



Programme: **BSc (Hons) Applied Computing, Level 6 Term 1 Group 1**

Module name and code: **Usability Engineering, ACCB6017**

Lecturer: **Koushik Modak**

Assignment: 1

# **User Requirements and Prototype**

## **UWTSD CLUEDO Mobile Game**

Student name: **Leonid Yanchev**

Student ID: **2215110**

Submission date: **November 28, 2025**

## TABLE OF CONTENTS

|                                                                            |           |
|----------------------------------------------------------------------------|-----------|
| <b>Introduction .....</b>                                                  | <b>3</b>  |
| <b>1. Personas and User Experience Requirements Gathering .....</b>        | <b>3</b>  |
| <b>1.1 Persona-1: L.A. (International Undergraduate Student) .....</b>     | <b>4</b>  |
| <b>1.2. Persona-2: J.P. (Co-worker and Strategic thinker) .....</b>        | <b>5</b>  |
| <b>1.3. Persona-3: P.W. (Friend &amp; Casual Relaxed Gamer) .....</b>      | <b>6</b>  |
| <b>1.4. Persona-4: M.H. (Artist and Illustrator) .....</b>                 | <b>7</b>  |
| <b>2. Designing for Usability .....</b>                                    | <b>8</b>  |
| <b>3. Wireframes Storyboards .....</b>                                     | <b>9</b>  |
| <b>Conclusion .....</b>                                                    | <b>12</b> |
| <b>Appendix-1: MoSCoW Requirements List.....</b>                           | <b>13</b> |
| <b>Appendix-2: Main Menu screens/wireframes .....</b>                      | <b>14</b> |
| <b>Appendix-3: Campus and Character selection screens .....</b>            | <b>14</b> |
| <b>Appendix-4: Loading Game Board .....</b>                                | <b>15</b> |
| <b>Appendix-5: Automated setup screens before loading Game Board .....</b> | <b>16</b> |
| <b>Appendix-6: Suggestion screen with confirmation .....</b>               | <b>17</b> |
| <b>Appendix-7: Clue (Detective) sheet screen .....</b>                     | <b>18</b> |
| <b>References .....</b>                                                    | <b>19</b> |

## Introduction

The purpose of this report is to present initial user research and design concepts for a mobile adaptation of a CLUEDO-style game with UWTSD titled "Who Killed the Vice-Chancellor?". The focus of the project is on usability design through systematic user research, persona creation and early prototyping on wireframe displays. This design will allow an optimal number of players from different segments of the university community while moving through the different campuses of UWTSD (Swansea, Carmarthen, Lampeter) and the different areas within the campuses to collect clues, to explore the premises and to predict the killer, the weapon and the location, and ultimately to win the game if the predictions prove to be correct.

This first assignment focuses on gathering user feedback, developing personas, initial sketches of the interface, and evaluating feedback for early prototypes. The approach follows engineering principles for usability and is informed by contemporary HCI literature. Research methods include interviews and message-based consultations with real users, ensuring that design choices reflect the authentic needs of players rather than presenting synthetic or generated assumptions.

### 1. Personas and User Experience Requirements Gathering

Personas were developed using data collected from four real potential users. These individuals represent a diverse range of digital skills, cognitive styles, and preferences for interactive mobile experiences. Each persona includes a scenario relevant to the game context as well as user and experience requirements. In accordance with GDPR requirements and standard UWTSD research ethical guidelines, all participants (personas) identities have been anonymized and presented with initials to protect privacy and confidentiality.

During these in-person interactions, I presented simple graphical representations of the game concept to help participants visualize the idea and provide grounded feedback. This approach aligns with accepted HCI research practices, where early artefacts enable clearer communication and richer user insights. [1], [2]

The discussions explored participants' preferred gameplay mechanics, accessibility needs, digital habits, and frustrations with traditional Cluedo-style games. Their feedback offered valuable insights—such as preferences for strategic movement, dislike of repetitive dice-rolling, desire for clearer clue structures, and differing levels of required visual simplicity. The resulting user and experience requirements derived from these conversations were categorized using the MoSCoW prioritization method, which is included in the Appendix-1 to distinguish essential, important, optional, and excluded features for the initial prototype.

## 1.1 Persona-1: L.A. (International Undergraduate Student)

### Background & Demographics:

L.A. is a female, 23 studying her third year as international student in Business Management. She enjoys competitive mobile games but often loses interest if the game feels repetitive. English is his second language, so she relies heavily on clear visual cues.

### Goals:

- To collect clues efficiently and compete with other players
- To quickly understand the suspect, weapon, and various campus premises combinations
- To progress through the game without confusion

### Frustrations / Difficulties

- Low replay-ability reduces her engagement
- Overly text-heavy interfaces slow her down
- Can misinterpret small or ambiguous UI symbols

### Accessibility Needs

- Icon-plus-text labels
- Adjustable text size
- Clear contrast between interactive elements

### Emotional Goals

- Wants to feel competitive and skilled
- Wants the satisfaction of deducting clues before others

### Scenario (Associated Use Case)

L.A. plays the UWTSD Cluedo game during her travelling between home and University. She opens the app quickly, checks his clue sheet, and wants to make fast assumptions. If the UI feels confused, she immediately becomes frustrated and may quit the session.

### Main User Requirements

- Clear visual layout and large tap targets
- Fast access to clue (detective) sheet and current evidence
- Reduced reliance on reading long text blocks

### Main Experience (UX) Requirements

- A competitive atmosphere
- Immediate feedback after action
- Smooth transitions with minimal cognitive load

## 1.2. Persona-2: J.P. (Co-worker and Strategic thinker)

### Background & Demographics:

J.P. is a male, 27, former computing student who enjoys complex board games and strategy apps. He is confident with technology, but dislikes cluttered interfaces. He values logic, planning, and psychological tactics like bluffing.

### Goals:

- To make strategic movements across rooms
- To bluff opponents and mislead them
- To analyze clues without unnecessary info overload

### Frustrations / Difficulties

- Screens with too many elements overwhelm him
- Poor visual hierarchy disrupts his strategic planning
- Lack of feedback makes it hard to track what others are doing

### Accessibility Needs

- High-contrast UI
- Clear indicators for actions taken by opponents
- Minimal visual noise

### Emotional Goals

- Wants to feel clever and in control
- Enjoys the tension of psychological play

### Scenario (Associated Use Case)

J.P. usually plays the game at home with his friends in the evening. He likes to take his time, analyze room positions, and make calculated decisions. He relies on a clean interface to keep track of deductions and subtle player behaviors.

### Main User Requirements

- Structured UI with distinct separations between sections
- Strategic movement map with visible pathways
- Clear feedback on other players' actions

### Main Experience (UX) Requirements

- A mentally stimulating environment
- Support for bluffing and misdirection
- Predictable and logical game behavior

### 1.3. Persona-3: P.W. (Friend & Casual Relaxed Gamer)

#### Background & Demographics:

P.W. is a female, 25, retail worker who plays mobile games mainly to relax after work. She prefers simple navigation, minimal pressure, and games that reward casual exploration. Sometimes she forgets clues or misinterprets implicit hints from opponents.

#### Goals:

- Relax with a low-pressure game
- Discover clues through exploration
- Enjoy a simple and understandable movement system

#### Frustrations / Difficulties

- Difficulty tracking implicit information
- Forgetting clues, she saw earlier
- Complex dice-based movement feels arbitrary

#### Accessibility Needs

- Color-blind-friendly palette
- Persistent on-screen reminders
- Simple navigation structure

#### Emotional Goals

- Wants the game to feel calming, not stressful
- Prefers a gentle discovery experience

#### Scenario (Associated Use Case)

P.W. usually plays the game on the sofa after work. She scrolls through the various rooms, taps on magnifying glass icons for bonus clues, and feels rewarded when discovering new information. If the screen becomes cluttered or too mentally demanding, she loses interest.

#### Main User Requirements

- Structured UI with distinct separations between sections
- Strategic movement map with visible pathways
- Clear feedback on other players' actions

#### Main Experience (UX) Requirements

- Relaxed pacing
- A sense of gentle progression
- Simple, predictable interactions

## 1.4. Persona-4: M.H. (Artist and Illustrator)

### Background & Demographics:

M.H. is a female, 41, artist and Illustrator who plays games primarily for storytelling. She dislikes luck-based mechanics like dice rolling and prefers logical deduction. She values good pacing, narrative coherence, and clear explanations.

### Goals:

- To uncover a mystery through storytelling
- To deduce the murderer logically using gathered clues
- To avoid repetitive or luck-driven mechanics

### Frustrations / Difficulties

- Dice-rolling movement feels meaningless
- Repetitive tasks break immersion
- Too many steps confuse the story flow

### Accessibility Needs

- Audio narration or text-to-speech for story sequences
- A simple guide that shows where the player is and how they got there
- Clearly labelled actions

### Emotional Goals

- Wants immersion in a compelling murder mystery
- Wants to feel like an investigator, not a random dice roller

### Scenario (Associated Use Case)

M.H. plays games on weekends. She selects “Story Mode,” listens to voice-narrated scenes, and follows a clear visual indicator showing the user’s current location in the game to explore rooms. Her immersion breaks if the interface is confusing or forces luck-based interactions.

### Main User Requirements

- Clear narrative structure
- Minimal randomness in core mechanics
- Simplified navigation

### Main Experience (UX) Requirements

- Strong atmosphere and story immersion
- Logical progression between scenes
- Smooth guidance through tasks

## 2. Designing for Usability

The design of the initial wireframe storyboards places strong emphasis on usability, ensuring that the UWTSD Cluedo game supports clear, efficient, and accessible interaction for a diverse group of users. The approach follows established HCI usability principles, including Schneiderman's Eight Golden Rules [3] and Norman's visibility and mapping concepts.[4]

In creating the wireframes, I focused on consistency, visibility of system status, simplicity, and error prevention as essential principles for effective user experience. For example, consistent placement of navigation buttons, repeatable screen structures, and predictable transitions between panels address the need for recognizable patterns that reduce cognitive load, particularly for users who struggle with busy interfaces or linguistic barriers. Visibility is achieved by maintaining always-accessible buttons for core functions, aligning with Schneiderman's recommendation to keep users informed of what is happening at every stage of interaction. [3]

Several specific usability issues were uncovered during the storyboard development and were deliberately addressed. First, the traditional Cluedo reliance on dice-rolling was replaced with a clear tap-to-move system, addressing user frustration with randomness and aligning with Norman's principle of making actions "visible and meaningful." [4]

Second, the interface avoids clutter by organizing rooms, icons, and pathways with sufficient spacing, supported by simple labels and shapes and this directly responds to the needs of users such as Persona 2, who require a clear visual hierarchy to support strategic thinking.

Finally, the design incorporates the literature's emphasis on reducing memory burden by ensuring that key information (e.g., collected clues, suspects, and eliminated items) is persistently available within a dedicated Clue (Detective) Sheet.

Collectively, these decisions demonstrate a synthesis of usability engineering principles within the early prototype, ensuring that the game is not only functional but also intuitive, inclusive, and aligned with the diverse cognitive and emotional needs of the target user group.

### 3. Wireframes Storyboards

The wireframe storyboards represent the first low-fidelity visualization of the UWTSD Cluedo mobile game and illustrate how users will interact with the main functional components of the application.

These early designs intentionally focus on layout, structure, and navigation rather than color or graphical detail, following the guidelines of Rogers, Sharp and Preece (2015), who emphasize the value of early sketching for exploring interaction flow.

Each storyboard panel corresponds to a key stage in the player's journey—beginning at the Main Menu and progressing through campus selection, board navigation, clue investigation, suggestion making, and accessing the clue (detective) sheet. The goal of these wireframes is to ensure that the interface reflects strong usability principles such as consistency, visibility, and simplicity, while also supporting the different cognitive and gameplay preferences identified in the persona's experiences.

The Main Menu wireframes were designed to establish a clear entry point into the game. It includes a small number of high-value options: Start, New Game, Continue, How to Play, and Settings, arranged vertically to reduce visual complexity and comply with Schneiderman's rule of striving for simplicity. (see Appendix-2)

The Campus Selection Screen and Character Selection Screen are reflecting the user requirement for replay ability by offering Swansea, Carmarthen, Lampeter and London as selectable maps and choosing the character they want to be in the game. These screens adhere to a simple radio-button format to ensure clarity and avoid decision overload. (see Appendix-3)

The Game Board storyboard is the most structurally important, presenting the campus map as a series of interconnected rooms with labelled pathways. The layout prioritizes clarity by separating rooms with sufficient spacing and using simple geometric shapes for rooms and icons. This supports users like Persona 3, who prefer visually simple and low-distraction layout, and Persona 2, who values a structured environment for strategic thinking. (see Appendix-4)

After the Game Board loads, the system will present a series of automated setup screens that do not require user interaction and therefore do not constitute part of the core HCI design. First, the system randomly selects one Suspect, one Weapon, and one Room card and places them into a virtual envelope, forming the hidden murder solution. Immediately afterwards, the remaining cards are automatically shuffled and evenly dealt evenly to every player, establishing their starting hands without any player input. A final automated screen displays a rotating spinner that replaces the traditional dice-rolling method for determining who begins the game. These automated transitions ensure a smooth, unbiased setup process while keeping the focus of the HCI design on the interactive elements that follow once the game board appears. (see Appendix-5)

Movement between rooms is represented in a dedicated Movement Confirmation Overlay, which prevents accidental actions by allowing users to review and approve their chosen path before moving. This aligns with Shneiderman's principle of preventing errors through confirmation screens. The Room Investigation Screen provides a focused interface for interacting with clues, making suggestions, or returning to the board. Its layout emphasizes visibility, ensuring that users understand what actions are available when entering a new space.

Enabling Suggestion Screen within the Investigation Room Screen employs vertical grid pop-up menu lists for selecting suspects, weapons, and rooms. This reinforces consistency and reduces memory load, as the room is auto filled based on where the player currently stands. (see Appendix-6)

The Clue Reveal Screen, also within the Investigation Room screen and provides immediate feedback, employs a horizontal drop-down menu, as an essential usability requirement, by highlighting which clue was revealed and offering a clear action to add it to the clue (Detective) sheet. (see Appendix-6)

Finally, the Clue (Detective) Sheet Screen organizes all collected information in a grid-like layout, using checkboxes or markers to help players track eliminated options. This supports key usability goals such as minimizing cognitive effort and maintaining a clear mental model of the game state. (see Appendix-7)

Together, these wireframe storyboards demonstrate the end-to-end user journey and highlight how the interface has been shaped by established usability practices. They provide a foundation for iterative refinement in the next assignment, where these layouts will evolve into full-color, high-fidelity prototypes.

## 4. Prototype Evaluation and Feedback

Feedback on the wireframe prototypes was collected through brief face-to-face walkthroughs with the same four users who informed the personas, ensuring that the evaluation represented the full range of user types identified earlier. Each participant reviewed the storyboard screens and completed simple tasks such as navigating the game board, entering a room, and opening the clue sheet.

The positive feedback indicated that users found the overall layout clear and easy to follow, particularly praising the simplicity of the main menu, the logical structure of the clue sheet, and the replacement of dice-rolling with tap-to-move interactions.

However, several negative observations emerged: two users felt some icons lacked clarity, one suggested greater spacing between rooms to avoid visual crowding, and another noted that narrative transitions felt abrupt and needed more emotional depth. Emotional reactions broadly matched expectations, competitive enthusiasm from the international student, strategic satisfaction from the analytical user, relaxation from the casual gamer, and a desire for stronger storytelling from the narrative-focused participant. These findings confirmed most assumptions derived from the personas, while also highlighting specific areas for refinement in the next design phase, particularly in visual clarity and narrative flow. Also, these findings align with early prototype literature emphasizing that low-fidelity prototypes effectively reveal usability concerns [5],[6],[7].

## **Conclusion**

This report outlined the initial user-centered design process for developing a UWTSD-themed Cluedo mobile game, demonstrating how real user input shaped the personas, usability requirements, and early conceptual storyboard wireframes.

Through face-to-face discussions, early sketches, and prototype walkthroughs with four participants representing diverse user types, the project incorporated authentic expectations, accessibility needs, and gameplay preferences into the design.

The resulting wireframes addressed key usability principles: clarity, consistency, reduced cognitive load, and accessible navigation, while the evaluation process revealed both strengths and areas for refinement, such as icon clarity and narrative transitions. Feedback closely aligned with persona characteristics, validating the user research and informing the next iteration.

Overall, this stage established a solid usability foundation, ensuring that the subsequent full-color UI designs will be both user-driven and grounded in established HCI principles.

## Appendix-1: MoSCoW Requirements List

### MoSCoW Requirements List

#### MUST HAVE:

- Accessible UI (text scaling, high contrast, colour-blind mode)
- Simple tap-to-move navigation
- Room investigation interface
- Suggestion reveal system
- Campus selection
- Clue (Detective) sheet

#### SHOULD HAVE:

- Story mode
- Audio narration
- Bluffing / hidden clue indicators
- Hints

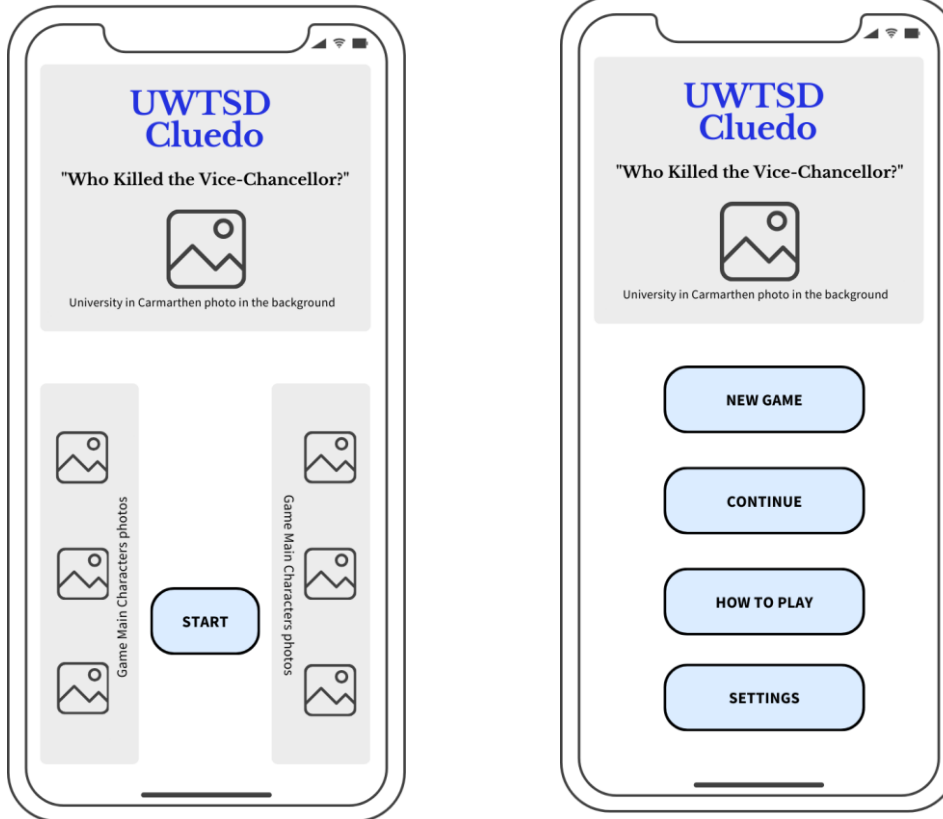
#### COULD HAVE:

- Additional campuses
- Custom character avatars
- Alternate game modes
- Magnifying glass bonus clues

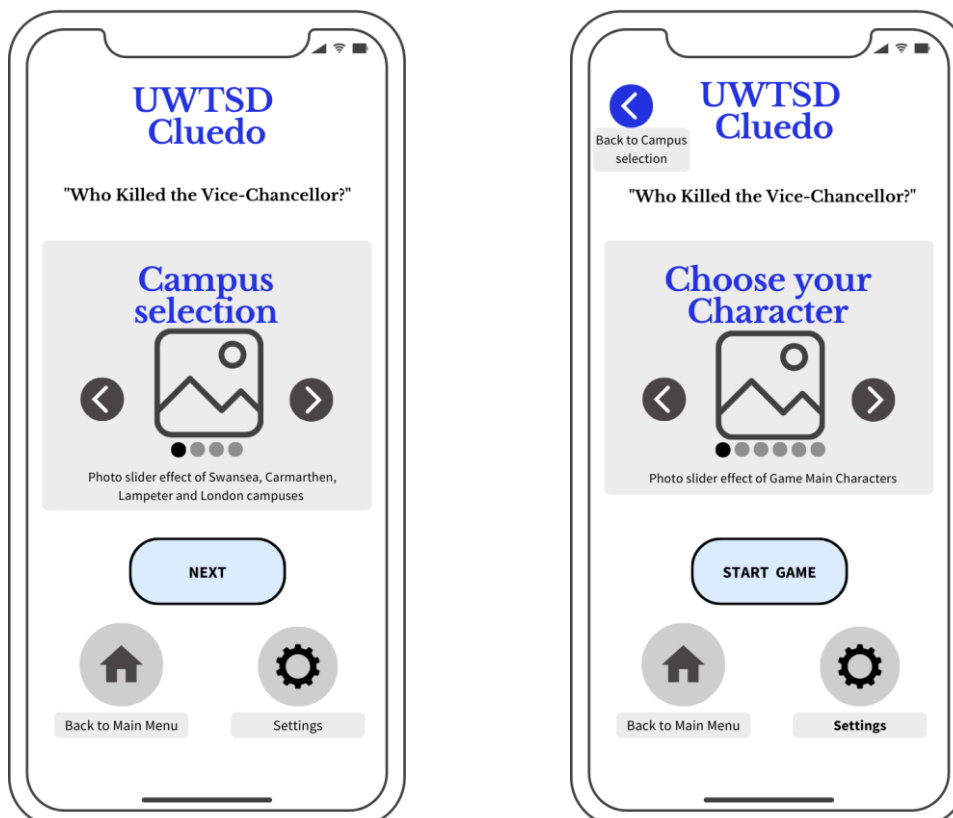
#### WON'T HAVE (Initial prototype):

- Real-time voice chat
- Multiplayer matchmaking
- 3D graphics

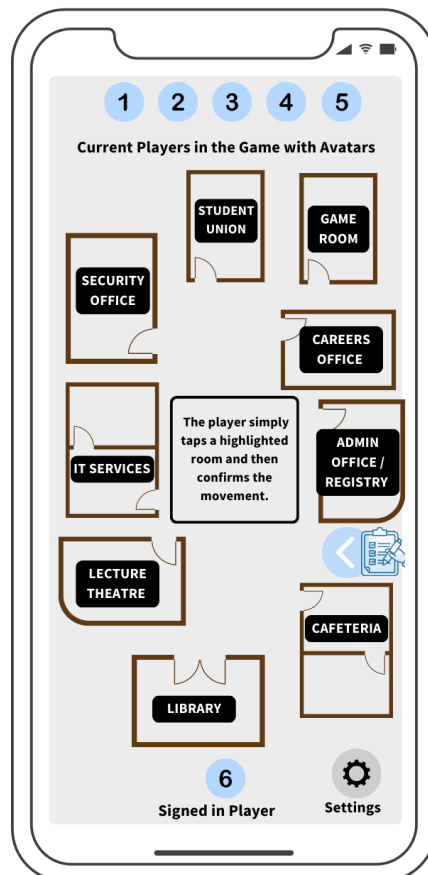
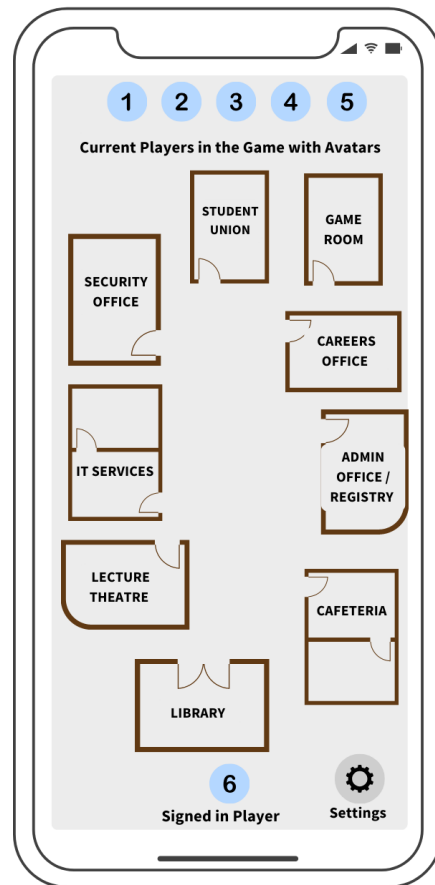
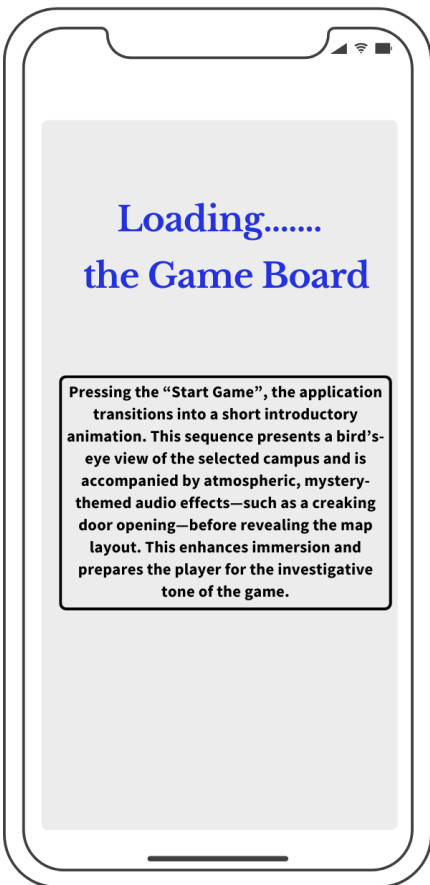
## Appendix-2: Main Menu screens/wireframes



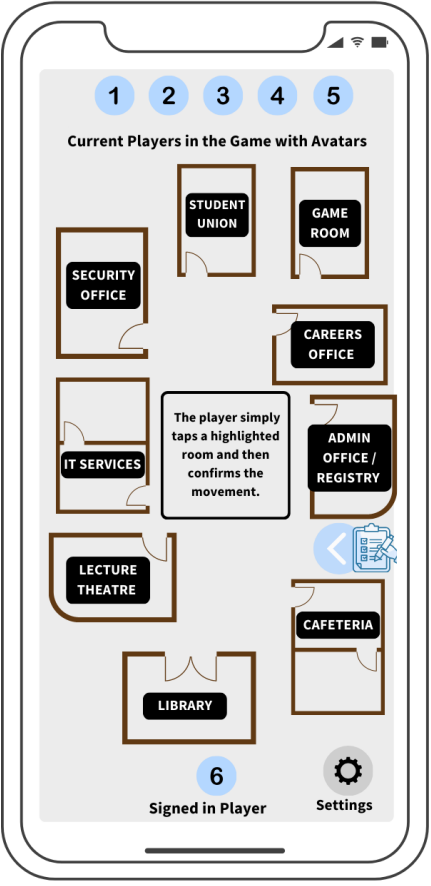
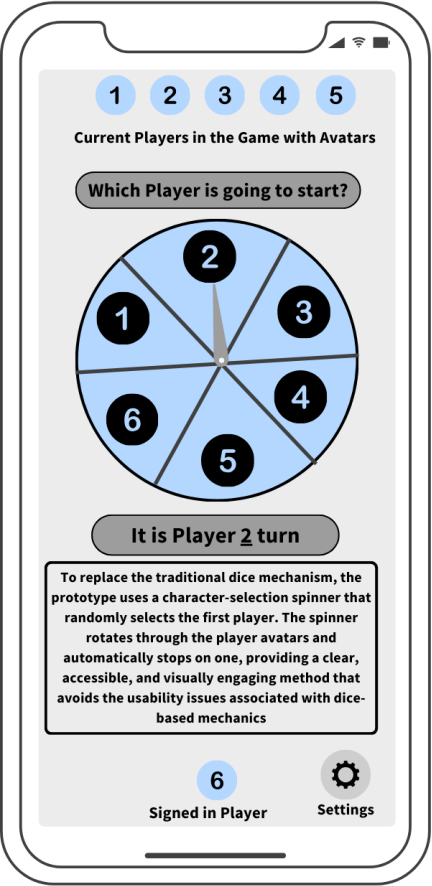
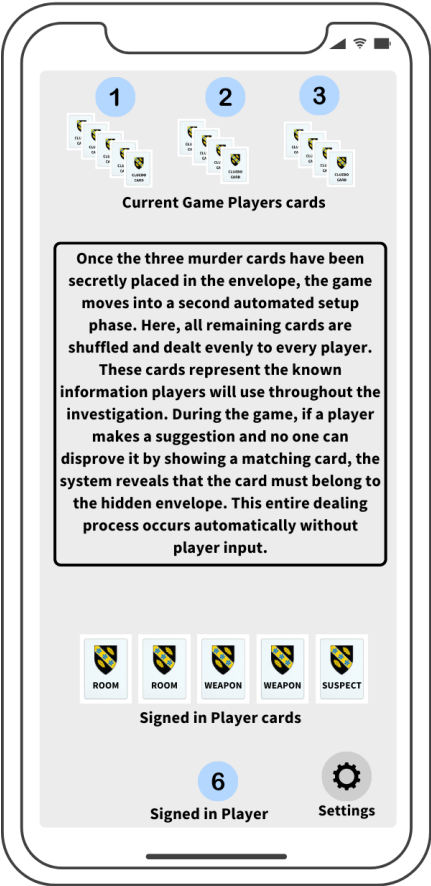
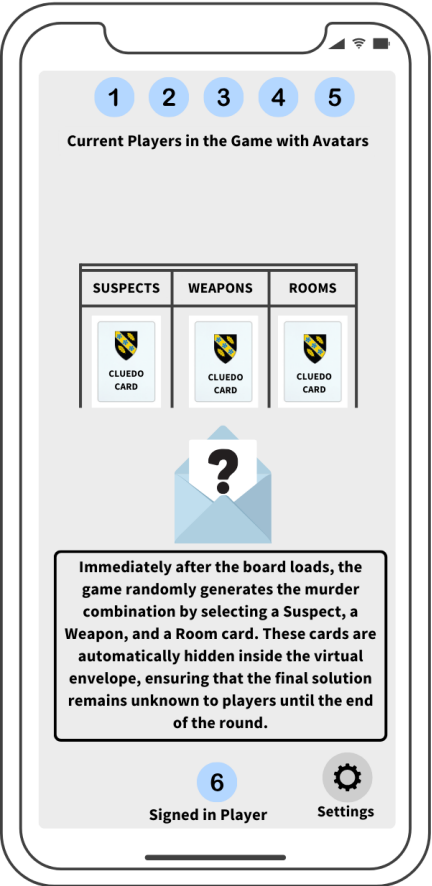
## Appendix-3: Campus and Character selection screens



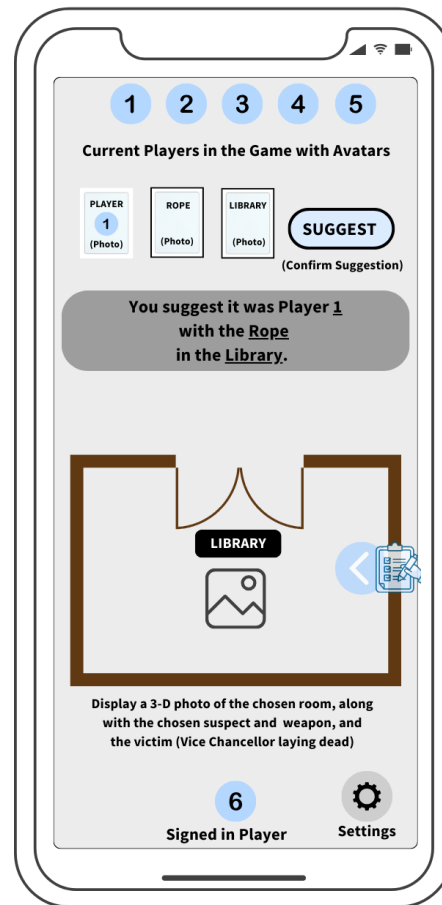
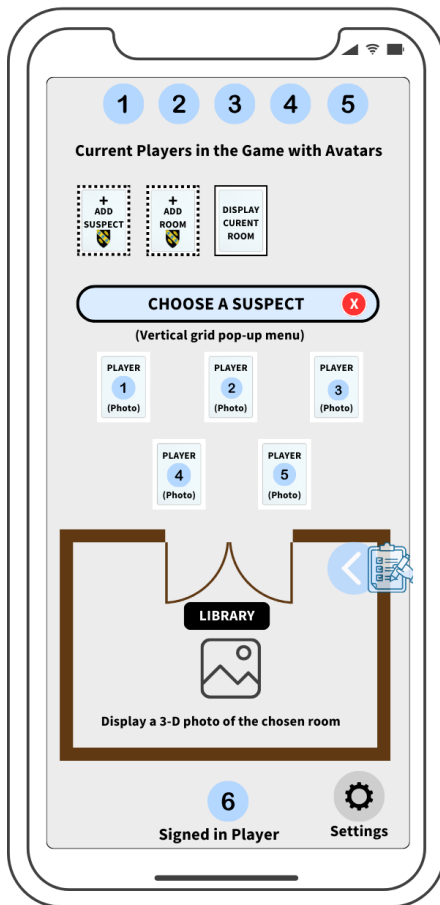
## Appendix-4: Loading Game Board



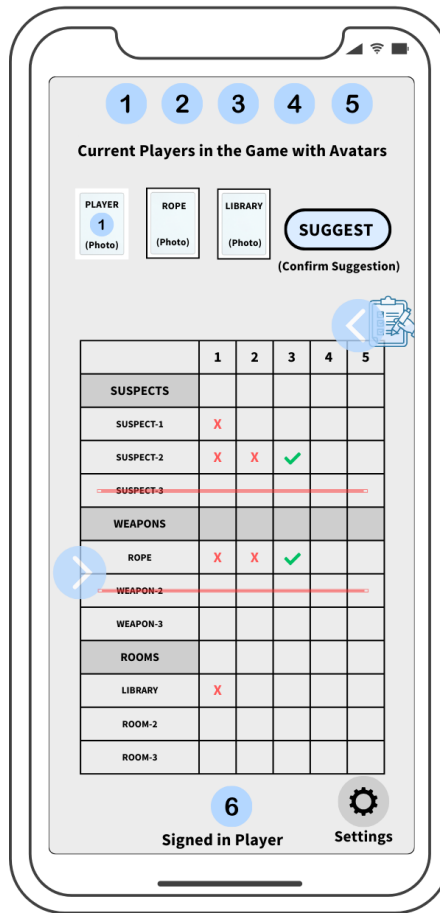
# Appendix-5: Automated setup screens before loading Game Board



## Appendix-6: Suggestion screen with confirmation



## Appendix-7: Clue (Detective) sheet screen



The interface is a mobile app screen for a detective game. At the top, there are five numbered circles (1-5). Below them is the title "Current Players in the Game with Avatars". Under this title are three boxes: "PLAYER 1 (Photo)", "ROPE (Photo)", and "LIBRARY (Photo)". To the right of these boxes is a "SUGGEST" button with the text "(Confirm Suggestion)" below it. A blue arrow points from the "SUGGEST" button to a clipboard icon. Below this is a table with 5 columns (1-5) and several rows. The rows are grouped into sections: "SUSPECTS", "WEAPONS", and "ROOMS". The "SUSPECTS" section has rows for "SUSPECT-1", "SUSPECT-2", and "SUSPECT-3". The "WEAPONS" section has rows for "ROPE", "WEAPON-2", and "WEAPON-3". The "ROOMS" section has rows for "LIBRARY", "ROOM-2", and "ROOM-3". The table contains red 'X' marks and green checkmarks. A blue arrow points from the left side of the table to the "ROPE" row. At the bottom, there is a "Signed in Player" button with a gear icon and a "Settings" button with a gear icon.

|                      | 1 | 2 | 3 | 4 | 5 |
|----------------------|---|---|---|---|---|
| <b>SUSPECTS</b>      |   |   |   |   |   |
| SUSPECT-1            | X |   |   |   |   |
| SUSPECT-2            | X | X | ✓ |   |   |
| <del>SUSPECT-3</del> |   |   |   |   |   |
| <b>WEAPONS</b>       |   |   |   |   |   |
| ROPE                 | X | X | ✓ |   |   |
| <del>WEAPON-2</del>  |   |   |   |   |   |
| WEAPON-3             |   |   |   |   |   |
| <b>ROOMS</b>         |   |   |   |   |   |
| LIBRARY              | X |   |   |   |   |
| ROOM-2               |   |   |   |   |   |
| ROOM-3               |   |   |   |   |   |

## References

- [1] Y. Rogers, H. Sharp, and J. Preece, *Interaction Design: Beyond Human–Computer Interaction*, 4th ed. John Wiley & Sons, 2015.
- [2] J. Lazar, J. H. Feng, and H. Hochheiser, *Research Methods in Human–Computer Interaction*. Morgan Kaufmann, 2017.
- [3] B. Shneiderman et al., *Designing the User Interface: Strategies for Effective Human–Computer Interaction*, 6th ed., Pearson, 2017.
- [4] D. Norman, *The Design of Everyday Things*, Revised ed. MIT Press, 2013
- [5] M. Walker, L. Takayama, and J. Landay, “High-Fidelity or Low-Fidelity, Paper or Computer? Choosing Attributes When Testing Web Prototypes,” *Conference Paper*, 2002.
- [6] A. A. Ogunyemi et al., “A Systematic Mapping Study of HCI Practice: Prototyping, Wireframing and Storyboarding Usage,” *International Journal of Human–Computer Interaction*, 2018.
- [7] W3C, “Web Content Accessibility Guidelines (WCAG) 2.1,” 2018.