How might we design a notification system that ensures students receive relevant updates about academic information and social events?
- How might we incorporate interactive elements that encourage students to engage more with the app?
- How might we use gamification to make the app experience more engaging and rewarding for students?

Idea Parking Lot

III.1.3. Site Maps

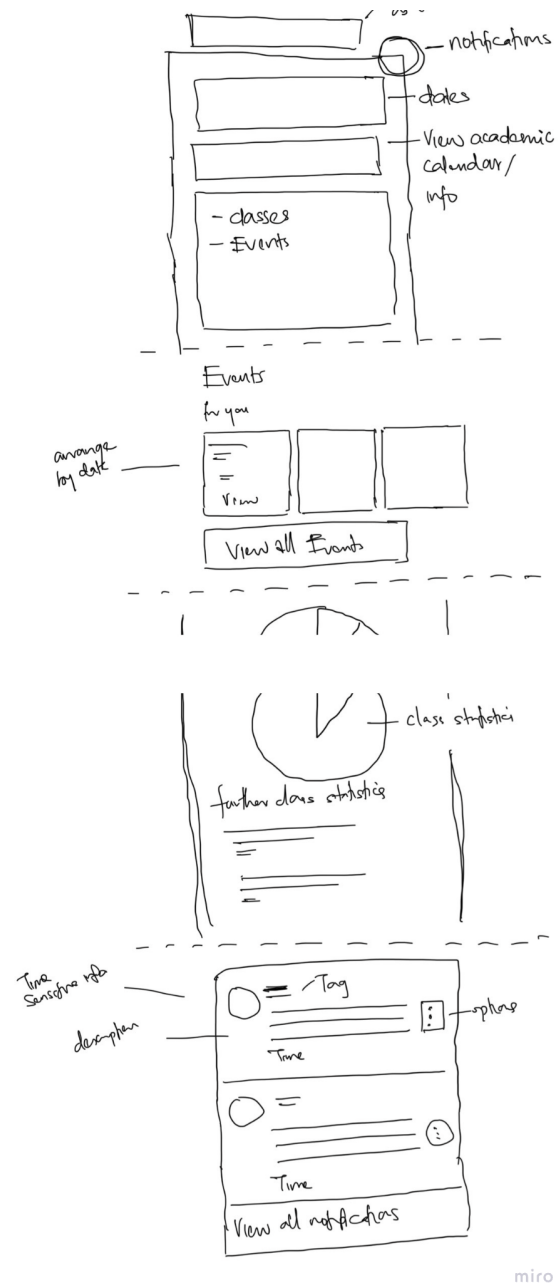
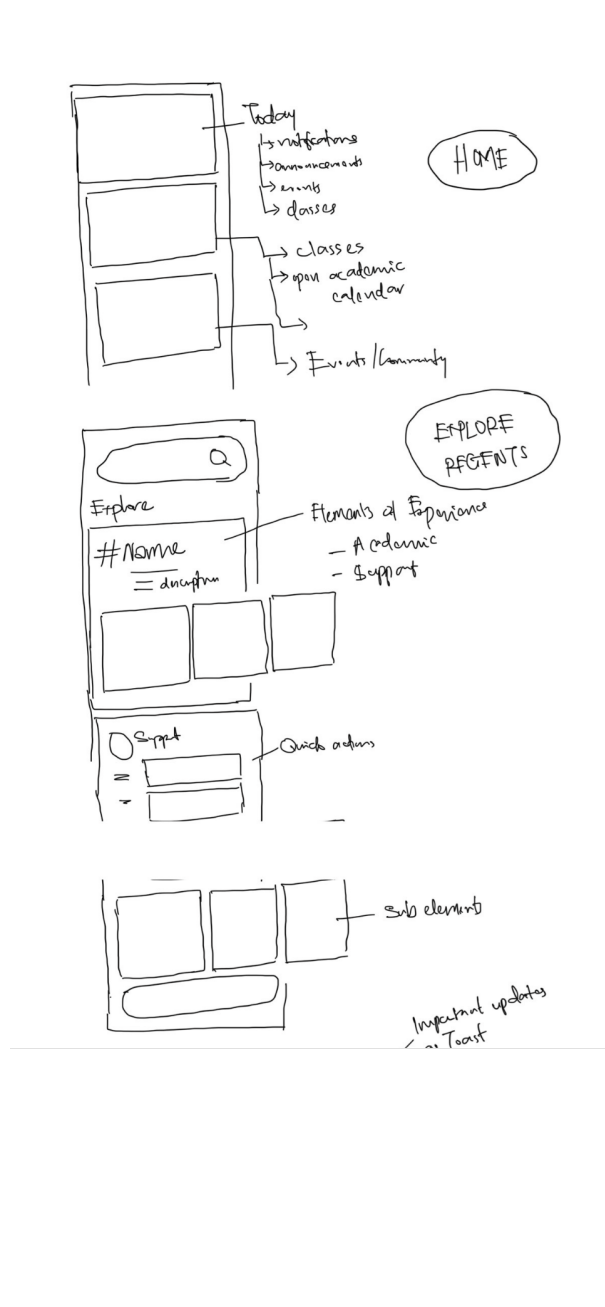


Regents Proposed (ideated) Information Architecture

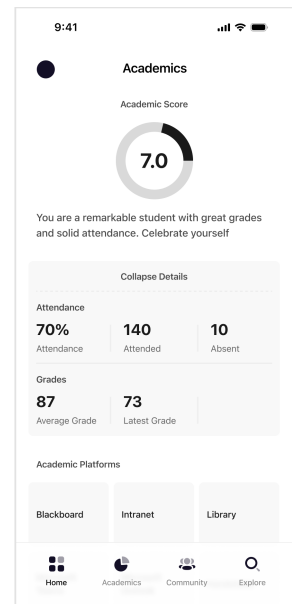
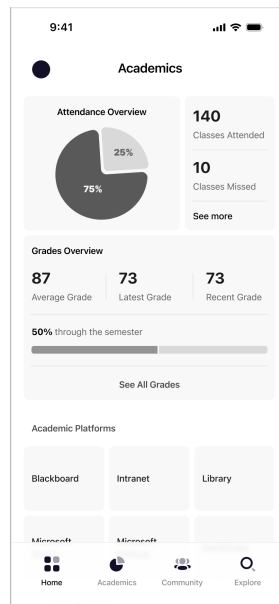
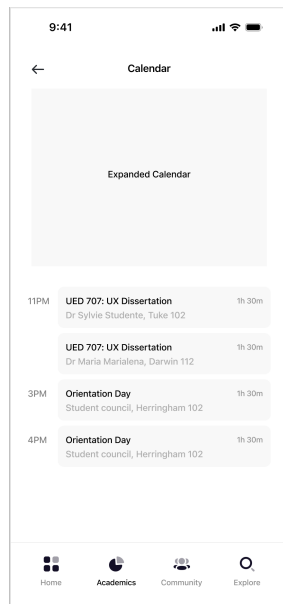
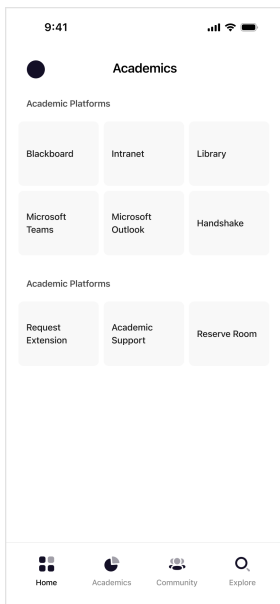
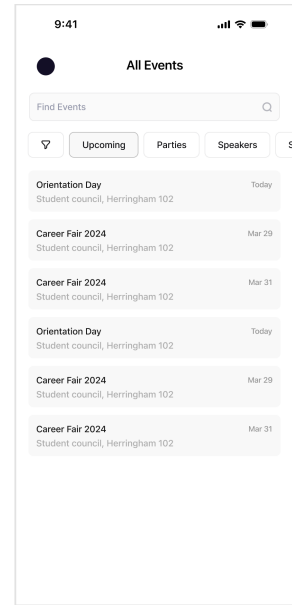
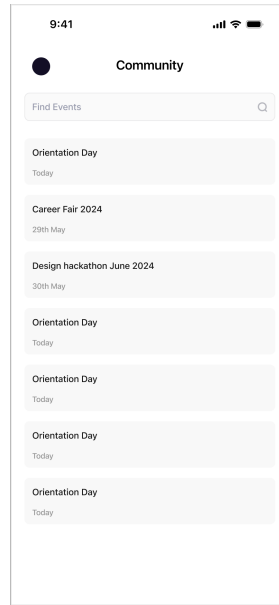
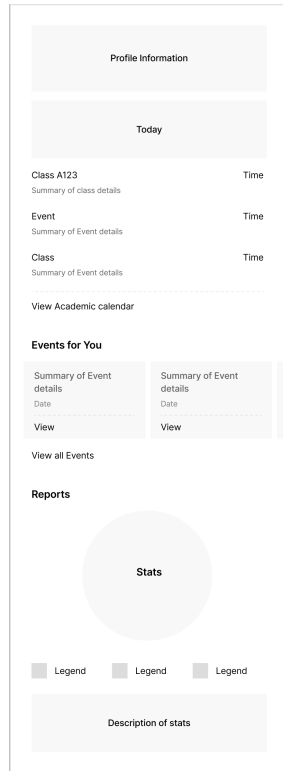
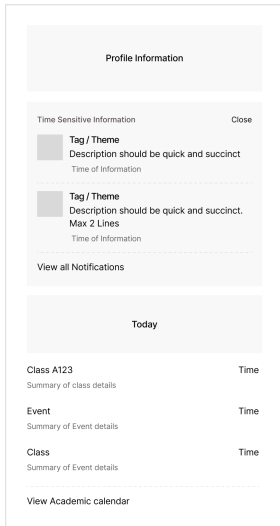


III.2. Wireframing and Prototyping

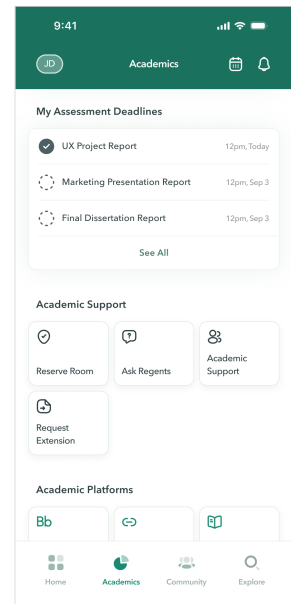
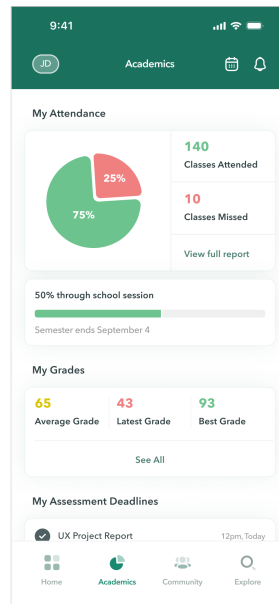
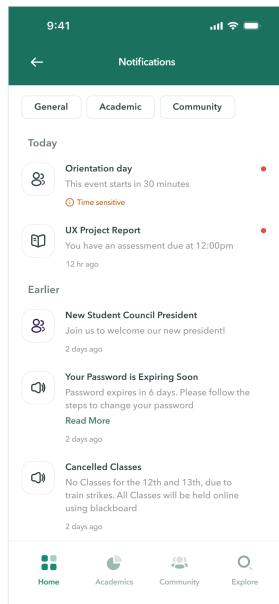
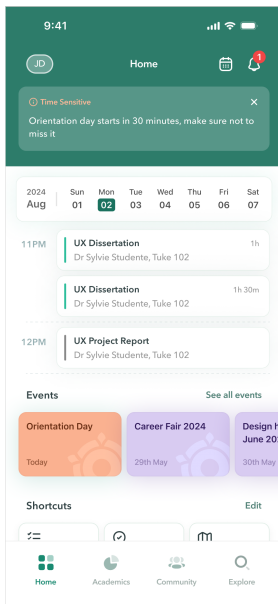
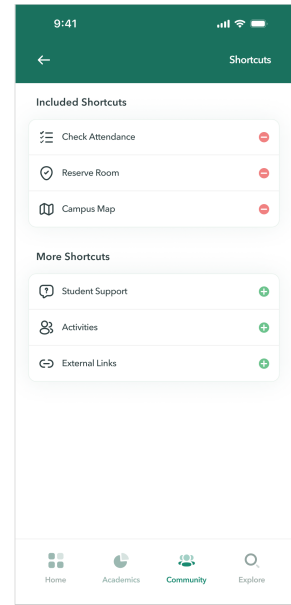
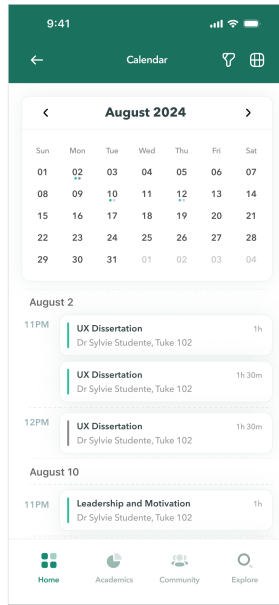
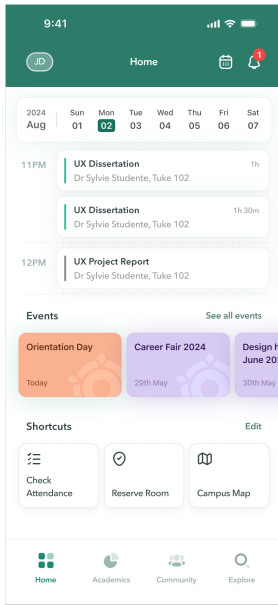
III.2.1. Low-Fidelity Wireframes

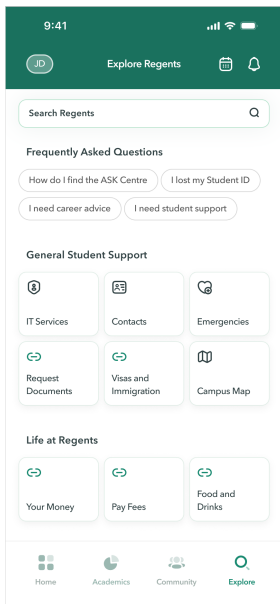
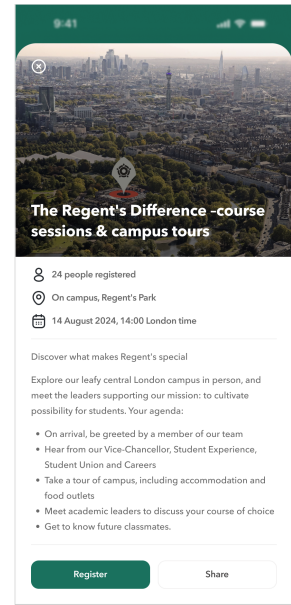
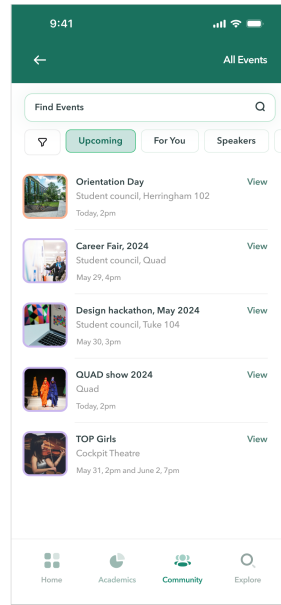
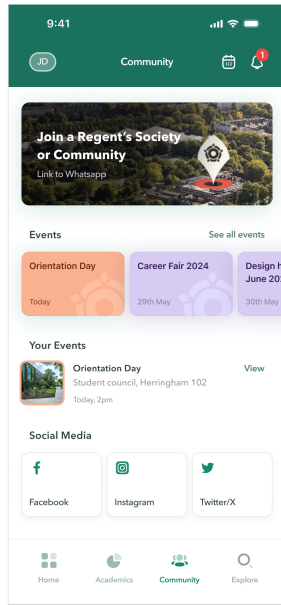
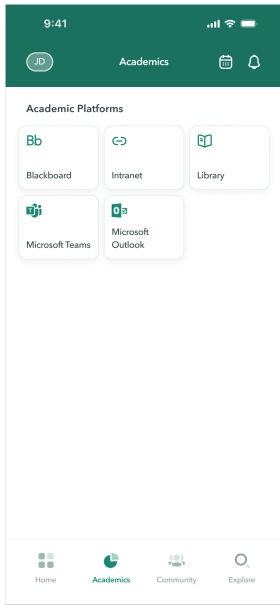


miro



III.2.2. High-Fidelity Mock-ups





Appendix IV: Project Management and Timeline

IV.1. Project Gantt Chart

