



Faculty of Computer Science and Information Technology

ETHICALPATH: THE ACADEMIC DILEMMA

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Bachelor in Computer Science (Multimedia Computing) with Honours

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ETHICALPATH: THE ACADEMIC DILEMMA

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Abstract

The rapid integration of Artificial Intelligence (AI) tools in academia presents both opportunities and challenges, particularly in maintaining academic integrity among undergraduate students. This research addresses these concerns by developing a 2D story-driven game that blends education and entertainment to raise awareness of ethical AI usage. Through interactive storytelling, decision-making mechanics, and immediate feedback, the game immerses players in real-world academic scenarios, encouraging reflection and ethical decision-making. Adopting the Scrum methodology ensures a structured and iterative development process with continuous user feedback. The game aims to demonstrate the consequences of unethical AI usage, assess players' decision-making behaviors, and evaluate its effectiveness as an educational tool for promoting academic integrity. By offering an engaging learning experience, this project highlights the importance of responsible AI use in education and fosters ethical awareness among students.

Abstrak

Penyepaduan pantas alatan Kecerdasan Buatan (AI) dalam akademik memberikan peluang dan cabaran, terutamanya dalam mengekalkan integriti akademik dalam kalangan pelajar sarjana muda. Penyelidikan ini menangani kebimbangan ini dengan membangunkan permainan dipacu cerita 2D yang menggabungkan pendidikan dan hiburan untuk meningkatkan kesedaran penggunaan AI yang beretika. Melalui penceritaan interaktif, mekanik membuat keputusan, dan maklum balas segera, permainan ini melibatkan pemain dalam senario akademik dunia sebenar, refleksi yang menggalakkan dan membuat keputusan yang beretika. Mengguna pakai metodologi Scrum memastikan proses pembangunan berstruktur dan berulang dengan maklum balas pengguna yang berterusan. Permainan ini bertujuan untuk menunjukkan akibat penggunaan AI yang tidak beretika, menilai tingkah laku membuat keputusan pemain dan menilai keberkesanannya sebagai alat pendidikan untuk mempromosikan integriti akademik. Dengan menawarkan pengalaman pembelajaran yang menarik, projek ini menyerlahkan kepentingan penggunaan AI yang bertanggungjawab dalam pendidikan dan memupuk kesedaran etika dalam kalangan pelajar.

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Abbreviations

AI - Artificial Intelligence

2D – 2Dimensional

RPG – Role-Playing Game

NPC – Non-Player Character

UI – User Interfaces

UML – Unified Modeling Language

CHAPTER 1: INTRODUCTION

1.1 Background

Artificial Intelligence (AI) tools are becoming a big part of education, helping students learn better and making study tools more accessible. In the modern era, AI tools are transforming how students and educators address these principles, offering new methods to support and enhance ethical academic practices. According to Roe et al. (2023), these tools have been existed for a long time, such as spellcheckers and basic grammar checkers that are available on word processing software. From advanced plagiarism detection systems to AI-driven study aids that promote original thinking, these tools help students not only adhere to academic guidelines in research, writing, and problem-solving. These tools offer quick help and can make studying easier, especially students learning from home. In this modern era of the industrial revolution 4.0, almost all activities of human life cannot be separated from the use of information technology (IT) as an enabler for other activities and services. It is no longer just a tool and is now a required component that must be owned. Its advancement, which significantly facilitates human life activities, has resulted in a high reliance on the existence of information technology (Rahmatullah et al., 2022).

However, while AI tools can be helpful, they can also be misused. Some students may rely too much on these tools, letting AI do the work for them instead of learning the material themselves. For example, AI essay writing systems are designed to generate essays based on a set of parameters or prompts. This means that students could potentially use these systems to cheat on their assignments by submitting essays that are not their own work (e.g. Dehouche, 2021), which makes it tempting for students to submit this work as their own. This goes against academic integrity because it does not show true effort or learning. In addition, the speed at which assistive writing technologies are developing may outpace the creation of institutional academic integrity policies and guidelines for their use. This results in grey areas, confusion, and a lack of awareness of such tools and their uses among educators, students, and administrators (Roe et al., 2023).

This project aims to address these challenges by developing a 2D RPG game that raises awareness about the risks of misusing AI in academics. The game will help students understand the importance of academic integrity and the right to use AI tools to ensure players do not cross the line of academic integrity. The game also includes the decision-making for the player,

which impact their choices on real learning and achievement. The game will encourage students to use AI responsibly and value academic integrity by guiding players through realistic scenarios.

1.2 Problem Statement

ChatGPT is one of the most functional AI tools for academics as it can review students' writing, suggest improvements for grammar, vocabulary, and style, and give feedback on the overall flow of their work. While ChatGPT provides numerous capabilities and uses for English as a Foreign Language (EFL) writing instruction, it is important to acknowledge that there are potential misuses or drawbacks associated with its use (Rezaei et al., 2024b). Students will face new challenges in balancing their studies with the ethical use of technology. Many students rely on AI for quick answers, especially in online learning, where motivation can be harder to maintain. Relying too heavily on AI-generated feedback could impede learners' ability to independently analyse and evaluate their writing, hindering their development as proficient writers (Rezaei et al., 2024b). This over-reliance on AI can lead to a loss of self-control and may cross the line of academic integrity, as students may use AI to complete assignments instead of learning the material themselves.

The growing use of AI tools like article generators, specifically in education, creates problems for academic dishonesty and writing quality. There are a few things that have potential academic integrity issues associated with the article generators. First, educators do not understand the underlying reasons for plagiarism. One study has highlighted five conditions that cause academic dishonesty. They are academic aptitude, perseverance, personal issues, competing objectives, and self-discipline (Amigud & Lancaster, 2019).

It is important for educators and students to recognize the structure of writing that is not genuinely theirs to help identify problems with understanding and honesty. Students do not know the characteristics of the generated writing works. According to Rezaei et al. (2024b), a significant number of references that a student has included in his/her work but the marker suspects that there was not enough time or possibility for the student to actually gather and read these, then it should raise suspicions. If a student's work has flawless grammar and is formatted incredibly well while the fundamental ideas are not there or don't make sense, then it should raise alarm.

A recent study found that a large percentage of students who study face-to-face courses and online courses did not consider their behaviours to be a violation of academic misconduct (Burgason, Sefiha, & Briggs, 2019). As many students do not know these tools exist such a discussion could unintentionally advertise them. A study conducted to investigate perceptions and motivations for cheating suggested that the general apathy students may have towards study causes cheating, and online classes increased that apathy (Rezaei et al., 2024b).

1.3 Objective

1. To design a game that allows players to understand the consequences of using AI tools in academia.
2. To develop a game that tests players' behaviours and decisions regarding the usage of AI and academic dishonesty among undergraduate students.
3. To test the effectiveness of using a game as a tool in creating awareness of academic integrity using AI tools towards undergraduate students.

1.4 Brief Methodology

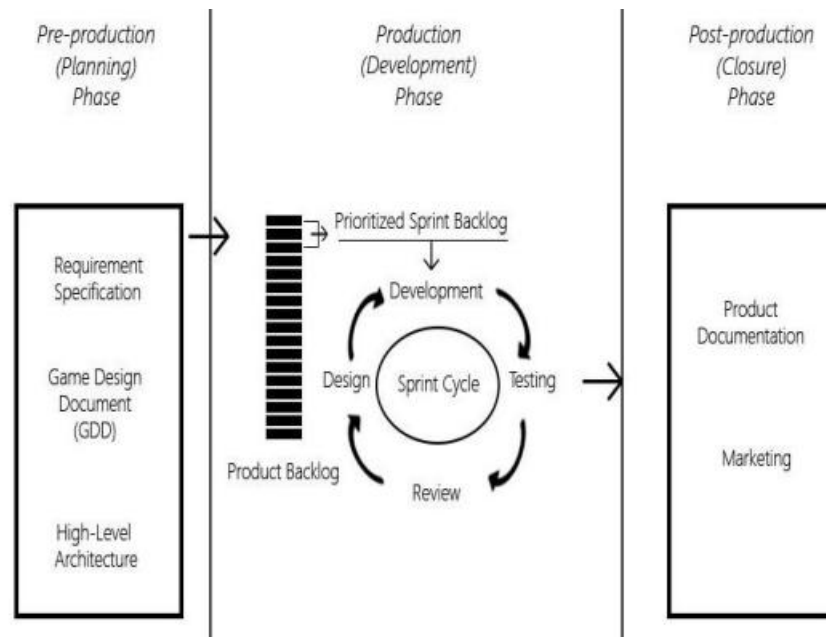


Figure 1.1 Game Development with Scrum Methodology (Kristiadi et al., 2019)

The development methodology for this project follows a structured approach divided into three main phases: Pre-production, Production, and Post-production, adhering to the Scrum framework.

Pre-production Phase (Planning): This phase focuses on the essential planning and preparation tasks. It begins with Requirement Specification, where user needs are identified and both functional and non-functional requirements are documented to form a comprehensive product backlog. Following this, a Game Design Document (GDD) is developed to outline the game's goals, mechanics, and all necessary components for the development process. Finally, the High-Level Architecture is established, which defines the technical responsibilities, including character and asset design, programming infrastructure, and sound design.

Production Phase (Development): The development phase starts with sprint planning, where selected items from the product backlog are moved into the sprint backlog. This phase includes four key activities:

- **Design:** Storyboards are created to guide development, and tools are used to design various game assets such as characters, environments, and interactive elements.
- **Development:** The game is built using the Unity Game Engine with C# as the primary programming language. This phase focuses on implementing game mechanics and functionality to create an engaging experience.
- **Testing:** Quality assurance is conducted through two testing methods. Beta testing involves external testers evaluating the game's functionality, while heuristic-based testing assesses user interface, gameplay, and mechanics to ensure the game is user-friendly and engaging.
- **Review:** Based on test results, feedback is gathered to analyze necessary adjustments. Any issues found in testing are addressed, and new mechanics may be added to improve the game further.

Post-production Phase (Closure): Once testing is complete and the game meets quality standards, it is prepared for release. This includes creating user documentation to ensure players understand how to interact with the game effectively. Additionally, marketing efforts are initiated to promote the game to the target audience.

1.5 Scopes

The sample for the study will be undergraduate students in the Faculty of Computer Science and Information Technology at Universiti Malaysia Sarawak (UNIMAS). The game will cover the topic of academic integrity when using AI tools. The data to be analysed will focus on students' knowledge of academic integrity.

1.6 Significance of Project

The significance of this project is to help undergraduate students understand the use of AI tools. Using games as an educational approach will help students process information more effectively when they are actively engaged. In addition, the project will raise awareness in an entertaining way, allowing players to consider the disadvantages of academic misconduct involving AI tools.

1.7 Project Schedule

The project is planned to be completed within a year, which is split into two stages: (1) FYP 1, and (2) FYP 2. With each stage's spans over a semester, which is approximately 14 weeks each. FYP 1 will be carried out in the first semester (18th October 2024-12th January 2024) while FYP 2 will be carried out in the second semester (18th March 2024-30th June 2024). Both the Gant charts for FYP 1 and FYP 2 are shown in Appendix A.

Table 1.1 Project Schedule

Task/Week	W1	W2	W3	W4	W5	W6	W7	W8	W9	W10	W11	W12	W13	W14	W15	W16	W17	W18	W19	W20	W21	W22	W23	W24
Brief Proposal																								
Full Proposal																								
Chapter 1																								
Chapter 2																								
Chapter 3																								
Chapter 4																								
Chapter 5																								
Chapter 6																								

1.8 Expected Outcome

By the end of this project, university students will understand the importance of ethically using AI tools in their studies. They will learn about the risks of academic misconduct in coursework and recognize how it can harm their learning and skill development. This project aims to help students appreciate ethical practices and commit to using AI tools responsibly in their academic work.

1.9 Chapter Outlines

Chapter 1: Introduction

This chapter introduces the background and motivation behind the project, which focuses on the ethical challenges arising from the use of AI tools in academic settings. It highlights issues such as student over-reliance on AI-generated content and a general lack of awareness about academic integrity. The main objectives are to design, develop, and evaluate a 2D role-playing game that educates students on the responsible use of AI. The chapter also outlines the project's scope, significance, expected outcomes, and the development methodology, which follows the Scrum framework.

Chapter 2: Literature Review

This chapter explores related works and existing game-based learning systems that blend education with gameplay. It reviews three notable examples—Loco Motive, Be Internet Awesome, and Papers, Please and compares their features to those planned for the proposed game. By analysing their mechanics and educational value, the chapter identifies key elements that can enhance engagement and learning, such as decision-making, interactive storytelling, and task-based challenges. These findings guide the design of a game that encourages players to reflect on the ethical use of AI in academic environments.

Chapter 3: Requirement Analysis and Design

In this chapter, the project requirements are established through surveys and research. It details both functional and non-functional requirements and documents the early planning stages under the Scrum methodology. Design elements such as storyboards, wireframes, and UML diagrams are presented alongside a comprehensive Game Design Document. The chapter introduces core game features including a decision-making system, inventory management, a crafting system, and quest mechanics all aimed at delivering an interactive learning experience.

Chapter 4: Implementation

This chapter discusses the technical execution of the game using Unity as the game engine and C# for scripting. It covers the development of character movement, dialogue systems (using Ink), quiz integration, and mini-games. Visual assets were created using Aseprite to maintain a cohesive pixel art style. The implementation focuses on bringing together narrative and gameplay to support the project's goal of promoting ethical awareness in academic AI usage.

Chapter 5: Testing

Testing was carried out to ensure the game's performance, usability, and educational effectiveness. This chapter details the functional and non-functional testing processes, including beta testing, heuristic evaluation, and usability testing. Feedback gathered from users helped improve aspects such as dialogue clarity, interface design, and overall user experience. The results confirmed that the game performs well and successfully encourages players to think critically about academic integrity.

Chapter 6: Conclusion and Future Work

The final chapter reflects on the outcomes of the project, confirming that the main objectives were achieved. The game succeeded in raising awareness about ethical issues related to AI use in education. However, the project faced some limitations, such as time constraints and scope for deeper content. Suggestions for future work include expanding storylines, enhancing interactivity, and possibly adding multiplayer or real-time feedback features to broaden the game's impact and reach.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

Games are a powerful tool for making learning both fun and engaging. Games create the opportunity to build an immersive setting where players can engage with the pictures, which makes for a much better learning opportunity than conventional media formats (Artificial & De Alicante Departamento De Ciencia De La Computación E Inteligencia Artificial, 2008). They can help people grasp important topics and encourage critical thinking about real-life situations. Therefore, acquiring knowledge through play leads to an improvement in the participants' motivational range, so they spend more time learning (Lemos et al., 2023). This project focuses on using a game to teach students about academic honesty when utilizing artificial intelligence (AI) tools. Games allow players to make decisions and observe their consequences, enabling them to learn through experience in a safe and interactive environment.

In this chapter, will discuss the features of the game for the future development that have been selected as an inspiration. These games have various types of features which can be fun and entertaining while giving awareness and education to the players. This approach not only makes learning more enjoyable but also helps raise awareness about key educational issues. There are three games that have been selected from Steam and Google which have received good feedback from the players who have already played these games.

2.2 Review on Similar Existing Systems

This section focuses on reviewing similar existing systems for the inspiration upon development. The purpose of this review is to gather insights and generate ideas for the development of the current project. By examining selected systems with similar concepts, this section aims to identify opportunities for incorporating creative and effective elements into the project. A few games have been selected for review, as they provide valuable examples that can enhance the effectiveness of the project.

2.2.1 Loco Motive

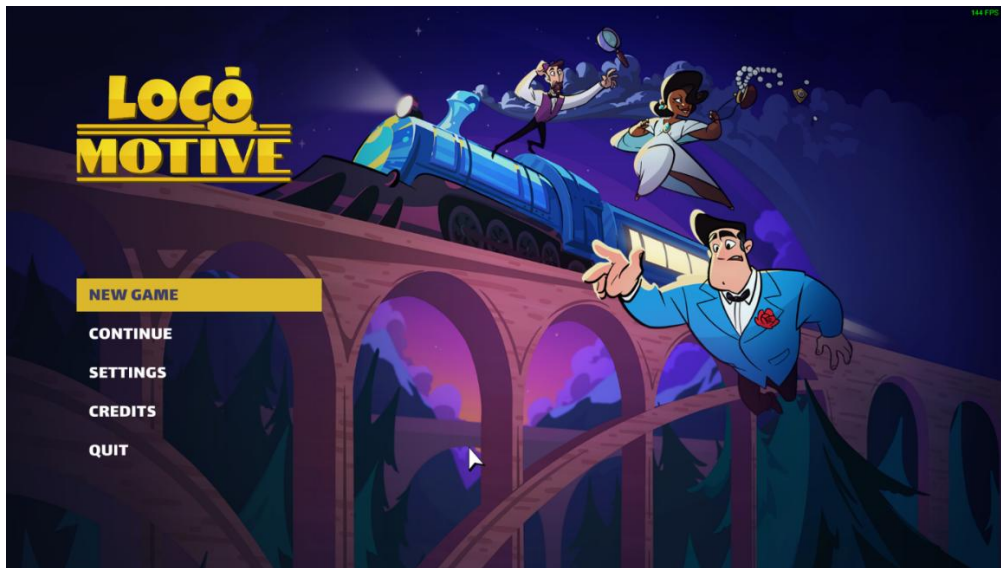


Figure 2.1 Loco Motive

Figure 2 shows the main menu of Loco Motive, a point-and-click adventure game with detailed pixel art, interactive storytelling, and voiced characters. The game encourages players to use reasoning and problem-solving skills by solving puzzles through deduction, without relying on complicated mechanics or unclear solutions (Hodges, 2024). A key feature of the game is its interactive system, where animations appear when players interact with objects. This level of detail makes the game more immersive, even for simple actions like opening drawers or picking up items. The game's simple visual style is complemented by these interactive elements, creating an engaging and responsive experience for players.

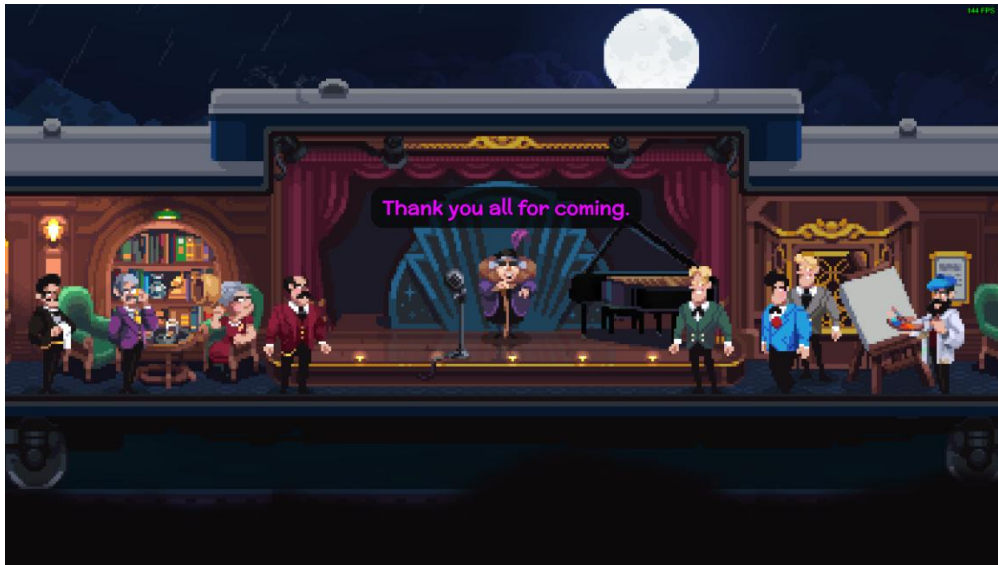


Figure 2.2 Loco Motive

Figure 3 shows the cutscene which tells the starting story of the game. This help players to understand the story of the game and makes it more engaging while playing. This game use side-scrolling where the player will only move left or right, which means the view from a side-angle camera which brings back the era of retro gaming such as Super Mario, Sonic, Rayman and more.



Figure 2.3 Loco Motive

Figure 4 shows the dialogue between the characters which will need player to decide the dialogue they want, and the choices does not affect the ending of the game.



Figure 2.4 Loco Motive

Figure 5 shows the tutorial that the game provides for the player which is very understandable. Since the game uses point and click interaction, information will be pop up when the player hovers over the object. Also, players will be using point-and-click to move the character they played. The icon at the bottom left is for inventory, where the player will store the object into it.



Figure 2.5 Loco Motive

Figure 6 shows the inside of the inventory where the objects were stored. This inventory can also customize the object by dragging and stacking it so that the objects will be combined.

2.2.2 Be Internet Awesome

Be Internet Awesome is game about online safety which can help parents and teachers to navigate the importance of online safety with their children and students. According to Brooks (2024) a program designed in partnership with leading child development and safety experts focused on topics like how to spot scams, create strong passwords and be cautious about sharing personal information online.

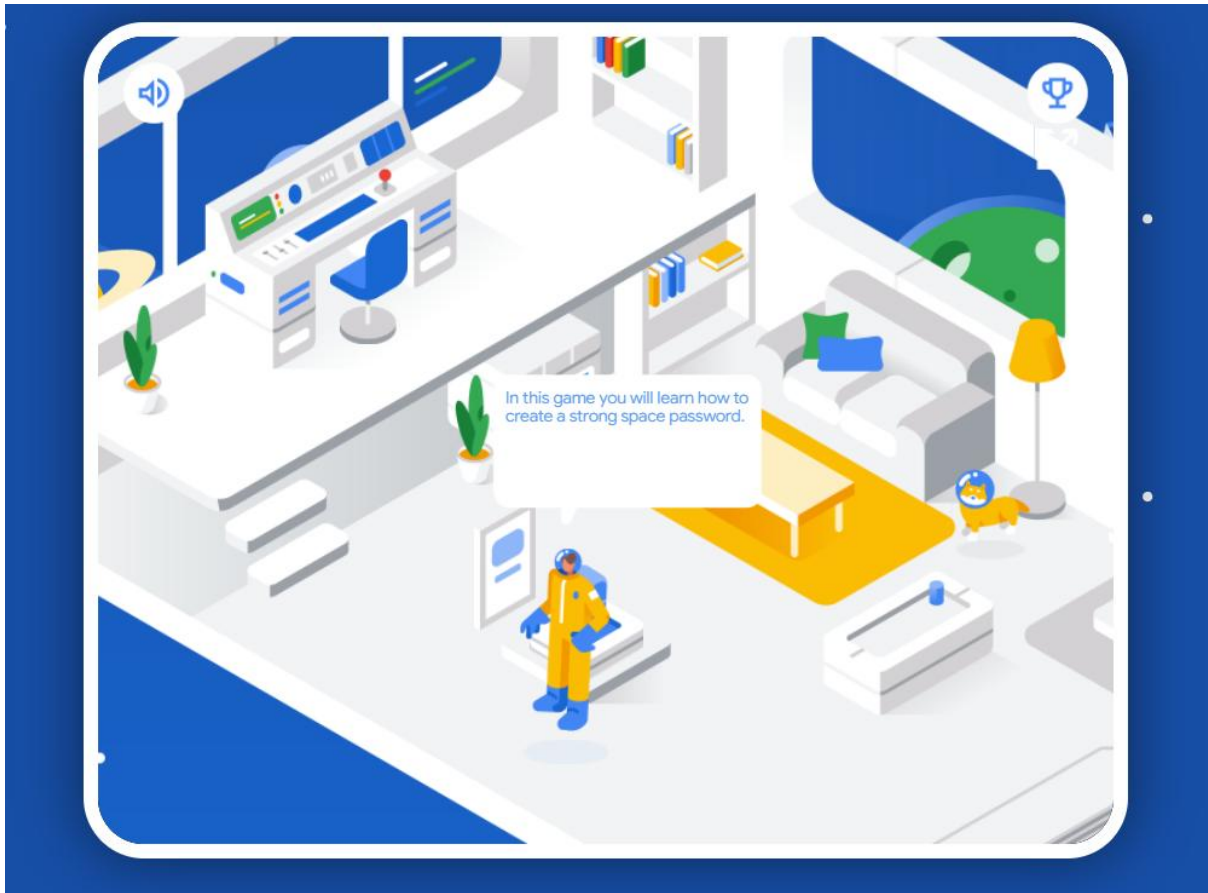


Figure 2.6 Be Internet Awesome

Figure 7 shows the introduction of the Space Shelter game. This main page to introduce the game and the game objectives. Some cutscene included in this game to show the flow of the game about.

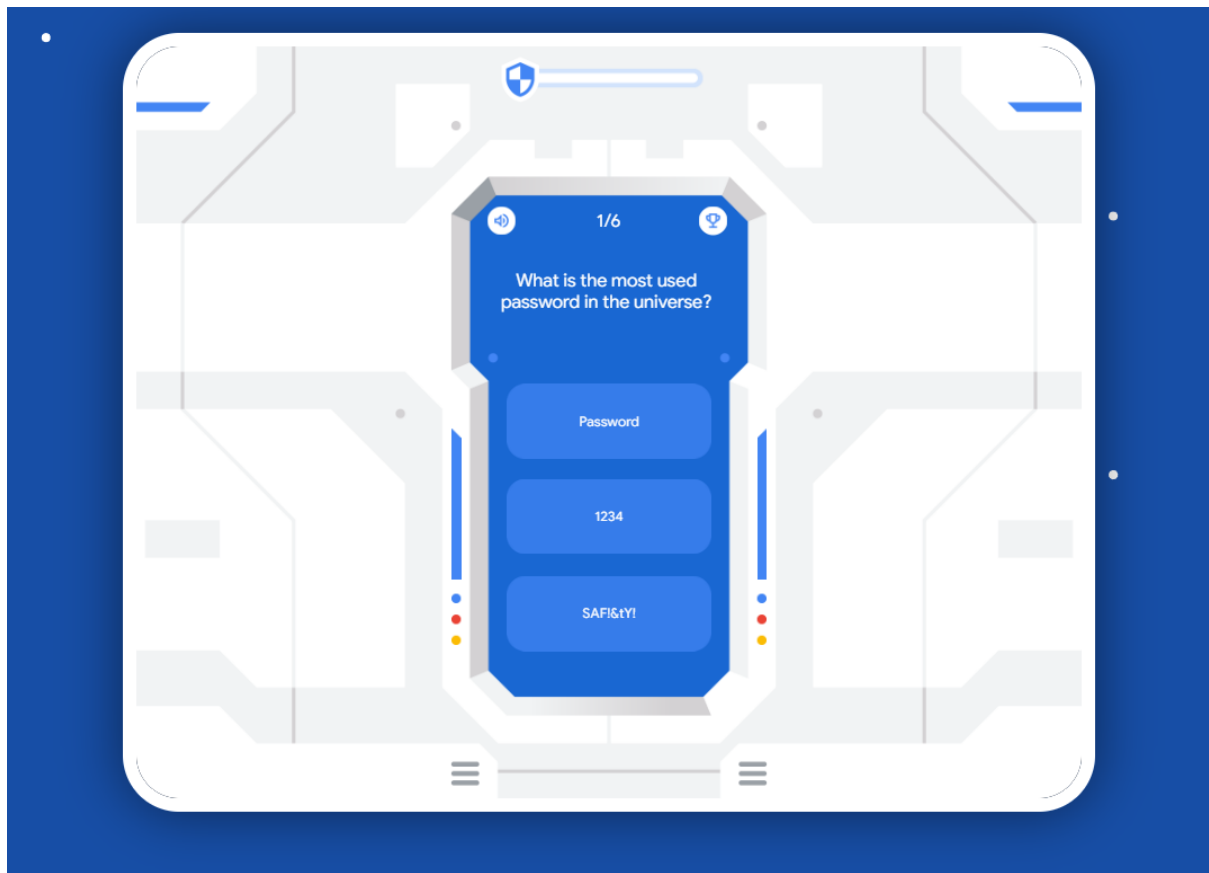


Figure 2.7 Be Internet Awesome

Figure 8 shows the game task to evaluate a player. The button size and colour make it easier for the player to understand how the navigation works and make game interface look simply. Player can interact by clicking the button and it will directly to the next question.

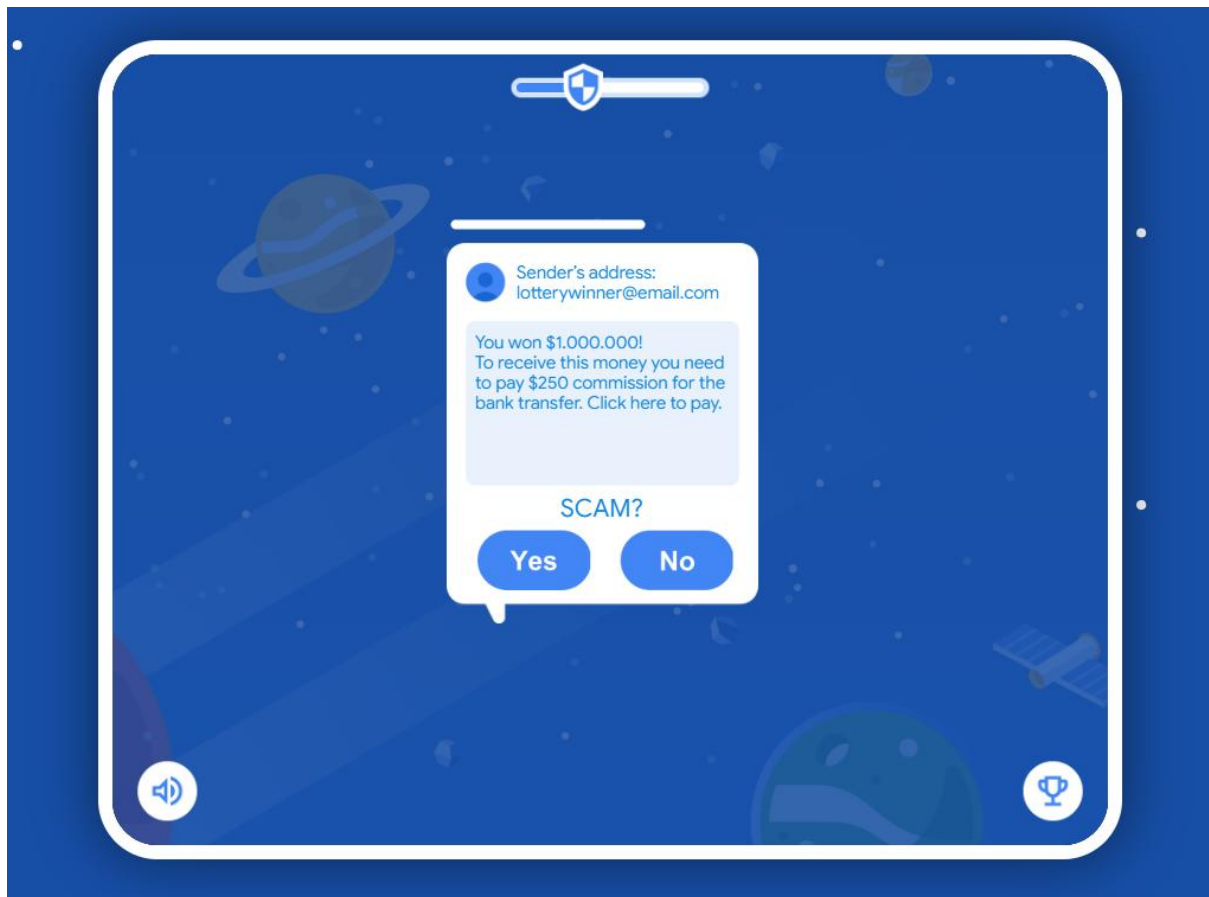


Figure 2.8 Be Internet Awesome

Figure 9 shows the game to test player understanding and indirectly educate the player about the scam. This method helps improve learning process to the player as it is can be applied to real world.

2.2.3 Paper, Please



Figure 2.9 Paper, Please

Figure 10 shows Paper, Please game that is a checking and verifying documents of NPCs who wish to enter Arstotzka. The game has multiple endings determined by daily decisions and interactions made by the player. There are 31 playable days in story mode. Each day will bring new rules, regulations and features to pay attention to; failure to comply can result in penalties.

2.2.4 Comparison of Features between Systems

Table 2.1 Comparison of Features between similar existing systems and proposed systems

	Loco Motive	Papers, Please	Space Shelter	Proposed System
Core Mechanics	Solving puzzles, interacting with characters, unravelling a mystery	Inspecting documents, making decisions, moral dilemmas	Completing tasks focused on digital safety concepts	Edutainment: Provides context and hints before progressing to the next stage, reinforcing educational messages.
Unique Features	In-game hint system, voice acting, slapstick humour	Time pressure, evolving rules, balancing personal needs with job requirements	Teaches critical skills like phishing detection and password security	Interactive Gameplay: Simulates academic tasks, encouraging critical thinking and problem-solving.
Educational Value	Entertainment-focused	Ethical decision-making, systemic understanding	Focus on teaching digital literacy and internet safety	Task-Based Challenges: Reinforces lessons on academic integrity and

				the responsible use of AI tools
Multiplayer Support	No	No	No	

2.3 Proposed Game System

This section reviews the game features considered for developing the "Academic Integrity Using AI Tools" game, drawing inspiration from features in existing games. The review highlights how these features can be adapted to enhance the educational and entertainment value of the game.

2.3.1 Edutainment Features

Edutainment, the combination of entertainment and learning, is a key concept for this project. For example, incorporating cutscenes inspired by "Papers, Please" can provide players with hints or context before progressing to the next stage of the story. These narrative-driven moments help to convey important educational messages in a visually engaging way.

2.3.2 Interactive Gameplay

Interactive elements are vital for creating player engagement, particularly in educational games. A feature from "Loco Motive" that could be adapted is the drag-and-drop mechanic, which allows players to combine different items for crafting purposes. This mechanic can be used in the game to simulate academic tasks, encouraging players to think critically and experiment with solutions.

2.3.3 Task-Based Challenges

From the game "Space Shelter", a feature that tests players with immediate tasks tied to the storyline can be adapted. In the context of this project, players could face tasks that require ethical decision-making under time constraints. These scenarios would emphasize the

consequences of unethical behaviour or the misuse of AI tools in academics, reinforcing the educational goals of the game.

2.3.4 Purpose of the Features

The inclusion of these features aims to make the game both engaging and educational. They provide players with interactive experiences that not only entertain but also teach valuable lessons about academic integrity and responsible use of AI. By simulating realistic scenarios and encouraging active participation, the game fosters critical thinking and ethical awareness among its players.

2.3.5 Chapter Summary

This chapter explored key features of the proposed game-based learning system, emphasizing the integration of edutainment elements to enhance player engagement and educational value. Narrative-driven cutscenes inspired by *Papers, Please* provide context and hints to reinforce learning objectives, while interactive gameplay mechanics, such as the drag-and-drop system from *Loco Motive*, encourage critical thinking and problem-solving through simulated academic tasks. Additionally, task-based challenges adapted from *Space Shelter* introduce ethical decision-making scenarios under time constraints, highlighting the consequences of academic dishonesty and AI misuse. By incorporating these interactive elements, the proposed system aims to create an immersive learning experience that fosters critical thinking, ethical awareness, and responsible AI usage among players.

CHAPTER 3: REQUIREMENT ANALYSIS AND DESIGN

3.1 Introduction

The use of artificial intelligence (AI) tools in education has grown rapidly, bringing both opportunities and challenges. While AI can enhance students' learning and productivity, it also raises concerns about academic integrity when misused. The game aims to educate players, particularly students, on the ethical use of AI tools through engaging scenarios and decision-based gameplay. It outlines the foundational elements essential to the project's development.

3.2 Game Development with Scrum Methodology

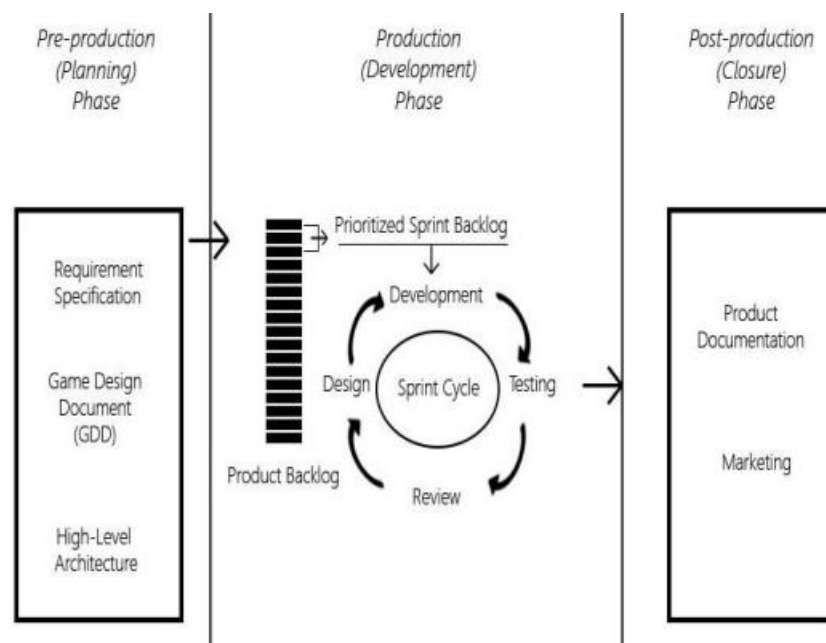


Figure 3.1 Game Development with Scrum Methodology (Kristiadi et al., 2019)

3.2.1 Pre-production Phase (Planning)

In this phase, there are three key planning stages: Requirement Specification, Game Design Document (GDD), and High-Level Architecture. Firstly, Requirement Specification involves understanding and identifying user needs and specifying both functional and non-functional requirements to create the product backlog (Kristiadi et al., 2019). Secondly, the Game Design Document outlines goals and all necessary elements for planning and development. Thirdly, High-Level Architecture defines the responsibilities required in game development, including character and asset design, programming the infrastructure to integrate all components, and creating background music and sound effects. This is all organized before creating the product backlog.

3.2.1.1 Requirements Specification

A. Survey

What is your field of study?
21 responses

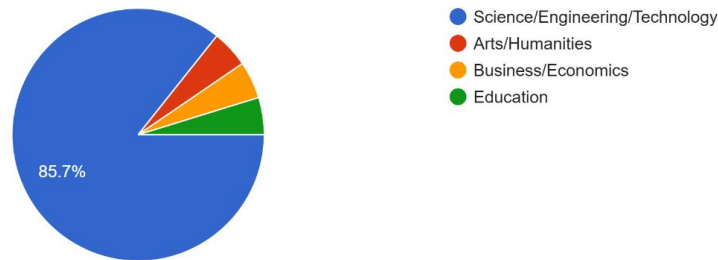


Figure 3.2 What is your field of study?

Figure 12 shows that 85.7% of respondents are from Science/Engineering/Technology and the others are from Arts/Humanities, Business/Economics, and Education. The purpose of this research is to measure their understanding and familiarity using AI tools towards academic.

What is your year of study?
21 responses

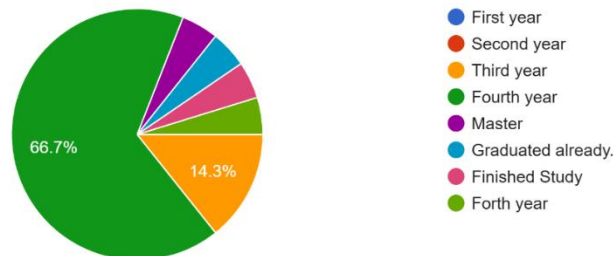


Figure 3.3 What is your year of study?

Figure 13 shows that 66.7% of respondents are from fourth year while some are first year, second year, third year with 14.3% and others. The purpose of this research is to measure their understanding and familiarity using AI tools towards academic.

What is your education level
21 responses

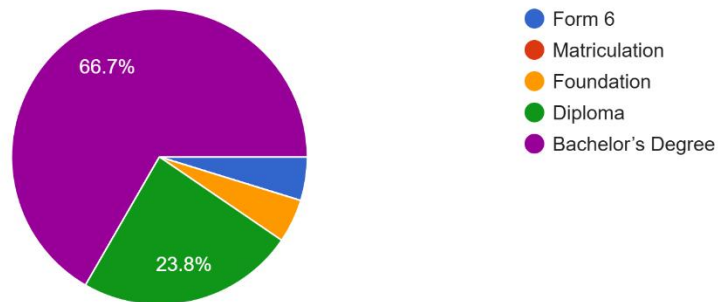


Figure 3.4 What is your educational level?

Figure 14 shows that 66.7% of respondents are bachelor's degree while some are form 6, matriculation, foundation, and diploma reach 23.8%. The purpose of this survey is to measure their understanding of using AI tools in academic by comparing based on their educational level.

How familiar are you with AI tools (e.g., ChatGPT, Grammarly, DALL-E)?
21 responses

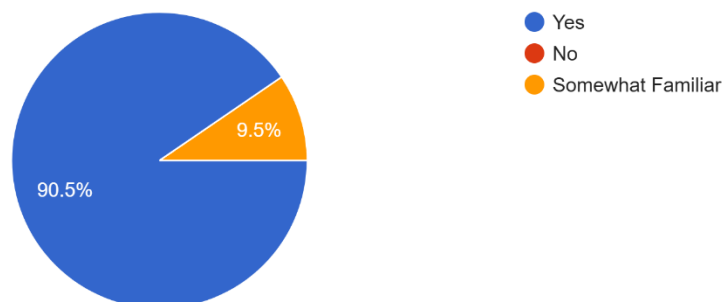


Figure 3.5 How familiar are you with AI tools?

Figure 15 shows that 90.5% of respondents are choosing yes, meaning most of the respondents familiar with AI tools while the others are somewhat familiar. The purpose of this survey is to find how much of respondents familiar with AI tools.

Have you used AI tools for academic purposes? (e.g., writing assignments, coding, idea generation)
21 responses

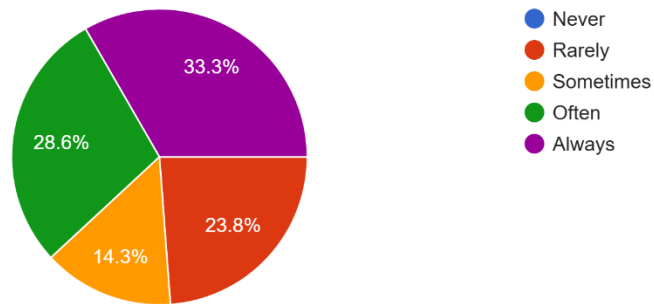


Figure 3.6 Have you used AI tools for academic purposes?

Figure 16 shows that 33.3% of respondents are choosing “Always”, meaning most of the respondents used AI tools consistently for academic purposes. The purpose of this survey is to discover how many of the respondents are familiar with AI tools.

What does academic integrity mean to you
21 responses

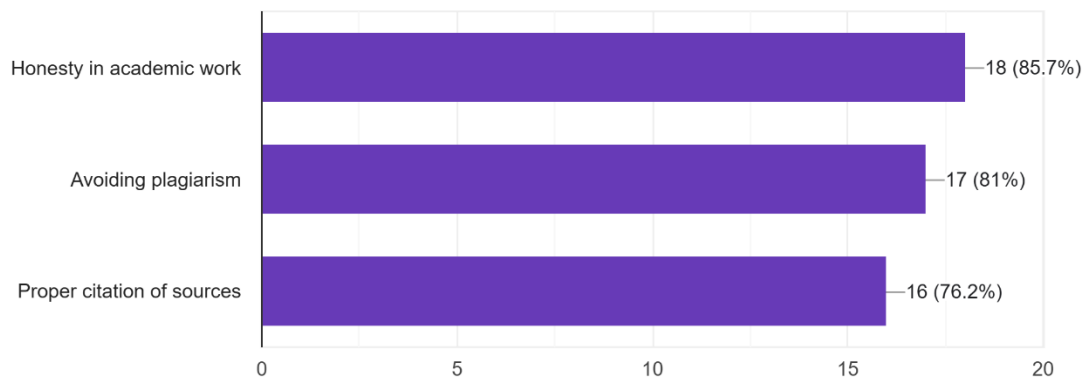


Figure 3.7 What does academic integrity mean to you?

Figure 17 shows that 85.7% of respondents are choosing “Honestly in academic work”, meaning majority understand that honesty is considered integrity especially in academic. 81% choose “Avoiding plagiarism”, meaning academic integrity the purpose of this survey is to evaluate how many of the respondents are understand with academic integrity.

What ethical concerns do you associate with using AI tools for academic work? (Select all that apply)

21 responses

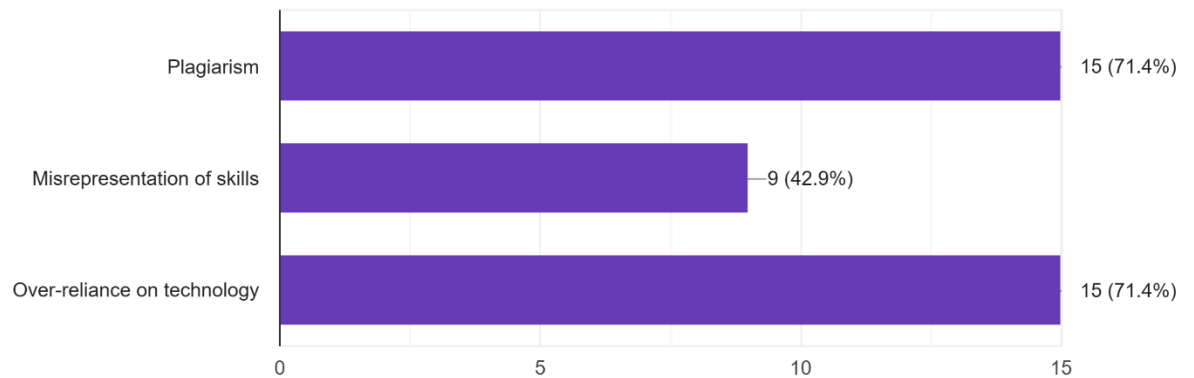


Figure 3.8 What ethical concerns do you associate with using AI tools for academic work?

Figure 18 shows that 71.4% of respondents are choosing “Plagiarism” and “Over-reliance on technology”, meaning majority plagiarism and over-reliance on technology make them have moral dilemma when using AI tools for academic work. The purpose of this survey is to evaluate how many of the respondents are understand with academic integrity.

Have you encountered a situation where you were unsure if using an AI tool was academically appropriate?

21 responses

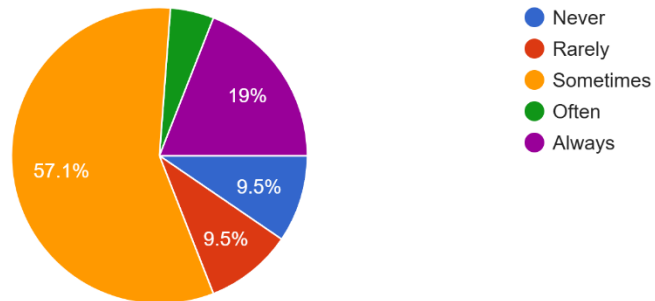


Figure 3.9 Have you encountered a situation where you were unsure if using an AI tool was academically appropriate?

Figure 19 shows that 85.7% of respondents are choosing “Sometimes”, meaning majority occasionally experienced unsure when using AI tools for academic. The purpose of this survey is to evaluate how many of the respondents are experienced not confident with using AI tools in academic.

What game mechanics do you think would effectively raise awareness about academic integrity and the ethical use of AI tools?

21 responses

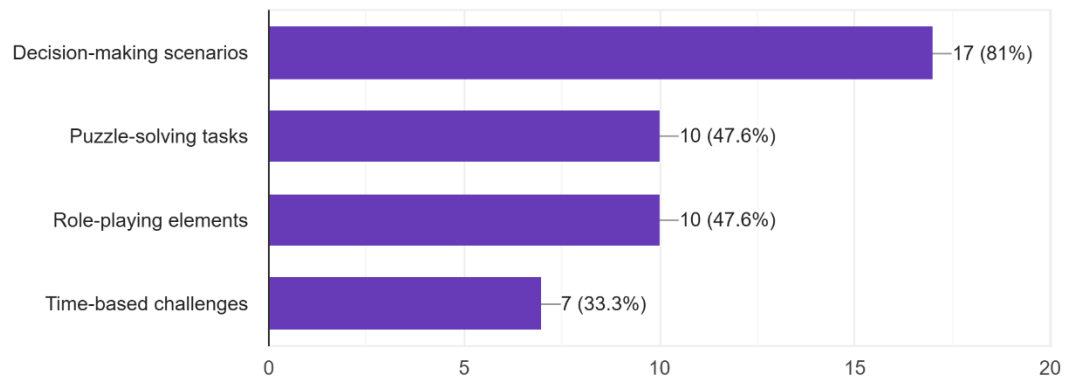


Figure 3.10 What game mechanics do you think would effectively raise awareness about academic integrity and the ethical use of AI tools?

Figure 20 shows that 81% of respondents are choosing “Decision-making scenarios”, meaning majority agreed with decision making scenarios for game mechanics as it is helpful to raise awareness. 47.6% choose “Puzzle-solving tasks” and “Role-playing elements”, meaning almost half of respondents agreed both game effectual to raise awareness through games. The purpose of the survey to overview their perspectives towards game that raised awareness.

Would you be interested in a game that simulates real-life scenarios, such as navigating academic challenges?

21 responses

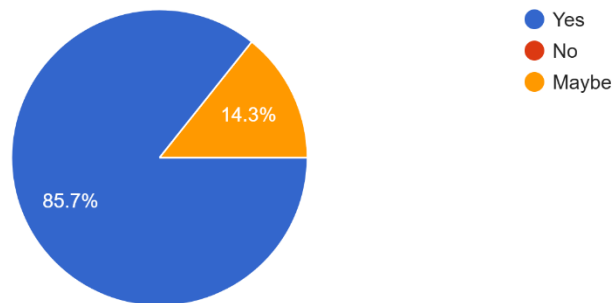


Figure 3.11 Would you be interested in a game that simulates real-life scenarios, such as navigating academic challenges?

Figure 21 shows that 85.7% of respondents are choosing “Yes”, meaning majority attentive to a game that simulates real-life scenarios. 14.3% choose “Maybe”, meaning their uncertainty how the game mechanics should be to make them interested. The purpose of this survey is to recognize the users’ game preferences to be refine in future development.

Would you prefer the game to provide immediate feedback on your decisions related to academic integrity?

21 responses

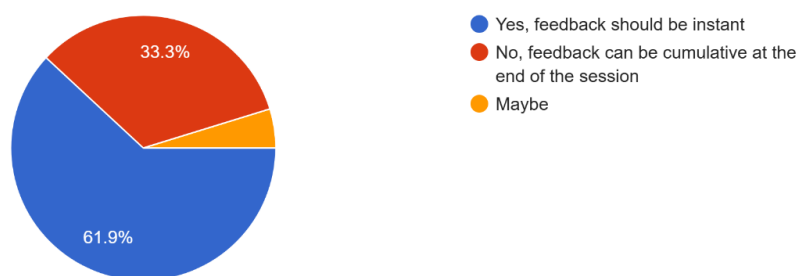


Figure 3.12 Would you prefer the game to provide immediate feedback on your decisions related to academic integrity?

Figure 22 shows that 61.9% of respondents are choosing “Yes, feedback should be instant”, meaning majority agreed to have immediate feedback on decisions related to

academic. 33.3% choose “No, feedback can be cumulative at the end of the session”, meaning their preferred the feedback at the end of the game. The purpose of this survey to identify the user’s game preference to be improve in future development.

How likely are you to engage with games that include moral decision-making and consequences?
21 responses

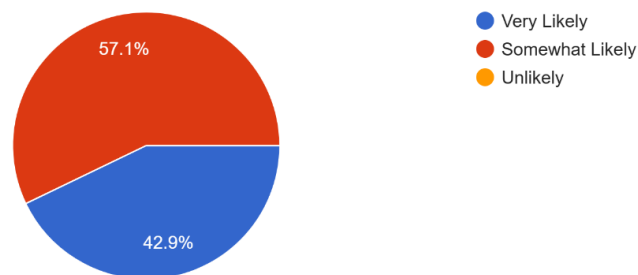


Figure 3.13 *How likely are you to engage with games that include moral decision-making and consequences?*

Figure 23 shows that 57.1% of respondents are choosing “Somewhat Likely”, meaning majority more likely engaging with the decision-making game at the same time their still not sure. 42.9% choose “Very Likely”, meaning their agreed that decision-making can make the game more engaging. The purpose of this survey is to investigate their interested with adding the decision-making and consequences in game.

What motivates you to complete a game?
21 responses

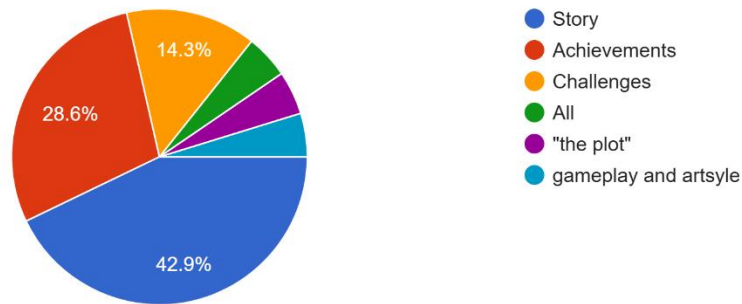


Figure 3.14 *What motivates you to complete a game?*

Figure 24 shows that 42.9% of respondents are choosing story, meaning majority like the game that have story. 28.6% choose to have achievements in games, meaning the game that have reward lead them to stay for achieving the goals in game. The purpose of this survey is identifying what features inspire them to complete a game.

How do you feel about games that mix entertainment with learning?
21 responses

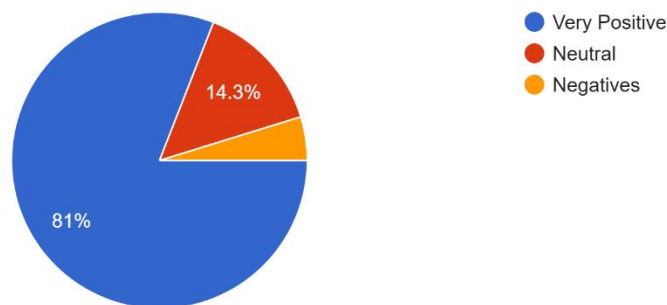


Figure 3.15 *How do you feel about games that mix entertainment with learning?*

Figure 25 shows that 81% of respondents are choosing “Very Positive”, meaning majority give positive feedback on games that mix entertainment with learning. The purpose of this survey is to collect user’s game preferences to be include in the game.

B. Software Requirements

Game development relies heavily on software tools for designing, programming, testing, and deployment. Several key tools will be used in this project. First, the Unity game engine will be utilized due to its robust environment, flexibility, and support for both 2D and 3D assets. Unity's asset store provides ready-made templates and plugins, which help accelerate the development process. Second, for pixel art design and sprite creation, Aseprite is an excellent choice. Its intuitive interface and advanced features make it ideal for creating detailed sprites and animations.

C. Hardware Requirements

The choice of hardware significantly influences the quality of the development process and the end product's performance. A powerful computer with at least 16GB of RAM, a multi-core processor, and a dedicated GPU, such as the NVIDIA GeForce 940M or higher, is recommended for efficiently handling high-resolution textures and real-time rendering. For designing, additional hardware like drawing tablets can greatly enhance precision when creating characters or environments. It is also essential to test the game on devices representative of the target audience. For example, when developing computer games, ensure testing on both high-end and low-end systems to optimize performance across a wide range of hardware. Lastly, fast storage devices like SSDs are crucial for reducing asset loading times, which improves productivity during development. External hard drives or cloud storage are strongly recommended for backups to prevent data loss.

D. Functional

The functional requirements that have been extracted from chapter 2 and survey will be listed, elaborated, finalize here:

- I. Providing decision-making scenarios and role-playing elements making game helpful in raise awareness about academic integrity using AI tools.
- II. Providing real-life scenarios like navigating academic challenges in the game.
- III. Providing immediate feedback on users' decisions in game instead of the end of the game.
- IV. Providing moral decision-making and consequences improve engagement of the game.

- V. Providing story for the game to inspire users to complete a game.
- VI. Mixing entertainment with learning gives positive way to users to learn something from the game.

E. Non-Functional

- I. Address common ethical concerns like plagiarism, over-reliance, and data privacy to educate players on responsible AI tool usage.
- II. Providing user-friendly and eye-catching design to ensure the game runs smoothly in terms of user experience.

3.2.1.2 Game Design Document

A. Storyboarding and Storytelling

The story follows a university student living on campus who becomes intrigued by the growing influence of Artificial Intelligence (AI) in education. One day, he notices several social media posts about AI and watches a TV news report highlighting how AI is transforming learning. Curious but unsure, he decides to explore the topic further. Later, he receives a message from his academic advisor informing him about a meeting scheduled for the next day. Intrigued, he wonders what the meeting will be about.

At the meeting, the student and his peers gather in a small office filled with books and posters. The academic advisor explains the potential benefits of AI in academics when used correctly, while also cautioning about the ethical concerns and challenges of its misuse. The students are captivated by the possibilities that AI offers and feel inspired to learn how to use it responsibly.

That evening, back in his dorm room, the main character receives an assignment from his lecturer. As he sits at his desk, he contemplates how to approach the task. He is presented with two options: use AI as a tool to conduct research and write the paper himself or copy AI-generated text without understanding or effort. The game emphasizes these choices, providing immediate feedback based on his decision. If he uses AI responsibly, the game displays a positive response, praising his effort and ethical approach. Conversely, if he chooses the unethical route, the game presents a negative outcome, highlighting the consequences of his actions.

This interactive storytelling approach integrates decision-making with a strong educational message, encouraging players to reflect on the importance of honesty and ethical behaviour when utilizing AI tools in academics.

B. Game Mechanics

The game has a role-playing game style interface. In this style, the character can move around the college to gain knowledge regarding academic integrity using AI tools. The character can interact with non-playable characters and objects.

C. Inventory System

An Inventory System is a tool for a player to store the item that they collected. They can obtain an item from interacting with an object or NPC. The item that the players store is use for crafting, inspect and equip the item.

D. Quest System

A quest system is implemented to give players tasks of main quest to complete that help advance the game's story and immerse them in the game world. The purpose of this quest is to bring the variety and excitement of player exploration through the game.

E. Crafting System

A crafting system is one of the gameplay mechanics that allow players to create or improve the items in a game. It uses players skills to gather the resources by interacting the object and combining them in specific ways.

3.2.2 Production Phase (Development)

In this phase, the team begins creating the product by selecting items from the product backlog to form a sprint backlog, targeting completion for each item. This phase encompasses four key processes: design, development, testing, and review. In the design process, a storyboard is created to meet requirements, utilizing tools to sketch and develop assets such as walls, characters, tile sets, and other necessary game elements. During development, a platform or programming language, such as C# or Java, is used to build the game, with game engines facilitating the process. In this case, the Unity Game Engine is employed, using C# as the embedded language to drive the game mechanics.

The testing process ensures the game's quality through beta testing and heuristic-based testing. Beta testing involves external testers who assess overall functionality and help identify bugs that developers might have missed (Kristiadi et al., 2019). Heuristic-based testing evaluates the user interface and playability experience, covering elements like the game's story, gameplay, and mechanics (Kristiadi et al., 2019). Finally, the review process involves a thorough assessment of the game post-testing, analysing test results to pinpoint areas for improvement and adding new mechanics if necessary.

3.2.3 Post-production Phase (Closure)

After completing testing and quality assurance, the game will be ready for launch. During this phase, user documentation is created to ensure the game is well-packaged and easy to use. Once everything is finalized, marketing efforts will begin to promote the product.

3.3 Wireframes

3.3.1 Main Menu

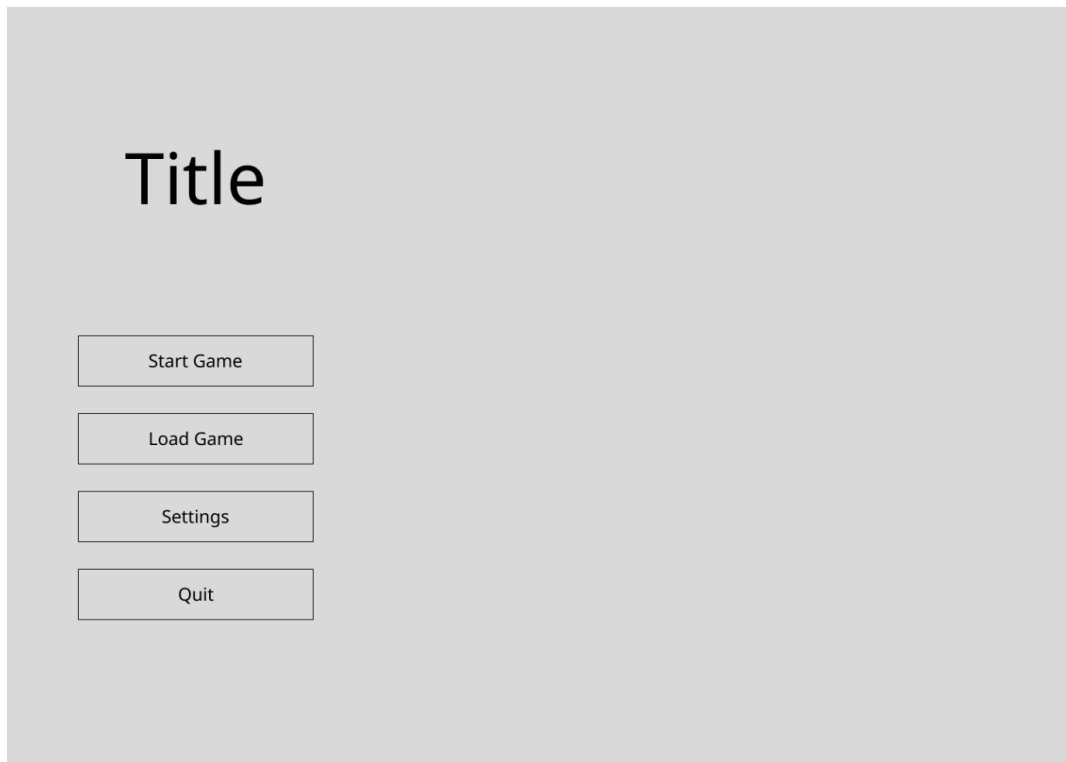


Figure 3.16 Main Menu

3.3.2 Dialogue

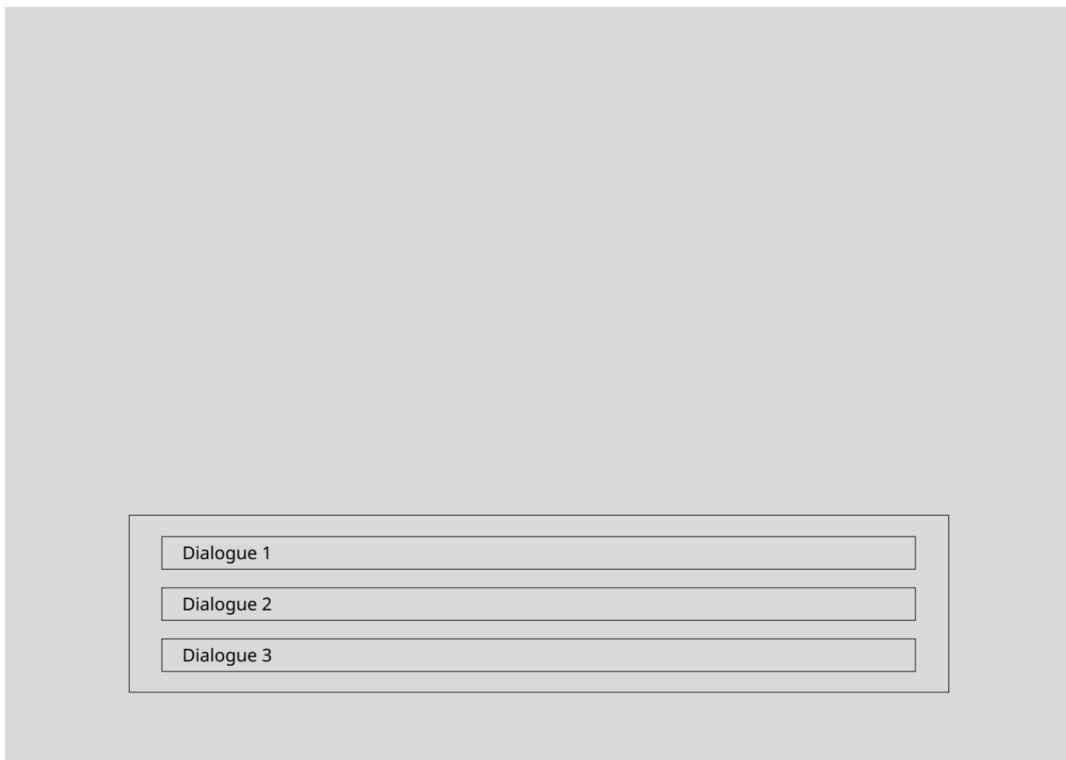


Figure 3.17 Dialogue Box

3.3.3 Inventory

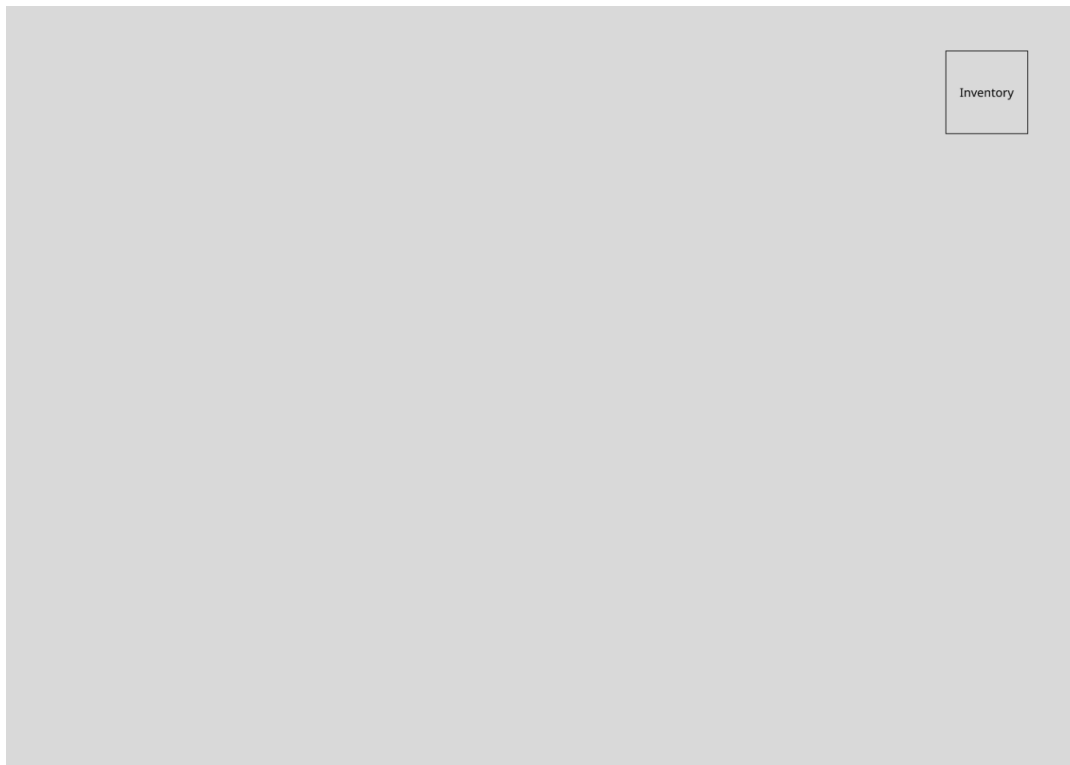


Figure 3.18 Inventory

3.3.4 Inventory Tab

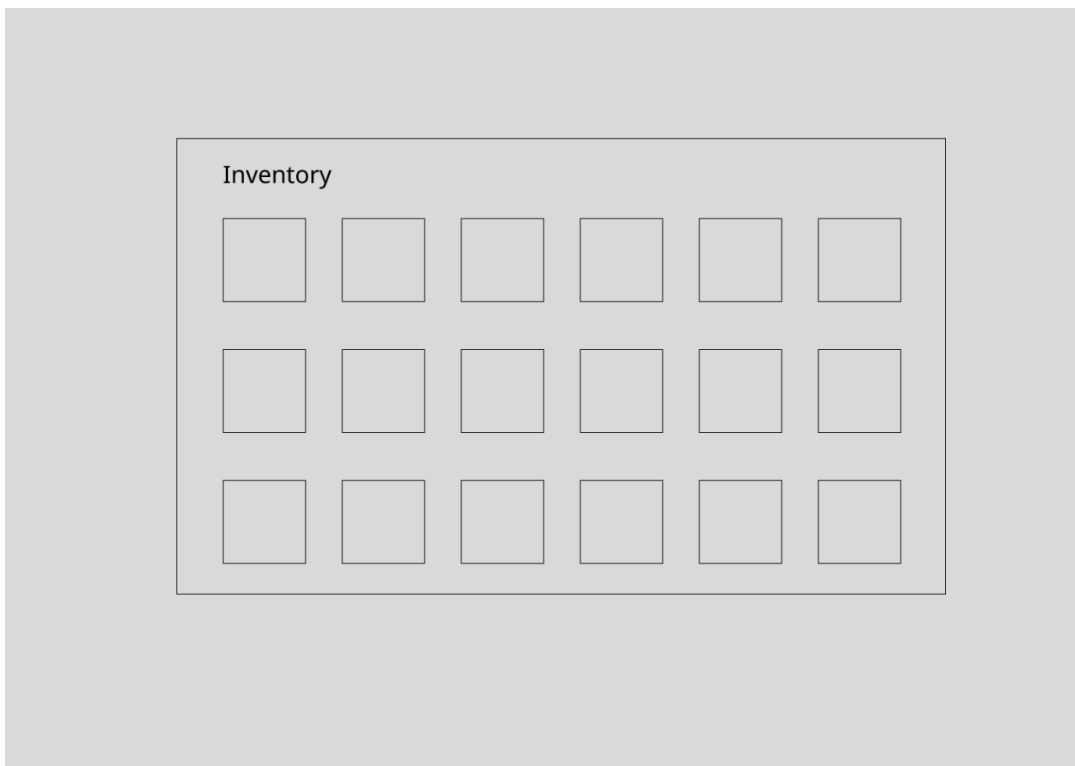


Figure 3.19 Inventory Tab

3.3.5 Cover Story Cutscene



Figure 3.20 Cover Story Cutscene

3.3.6 Decision Making

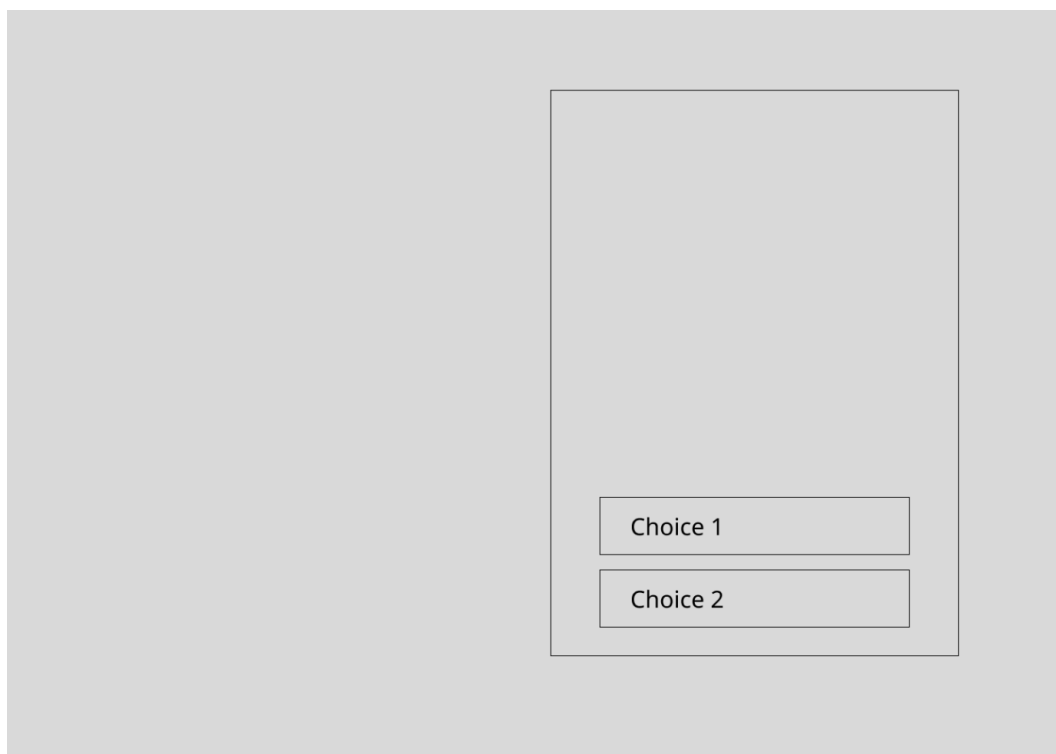


Figure 3.21 Decision Making

3.3.7 Settings

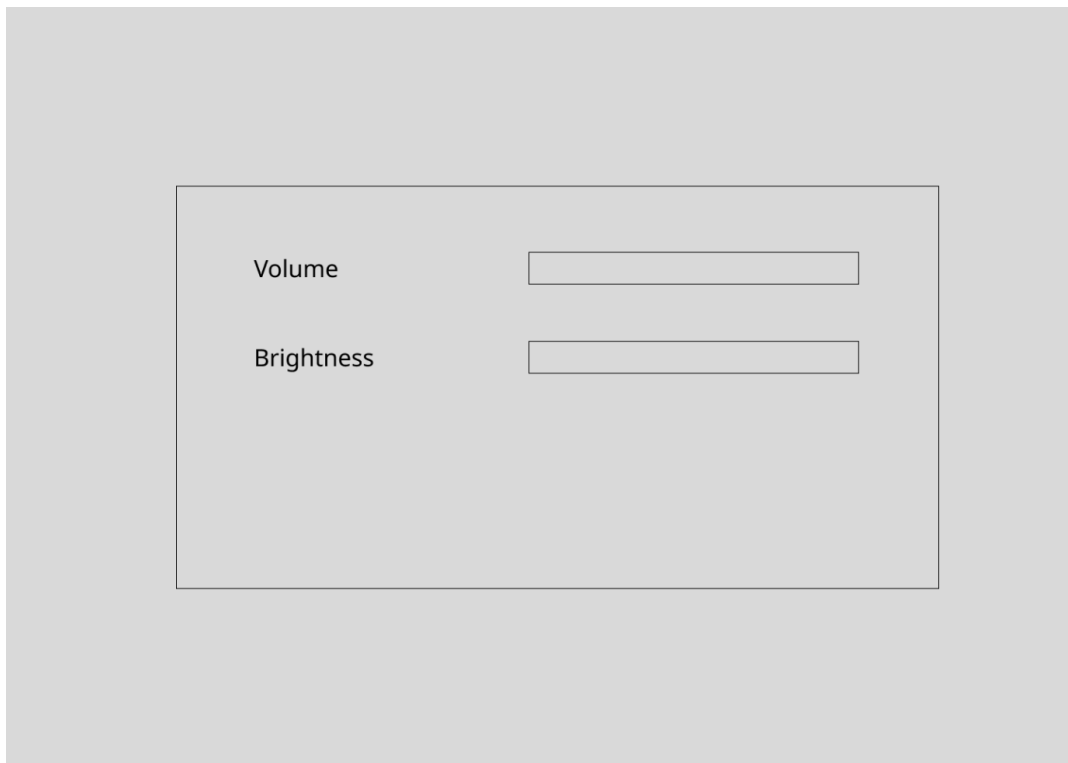


Figure 3.22 Settings

3.4 Use Case Diagram

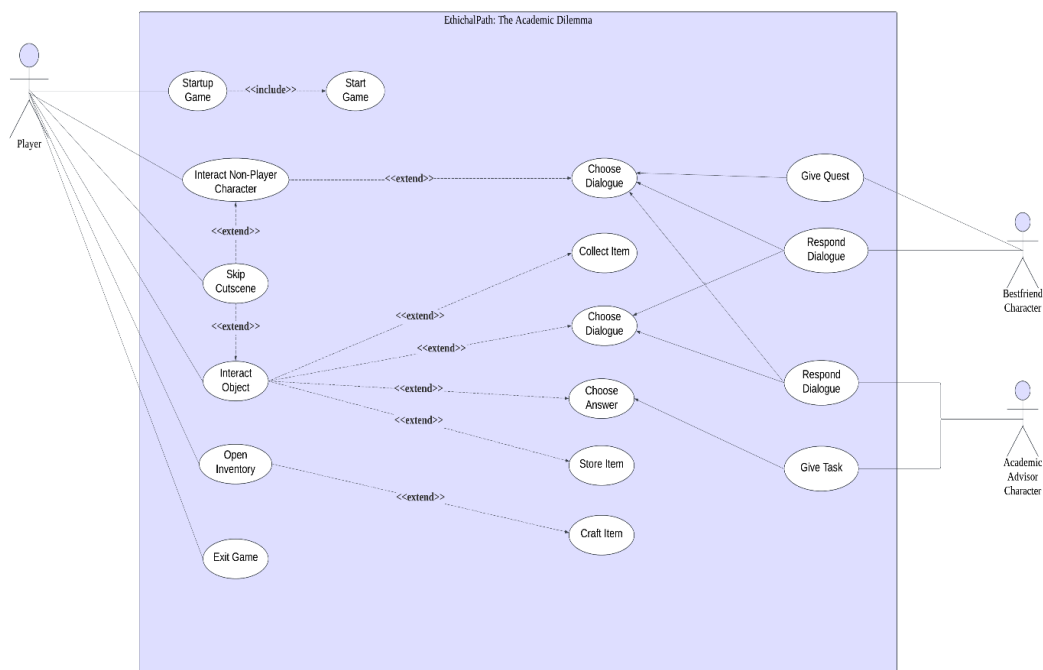


Figure 3.23 Use Case Diagram

3.4.1 Startup Game

Table 3.1 Startup Game

Actors	• Player
Goal	• To initialize the game and prepare the environment for the player to begin playing
Preconditions	• The game is installed and ready to be launched • The player's device meets the game's system requirements
Postconditions	• The game assets are loaded, and the main menu or introductory screen is displayed. • The player can choose to start a new game, continue an existing game, or access other options.
Main Flow	• The player launches the game. • The system loads the game assets (e.g., visuals, sounds, and scripts). • The system displays the main menu or title screen.
Alternate Flow	• None for this use case.
Exceptions	• The game fails to launch due to missing files or errors, showing an error message.
Relationships	• Include: "Start Game". • Extend: None.

3.4.2 Start Game

Table 3.2 Start Game

Actors	• Player
Goal	• To begin gameplay by starting a new session or continuing from a saved state.
Preconditions	• The game is successfully launched. •
Postconditions	• The initial game scene or the most recent saved progress is loaded.
Main Flow	• The player selects "Start Game" from the menu. • The system loads the relevant game assets. • The system begins the gameplay sequence.
Alternate Flow	• None.

Exceptions	The save file is corrupted, and the player is returned to the main menu.
Relationships	- Include: None. - Extend: "Startup Game".

3.4.3 Interact Non-Player Character

Table 3.3 Interact Non-Player Character

Actors	Player
Goal	To interact with a non-player character (NPC) for dialogue, information, or quests.
Preconditions	The player is near an NPC in the game world.
Postconditions	A dialogue or action sequence is initiated.
Main Flow	- The player approaches and interacts with an NPC. - The system triggers a dialogue or action sequence.
Alternate Flow	If the player does not interact, the NPC continues idle behaviour.
Exceptions	NPC interaction fails if the player is not within range.
Relationships	- Include: "Choose Dialogue," "Respond Dialogue". - Extend: None.

3.4.4 Skip Cutscene

Table 3.4 Skip Cutscene

Actors	Player
Goal	To allow the player to skip non-interactive cutscenes.
Preconditions	A cutscene is playing.
Postconditions	The cutscene ends, and the gameplay resumes.
Main Flow	- The cutscene starts playing. - The player presses the skip button. - The system skips the cutscene and transitions to the next scene.
Alternate Flow	None.

Exceptions	• The skip button does not work if skipping is disabled for specific cutscenes.
Relationships	• Include: None. • Extend: "Startup Game," "Start Game".

3.4.5 Interact Object

Table 3.5 Interact Object

Actors	• Player
Goal	• To interact with an object in the game world.
Preconditions	• The player is near an interactive object.
Postconditions	• The system processes the object's interaction logic.
Main Flow	• The player approaches and interacts with an object. • The system performs the object-specific action (e.g., opening, picking up, examining).
Alternate Flow	• None.
Exceptions	• The object is locked or unavailable for interaction.
Relationships	• Include: "Collect Item," "Store Item". • Extend: None.

3.4.6 Open Inventory

Table 3.6 Open Inventory

Actors	• Player
Goal	• To view and manage items in the inventory.
Preconditions	• The player has items stored in their inventory.
Postconditions	• The inventory screen is displayed.
Main Flow	• The player opens the inventory menu. • The system displays the list of collected items.
Alternate Flow	• None.
Exceptions	• The inventory is empty, and the screen shows "No items available."
Relationships	• Extend: "Craft Item". • Include: None.

3.4.7 Exit Game

Table 3.7 Exit Game

Actors	• Player
Goal	• To exit the game session.
Preconditions	• The game is running.
Postconditions	• The player exits to the main menu or closes the game.
Main Flow	• The player selects the exit option. • The system saves progress (if applicable) and closes the session.
Alternate Flow	• None.
Exceptions	• The game fails to save before exiting.
Relationships	• Include: None. • Extend: None.

3.4.8 Choose Dialogue

Table 3.8 Choose Dialogue

Actors	• Player
Goal	• To select dialogue options when interacting with an NPC.
Preconditions	• The player is in a dialogue sequence.
Postconditions	• The chosen dialogue option determines the NPC's response or action.
Main Flow	• The system displays dialogue options. • The player selects a dialogue option. • The system processes the NPC's response.
Alternate Flow	• None.
Exceptions	• The system fails to register the player's choice.
Relationships	• Extend: "Interact Non-Player Character" • Include: None.

3.4.9 Collect Item

Table 3.9 Collect Item

Actors	• Player
Goal	• To craft the item. • To complete the main quest created by the player.
Preconditions	• The player interacts with object. • The object is in used.
Postconditions	• The player start dialogue. • The NPC player starts dialogue. • The object is saved in inventory.
Main Flow	• The objects show interactable icon. • The player selects the object. • The player drags the object to inventory. • The system displays the inventory. • The player drops the objects in inventory. • The system processes player and NPC dialogues.
Alternate Flow	• None.
Exceptions	• The object is locked or unavailable for interaction.
Relationships	• Extend: “Interact Object”. • Include: None.

3.4.10 Choose Dialogue

Table 3.10 Choose Dialogue

Actors	• Player
Goal	• To select dialogue options when interacting with an NPC.
Preconditions	• The object successfully interacted.
Postconditions	• The dialogue determined the NPC actions.
Main Flow	• The system displays dialogue options. • The player selects a dialogue option. • The system processes the NPC's response.
Alternate Flow	• None.

Exceptions	• The system fails to register the player's choice.
Relationships	• Extend: "Interact Object" • Include: None.

3.4.11 Choose Answer

Table 3.11 Choose Answer

Actors	• Player
Goal	• To select answer options when the question displayed.
Preconditions	• The player in question-and-answer menu.
Postconditions	• The player starts dialogue. • The NPC player starts dialogue.
Main Flow	• The system shows questions. • The system shows the list of answers to be select. • The player selects answer from the list. • The system processes the NPC's response.
Alternate Flow	• None.
Exceptions	• The response is not aligned with the selected answer by the player.
Relationships	• Extend: "Interact Object". • Include: None.

3.4.12 Store Item

Table 3.12 Store Item

Actors	• Player
Goal	• To store the interactable items.
Preconditions	• The items can be drag anywhere.
Postconditions	• The items are stored in inventory. • The inventory is filled with the interacted items.
Main Flow	• The player interacts with the object. • The player drags the object to inventory button. • The screen displayed inventory. • The inventory shows the stored items.

Alternate Flow	• Inventory full.
Exceptions	• None of the items is interactable.
Relationships	• Extend: “Open Inventory”. • Include: None.

3.4.13 Craft Item

Table 3.13 Craft Item

Actors	• Player.
Goal	• To craft collected item in inventory.
Preconditions	• The objects can be interacted. • The inventory can be opened. • The player can drag the objects anywhere in inventory.
Postconditions	• The objects are crafted. • The crafted objects in the inventory. • The action is determined by the player
Main Flow	• The screen displayed inventory. • The player drags and drop the objects. • The crafted item saved in inventory. • The screen shows the crafted item. • The system processes the player's response.
Alternate Flow	• Wrong material needed to craft. • The player’s response to the action.
Exceptions	• The item are not craft.
Relationships	• Extend: “Open Inventory”. • Include: None.

3.4.14 Respond Dialogue

Table 3.14 Respond Dialogue

Actors	• Best Friend NPC.
Goal	• To make player able to choose dialogue for conversations.
Preconditions	• The player is in a dialogue sequence.

Postconditions	• The Best Friend NPC's response on player action.
Main Flow	• The system displays dialogue options. • The player selects a dialogue option. • The system processes the player's dialogue.
Alternate Flow	• The player not selecting any dialogue option, the Best Friend NPC will stay idle.
Exceptions	• Wrong action on selected dialogue option.
Relationships	• Extend: None. • Include: None.

3.4.15 Give Task

Table 3.15 Give Task

Actors	• Academic Advisor NPC.
Goal	• To give player make decisions to answer questions.
Preconditions	• The object can be interacted.
Postconditions	• The player starts dialogue.
Main Flow	• The object shows interactable icon. • The screen displays questions. • The player chooses listed answers. • The system process player's dialogue.
Alternate Flow	• The player not response to interactable object.
Exceptions	• The screen not displayed questions.
Relationships	• Extend: None. • Include: None.

3.5 Activity Diagram with Swimlanes

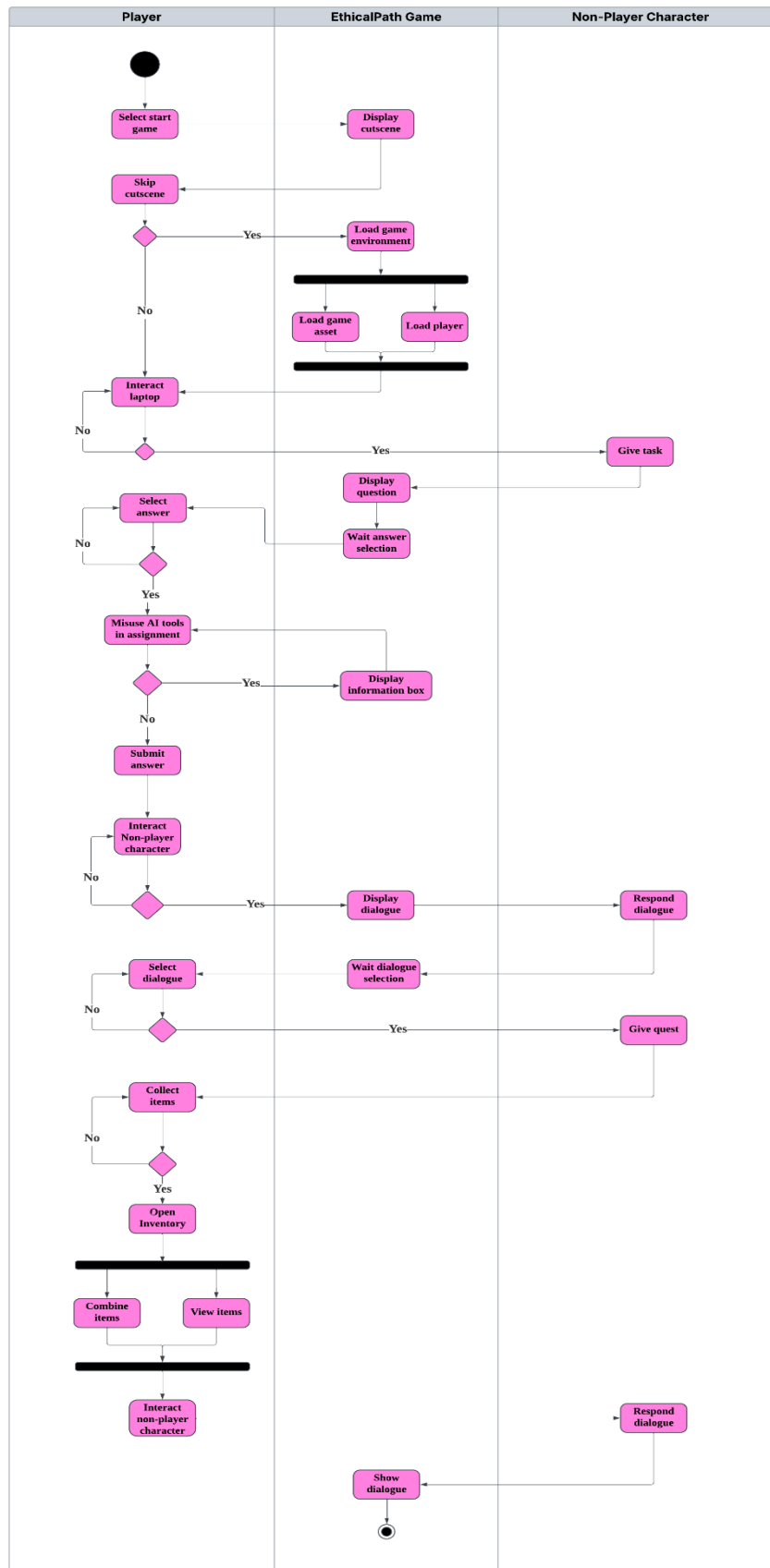


Figure 3.24 Activity Diagram with Swimlanes

3.6 Sequence Diagram

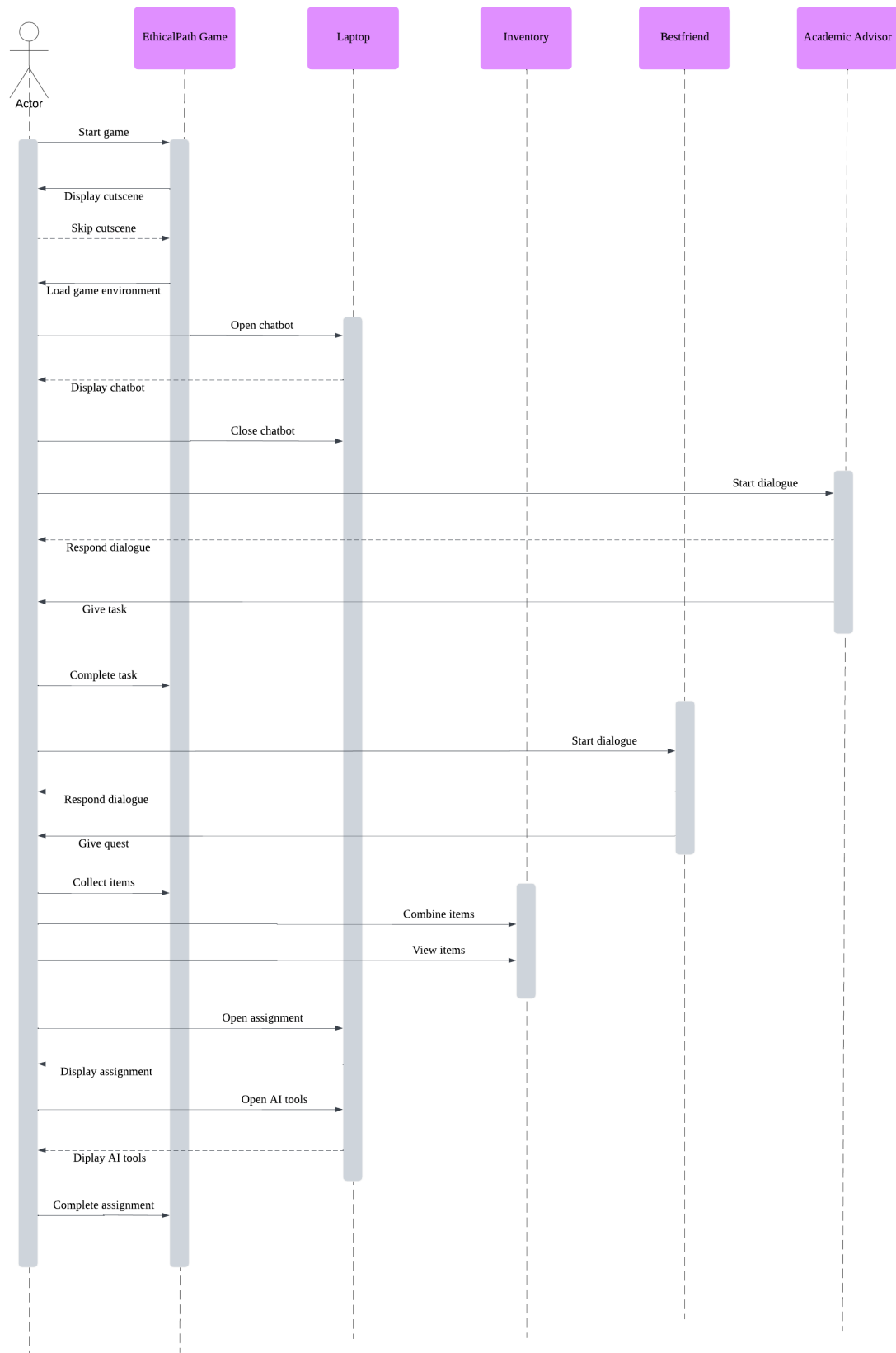


Figure 3.25 Sequence Diagram

3.7 UML Activity Diagram

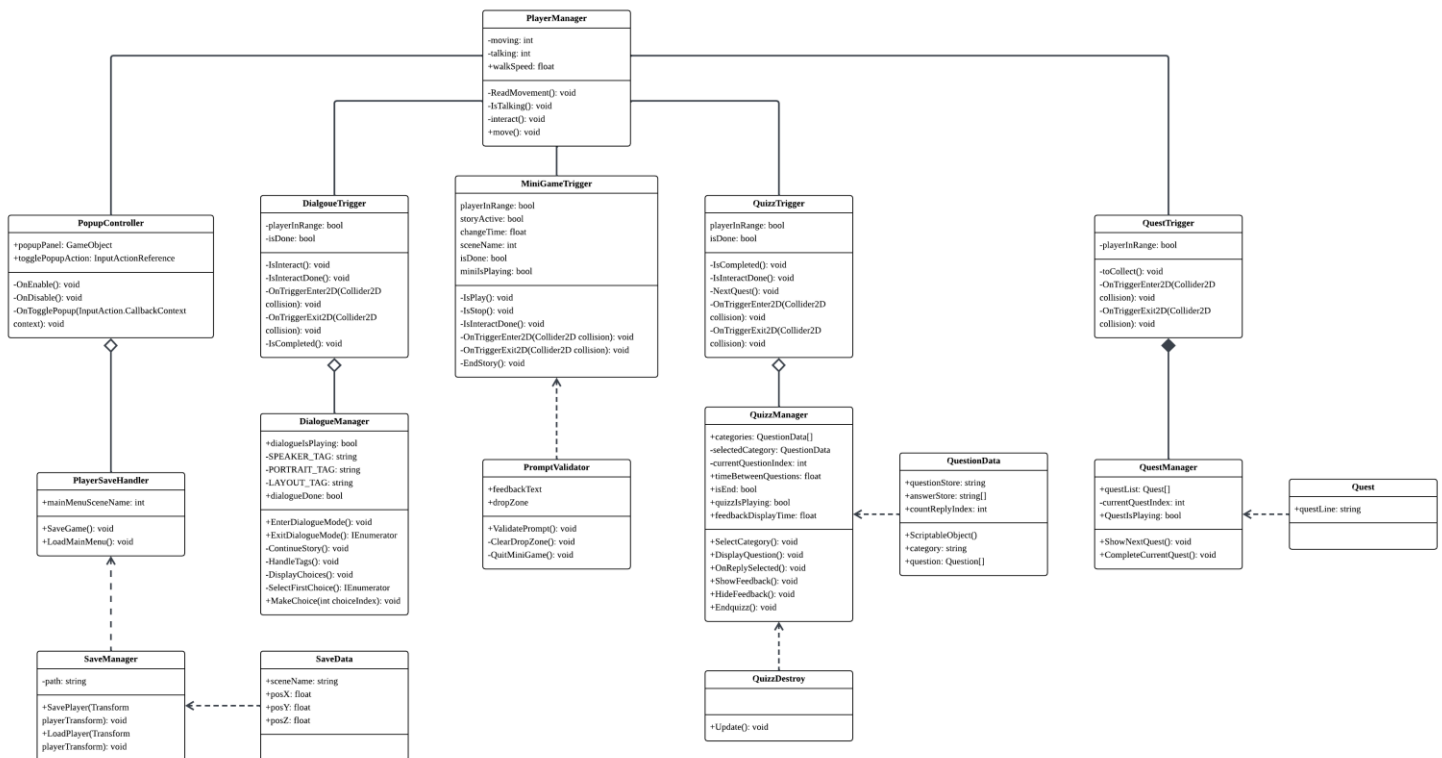


Figure 3.26 UML Activity Diagram

3.8 Summary

This chapter has outlined the requirements, analysis, and design processes for the game. By using Game Development with Scrum Methodology, the project progresses through iterative sprints, enabling continuous refinement. The game's design focuses on educating players about academic integrity through engaging storytelling and decision-making mechanics. These processes ensure that the game meets its educational objectives while providing an enjoyable user experience.

CHAPTER 4: IMPLEMENTATION

4.1 Introduction

This chapter discusses the implementation phase of the game development project aimed at promoting academic integrity in the use of AI tools. Building upon the planning and design stages outlined in earlier chapters, the development transitioned into the construction of the actual game using Unity as the primary game engine and C# as the programming language. Visual assets including characters, backgrounds, and objects were created using Aseprite, maintaining a consistent and engaging 2D pixel art style that supports the game's educational and narrative-driven objectives.

The implementation phase focused on integrating these visual assets with core gameplay mechanics, interactive dialogues, and decision-based scenarios that simulate real-life academic situations involving AI tools. This chapter provides an overview of the tools and technologies used, the structural design of the game, and the development of key features such as character movement, dialogue systems, quizzes and mini-games. It also outlines the challenges faced during development and the strategies employed to overcome them, ensuring that the game effectively meets its educational goals while maintaining player engagement.

4.2 Software Requirements

Unity Game Engine	Game engine
Visual Studios Code	Code editor
Aseprite	Pixel art designs
Ink	A narratives scripting language for games

Table 4.1 Software Requirements

4.3 Installation and Configuration

Game engines are important in this project where they provide framework for building and running games, handling tasks like rendering graphics, physics and input management. The game engine used in this project is a Unity Game Engine. Also, to align with the project objectives the scripting is one of the crucial in this project where it supports making the game more engaging and giving an impact to the player. In this project I used Ink which simplifies scripting languages for developing games.

4.4 Unity Game Engine

Unity Game Engine is a cross-platform engine. It is supported on Windows, macOS, and the Linux platform, while the engine itself supports multiple platforms, including mobile, desktop, consoles, and virtual reality.

Unity Game Engine installation:

1. Open a browser and search for “Unity Download” or <https://unity.com/download>
2. Click “Download for Windows”.
3. After the “UnityHubSetup” downloaded, double click to proceed installations.
4. Once the installations start, click “Agree” to proceed next setup.
5. Next, click “Install” once you agreed with file locations.
6. Lastly, click “Finish” after done setup.

Creating a new project in Unity Engine:

1. Before begin creating new project make sure the editor version is the latest or stable version.
2. Then, click “New Project”.
3. Next, click “2D (Built-in Render Pipeline)”.
4. Rename a project.
5. Lastly, click “Create project”.

4.5 Character Movements:

Once the project has been created, now it is time to make character movements using simple sprites and the most crucial component in creating character movements is Rigidbody2D. Rigidbody2D is a physics component that controls the movement and interaction of objects in a 2D environment.

1. Input Actions

Player input is essential for controlling character movement. The game captures keyboard input, specifically the arrow keys or W, A, S, D keys, to move the character in four directions. These inputs are processed in the script to determine movement direction and speed.

2. Rigidbody2D

The player object uses a Rigidbody2D component to enable physics-based movement. This allows the character to move smoothly within the 2D environment.

- The Body Type was set to "Dynamic" to allow motion.
- Gravity Scale was set to zero, as vertical gravity is not required in a top-down 2D game.

3. Movement Script

A C# script was written to control the character's movement. It reads input values and applies them to the Rigidbody2D's velocity property, enabling movement across the scene.

1. Creating simple sprites:

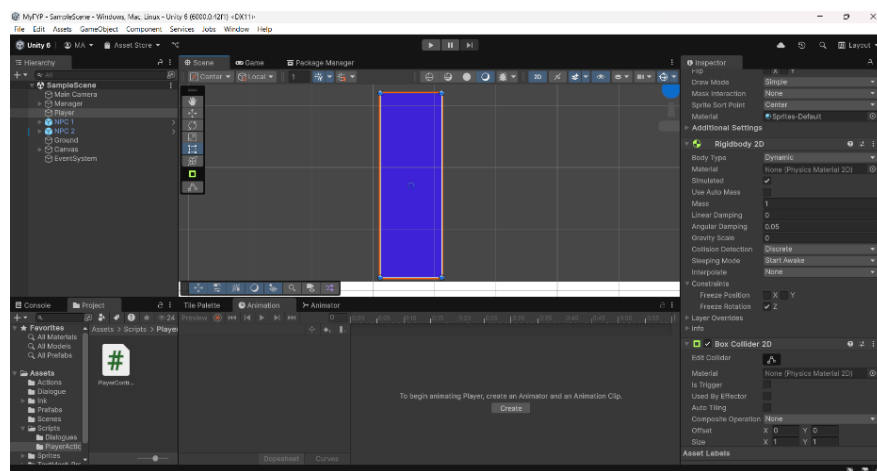


Figure 4.1 Create Character Sprite

2. Add Rigidbody2D



Figure 4.2 Add Rigidbody2D

3. Create new folder to store Input Actions

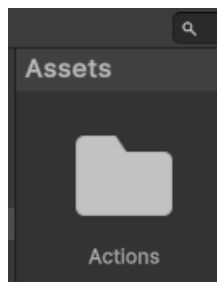


Figure 4.3 Create New Folder

4. Creating new Input Actions

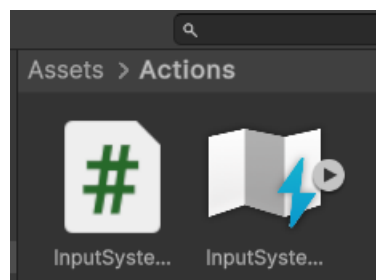


Figure 4.4 Creating New Input Actions

5. Create new Actions Maps and Actions.
6. Add binding keys on Actions.
7. Set Action type to value and set Control type to Vector 2.
8. Under 2D vector key binding, add key for Ups, Downs, Left, and Right.

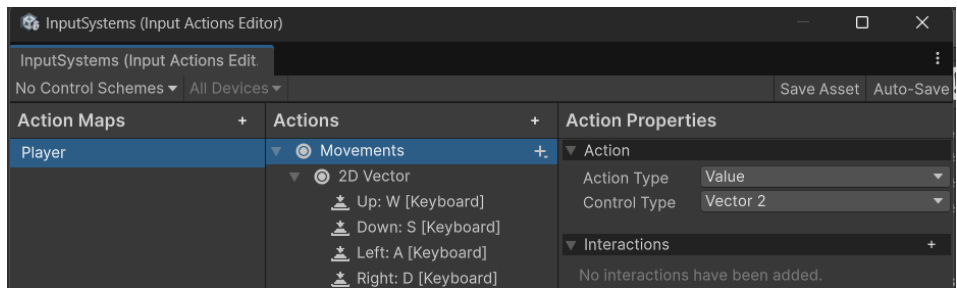


Figure 4.5 Setup Input Actions

9. Create script folder.

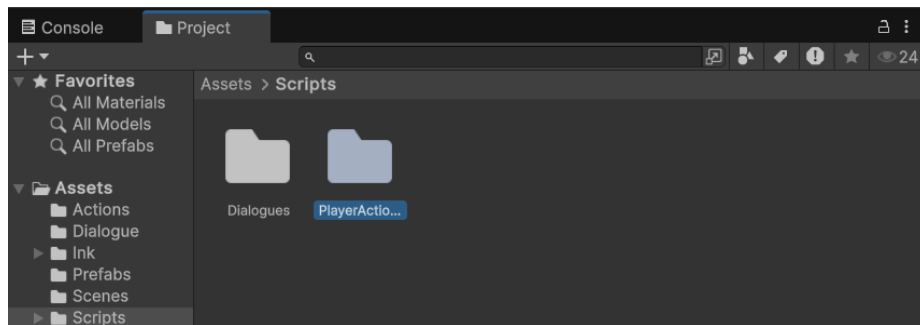


Figure 4.6 Create New Script Folder

10. Create new script for character movements.

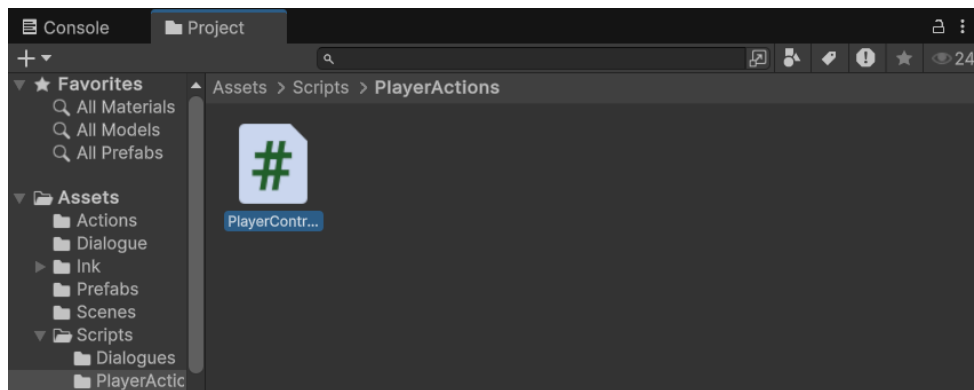


Figure 4.7 Create New Script File

11. Write code using C# to make the objects moves.

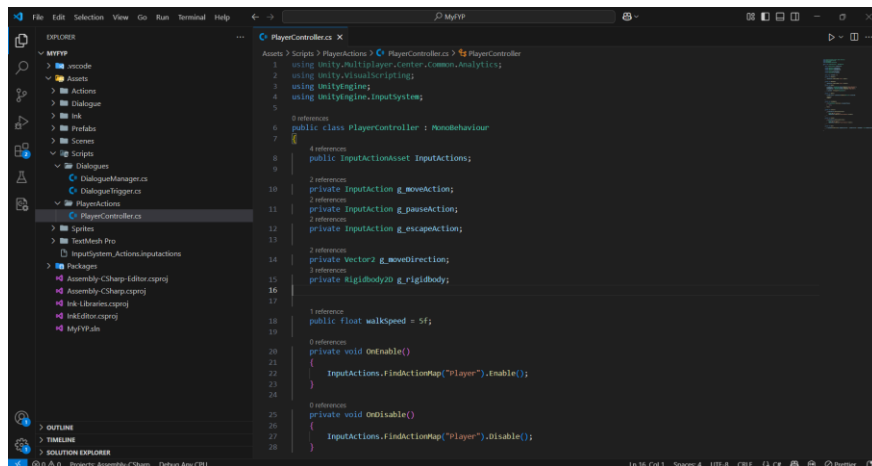


Figure 4.8 Coding for Player Movements

12. Once the script is completed, add scripts to the players inspector

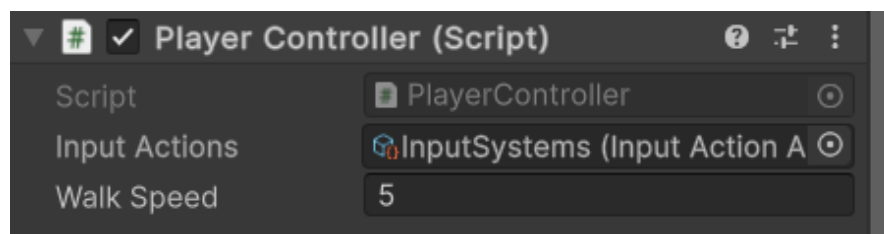


Figure 4.9 Add Script to Player Inspector

4.6 Sprites and Game Assets Design:

The visual design of the game is a critical component in delivering an engaging and immersive player experience. To ensure stylistic consistency and alignment with the educational and narrative objectives of the game, all 2D sprites and assets were created using Aseprite, a specialized pixel art tool widely used in indie game development. This section outlines the tools, design processes, and integration methods used during the visual asset creation phase.

1. Aseprite

Aseprite was selected for its intuitive interface, robust pixel art support, and animation tools. It enabled the efficient creation of sprite sheets, frame-by-frame animations, and tile-based assets, which were essential for the game's 2D environment.

2. Character Sprites

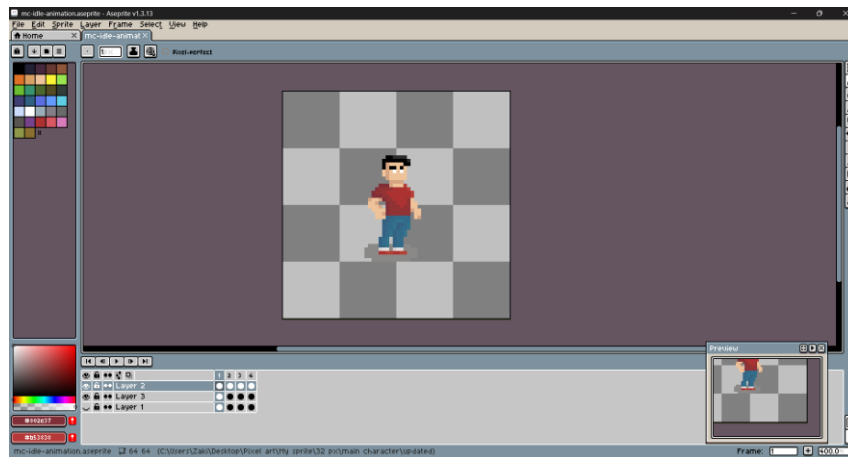


Figure 4.10 Player Idle Animations

Characters were designed in a consistent resolution (e.g., 32x32 or 48x48 pixels) to maintain a uniform art style. The player character includes animations for:

- Walking in four directions (up, down, left, right).
- Idle states.

Non-player characters (NPCs) were also animated with basic movement or idle loops to bring life to the game world, enhancing the immersive university environment.

3. Environmental Assets

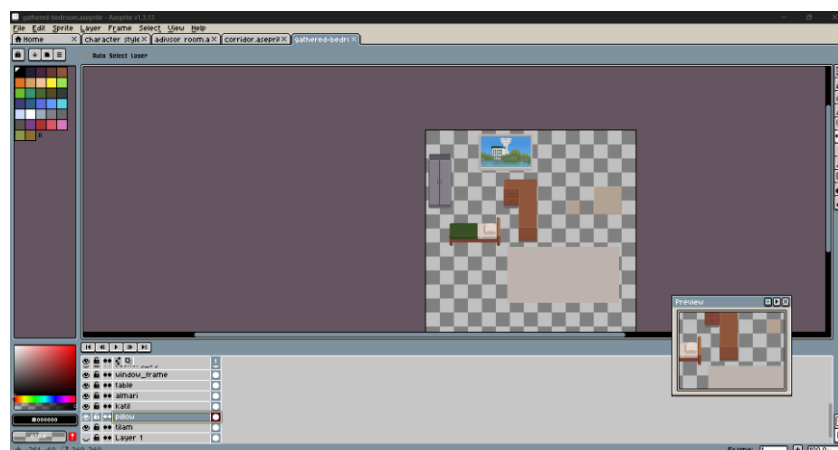


Figure 4.11 Game Assets

Environmental design focused on creating a believable university setting using tile-based sprites. Assets included:

- Floor and wall tiles.
- Doors and windows.
- Furniture.

- Decorative items.

Tilesets were modular to support flexible scene construction using Unity's Tilemap system, optimizing both performance and design efficiency.

4. UI Elements



Figure 4.12 UI Elements

User interface components were also created in Aseprite, ensuring visual consistency across the game. These include:

- Dialogue boxes.
- Interactive choice buttons.
- Icons and indicators.

UI design prioritized clarity and accessibility, ensuring that players could easily navigate dialogues, make decisions, and understand feedback during gameplay.

5. Importing into Unity

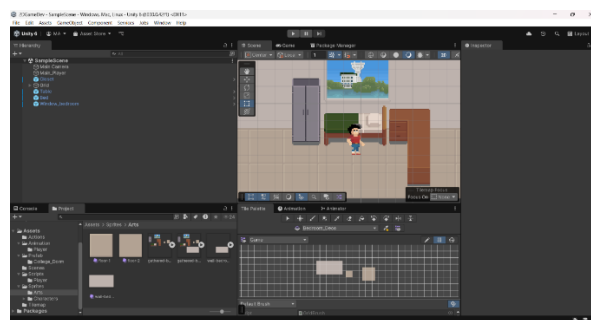


Figure 4.13 Import Game Design to Unity Engine

After design completion, assets were exported as PNG files and imported into Unity. Using Unity's Sprite Editor, sprite sheets were sliced into individual frames. These frames were then used to create animations through:

- Animator Controller for managing animation states.
- Animation Clips for specific actions.

The integration allowed smooth animation transitions based on player inputs and game logic, contributing to an engaging and responsive user experience.

4.7 Dialogue Setup

To create dynamic, choice-driven storytelling, Ink by Inkle was integrated into the game project. Ink is a narrative scripting language well-suited for branching dialogues and decision-based games. It was chosen for its simplicity, flexibility, and strong integration with Unity.

1. Ink installation

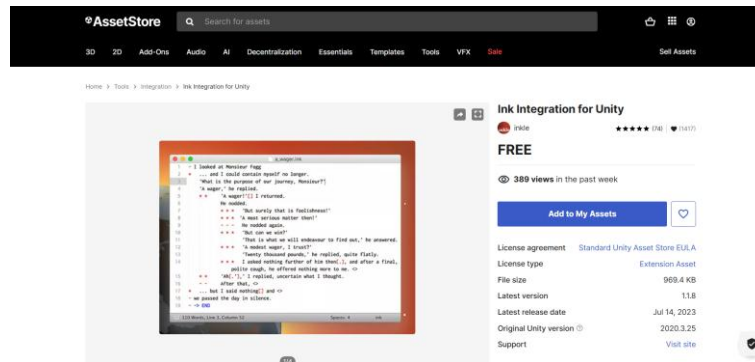


Figure 4.14 Install Ink from Asset Store

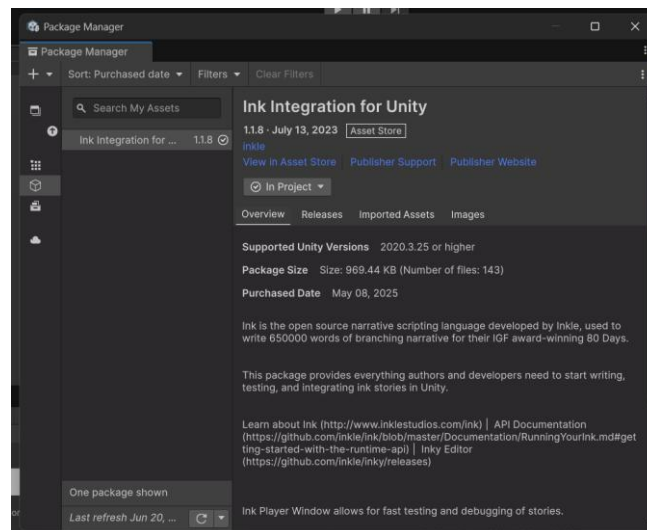


Figure 4.15 Package Manager Unity

Installed the Ink Unity Plugin via Unity Package Manager.

- Created ink file to write and manage dialogue scripts.
- Linked Ink scripts with Unity UI using the InkStory component.
- Built a dialogue manager to control speaker name, dialogue text, and player choices.
- Implemented conditions to check if the player selected correct or incorrect dialogue options:
 - **Incorrect** choices trigger feedback and loop the question.
 - **Correct** choices progress the dialogue or unlock new content.

2. Dialogue panel design

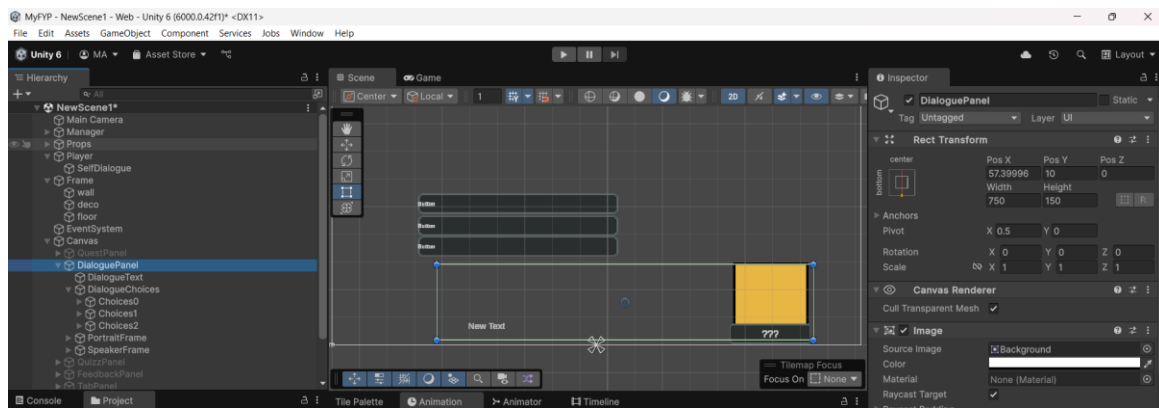


Figure 4.16 Design Dialogue Panel

Key important in dialogue panel design includes:

- Colour of the portrait, button, display name text and dialogue text
- Size of the dialogue panel without covering half of the game.
- Font size

3. Dialogue layout setup

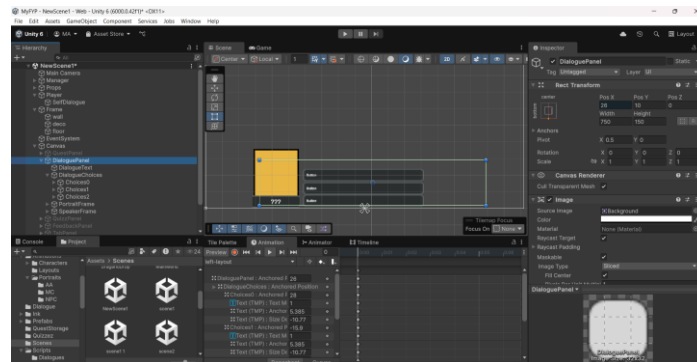


Figure 4.17 Set Animation to Dialogue Panel

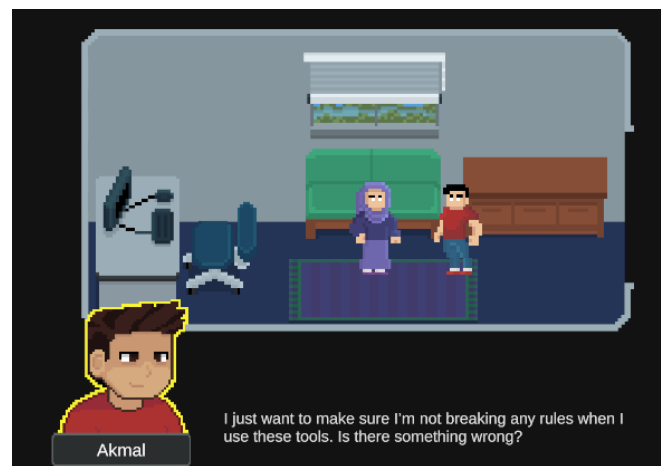


Figure 4.18 Result dialogue layout animation for Main Character

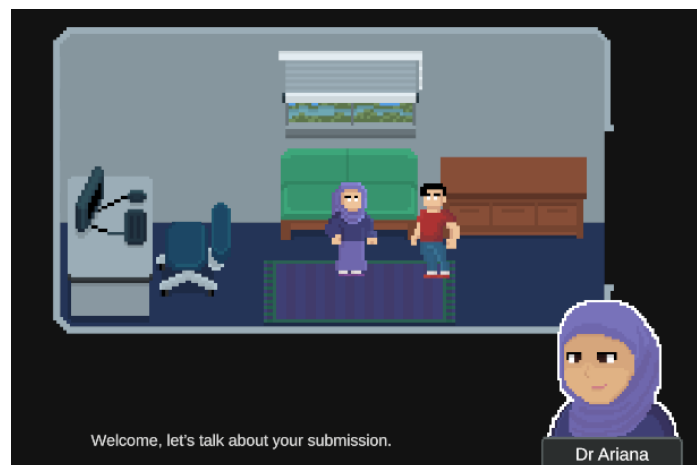


Figure 4.19 Result dialogue layout animation for NPC

Dialogue layout is important to make good user experience, for example:

- Main characters named Akmal are on the left side of the dialogue to show that main characters are in dialogue.
- NPC is on the right side of the dialogue to show they are involved in the dialogue.

5. Dialogue script setup

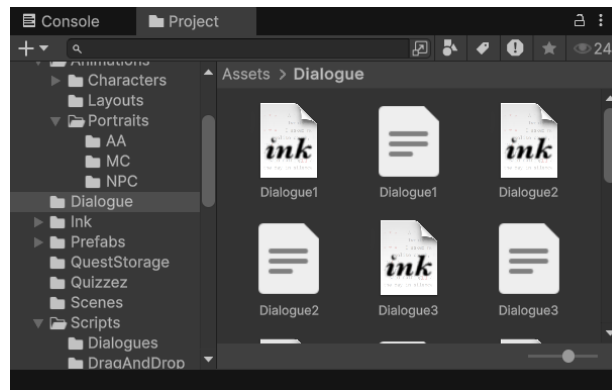


Figure 4.20 Folder Ink Files

This is where the Ink dialogue is stored. Each dialogue has two scripts:

- Ink scripting language file.
- Converted ink scripting language to JSON

6. Assigning script to specific character

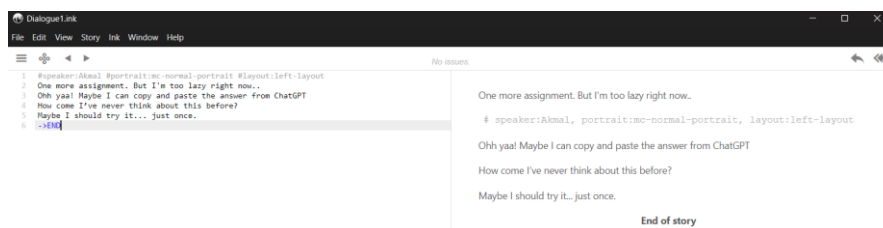


Figure 4.21 Create script with Ink scripting languages

The dialogue layout, display name text and portrait are integrated with Ink Runtime API which allows developers to control the story flow, manipulate variables, and use callbacks.

4.8 Quiz setup

To evaluate player understanding of academic integrity and the ethical use of AI tools, a quiz system was developed and embedded in the game.

1. Quiz design panel

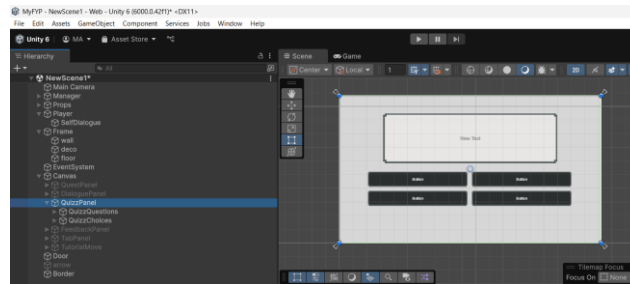


Figure 4.22 Setup quiz panel

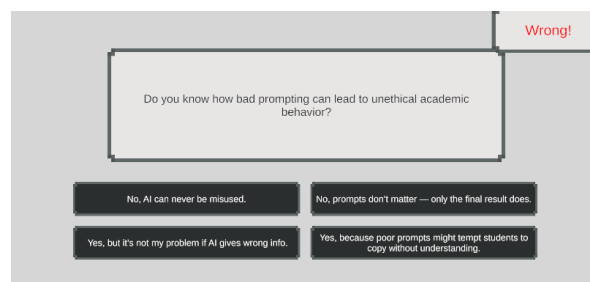


Figure 4.23 Result quiz panel design

Quiz Implementation:

- Designed using Unity's UI Canvas system with toggles, text, and buttons.
- Each quiz question includes:
 - One correct answer.
 - Wrong answer for others.
 - Feedback panel.
- On selecting an **incorrect** answer, the question is repeated with gentle feedback
- On selecting the **correct** answer, the quiz progresses to the next question.
- All answers are non-punitive, in line with the game's educational goals.

Quiz topics include:

1. Ethical vs unethical use of AI tools (ChatGPT)
2. Academic dishonesty and plagiarism.

4.9 Mini games (Drag and Drop)

The game includes interactive mini games to enhance learning through play. These are designed to reinforce understanding of academic integrity and effective use of AI.

1. Mini games design panel

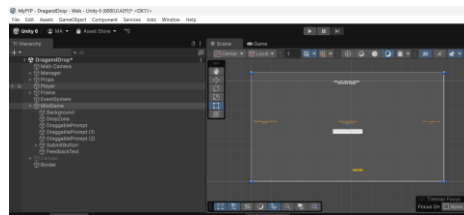


Figure 4.24 Setup mini games panel



Figure 4.25 Result mini games panel design

Prompt Builder Game

- Players are asked to drag and drop phrases to form a good academic AI prompt.
- **Objective:** Understand how to prompt clear, educationally sound questions to AI.
- Feedback is given based on the structure and intention of the prompt created.

CHAPTER 5: TESTING

5.1 Introduction

This chapter describes the rigorous testing process used to evaluate the game's technical performance, usability, and educational impact. Participants engaged in heuristic evaluations, functional testing, and beta testing. Key insights emerged from user feedback, leading to iterative improvements in dialogue clarity, interface design, and mini-game usability.

To support these efforts, academic literature underscores the importance of using serious games to train academic integrity awareness. In one study, Integrity Games demonstrated a modest yet positive effect on students' sensitivity to grey-zone integrity issues, although long-term retention and behavioral outcomes remain underexplored. The authors suggest integrating such games with classroom discussion and teacher feedback to enhance their effectiveness (Goddiksen et al., 2024b)

Moreover, educational theory on ethics games points to a clear distinction between instrumental gameplay (focused on winning) and ethical gameplay (where choices reflect moral reasoning beyond game goals). Facilitating genuine ethical reflection hinges on designing endogenous gameplay experiences, whereby moral choices are embedded in narrative and consequence rather than layered superficially over game mechanics (Nardo & Gaydos, 2021)

5.2 Functional Testing

Functional testing was conducted to verify that each game feature behaves according to the specifications defined in the requirements. The test cases were designed to cover all interactive aspects of the game, ensuring players experience real-life decision-making aligned with academic integrity themes.

Functional Testing Test Case ID	F1
Test Case Description	Test the dialogue system where the player is presented with multiple choices regarding the use of AI in an assignment.

Pre-conditions		1. Player has reached a decision point in the game. 2. Player press button to trigger the dialogue 3. Dialogue system is functional.	
Step no.	Test Description	Expected Result	Results
1	Player reply dialogue NPC by telling the correct way of use AI tools in academic	Dialogue choices appear correctly continue to the next dialogue	Pass
2	Player reply dialogue NPC by telling the wrong way of use AI tools in academic	NPC responses reflect the decision made and repeat the questions until player choose the right way of use AI tools	Pass

Table 5.1 Functional Testing F1

Functional Testing Test Case ID		F2	
Test Case Description		Ensure that game scenes reflect realistic academic having an quiz assignment and dialogue about AI tools in academic	
Pre-conditions		1. Player is mid-way through the game. 2. Scenario involving player behavior during the dialogue.	
Step no.	Test Description	Expected Result	Results
1	The player navigates a scene where they must finish a last-minute assignment. They are tempted to use AI tools without understanding the ethical implications.	1. Player recognizes the dilemma of using AI tools. 2. Game offers realistic academic choices and paths.	Pass

Table 5.2 Functional Testing F2

Functional Testing Test Case ID	F3
---------------------------------	----

Test Case Description		Check that feedback is given instantly when players make a decision or answer a quiz question.	
Pre-conditions		1. Player has to complete quest until it shows “Answer quiz” or “Submit quiz”. 2. Feedback is active during quiz.	
Step no.	Test Description	Expected Result	Results
1	“Is it acceptable to copy AI-generated content into your report without citation?” System gives instant response upon answer selection.	Immediate message indicating correct/incorrect.	Pass

Table 5.3 Functional Testing F3

Functional Testing Test Case ID		F4	
Test Case Description		Test that player decisions (ethical or unethical) affect the game through dialogue.	
Pre-conditions		1. Player is dialogue with NPC scene. 2. NPC replies to the consequences.	
Step no.	Test Description	Expected Result	Results
1	Player is offered an unethical AI option. If chosen, NPC will response the consequences through dialogue.	Dialogue with consequence appears instantly (e.g., NPC distrust).	Pass

Table 5.4 Functional Testing F4

Functional Testing Test Case ID		F5	
Test Case Description		Verify that the story structure is strong enough to motivate players to progress and complete the game.	

Pre-conditions		1. Player has completed at least 50% of the game. 2. Story progression system is functional.	
Step no.	Test Description	Expected Result	Results
1	Track if players are engaged by the story of a student learning to use AI ethically and how their journey evolves based on decisions.	Story adapts to player choices.	Pass

Table 5.5 Functional Testing F5

Functional Testing Test Case ID		F6	
Test Case Description		Ensure that mini-games (e.g., drag-and-drop for AI prompting) provide educational value in a fun and interactive way.	
Pre-conditions		1. Player has unlocked the mini-game section. 2. Educational content is integrated into the gameplay.	
Step no.	Test Description	Expected Result	Results
1	Player is given a list of AI prompts and must drag the correct way into a box and click submit once confirm the answer. The result will show through text and if it wrong, the player must try again until it is correct.	Mini-game functions correctly.	Pass

Table 5.6 Functional Testing F6

5.3 Non-Functional Testing

Non-functional testing was focused on performance, usability, and ethical content. The aim was to ensure the game not only runs smoothly but also communicates important messages effectively.

Non-Functional Testing Test Case ID		NF1	
Test Case Description		Ensure the game content covers ethical concerns (plagiarism, AI misuse, data privacy) through dialogues, story, quizzes, and mini-games.	
Pre-conditions		1. Game is installed and running. 2. Player need complete the quest before to the next story. 3. All content modules (dialogue, quiz, story) are functional.	
Step no.	Test Description	Expected Result	Results
1	Observe the in-game content to verify if ethical concerns such as plagiarism and over-reliance on AI are discussed clearly. Check if feedback is given when the player engages in unethical AI use.	1. Ethical concerns are mentioned clearly in dialogue and quiz explanations. 2. Game provides specific examples of inappropriate AI use. 3. Player receives direct feedback for unethical actions. 4. Consequences are clearly communicated.	Pass

Table 5.7 Non-Functional Testing NF1

Non-Functional Testing Test Case ID		NF2	
Test Case Description		Verify that the user interface (UI) and user experience (UX) are accessible, visually engaging, and responsive throughout the gameplay.	
Pre-conditions		1. Game is installed on a device meeting minimum requirements. 2. Player navigates through main menu, gameplay, quizzes, and mini-games.	

Step no.	Test Description	Expected Result	Results
1	Evaluate menu navigation, text readability, color contrast, visual assets, animations, and responsiveness. Confirm buttons, choices, and game elements function smoothly without lag or confusion.	1. UI elements (buttons, menus, text) are easy to understand and interact with. 2. Visual design is attractive and consistent across all scenes. 3. Game runs smoothly without freezing or delays. 4. Fonts, layouts, and color schemes support readability and accessibility.	Pass

Table 5.8 Non-Functional Testing NF2

5.3.1 Beta Testing

Beta testing was carried out with external testers who represent the target audience undergraduate students. The objective was to evaluate the game's stability, functionality, and overall user experience in a real-world environment.

Testing scope

- Game launch and performance across devices
- Dialogue interaction and choice functionality
- Quiz and mini-game logic
- Bug identification and unexpected behaviours

Findings

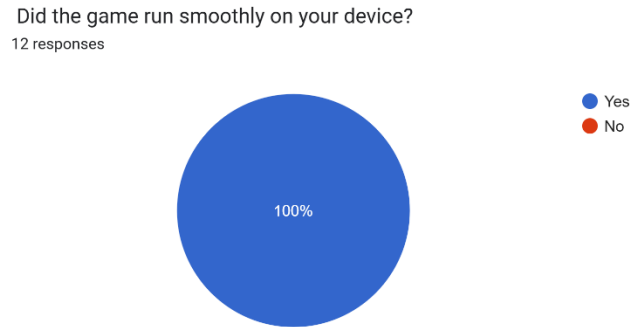


Figure 5.1 Did the game run smoothly on your device?

Figure 61 demonstrates that the game runs smoothly without any performance issues on the tested device. The game was developed, tested, and deployed on a Windows platform to ensure stability and compatibility.

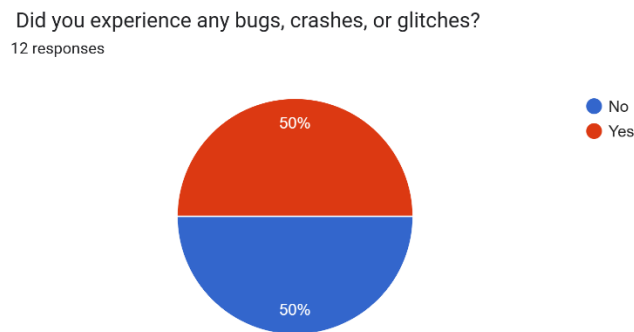


Figure 5.2 Did you experience any bugs, crashes, or glitches?

Figure 62 illustrates that more than 50% of players encountered bugs, crashes, or glitches during gameplay. This indicates that the majority of players had negative experiences, which may have led them to discontinue playing the game.

Were the dialogues and choices responsive and working properly?
12 responses

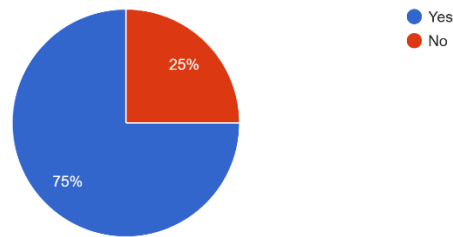


Figure 5.3 *Were the dialogues and choices responsive and working properly?*

Figure 63 shows that 75% of players reported that the dialogue and choice system functioned properly. The dialogue system was enhanced with animations, including alternating left and right layouts and dynamic portrait switching. Button transitions and layout changes were also animated to create a smoother and more engaging player experience.

5.3.2 Heuristic Testing

Heuristic evaluation was conducted to assess the game's design quality based on common usability principles. This evaluation was done by the developer and peers familiar with usability standards.

Was the user interface (UI) easy to understand and navigate?
12 responses

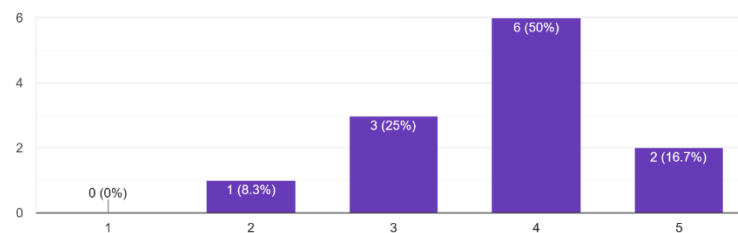


Figure 5.4 *Was the user interface (UI) easy to understand and navigate?*

Figure 64 illustrates player satisfaction with the game's User Interface (UI), measured on a scale from "Strongly Disagree" to "Strongly Agree." The highest response, at 50%, indicates that most players agreed the UI is understandable and easy to use.

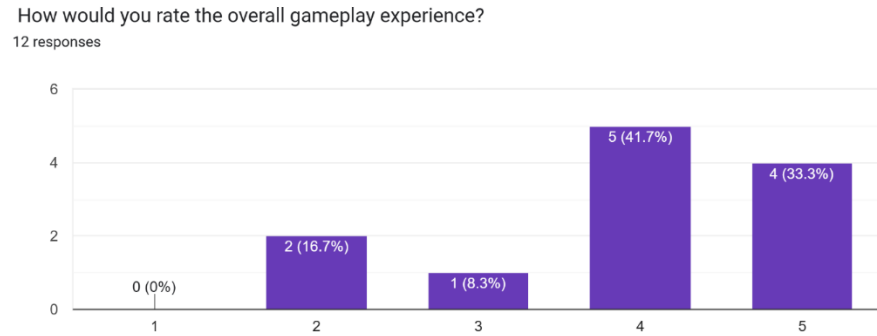


Figure 5.5 *How would you rate the overall gameplay experience?*

Figure 65 illustrates the overall gameplay experience reported by players. The highest percentage, 41.7%, indicated they were satisfied with the game. This suggests that most players encountered minimal issues with navigation and user interface, contributing to a positive overall experience.

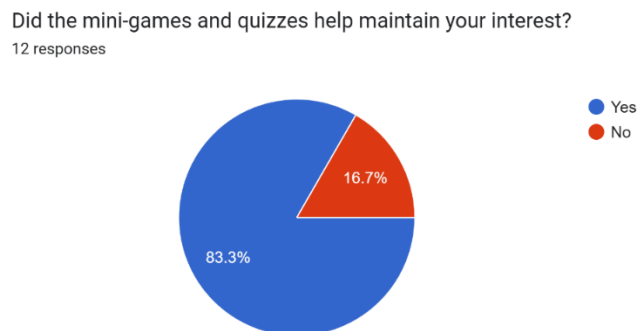


Figure 5.6 *Did the mini-games and quizzes help maintain your interest?*

Figure 66 shows that 83.3% of players agreed that mini-games and quizzes helped maintain their interest in the game. This indicates that players not only enjoyed the interactive elements but also appreciated the opportunity to test their knowledge in an engaging way.

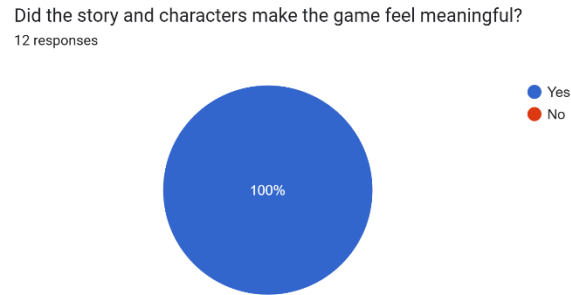


Figure 5.7 Did the story and characters make the game feel meaningful?

Figure 67 shows that 100% of respondents agreed that the story and characters are meaningful in this game. The narrative plays an important role in making the game relatable to the project's theme academic integrity and responsible AI usage. Additionally, the characters serve as key elements that drive the story forward, allowing players to connect with the content and feel engaged throughout the gameplay.

5.3.3 Usability Testing

Usability testing was conducted to observe how real users interact with the game in a natural setting. This method provided insights into whether players could understand instructions, navigate the interface, and engage meaningfully with the educational content.

After playing, do you feel more aware of ethical and unethical ways to use AI tools in academics?
12 responses

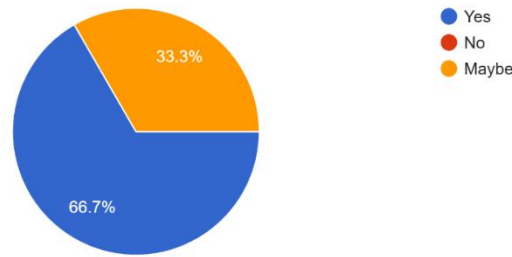


Figure 5.8 After playing, do you feel more aware of ethical and unethical ways to use AI tools in academics?

Figure 68 shows that 66.7% of players agreed they became more aware of ethical and unethical ways to use AI tools in academic settings. In the game, this awareness is developed through interactive dialogue with an NPC named Dr. Ariana, who plays the role of a lecturer. Players are required to pay attention to the dialogue, as they will later be tested through quizzes and mini games designed to reinforce the information and promote understanding.

Do you understand the consequences of misusing AI tools in academic work better after playing?
12 responses

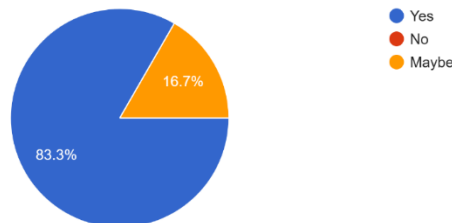


Figure 5.9 Do you understand the consequences of misusing AI tools in academic work better after playing?

Figure 69 shows that 83.3% of players reported understanding the consequences of misusing AI tools in academic work after playing the game. The in-game quizzes are designed to assess players' comprehension of academic integrity related to AI usage. Additionally, the mini-games are closely tied to the dialogue with the in-game lecturer character, challenging players to demonstrate proper AI prompting techniques. These activities encourage players to

identify, analyze, and understand academic questions without misusing AI tools, reinforcing responsible and ethical use in educational contexts.

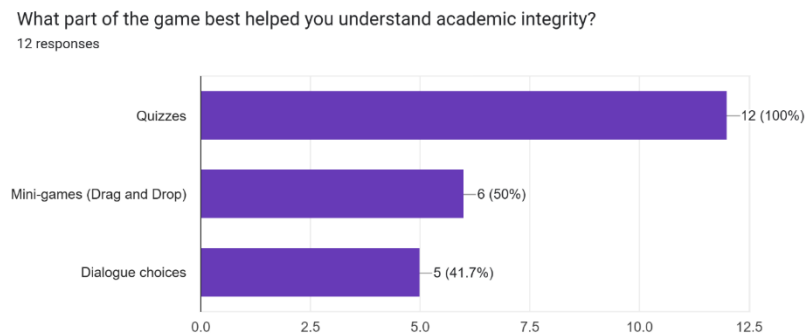


Figure 5.10 *What part of the game best helped you understand academic integrity?*

Figure 70 illustrates how players responded to their understanding of academic integrity after engaging with different game elements. The highest percentage of players indicated that quizzes were the most helpful in enhancing their understanding of academic integrity when using AI tools. In comparison, mini games were found helpful by 50% of players, while 41.7% selected dialogues as the component that contributed most to their understanding. This suggests that structured, question-based interactions are more effective for reinforcing ethical concepts than passive narrative elements alone.

5.3.4 Improvements After Testing

Based on the feedback received during beta testing, heuristic evaluation, and usability testing, the following changes and improvements were made to the game:

- Disabling and removing visual cue on interact object to avoid interaction access continuously.



Figure 5.11 Before adjustment

Figure 71 illustrates the use of an interactive object indicator implemented within the game. This indicator is designed to guide players by highlighting objects they need to interact with in order to answer a quiz. It serves as a visual cue to inform players of the required task or objective that must be completed before they can proceed to the next activity. This feature enhances user navigation and ensures players remain on track throughout the gameplay experience.



Figure 5.12 After adjustment

Figure 72 illustrates the game state after a player submits the quiz. Upon submission, all related interactions are disabled, and the visual cue (indicator) is hidden. This implementation ensures that players cannot re-interact with the quiz object, maintaining the integrity of the gameplay flow and preventing repeated attempts on the same activity.

- Adjusted font and UI elements for mini games to make it accessible and readable

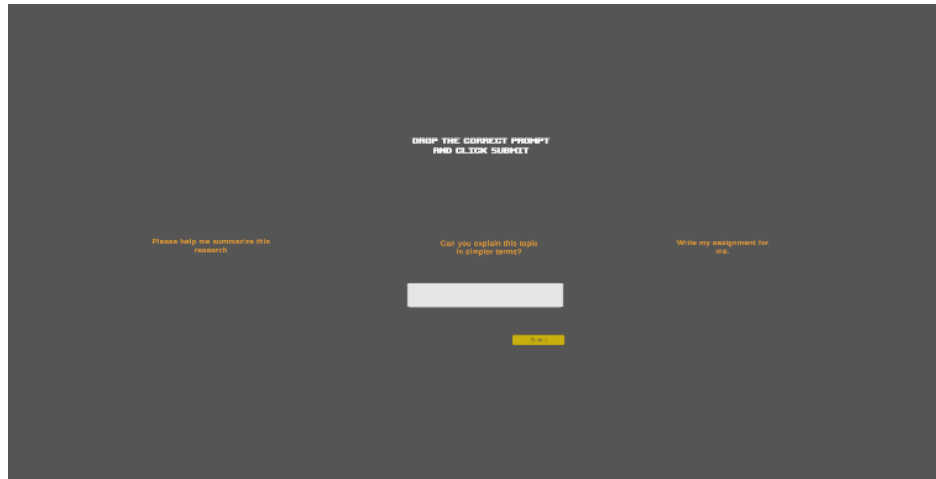


Figure 5.13 Before UI adjustment

Figure 73 highlights the areas of the user interface (UI) that require improvement. Specifically, the font used for the draggable text objects is yellow, while the font displaying the selected answer results is white. This contrast may affect readability and user experience, indicating a need for clearer visual distinction and consistent design styling.

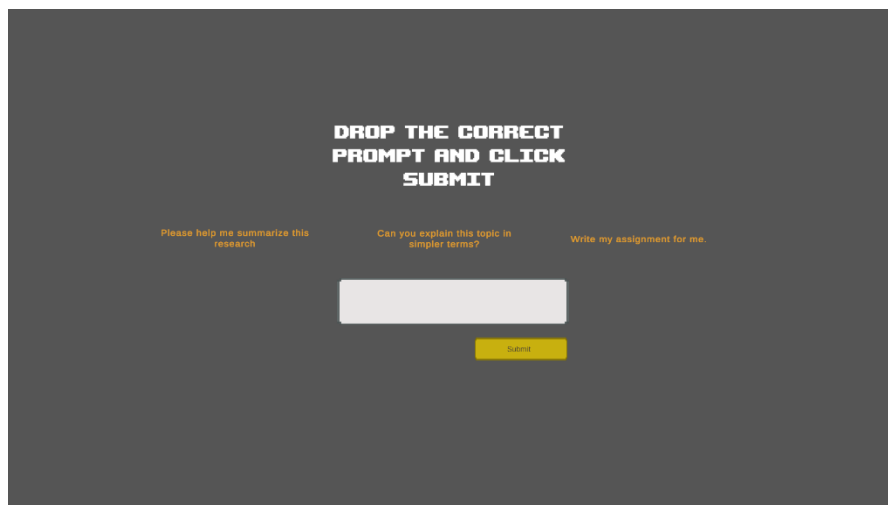


Figure 5.14 After UI adjustment

Figure 74 shows the adjustments made based on user feedback. The font, placeholders, and buttons have been resized to a medium scale, improving readability and enhancing the overall user experience.

- Add instructions button every second when a character in idle mode to ensure the game is easy to use.



Figure 5.15 Navigation button

Figure 75 illustrates the interactive navigation buttons implemented in the game. These buttons enable players to move and interact smoothly. When the player is idle, a popup appears automatically to remind them of the available interaction controls, enhancing usability and gameplay flow.

- Reduced feedback respond time on quiz.

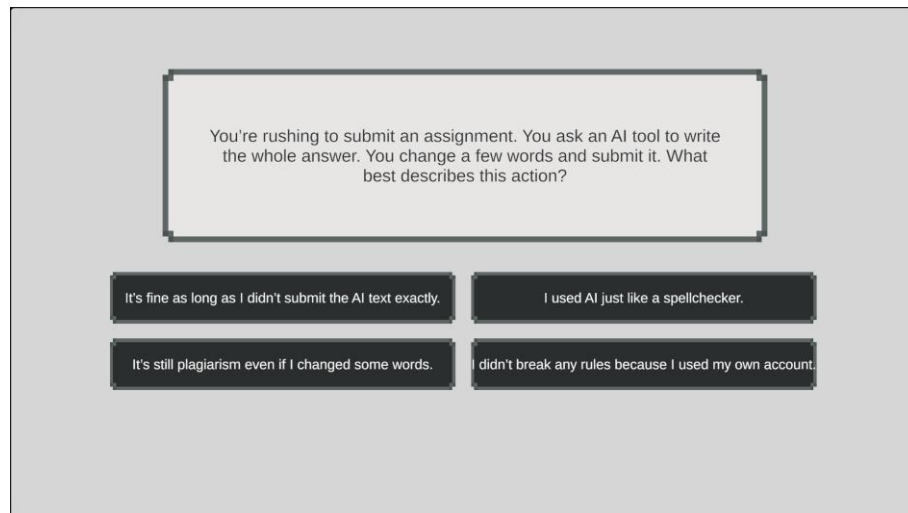


Figure 5.16 Quiz Panel

These updates improved the game's overall usability and helped align the experience more closely with the project objectives particularly in promoting academic integrity and responsible AI use in academic settings.

5.4 Summary

This chapter described the methods used for testing the developed educational game focused on raising awareness of academic integrity and responsible AI usage. Functional testing was conducted to ensure that all features, including decision-making scenarios, real-life academic challenges, immediate feedback, and story-driven gameplay, worked as intended. Each module was tested to confirm that the game responded correctly to user inputs and provided an engaging, informative experience. Non-functional testing assessed usability, performance, and ethical content delivery to ensure the game ran smoothly and communicated its learning objectives effectively. Overall, the testing process confirmed that the game met its intended goals in terms of functionality, user experience, and educational value.

CHAPTER 6: CONCLUSION AND FUTURE WORK

6.1 Introduction

This chapter reflects on how EthicalPath: The Academic Dilemma achieved its aims: by weaving ethical decision-making into gameplay, the project succeeded in raising awareness about responsible AI use and academic integrity. The immersive narrative and decision-based mechanics enabled players to engage with ethical dilemmas in a realistic, reflective manner consistent with findings in educational ethics gaming research (Nardo & Gaydos, 2021)

Despite achieving core objectives, there are limitations: the testing phase did not assess long-term retention or real-world behavior change, echoing concerns noted in the Integrity Games study (Goddiksen et al., 2024). Technical constraints and limited branching in dialogue also restricted deeper exploration of ethical complexity.

For future work, integrating classroom-based facilitation is recommended. Embedding the game within educational discussions could foster richer ethical reflection and longer-lasting understanding (Goddiksen et al., 2024). Additionally, expanding decision branches and unlocking multiplayer or real-time feedback features would allow players to experience more contextually rich, collaborative dilemmas further promoting critical thinking and agency (Nidhi et al., 2024)

6.2 Objectives Achievements

The project successfully achieved its primary objectives:

- An interactive 2D story-driven game was developed using the Unity Engine and C#, with visual assets designed in Aseprite to ensure consistent and appealing character and environment design.
- The game integrated decision-making scenarios and role-playing elements to simulate academic challenges associated with AI tools, including issues such as plagiarism, over-reliance, and improper citation.
- Immediate feedback was provided based on player choices, reinforcing learning outcomes and encouraging ethical decision-making.
- A narrative-driven experience was implemented to maintain user engagement while delivering educational content focused on responsible AI usage.

- A user-friendly interface was designed with consistent visual styling and intuitive controls to support accessibility and ease of use.

User testing and feedback confirmed that the game effectively raised awareness of academic integrity and helped players better understand the consequences and ethical considerations of using AI tools in academic settings.

6.3 Project Limitations

While the project achieved its core objectives, several limitations were identified that may affect the depth, realism, and accessibility of the current version:

- **Lack of Voice Acting and Audio Feedback:** The absence of audio elements such as narration, voice acting, and sound cues reduces the overall immersion and emotional engagement. Adding audio feedback could significantly enhance the storytelling and learning impact.
- **Irrelevant Inventory System:** The current inventory system does not contribute meaningfully to the gameplay or support the learning objectives of promoting academic integrity and responsible AI usage. Since it lacks interactive feedback and does not align with the core purpose of the game, its presence may confuse players or dilute the educational focus. Therefore, it is recommended that the inventory system be removed or reworked entirely to better fit the game's objectives.
- **Platform Limitation:** The game has only been developed and tested on desktop environments. Without optimization for mobile platforms, accessibility is limited particularly for users who rely on smartphones or tablets for learning.

6.4 Future Works

Several improvements and extensions are proposed to enhance the project further:

- **Expand Scenarios:** Introduce more academic situations, such as collaborative work, exam settings, and research writing with AI tools.
- **Add Audio and Voice Acting:** Implement background music, sound effects, and character voiceovers to improve immersion.
- **Mobile Platform Support:** Adapt the game for Android and iOS devices to reach a broader audience, especially students in mobile-first environments.

- Multilingual Support: Offer translations to make the game accessible to non-English speaking users.
- Progress Tracking: Integrate simple analytics or save system to track player decisions and learning progress over time.

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