The UWTSD Traitors

A Mobile Game — User Research & Interface Design Report

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1 Introduction

The Traitors is a strategy and social deduction game in which players work together to collect treasure while trying to identify hidden traitors among them. This report documents the initial user research and interface design work for a UWTSD-themed digital version of that game, intended to be played on a mobile phone. The game is set on the Birmingham campus and features up to six characters drawn from different parts of the university community: a Computing student, a Fine Art student, a mature student, a student with a visual impairment, an international student, and a member of university staff.

The report is organised as follows. Section 2 presents four user personas developed from real research with potential players. Section 3 describes the research methods used and the key findings. Section 4 discusses how usability requirements were applied in the wireframe design. Section 5 describes the main wireframe screens. Section 6 explains how prototype feedback was gathered and what it showed. Appendix A provides a full MoSCoW requirements list and Appendix B describes the complete wireframe storyboard set.

2 Test Personas and User Requirements

Four personas were defined to represent the real diversity of potential players. The aim was to avoid the common design mistake of treating every user as a typical able-bodied eighteen-year-old from Birmingham. As Rogers, Sharp and Preece (1) argue, personas are only useful when they reflect genuine variation in the user population, including differences in age, ability, technical experience, and context of use.

2.1 Persona 1 — Walter White

Persona 1: Walter White — Second-year Computing Student

Age: 20 **Degree:** BSc Computer Science **Disability:** None

Background: Walter lives in student halls and plays mobile games daily. He is confident with technology and often plays multiplayer games with friends in the evening. He has moderate experience with social deduction games such as *Among Us*.

Scenario: Walter discovers the game through the Students' Union app. He wants to start a match with four course-mates during a lunch break. He expects smooth onboarding and short round timers.

Key UX requirements: Fast loading times, simple lobby system, minimal tutorial for experienced players, push notifications for game events.

2.2 Persona 2 — Jesse Pinkman

Persona 2: Jesse Pinkman — International Student, Fine Art

Age: 24 **Degree:** BA Fine Art **Disability:** None

Background: Jesse arrived from Ghana six months ago. His first language is not English and he sometimes finds long written instructions difficult to read quickly. He has a smartphone but is not a frequent mobile gamer. He is interested in the game for its social aspects.

Scenario: Jesse is invited to join a game session by course-mates during a free afternoon in the library. He has never played the game before and needs clear guidance without reading several screens of rules.

Key UX requirements: Visual and icon-based instructions, short and simple language, an accessible tutorial, and the option to change the interface language.

2.3 Persona 3 — Saul Goodman

Persona 3: Saul Goodman — Part-time Mature Student

Age: 47 **Degree:** BA Education Studies (part-time) **Disability:** Mild arthritis in both hands

Background: Saul works part-time and studies two days a week. He is not a gamer and uses his smartphone mainly for messages and email. Mild arthritis makes small touch targets and complex gestures uncomfortable.

Scenario: Saul joins a game session organised as a group bonding activity for his cohort. He is willing to participate but is worried about making mistakes in front of other students.

Key UX requirements: Large touch targets, high contrast text, clear error recovery, no reliance on rapid gestures, a "How to Play" guide accessible from every screen.

2.4 Persona 4 — Gus Fring

Persona 4: Gus Fring — Third-year Student with Low Vision

Age: 22 **Degree:** BA Media Studies **Disability:** Low vision (uses screen magnification and VoiceOver)

Background: Gus has studied at UWTSD for two years and uses both screen magnification and the VoiceOver screen reader on his iPhone. He is comfortable with assistive technology and wants to participate in the same games as his peers.

Scenario: Gus wants to join a game session with friends. The interface must work correctly with VoiceOver and remain readable at 150% magnification without breaking the layout.

Key UX requirements: Full VoiceOver compatibility, scalable text, colour contrast meeting WCAG 2.1 Level AA, no information communicated by colour alone.

3 User Research Methods and Findings

3.1 Research Approach

To construct realistic personas, primary research was carried out with ten potential users recruited from the UWTSD Birmingham campus. The process combined an online questionnaire with three semi-structured interviews. This mixed approach is well supported in the literature: (1) argue that combining quantitative questionnaires with qualitative interviews allows designers to identify both the frequency and the depth of user needs. Weichbroth (2024) notes that fewer than five percent of mobile applications succeed commercially, underlining the importance of early usability evaluation (2). The questionnaire provided broad patterns across the group, while the interviews gave richer understanding of specific situations and motivations.

3.2 Questionnaire

A short online questionnaire of eleven questions was distributed via a QR code displayed in two campus locations: the student lounge and the main library entrance. Questions covered mobile gaming habits, familiarity with social deduction games, any accessibility needs, and preferences for interface style (for example, text-based instructions versus icon-based instructions). Eight usable responses were received within one week. Key findings included the following: six out of eight respondents played mobile games at least once a week; only two had previously played a social deduction game on a mobile device; four preferred icon-based instructions over written text; and two reported having an accessibility need.

3.3 Semi-Structured Interviews

Three semi-structured interviews were conducted, each lasting approximately twenty minutes. Participants included a mature student in his forties, an international student in his early twenties, and a second-year undergraduate. Interviews were audio-recorded with consent and transcribed. Thematic analysis of the transcripts identified four themes.

First, all three participants valued being able to start a game quickly, particularly in short gaps between lectures. Second, all participants found the Traitor and Faithful roles confusing without a clear visual explanation. Third, one participant said the game would feel more engaging if characters and locations were connected to real places on the UWTSD campus. Fourth, one participant raised the problem of colour-only information encoding after seeing a prototype that used red and green as the sole indicators of game status, with no alternative icons.

These findings shaped the personas in Section 2 and the MoSCoW requirements in Appendix A.

4 Designing for Usability

4.1 Heuristic Framework

The primary usability framework used in the wireframe design was Nielsen's ten heuristics for user interface design (3). A systematic review by Wu and Duffy (2022) confirmed that usability evaluation is the most widely used quality method in mobile application development (4). These principles, originally developed in 1994 and updated with new examples and clarifications in 2020, remain the most widely cited usability evaluation framework in HCI. Four heuristics were especially relevant to this project.

Visibility of system status: Players must always know whose turn it is, which phase the game is in, and how many players remain. In the wireframes, a persistent status bar at the top of every screen shows the current phase, round number, and remaining player count.

Match between the system and the real world: Game language uses familiar UWTSD terminology rather than abstract labels. Characters are named after recognisable campus roles such as "The Librarian" or "The Engineering Lecturer", and settings reference real Birmingham buildings.

Error prevention: Destructive actions, such as voting to eliminate a player, require a confirmation step before the action is submitted. This is particularly important for users like Saul, who may tap a button accidentally due to his motor impairment.

Recognition rather than recall: Role cards, the voting screen, and night-phase actions all

display visible icons and labels so that players do not need to remember what each option means from one round to the next (5).

4.2 Accessibility in Game Design

Rehman et al. (6) found in their review of game usability research that accessibility is consistently underrepresented in early-stage design, which makes problems more expensive to fix in later stages. Accessibility requirements were therefore built into the wireframes from the start. The design follows WCAG 2.1 (7) Level AA guidance for colour contrast and text size. Colour is never used as the only way to communicate a game state: for example, the voting screen uses both a red highlight and an "X" icon to show eliminated players. All interactive elements are designed with accessible label text that works with screen readers. Huang and Benyoucef (2022) found that learnability and visual clarity are the most important usability features common to all mobile app categories (8).

4.3 Cognitive Load and Mobile Context

Benyon (5) notes that mobile interfaces require particular care about cognitive load because users are often in environments with distractions and limited attention. Each screen in the game was therefore designed to show no more than three or four interactive options at once. Turn instructions are written as a single short sentence with a supporting icon. The Night Phase screen, which involves the most decision-making, uses a step-by-step modal dialog rather than showing all options simultaneously.

5 Wireframe Storyboards

5.1 Overview

A complete set of wireframe screens was produced using a low-fidelity wireframe tool. All screens are designed at 390 by 844 points in portrait orientation, which corresponds to the dimensions of a standard modern smartphone. The full set is presented in Appendix B. The six main screens are described below.

5.2 Screen 1 — Welcome Screen

Wireframe 1: Welcome Screen

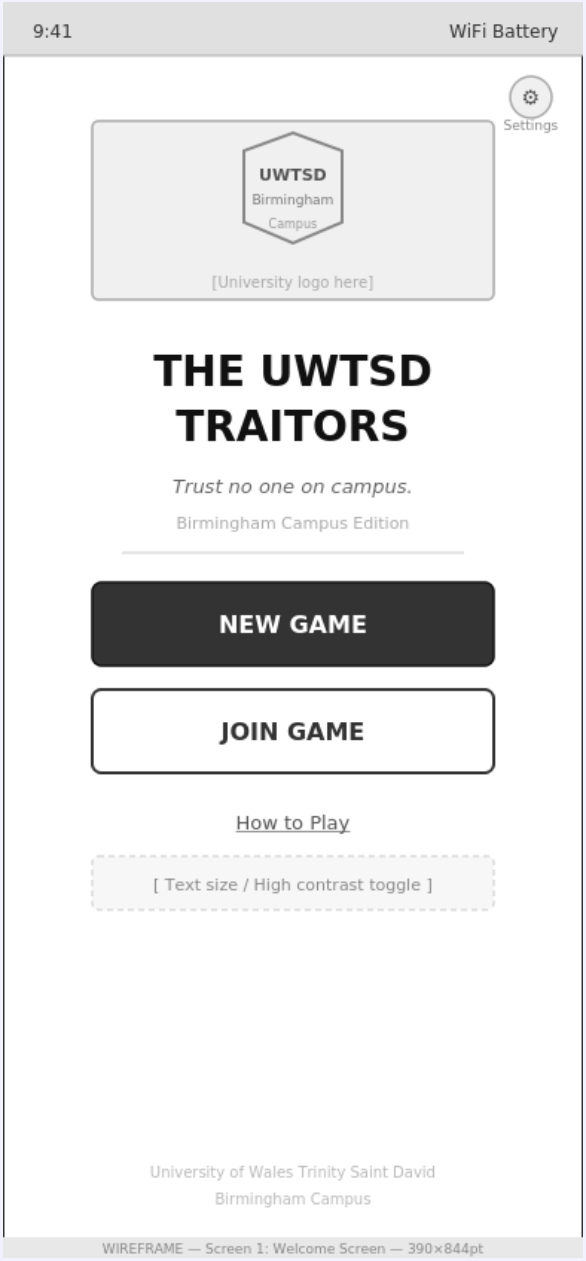

Figure 1: Wireframe 1: Welcome Screen.

The welcome screen displays the game title, a short tagline, and two large buttons: **New Game** and **Join Game**. A settings icon in the top-right corner opens accessibility options including text size adjustment and high-contrast mode. No tutorial text appears on this screen; information is introduced progressively once the player enters the game.

5.3 Screen 2 — Player Lobby

Wireframe 2: Player Lobby

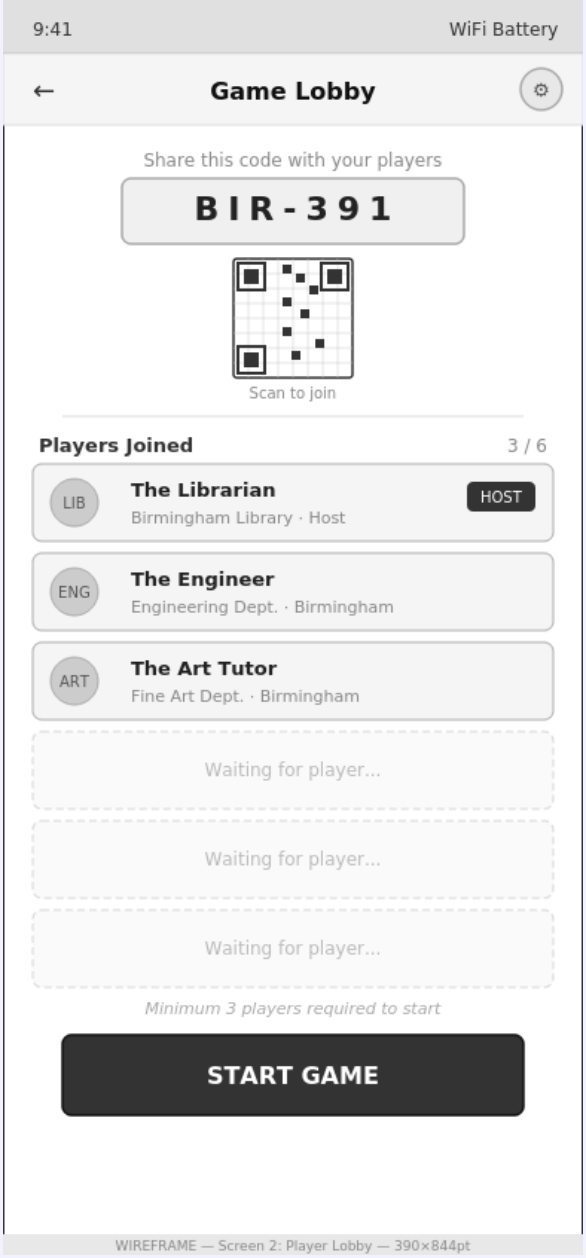

Figure 2: Wireframe 2: Player Lobby.

Players join using a six-character room code or by scanning a QR code. As each player connects, their chosen avatar from one of six UWTSD campus characters appears in the lobby list. The host sees a **Start Game** button that activates once at least three players have joined. A character key at the bottom of the screen shows all six characters with their names and campus area.

5.4 Screen 3 — Role Reveal

Wireframe 3: Role Reveal

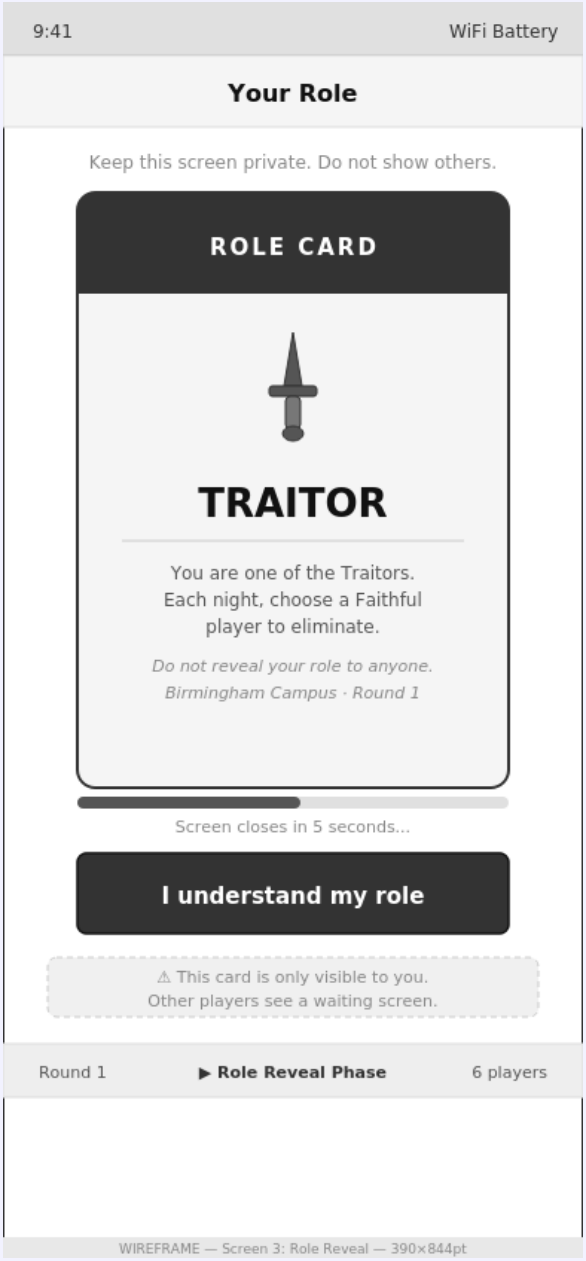

Figure 3: Wireframe 3: Role Reveal Card.

Each player privately sees their own role card showing either **Faithful** (shield icon) or **Traitor** (dagger icon), with a short plain-English description. The card closes after ten seconds or when the player taps "I understand my role". Other players cannot see each other's role cards.

5.5 Screen 4 — Day Phase

Wireframe 4: Day Phase

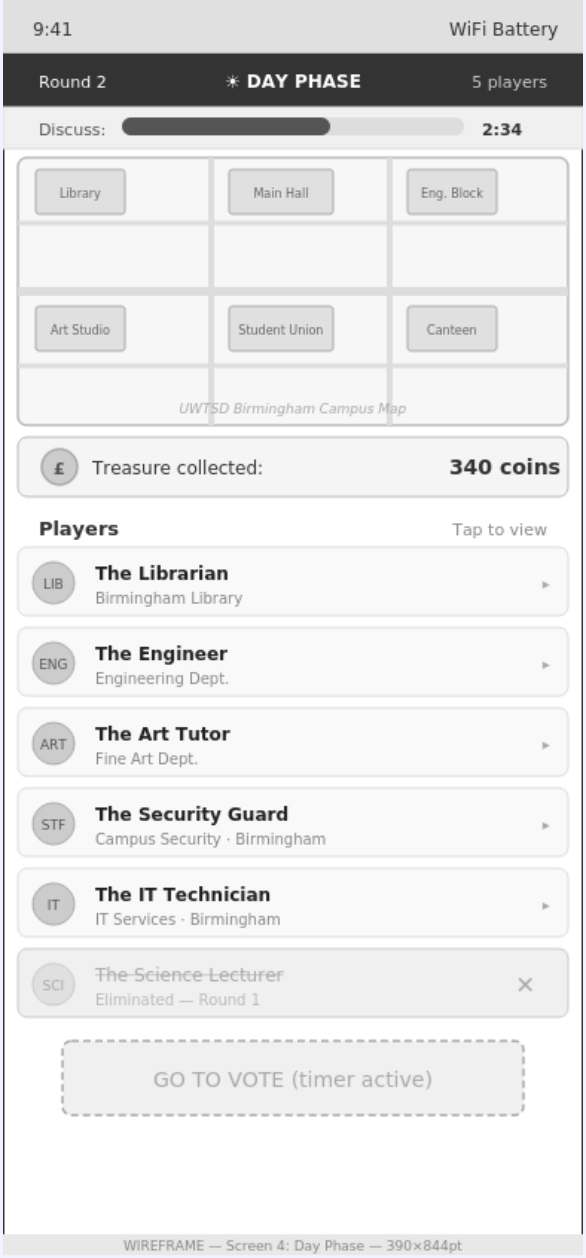

Figure 4: Wireframe 4: Day Phase.

The Day Phase screen shows a simplified map of the Waterfront area, the list of active players, and a discussion timer. Tapping a player avatar opens their character card. A gold coin counter shows the treasure collected so far. The **Go to Vote** button activates when the timer reaches zero. The persistent status bar always shows the phase, round number, and remaining players.

5.6 Screen 5 — Night Phase

Wireframe 5: Night Phase

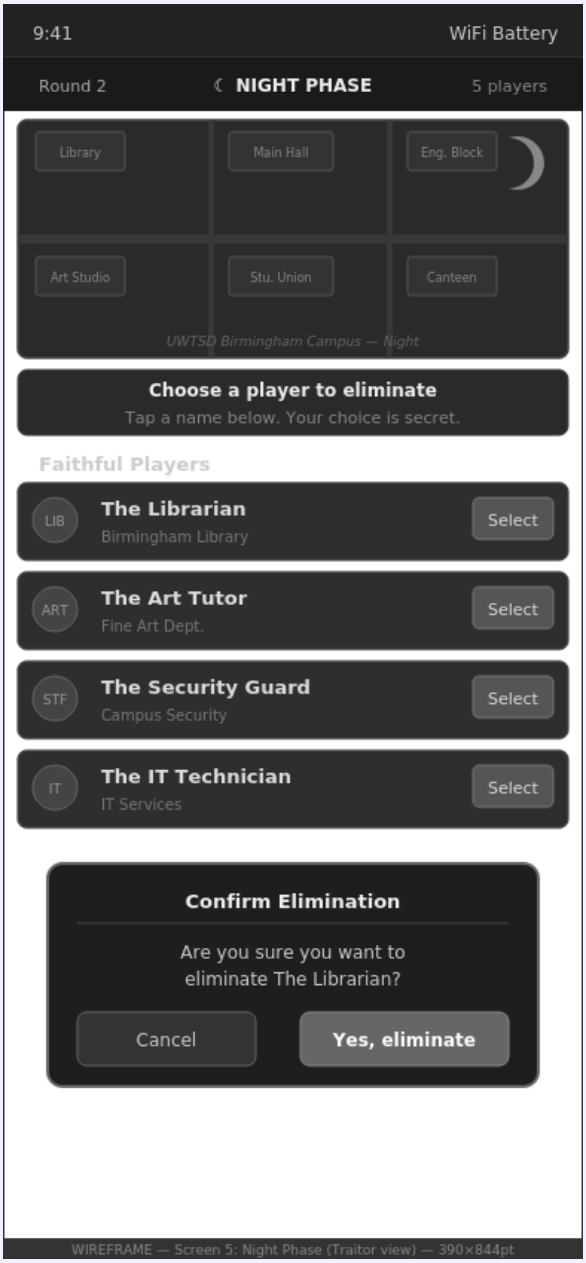

Figure 5: Wireframe 5: Night Phase — Traitor View.

Traitors see a darkened campus map and a list of Faithful players. Tapping a name selects a murder target, followed by a confirmation dialog. Faithful players see a "Night falls... wait for morning" holding screen. This split experience is key to the game design and is shown in the navigation flow diagram in Appendix B.

5.7 Screen 6 — Voting and Elimination

Wireframe 6: Vote to Banish

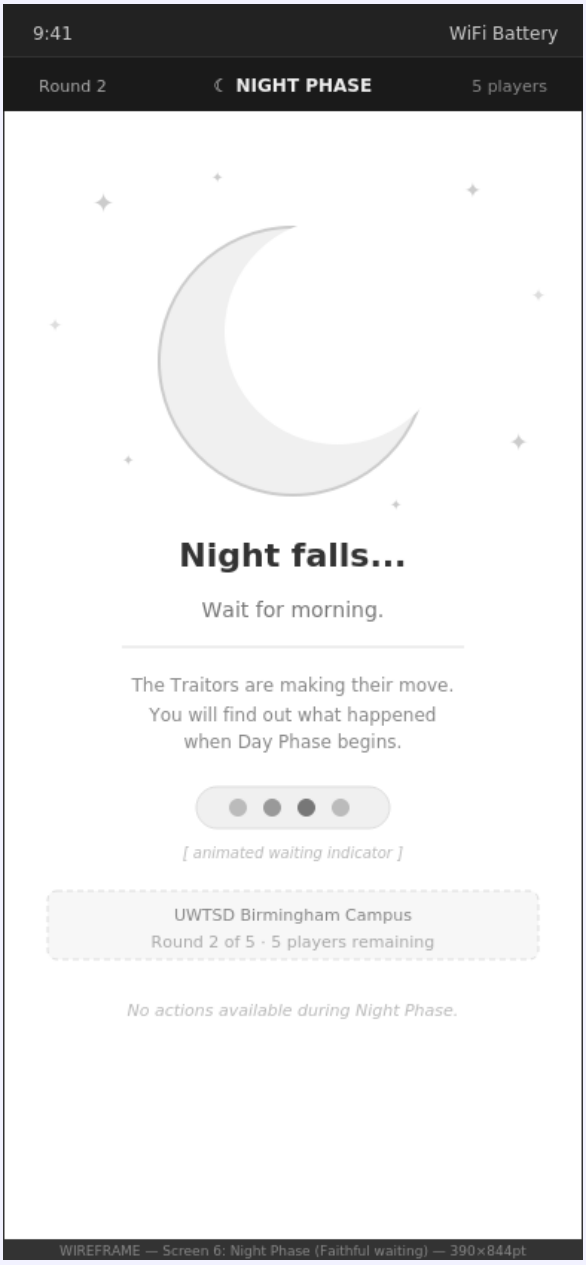

Figure 6: Wireframe 6: Night Phase — Faithful Waiting View.

Each player portrait has a **Vote** button beneath it, which is disabled once the player votes. Results are shown as a bar chart with player names. The player with the most votes is eliminated and their role is revealed immediately. A brief toast notification summarises the outcome. All screens include a back-navigation icon protected by a confirmation dialog.

6 Prototype Feedback Collection

6.1 Method

After completing the wireframes, feedback was collected through a think-aloud session with five participants chosen to cover the range of personas defined in Section 2. Each participant was shown the wireframe screens as a PDF on a tablet and asked to narrate their thoughts aloud as they moved through the design. A short post-session questionnaire using the System Usability Scale (SUS) was then completed by each participant (1; 9). Two open questions were also asked: what they liked about the design, and what confused or frustrated them. Hertzum (2024) found in a meta-analysis that concurrent think-aloud sessions uncover more usability problems spontaneously than retrospective methods (10).

6.2 Ensuring Persona Coverage

The five participants were selected to match the persona types. The mature student participant (aged 45) corresponded to Saul; a participant who uses VoiceOver daily matched Gus; two experienced mobile gamers matched Walter; and one international student matched Jesse. This deliberate mapping ensured that feedback addressed the full range of usability and accessibility concerns identified during the research phase.

6.3 Feedback Summary

Table 1: Summary of positive and negative feedback by participant group

Participant Group	Positive Feedback	Areas for Improvement
Experienced gamers (×2)	Appreciated the clear role reveal screen and fast lobby setup.	Wanted an option to skip confirmation dialogs; would prefer gesture shortcuts for experienced play.
Mature student	Liked the large buttons and the confirmation step before voting.	Found the Night Phase screen too dark; wanted slightly larger fonts throughout.
Low vision user	Found icon labels helpful; status bar remained readable under magnification.	Map labels disappeared under magnification; QR code join was difficult to use without assistance.
International student	Liked the icon-based role cards; found character names easy to understand.	The countdown timer caused anxiety; wanted a clearer message about what happens when time runs out.

6.4 Expected and Unexpected Findings

Some findings matched expectations. The confirmation dialogs were expected to be valued by less experienced users, and this was confirmed. The clear status bar was appreciated across all participant groups, as the design intended.

However, some findings were surprising. The experienced gamers, who were expected to find the design too simple, actually praised its clarity and said they did not need a more complex interface. This suggests that the minimalist approach does not reduce engagement for experienced players as much as the research had suggested it might.

The most unexpected feedback came from the low vision user. The main accessibility challenge had been assumed to be text size. In practice, the campus map labels were a bigger problem: they became too small to read and then disappeared entirely when magnification was applied. This finding will directly inform the next design iteration, where the map will offer an audio description option and map labels will appear in a dedicated accessible list view rather than being layered over the graphic.

Average SUS scores were positive overall (mean of 74, placing the design in the "good" usability band). The mature student's score of 61 indicated that further work is needed on motor accessibility and font size, and the low vision user's score of 68 confirmed the map accessibility issue as the main remaining design priority.

7 Conclusion

This report has documented the initial user research and interface design work for a mobile game version of The Traitors set on the UWTSD Birmingham campus. Four personas grounded in real user research guided the definition of usability requirements. The wireframe storyboards applied Nielsen's heuristics (3) and accessibility guidance from the interaction design literature (5; 6). Prototype feedback validated the majority of design decisions but identified two specific areas for revision: the accessibility of the campus map under magnification, and the clarity of Day Phase timing information for new players. These findings will be carried forward into the full-colour design phase in Assignment 2.

7 References

[1] Y. Rogers, H. Sharp, and J. Preece, *Interaction Design: Beyond Human-Computer Interaction*. Chichester: John Wiley & Sons, 6th ed., 2023.

[2] P. Weichbroth, "Usability testing of mobile applications: A methodological framework," *Applied Sciences*, vol. 14, no. 5, p. 1792, 2024.

[3] J. Nielsen, "10 usability heuristics for user interface design." Nielsen Norman Group, 2020. Updated November 2020.

[4] J. Wu and V. G. Duffy, "Mobile applications usability evaluation: Systematic review and reappraisal," in *HCI International 2022 – Late Breaking Papers. Lecture Notes in Computer Science*, vol. 13516, pp. 498–516, Springer, 2022.

[5] D. Benyon, *Designing User Experience: A Guide to HCI, UX and Interaction Design*. Harlow: Pearson, 4th ed., 2019.

[6] U. Rehman, A. Z. Abbasi, M. U. Shah, A. Idrees, H. Ilahi, and H. Hlavacs, "Analyzing and prioritizing usability issues in games," in *Lecture Notes in Computer Science*, pp. 110–118, Springer International Publishing, 2021.

[7] World Wide Web Consortium, "Web content accessibility guidelines (WCAG) 2.1." W3C Recommendation, 2018.

[8] Z. Huang and M. Benyoucef, "An empirical study of mobile application usability: A unified hierarchical approach," *International Journal of Human–Computer Interaction*, vol. 39, no. 13, pp. 2624–2643, 2022.

[9] A. Bangor, P. Kortum, and J. Miller, "Determining what individual SUS scores mean: adding an adjective rating scale," *Journal of Usability Studies*, vol. 4, no. 3, pp. 114–123, 2009.

[10] M. Hertzum, "Concurrent or retrospective thinking aloud in usability tests: A meta-analytic review," *ACM Transactions on Computer-Human Interaction*, 2024.

[11] Agile Business Consortium, "MoSCoW prioritisation — DSDM project framework handbook." Agile Business Consortium, 2023.

A MoSCoW Requirements Lists

The requirements below were collected from the questionnaire and interviews described in Section 3 and categorised using the MoSCoW prioritisation method (11).

Table 2: MoSCoW Requirements for UWTSD Traitors

Priority	Requirement	Source
Must Have	Players must be able to join a game using a room code or QR code.	Interview
Must Have	All screens must meet WCAG 2.1 Level AA colour contrast requirements.	Persona 4
Must Have	Role assignment must be shown privately to each player at the start of each game.	Questionnaire
Must Have	A confirmation step must appear before any voting action is submitted.	Persona 3 / Interview
Must Have	Touch targets must be at least 44×44 points.	Persona 3
Must Have	All interactive icons must have a visible text label.	Persona 4 / Interview
Should Have	A "How to Play" guide must be accessible from any screen.	Interview
Should Have	The game must support iOS VoiceOver.	Persona 4
Should Have	The Day Phase timer should be configurable by the host.	Questionnaire
Should Have	Characters and settings should reference real UWTSD buildings.	Interview
Could Have	Players could change the interface language (English / Welsh / other).	Persona 2
Could Have	An animated summary screen could be shown at the end of each game.	Questionnaire
Could Have	Push notifications could alert players when it is their turn.	Questionnaire
Won't Have	Real-time voice chat will not be included in this version.	Scope
Won't Have	In-app purchases or cosmetic unlocks will not be included.	Scope

B Wireframe Storyboards — Full Set

Appendix B: Complete Wireframe Set and Navigation Flow Diagram

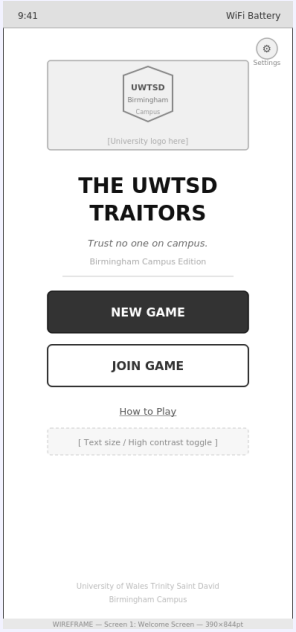

Figure 7: Wireframe 1: Welcome Screen.

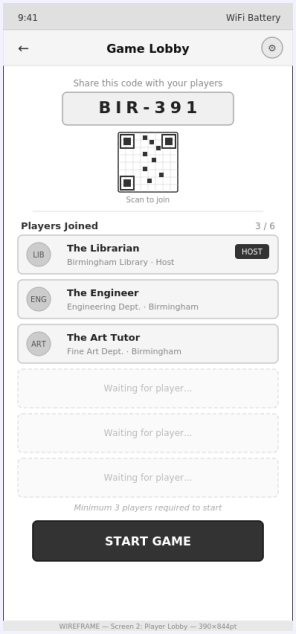

Figure 8: Wireframe 2: Player Lobby.

Appendix B: Complete Wireframe Set and Navigation Flow Diagram

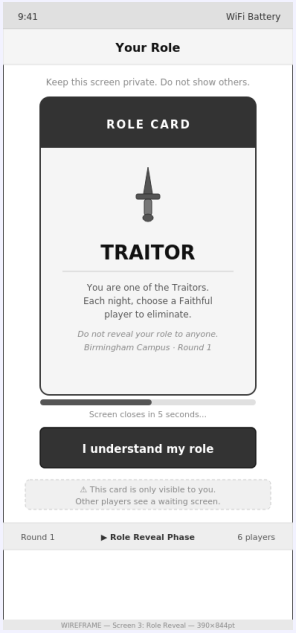

Figure 9: Wireframe 3: Role Reveal Card.

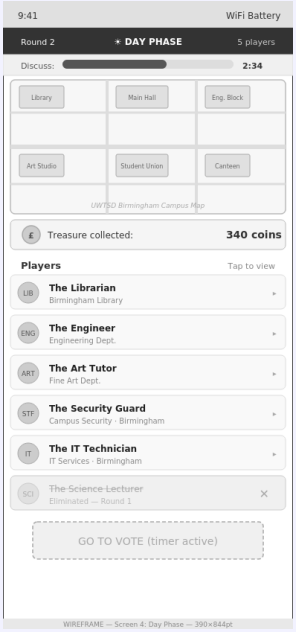

Figure 10: Wireframe 4: Day Phase.

Appendix B: Complete Wireframe Set and Navigation Flow Diagram

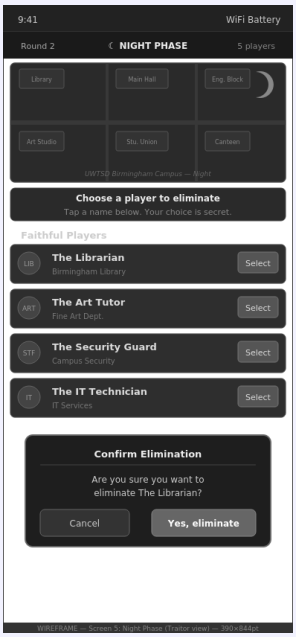

Figure 11: Wireframe 5: Night Phase — Traitor View.

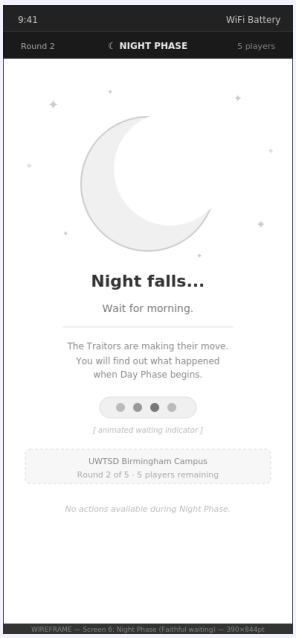

Figure 12: Wireframe 6: Night Phase — Faithful Waiting View.

Appendix B: Complete Wireframe Set and Navigation Flow Diagram

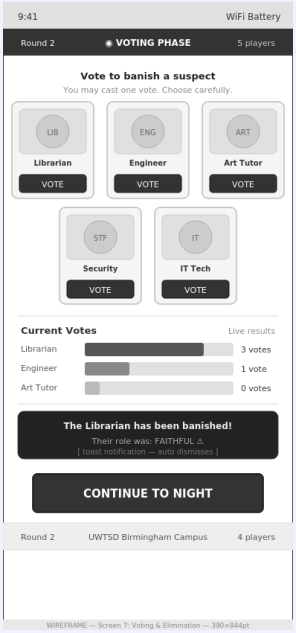

Figure 13: Wireframe 7: Voting and Elimination.

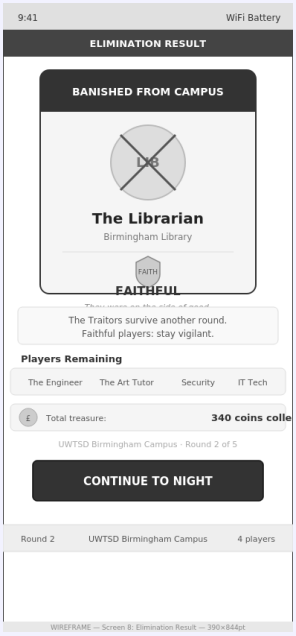

Figure 14: Wireframe 8: Elimination Result.

Appendix B: Complete Wireframe Set and Navigation Flow Diagram

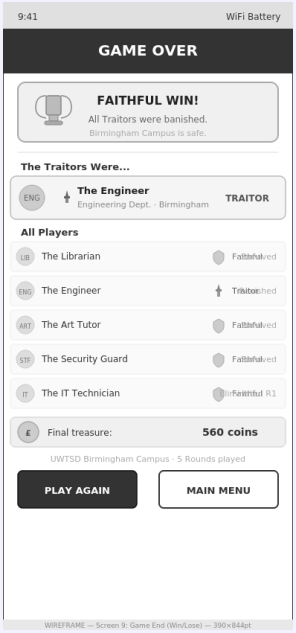

Figure 15: Wireframe 9: Game End Screen.

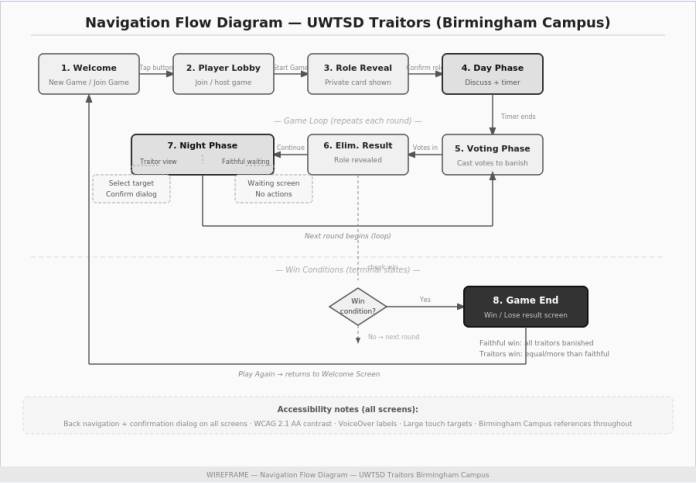

Figure 16: Figure 10: Navigation Flow Diagram.

Screens: 1. Welcome 2. New / Join Game 3. Lobby 4. Role Reveal 5. Day Phase 6. Night Phase (Traitor view) 7. Night Phase (Faithful waiting) 8. Voting 9. Elimination Result 10. Game End (Win / Lose)

Navigation Flow: Day → Vote → Elimination → Night → Day (loop), with terminal states for Traitors Win and Faithful Win.