UNIVERSITI TEKNIKAL MALAYSIA MELAKA

SIMVENTURE: UTILIZING 1ST PERSON PLAYER TECHNOLOGY FOR CAREER GUIDANCE IN HIGH SCHOOLS

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BACHELOR OF COMPUTER SCIENCE (MEDIA INTERACTIVE)

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A thesis submitted
in fulfillment of the requirements for the degree of
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DECLARATION

I declare that this thesis entitled “SIMVENTURE: UTILIZING 1ST PERSON PLAYER TECHNOLOGY FOR CAREER GUIDANCE IN HIGH SCHOOLS“ is the result of my own research except as cited in the references. The thesis has not been accepted for any degree and is not concurrently submitted in candidature of any other degree.

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APPROVAL

I hereby declare that I have read this thesis and in my opinion this thesis is sufficient in terms of scope and quality for the award of Bachelor of Computer Science (Media Interactive)

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DEDICATION

To the greatest mom in the universe, Ibu, I would like to dedicate my hard work to you. Your endless encouragement and care have been my guiding light and strength to finish my degree, get a good career, and give you the life that you deserve.

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Last but not least, I would like to thank Allah SWT, for letting me through all the difficulties. I would also like to thank personally to my mother, my family, and Afiq Rifqi who supports and encourages me to push myself to finish this project. All of you are one of the reasons I want to finish my study.

ABSTRACT

The concerning amount of high school students now who thought that becoming an influencer or sustained with only gig jobs or just believe that pursuing his/her study to tertiary level is a waste of time commence this research into eradicate this kind of problem and encourage the student to plan ahead for the sake of their future. This research will encompass the whole process of making “Simventure: Utilizing 1st Person Player Technology For Career Guidance In High Schools”. Simventure is an interactive simulation made in Unreal Engine that targets high school students to let them explore new career paths by giving them first-hand experience in a first-person simulation. With the help of AI NPC (Artificial Intelligent Non-Playable Character) mentors available in the simulation, they could learn more about what they need to do after graduating high school, what path they need to follow to capture their dream jobs, and so on. This research also touches on the topic of career guidance and interactive learning. Making the way for Simventure to be as accurate as possible to the real world, giving them what to expect if they choose that job. Using ADDIE (Analysis, Design, Development, and Evaluation) methodology, a clear flow for the development to start was created. Starting with recognizing the main purpose of this project, it helps in making sure that the project does not deviate from its established objectives. Moving on to the next chapter, where it focuses on how Simventure is built and put together into one working simulation. This phase also shows the assets that were used in making Simventure to be as realistic as possible and the use of ConvAI API inside the simulation. After that, the process of testing this simulation in a high school located in Kulai, Johor was shown. Using SUS (System Usability Scale) survey and Expert Evaluation, the real potential of current Simventure were tested. A lot of improvements needed to be done to make Simventure deliver what the users expect and that is where the next chapter shows, as it talks about the strengths and weaknesses that current Simventure has and what improvement this simulation can have in the future.

ABSTRAK

*Ramai pelajar sekolah sekarang yang berfikiran mereka mampu untuk melangsungkan kehidupan mereka dengan menjadi seorang pempengaruh, melakukan gig sampingan ataupun tidak menyambung pengajian mereka ke tahap yang lebih tinggi kerana bersangka bahawa ianya hanya membuang masa menyebabkan permulaan penyelidikan ini untuk membanteras masalah sebegini bergelumang dan meggalakkan mereka lebih prihatin untuk merancang masa depan mereka. Kajian ini menyeliputi seluruh proses pelaksanaan "*Simventure: Utilizing 1st Person Player Technology For Career Guidance In High Schools*". Simventure adalah simulasi interaktif yang dibuat dengan menggunakan* Unreal Engine *yang menyasarkan pelajar sekolah menengah untuk memberi mereka pengalaman dalam meneroka jalan kerjaya yang baharu dalam simulasi* first-person. *Dengan menggunakan mentor* AI NPC (Artificial Intelligent Non-Playable Character) *yang ada di dalam simulasi, mereka boleh belajar apa yang mereka patut lakukan selepas graduasi dari sekolah menengah, apa jalan yang mereka perlu ikut untuk mendapatkan kerjaya yang mereka impikan dan selebihnya. Kajian ini juga menyentuh tajuk tentang bimbingan kerjaya dan pembelajaran yang interaktif. Ini bagi memastikan* Simventure *mengikut dunia sebenar, memberikan expektasi terhadap pekerjaan yang mereka pilih jikalau mereka pergi menceburi kerjaya itu. Menggunakan* ADDIE (Analysis, Design, Development, and Evaluation) *metodologi, rangka pembangunan yang jelas dapat dilihat. Bermula dengan mengenal pasti tujuan utama project ini, ianya membantu dalam memastikan projek ini tidak tersasar jauh dari objektifnya. Bab yang seterusnya memfokuskan bagaimana* Simventure *dibina dan diletakkan untuk ianya menjadi satu simulasi yang befungsi. Fasa ini juga menunjukkan aset yang digunakan untuk menjadikan* Simventure *realistik seperti dunia yang sebenar dan penggunaan ConvAI API di dalam simulasi. Selepas itu, proses ujian simulasi di sekolah menengah yang terletak di Kulai, Johor jugak ditunjuk. Menggunakan tinjauan* SUS (System Usability Scale) *dan penilaian dari pakar, potensi sebenar* Simventure *sekarang diuji. Banyak penambahbaikan perlu dilakukan untuk menyampaikan apa yang diharap oleh pengguna dan disitu apa yang bab seterusnya akan menceritakan. Ia akan sentuh tentang kekuatan dan kelemahan yang ada pada* Simventure *sekarang dan apa penambahbaikan yang boleh dilakukan pada simulasi in pada masa hadapan.*

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LIST OF ABBREVIATIONS

ADDIE	Analyze, Design, Develop, Implement, and Evaluate
AI	Artificial Intelligent
AMD	Advanced Micro Devices
API	Application Programming Interface
AR	Augmented Reality
ASMR	Autonomous Sensory Meridian Response
CeLL	Center of Language Learning
FBX	Filmbox
FPS	First-Person Shooter
FTMK	Faculty of Information and Communication Technology
GTX	Giga Texel Shader eXtreme
NCS	Non-Copyright Sound
NPC	Non-Playable Character
PC	Personal Computer
RAM	Random-Access Memory
RPM	Ready Player Me
SMK	Sekolah Menengah Kebangsaan
STEM	Science, Technology, Engineering And Mathematics
SUS	System Usability Scale
TNA	Target Needs Analysis
UI	User Interface
UTeM	University Technical Malaysia Melaka
UX	User Experience
VR	Virtual Reality
XR	Extended Reality

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INTRODUCTION

1.1 Background

Choosing a career path after high school is a critical decision with long-term consequences (Risnasari & Basuki, 2020). Ideally, students graduate with a clear vision, eager to pursue a career that aligns with their passions and skills. The reality, however, often falls short. Many students struggle with this crucial decision, sometimes opting out of further education due to limited exposure to diverse career options. Traditional methods like career fairs and online job descriptions lack depth and engagement, failing to truly immerse students in the realities of different professions. Static presentations and text-heavy descriptions simply cannot compete with the interactive experience offered by a first-person player simulation (Risnasari & Basuki, 2020) .

This lack of immersive career exploration can lead students down the wrong path, choosing careers that don't align with their skills or passions. This mismatch can have significant consequences not just for individuals, but also for society. Uninformed career choices can contribute to skill gaps within specific fields, leading to a shortage of qualified workers in critical areas (Abe & Chikoko, 2020; Fuller & Raman, 2017). Additionally, students who end up in the wrong careers are more likely to experience job dissatisfaction and feel the need to change paths later in life, which can be disruptive (Azhenov et al., 2023) .

Simventure offers a solution. It's a simulation platform that utilizes a first-person player perspective to provide students with a first-hand career experience. Imagine a student interested in engineering controlling a virtual avatar on a construction site. They can interact with tools,

manipulate blueprints, and experience the dynamic environment first-hand. This type of interactive experience can provide invaluable insights that simply cannot be replicated through text-based methods (Risnasari & Basuki, 2020) .

Simventure has the potential to not only empower students to make informed career decisions, but it can also generate excitement and enthusiasm for a variety of career paths. By showcasing the diverse nature of working life through an interactive platform, Simventure can inspire students to consider careers they may not have previously considered. This, in turn, can lead to a more skilled and engaged workforce, benefiting both individuals and the economy as a whole (Abe & Chikoko, 2020) .

1.2 Problem Statement

The way that current career exploration is lacking in immersion and engagement are concerning considering this kind of thing needs to excite high school students as they are choosing a career that will write their future. Traditional methods often rely on passive delivery like static websites full of text, textbook and lectures or the infamous career fairs, failing to provide a realistic expectation for different professions (Blakeley, 2024; Chen et al., 2021) . This causes students to make a bad decision.

These conventional methods that were mentioned earlier rely heavily on passive delivery mechanisms, failing to capture the attention of today's young-adult (Blakeley, 2024; Chen et al., 2021) . This dry and old format quickly makes students walk away, as they are not interested. It limits their ability to fully grasp the essence of various industries. While textbooks and lectures offer a solid foundation of knowledge, they tend to take the approach of one-size-fits-

all that ignores individual learning styles and passion (Blakeley, 2024; Chen et al., 2021) . This led students to seek a much better alternative in ways to understand more about their future.

Career fairs are another poor example as it is commonly in packed environments with each person having only limited time with professionals. That creates a sense of overwhelm and prevents students from gaining valuable insights (Blakeley, 2024; Chen et al., 2021) . Some students may find it difficult to navigate in this type of event. Maybe they are introverted or maybe they just cannot seem to approach the professional resulting in lacking comprehensive understanding required for the career path.

This just shows it necessitates a new way to explore industries out there. Something that is much more engaging and immersive, that can capture attention in a short time, leveraging interactive technologies (Blakeley, 2024; Chen et al., 2021) . By combining passive knowledge and first-hand experiential learning, high school students can be empowered, making them much more informed about the future career choice.

1.3 Research Aim

The main aim of this research is to propose a simulation that could help high school students to make an informed career decision for their future based on what they have learned from the reality of the job that they have experienced first-person.

1.4 Project Objectives

In order to achieve the aim stated above, a few objectives need to be proposed as it become the outline of this project. This make sure that the workflow stays in its radar of research. The key objectives include:

I. To study how a first-person player career exploration platform influences high school graduates' career choices.
II. To develop an engaging first-person player platform with a variety of career simulations that will help students learn job skills first-hand.
III. To evaluate the usability of a first-person player platform with a variety of career simulations.

1.5 Project Scope

The scope of this project is to focus on developing a simulation that utilizes first-person experience to achieve the realistic feelings of someone who has a career while learning to know about oneself passion. This simulation will feature jobs that can be choose from to provide a depth understanding and feelings about the chosen career. The project will cover the following key areas:

High school students': This project would be focusing on this certain age group of people range from 13-17 years old. With this, their way of thinking needs to be studied in order to make sure that the simulation is engaging enough for them.

Platform: Unreal Engine 5.3.2 were used in order to develop the project and publishing it as a standalone simulation in PC platform.

AI Integrated NPC: This project will utilize ConvAI API in making the realism of the simulation one step closer. This lets the students to have a virtual mentor that they can ask for an answer.

Ready Player Me: This project will utilize Ready Player Me (RPM) as a tool to customize the character in simulation using oneself face. This adds a layer of depth in the realism that the goal wants to achieve.

1.6 Thesis Outline

Based on the objectives previously presented and on the approach proposed before, this thesis is made up of six (6) chapters, which contents are summarized as follows:

- **Chapter 1. Introduction.** This chapter presents the background of the study, research problems, aim, objectives, and scopes.

- **Chapter 2. Literature review.** This chapter starts with an overview of the high school students current challenges, focusing on the limitations of traditional career exploration methods. It then provide on why immersive experience helps in providing the lacks of realistic career experiences. After that, this chapter dig deep in the value of interactive learning tools. Futhermore dicusses the contribution that could be made by first-person technology in helping the students achiving what they want. Last but not least, an review of the larger impact for the future workforce and the economy.

- **Chapter 3. Methodology**. This chapter presents the methodology that has been used to develop this project. It contained several important steps that become the outline of the process that helped in making the simulation achieved its goal.

- **Chapter 4. Implementation**. This chapter presents the implementation of this simulation. In here, meticulous steps have been taken in order to put the pieces together to become what the project has called as Simventure

- **Chapter 5**. **Testing and Evaluation**. This chapter presents how Simventure interacts with its audience real-life and what is the outcome of this.

- **Chapter 6**. **Conclusion and Discussion**. This chapter will discuss what is the strength and weaknesess of Simventure. It also touch the topic of what Simventure were capable of doing in the future

LITERATURE REVIEW

2.1 Introduction

This chapter presents the literature analysis that has relation with Simventure, a simulation that will help students to find their true calling in career prospect. It will delve in the existing literature on the current ways of career exploration, challenges faced by high school students in choosing their future careers, the importance of having an effective career guidance and the limitations of traditional career exploration methods. The following section will focus on interactive learning technologies while focusing on first-person mode. This includes the definition and characteristic of first-person, benefits of immersive learning environments, first-person player simulation in education and last but not least past application of first-person mode in various educational field. The discussion would appear on the last section of this page as it will concludes this chapter.

2.2 Career Guidance

With the surge of Generation Z, someone who was born after 1995,(Nadya & Farozin, 2021) keep marching towards their future and soon to be someone who has a professional life, career guidance is really crucial for them as careers are regarded as something that will determine your future. This type of decision is crucial for the sake of what lies ahead but it needs to be determined within the early age and sometimes was made without giving much thought to it (Roy, 2020). Unless they know what are their strengths and weaknesses, their likes and dislikes, personal qualities and preferences, they will not be able to determine what they can achieve in the future (Haxhihyseni et al., 2021). This process of assessing the high school

students to really help them understand their own interest, skills, and values relation to work and education are called career guidance.

It typically consists of self-assessment, information provision, counselling, skill development and transition support. It can also be catered to the unique needs of the individual, including gifted adolescents, those with disabilities, or those in specific life transitions. The process is continuous and can be revisited at various stages of an individual's life as their interest and circumstances change (Bawn, 2020) but the first one is always intimidating as it is the pivotal choices in the student's life.

2.2.1 Current Career Exploration Methods

The effectiveness of career exploration programs in Malaysia has been a topic of interest in recent years. Several studies have investigated the impact of such programs on students' career maturity and self-concept. Here is the brief overview of methods that were used:

Table 2. 1 Shows the list of method used for career exploration

Methods used	Brief Overview
Traditional Career Fairs	Career fairs are a common method used in Malaysian schools to expose students to various career options. These events typically involve companies and organizations showcasing their job opportunities and providing information about their industries. Students can interact with representatives, ask questions, and gather information about the job market and required skills (Lau et al., 2019).

Online Job Descriptions and Databases	Online job descriptions and databases are also widely used in Malaysia. These platforms provide students with access to job information, career resources, and educational requirements. For example, the Malaysian Job Bank is a government-run database that lists job openings and provides career guidance (Lau et al., 2019).
Textbook-Based Career Education	Textbook-based career education is another method used in Malaysian schools. These textbooks provide students with information about different careers, job requirements, and educational pathways. They are often used in conjunction with other career exploration methods (Lau et al., 2019).
Counselling and Mentoring Programs	Counselling and mentoring programs are also popular in Malaysia. These programs involve trained counsellors and mentors who work with students to help them identify their career interests and goals. They provide guidance on career choices, educational pathways, and job opportunities (Lau et al., 2019). These methods are often used in combination to provide students with a comprehensive understanding of their career options. For example, a career fair might be followed by a counselling session to help students identify their career goals and develop a plan to achieve them (Lau et al., 2019).

In conclusion, the current career exploration methods in Malaysia include a mix of traditional and modern approaches. These methods, such as traditional career fairs, online job descriptions and databases, textbook-based career education, and counselling and mentoring programs, are

used in combination to provide students with a comprehensive understanding of their career options. While these methods have been effective in exposing students to various career paths and providing them with career guidance, there is still a need for more research on the effectiveness of these methods and the development of more innovative approaches to career exploration.

2.2.2 Challenges of Career Exploration

The career exploration process has been the subject of extensive scholarly inquiry, as researchers have sought to unpack the challenges that students face to shape their professional development and decision-making. The lack of effectiveness in career guidance curriculum makes it challenging for the students to understand what they want for their futures. There is a need to design career development and exploration programs that are tailored to individual student needs and incorporate their ideas and personal opinions (Wang, 2021). After reviewing some of the articles that were related to career guidance, it can be concluded the common challenges that the high schoolers faced are:

Traditional methods fall short: Traditional methods often provide generic advice that does not consider the unique interest, values, and strengths of the individual, which can lead to misalignment between a person's career path and their personal aspirations(Haxhihyseni et al., 2021; Wang, 2021). It also suffers from lack of real-world engagement. Students may have limited opportunities to directly experience different workplaces or gain hands-on industry experience, hindering their understanding of practical realities of various career paths(Marciniak et al., 2022).

Influence of family members: Family economic status, parental employment. And educational level can significantly affect career exploration. Parental involvement, support, and parenting styles also play a crucial role in influencing career choices and development (Lau et al., 2019). For example, middle-class parents will always get involved in their child development and provide them with an activity place of interest and encouragement, while the working-class parents tend to develop by natural process.(Chen et al., 2021).

Career guidance is outdated: Findings show that a significant portion of individuals (61%) considers career guidance a pointless process. This indicates inefficiency in the career guidance provided (Haxhihyseni et al., 2021). This is because of how fast the world is changing. This is in line with nowadays job market as new careers emerging and others becoming obsolete. The old ways may not keep pace with these changes and therefore, may not prepare students for future jobs that didn't exist before (Marciniak et al., 2022).

2.2.3 Importance of Effective Career Guidance

Engaging and comprehensive career guidance programs are essential for high school students to develop a clear understanding of their interests, skills, and abilities, which in turn allows them to make informed decisions about their future careers (Wang, 2021). However, the implementation of effective career guidance services is often lacking in many schools, as it requires the active involvement of counsellors or teachers of guidance and counselling to create targeted programs (Risnasari & Basuki, 2020). Students who lack access to career education are more likely to be uncertain about their futures and have no clear career goals, which can affect their subject choices in high school and lead to mismatches between their interest or strengths and their eventual career paths (Diogo et al., 2020; Risnasari & Basuki, 2020; Wang, 2021).

Providing students with guidance on career planning and subject selection can help them understand the relevance of their school education and ensure that they are selecting courses that are well-suited to their abilities and desired career pathways. To be effective, school-based career development programs should aim to assist students in formulating individualized pathway plans that connect what they learn in school with their specific career aspirations and help them prepare for future education and employment opportunities that align with their strengths.

In addition to that, educators need to be more creative in delivering their knowledge to the students as they tend to lose interest in conventional teaching methods (Wijaya et al., 2020). The amount of creativity that a teacher needs to prepare is massive as they need to make the session more interactive, informative and engaging for the students to hinders ennui among them. Engaging career guidance programs can spark curiosity and ignite students' passions for

different professions. This fosters a sense of purpose and direction in their academic pursuits, leading to increased motivation and engagement in their studies.

Effective career guidance will increase a significant number of positive outcomes that can greatly impact the overall development and future success of high school students (Risnasari & Basuki, 2020). This also prevents students from dropping out of school, which will result in many problems such as poverty, increased unemployment, and low quality of life (Risnasari & Basuki, 2020). It is worth to be noted that if a student really knows what they will do in their future that can contribute to a stronger and more skilled workforce. By ensuring individuals are well-matched to their careers, they can maximize their productivity and contribute more to the society and economy.

Career guidance enables individuals to find careers that are well-suited to their interests, skills, and values, allowing them to maximize their productivity and make valuable contributions to society and the economy (Roy, 2020b). It also promotes social mobility by providing individuals from disadvantaged backgrounds with the knowledge and skills necessary to pursue fulfilling careers (Roy, 2020b).

Moreover, effective career guidance helps students make informed decisions about their academic and career goals, reducing the likelihood of making hasty or uninformed choices (Abubakar, 2018; McLaren & Dik, 2011). By exploring various career options and assessing their own strengths and weaknesses, students can develop a realistic understanding of their potential and set achievable goals (Abubakar, 2018; McLaren & Dik, 2011).

In conclusion, investing in comprehensive and effective career guidance programs at the high school level is crucial for fostering the personal and professional growth of students, as well as for the overall development of society. By providing students with the necessary

tools and resources to make informed career decisions, we can help them unlock their full potential and contribute to a more prosperous future.

2.3 Interactive Learning Technologies

Interactive immersive learning is a teaching method that involves fully immersing students in a subject or experience through various techniques such as simulations, virtual reality, and experiential activities. This approach combines the benefits of both interactive and immersive learning, allowing learners to engage with the content in a more engaging and interactive manner. Interactive immersive learning involves learners actively shaping outcomes inside a risk-free environment for repeated learning and accurate success measurement. It further enhances learning objectives by encouraging learners to immerse themselves in learning or submerge themselves fully in the learning experience (ELM, 2024; Movchan, 2024).

By seamlessly integrating interactive learning technologies into traditional teaching methods, educators can unlock a new frontier of educational transformation. These technologies enable learners to actively participate in and shape their learning experiences, fostering deeper engagement and improving knowledge retention. Additionally, interactive learning technologies can be tailored to individual student needs, providing personalized learning paths and instant feedback to support their progress (Adeoye & Akinnubi, 2023).

2.3.1 Definitions and Characteristics of First-Person Simulation

First-person simulation is a type of interactive learning technology that allows learners to engage in a simulated environment where they can experience and interact with virtual objects

and scenarios. This technology is characterized by its immersive and interactive nature, which enables learners to feel as if they are actually present in the simulated environment (Nadiah et al., n.d.). The key attributes of first-person simulation include:

Table 2. 2 Characteristic of first-person

Characteristics	Overview
Immersive Experience	First-person simulations provide learners with an immersive experience by placing them directly within the virtual environment. This allows learners to feel as if they are actively participating in the simulation, rather than simply observing it from an external perspective. The immersive nature of first-person simulations helps learners develop a deeper sense of engagement and connection with the learning content (Beckem & Watkins, n.d.; Gorisse et al., 2017).
Interactive Elements	First-person simulations are highly interactive, allowing learners to engage with the virtual environment through various means such as voice commands, gestures, or other forms of input. This interactivity enables learners to actively shape the outcome of the simulation, which enhances their sense of agency and control over the learning process (Beckem & Watkins, n.d.; Gorisse et al., 2017).
Realistic Graphics	First-person simulations typically feature realistic graphics that create a sense of presence and immersion. The high-quality visuals and audio elements help learners feel as if they are actually within the virtual environment, which enhances their engagement and learning outcomes (Beckem & Watkins, n.d.; Gorisse et al., 2017).

Personalized Experience	First-person simulations can be tailored to individual learners, providing a personalized experience that caters to their unique needs and preferences. This personalization can be achieved through various means such as adaptive difficulty levels, customized scenarios, or tailored feedback mechanisms (Beckem & Watkins, n.d.; Gorisse et al., 2017).
Feedback Mechanisms	First-person simulations often include built-in feedback mechanisms that provide learners with instant feedback on their performance. This feedback can take various forms such as audio cues, visual effects, or other forms of feedback that help learners adjust their actions and improve their performance (Beckem & Watkins, n.d.; Gorisse et al., 2017).
Contextual Reality	First-person simulations often focus on the user's internal experience, including their thoughts, emotions, and reactions to the simulated environment. This can include elements such as dialogue, internal monologues, and other forms of internal narration (Beckem & Watkins, n.d.; Gorisse et al., 2017).
Sense of Embodiment	First-person simulations can create a sense of embodiment, where learners feel as if they are physically present within the virtual environment. This sense of embodiment enhances the sense of immersion and engagement, as learners feel more connected to the learning content and the virtual environment (Gorisse et al., 2017).

2.3.2 Historical Development and Technological Advances of First-person

The historical development and technological advances of first-person simulators have significantly shaped the landscape of simulation technology over the years. From the earliest forms of first-person simulators to the cutting-edge advancements of today, the evolution of this technology has been remarkable. This research review delves into the origins of first-person simulators, exploring their initial forms and tracing the trajectory of technological advancements that have enhanced the realism and immersion of these simulations. By examining how technology has played a pivotal role in refining the user experience and increasing the authenticity of first-person simulators, this paper aims to shed light on the transformative impact these simulations have had on various industries. Through a detailed analysis of the historical development and technological innovations in first-person simulators, this research seeks to provide a comprehensive understanding of their evolution and explore the implications of their widespread adoption across different sectors.

The first-person shooter (FPS) genre has undergone a remarkable evolution, driven by the relentless pursuit of technological advancement and the quest for an ever-more immersive and realistic gaming experience. The genre's origins can be traced back to the early 1970s, with the release of pioneering titles such as Maze War and Spasim, which laid the groundwork for the genre's distinctive gameplay centred on the player's perspective. As computing power and graphics capabilities improved over the decades, the first-person shooter genre has continued to push the boundaries of visual fidelity and interactivity, with each generation of hardware and software enabling new levels of re-positioning and realism (Laliberty, 2014).

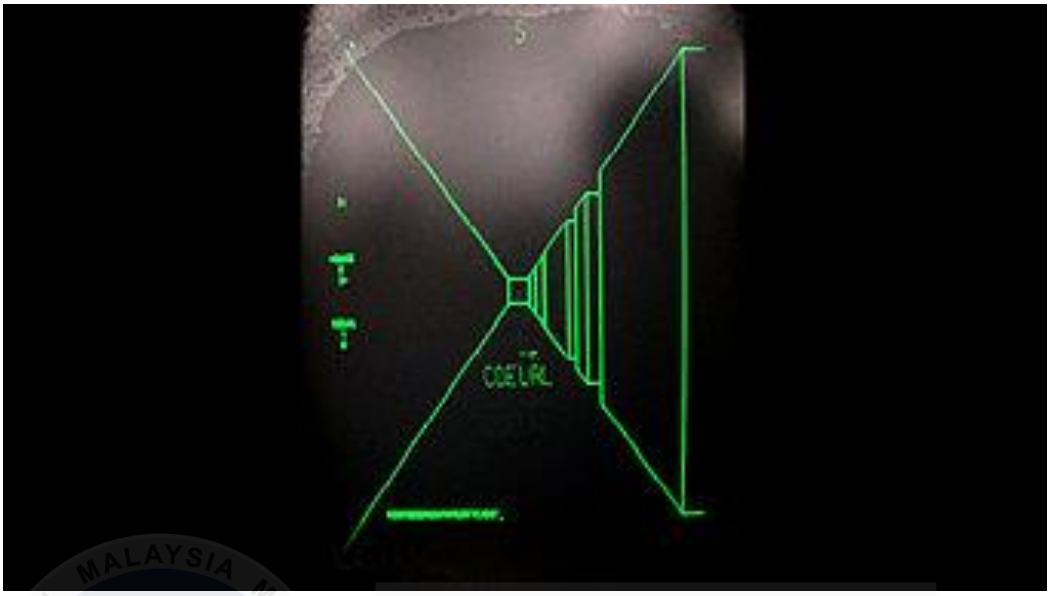

Figure 2. 1 Shows Maze war, the first FPS game

The 1990s saw a surge in the popularity of first-person shooters, with the release of iconic titles such as Doom, Quake, and Half-Life, which captivated players with their visceral combat, atmospheric environments, and increasingly sophisticated storytelling (Laliberty, 2014). The dawn of the 21st century ushered in a new era of first-person shooters, characterized by the rise of online multiplayer, the integration of advanced physics and lighting systems, and the incorporation of motion capture technology to create more lifelike character animations and interactions (Laliberty, 2014).

The aesthetic of realism has been a driving force behind the technological evolution of first-person shooters, with developers constantly striving to create environments and characters that feel more authentic and immersive.

2.3.3 Benefits of Immersive Learning Environments

Immersive learning environments settings signify a change in the field of learning, utilizing technology to craft captivating and interactive experiences that go beyond classroom setups. These settings utilize a range of technologies, like reality (VR) augmented reality (AR)

simulations and gamification to engage learners in authentic situations. Research has shown that immersive learning does enhance education in various ways (Felege et al., 2019).

One of the key advantages of immersive learning is its ability to improve memory retention. Studies have shown that learners who engage with content through immersive environments are better able to recall information compared to traditional learning methods (Buljan, 2022; Understanding Immersive Learning and Its Benefits, 2024). This is because the immersive experience helps to encode memories more effectively, making it easier for learners to retrieve the information later on. For example, a medical student practicing a surgical procedure in a virtual reality simulation is more likely to remember the steps and techniques compared to simply reading about them in a textbook (Understanding Immersive Learning and Its Benefits, 2024).

Immersive learning also excels at developing problem-solving skills. By placing learners in realistic scenarios, they are forced to apply their knowledge and critical thinking to find solutions (Buljan, 2022). This hands-on approach allows learners to experiment, make mistakes, and learn from the consequences in a safe environment. For instance, an engineering student designing and testing virtual prototypes can better understand how different design choices impact real-world performance.

Furthermore, immersive learning environments are highly engaging and motivating for learners. The interactive, multisensory nature of these experiences helps to capture and maintain the learner's attention, leading to increased focus and better learning outcomes (Sharma, 2023; Understanding Immersive Learning and Its Benefits, 2024). Learners are more likely to feel invested in the material and eager to continue exploring and discovering new information.

Immersive learning also fosters collaboration and teamwork, as learners can interact with each other within the simulated environment (Understanding Immersive Learning and Its Benefits, 2024). This social aspect of immersive learning encourages communication, problem-solving, and the exchange of ideas – all valuable skills for success in the real world.

In conclusion, the benefits of immersive learning environments are clear. By providing learners with realistic, first-person simulations, these innovative approaches to education can improve memory retention, develop problem-solving skills, increase engagement, and promote collaboration – all of which contribute to more effective and meaningful learning experiences.

2.3.4 First-Person Player Simulations in Education

The use of first-person player simulations in education has shown significant potential for enhancing student learning and engagement. These simulations allow students to actively participate in immersive, realistic scenarios, fostering deeper understanding and the development of critical skills.

First-person player simulations enable students to experience complex situations from a first-hand perspective, putting them in the shoes of key decision-makers or participants. This approach encourages active learning, as students must make decisions, solve problems, and navigate challenges in real-time (Vlachopoulos & Makri, 2017).

Figure 2. 2 Example of educational game out there that is in first-person view

Research has demonstrated that first-person player simulations can improve learning outcomes across a variety of disciplines, including healthcare, business, and the social sciences. These simulations have been effective in developing skills such as critical thinking, problem-solving, communication, and teamwork (Andersson & Strömsholm, 2018; Vlachopoulos & Makri, 2017).

One key advantage of first-person player simulations is their ability to provide a safe, controlled environment for students to practice and learn. Students can explore scenarios, make mistakes, and learn from the consequences without the risks associated with real-world situations. This allows for experimentation, iteration, and the development of expertise (Ameerbakhsh, 2018).

Figure 2. 3 Shows that simulation allows player to practice cooking in safe space

Furthermore, first-person player simulations can enhance student engagement and motivation by creating immersive, interactive learning experiences. The sense of agency and control inherent in these simulations can foster deeper investment in the learning process, leading to improved knowledge retention and application (Ameerbakhsh, 2018; Andersson & Strömsholm, 2018).

However, the successful implementation of first-person player simulations in education requires careful design and integration with the curriculum. Instructors must ensure that the simulations align with specific learning objectives and provide meaningful feedback to students. Additionally, the technical and resource requirements for developing and maintaining these simulations can present challenges for some educational institutions (Vlachopoulos & Makri, 2017).

In conclusion, the use of first-person player simulations in education holds significant promise for enhancing student learning and engagement. By providing immersive, realistic experiences, these simulations can foster the development of critical skills and deepen students'

understanding of complex topics. As educational technology continues to evolve, the integration of first-person player simulations into the classroom is likely to become an increasingly valuable tool for educators.

2.3.5 Application in Various Educational Fields

The use of first-person player simulations in education has been explored in various educational fields, demonstrating significant potential for enhancing student learning and engagement. These simulations allow students to actively participate in immersive, realistic scenarios, fostering deeper understanding and the development of critical skills. The simulation that will be in here most of it were taken from Steam Marketplace.

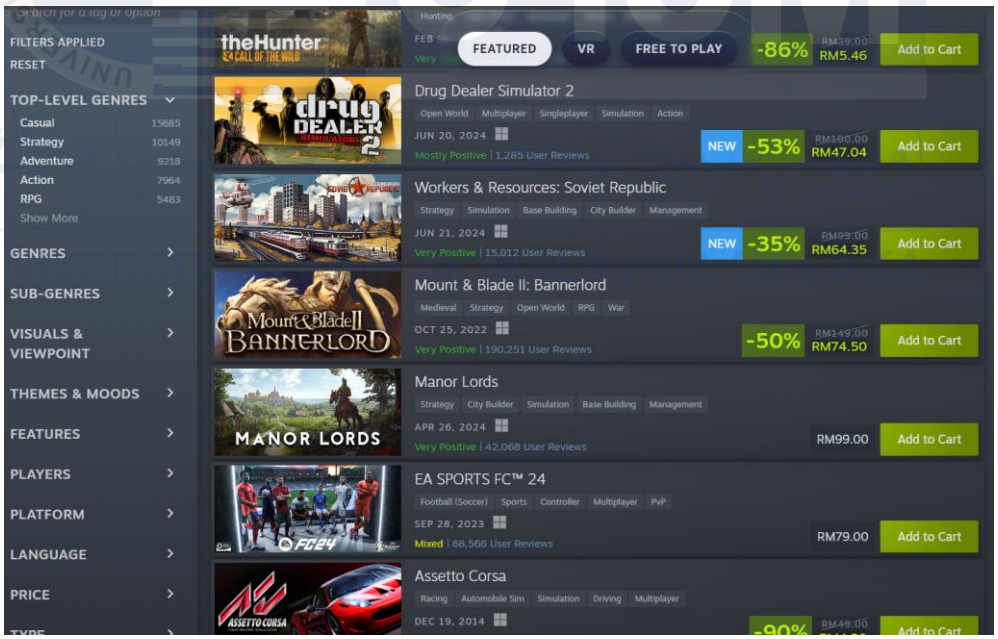

Figure 2. 4 Shows the variety of simulation that can be obtained in Steam Marketplace.

Business Education

Supermarket Simulator is a popular game that allows players to manage their own supermarket, making decisions on product purchases, pricing, and store operations. The game

demonstrates its use as an example of first-person and have significant applications in various educational fields, particularly in the areas of business, management, and social sciences.

Figure 2. 5 The screenshot shows how it is in the simulation

Upon reading the review left by people that has played this simulation, a lot of people actually liked it and they are suggesting for more updates to the game developer. One of the reviews said it actually feels like they are still in their in-real-life work after playing this game.

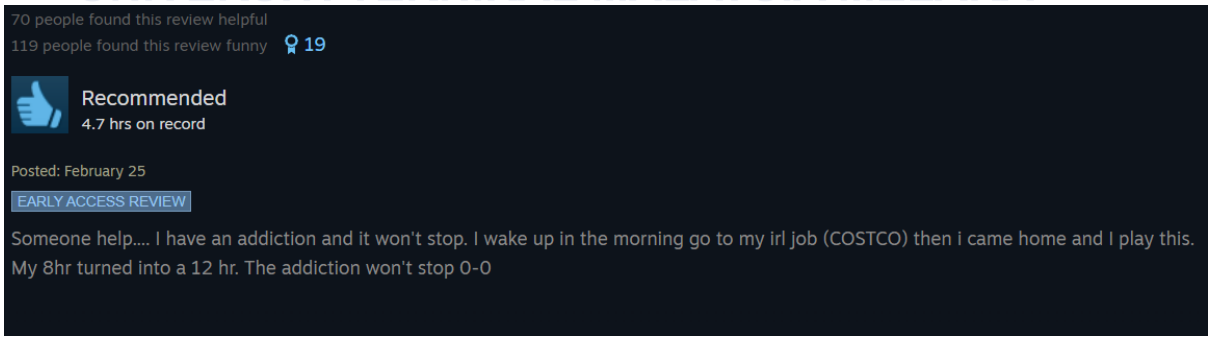

Figure 2. 6 Shows the review left by a player that played Supermarket Simulator

Farming Education

Farming Simulator 22, a realistic career simulation game, can be an effective tool for teaching agricultural and business principles to students in various educational fields, providing them

with hands-on experience in running a virtual farm and enhancing their understanding of key concepts such as crop cultivation, animal husbandry, and farm management.

Figure 2. 7 Shows the Farming Simulator 22 market page

Just like the previous simulation above, upon reading the review left by people that has played this simulation, a lot of people actually enjoyed playing this kind of simulation while gaining some knowledge in the field.

Figure 2. 8 Shows a review left by a player that played farming simulator 22

2.3.6 Discussion

In conclusion, this research highlights the intersection between career guidance and interactive learning technology. Through examining the previous work in the related field, heaps of knowledge have been gained in order to make an impactful project to the target audience.

This literature review provides a solid foundation for the Simventure project, highlighting the significance of career simulation games in addressing the limitations of traditional career exploration methods and the importance of effective career guidance programs in supporting the personal and professional development of high school students.

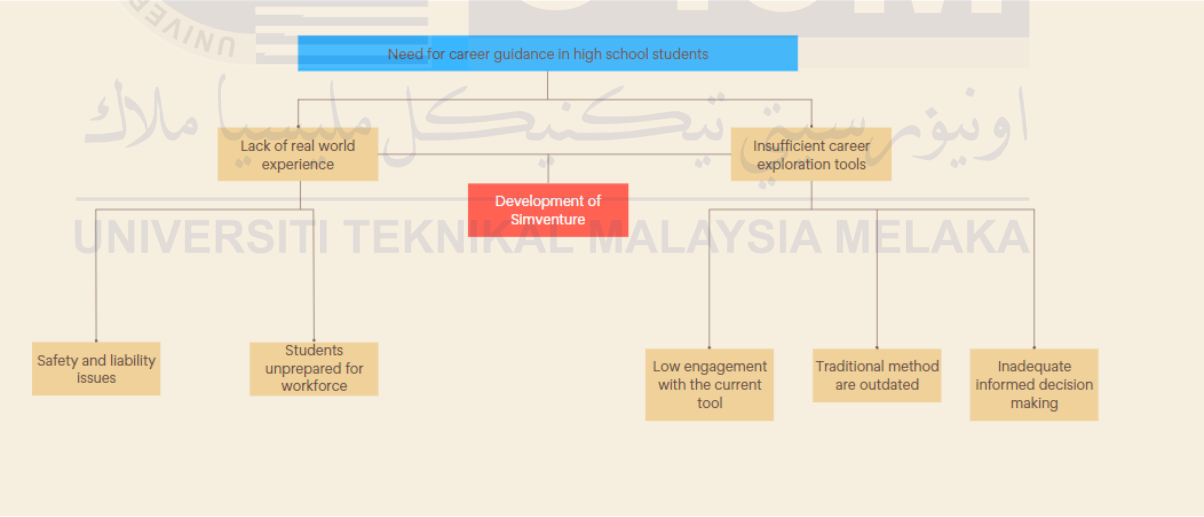

Figure 2. 9 Shows the intersection that leads to the making of Simventure

METHODOLOGY

3.1 Introduction

This chapter outlines the methodology used in the development of Simventure. The ADDIE model was chosen as the framework for this project due to its ability to provide a structured approach to the development process of this simulation. It stands for Analyze, Design, Development, Implement, and Evaluation and it is commonly used in ensuring that training programs are efficient, effective, and aligned with learners' goal.

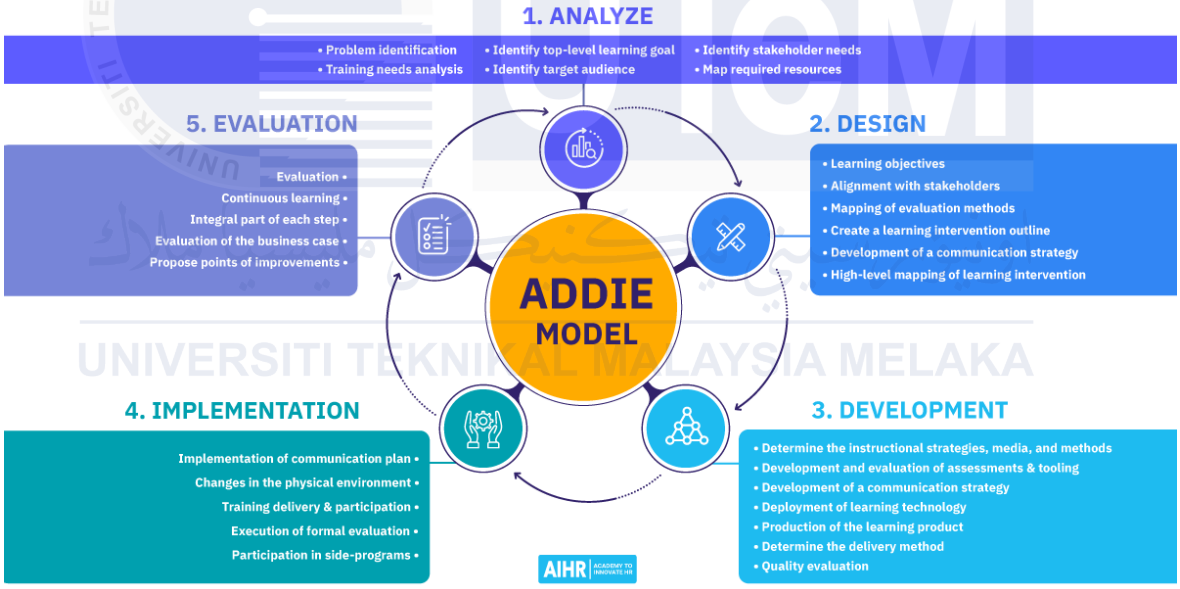

Figure 3. 1 shows the brief explanation of proposed methodology for this project

3.2 Project Design

The concept of this project using the ADDIE model is to create an interactive first-person player career exploration platform called Simventure. The project targets high school students who struggle to choose a career path. Simventure aims to provide an immersive, interactive

experience where students can explore different careers from a first-person perspective, practice relevant skills, and make more informed decisions about their future.

The traditional methods of career exploration, such as career fairs and online job descriptions, are often passive and lack depth, failing to truly immerse students in the realities of different professions. Simventure addresses this issue by providing a first-hand career experience through simulations that allow students to interact with tools, manipulate blueprints, and experience the dynamic environment first-hand. This type of interactive experience can provide invaluable insights that simply cannot be replicated through text-based methods.

The platform's objectives are multifaceted. Firstly, it aims to study how a first-person player career exploration platform influences high school graduates' career choices. Secondly, it aims to develop an engaging first-person player platform with a variety of career simulations that will help students learn job skills first-hand. Finally, it aims to evaluate how well the first-person player platform increases student interest and engagement in exploring various career paths.

The significance of Simventure lies in its potential to increase student engagement, enhance understanding, and facilitate informed decision making. By providing a safe, interactive, and immersive experience, Simventure can help students discover their strengths, weaknesses, and interests and making it a more active and engaging process. This, in turn, can lead to students making more informed decisions about their future careers, which can have significant long-term consequences for their personal and professional lives.

3.3 Analyse

In order to start the project, brainstorming session are needed to analyse what is the key factors that make Simventure the way it is imagined. For this to happen, few aspects need to be listed down as below:

Table 3. 1 Analysis of the project

Analyse	
Problem	Current career exploration method lack of engagement thus, leading high school students' choosing the wrong career for themselves.
Learning Goal	I. Students have increased their career awareness II. Students have a realistic expectation of a career. III. Students are able to experience first-hand of what a career does.
Target Audience	High school students
Target Needs Analysis (TNA)	Many researches actually conclude that high school students in Malaysia have a career maturity between low and moderate level and it is not enough for them to make a career decision at this point (Lau et al., 2019). With this simulation, it can help the students to actually gain the knowledge that are needed to increase their career maturities and make a more informed decision for their future.
Training Needs	A simulation of someone who has a career with a realism aspect in it as it helps in giving the immersive feelings to the students.
Resource Mapping	The resource required for this simulation are: • 3D models for character, environments, interaction

	• Library of sound for ambient and object interaction • A game engine to build the simulation • A personal computer with the required hardware specs to run the game engine.

Based on what listed above, the project draws a clear outline of what it needs to start the process of making it become a reality. A process of detailing is needed and that is where the second phase start.

3.4 Design

The design stage of the ADDIE methodology is crucial in developing a comprehensive and engaging simulation for high school students to make informed career decisions. Simventure aims to simulate real-world careers, providing students with a realistic and interactive experience that enhances their understanding of various career paths. This introduction outlines the key elements to be considered during the design stage:

3.4.1 Concept Development

In this stage, the core concept is identified and for this case, Simventure core concept is to provide a realistic and interactive simulation of real-world careers. This concept should be aligned with the learning objectives and the needs of the target audience. The simulation combines interactive learning elements with real-world career simulations, providing students with a comprehensive and engaging experience.

3.4.2 Prototype Development

Simventure aims to be the solution as it will offer a wide range of career simulations that allow students to experience various fields first-hand and practice relevant skills. The platform will utilize a first-person player perspective to provide a truly immersive and interactive experience, in contrast to the passive delivery of traditional career exploration methods. Below shows the storyboard of the prototype version of Simventure.

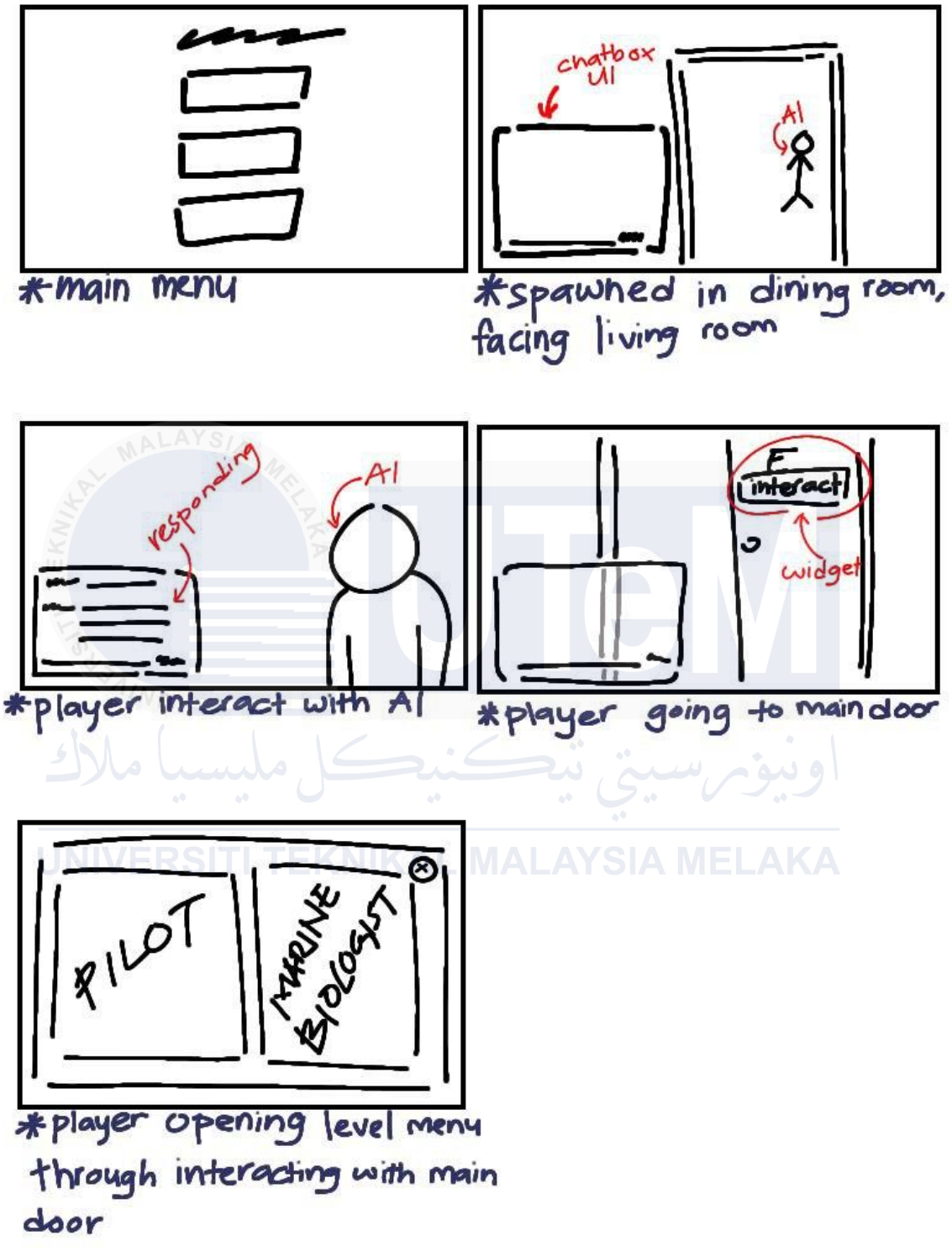

Figure 3. 2 Show sketch of Simventure Prototype

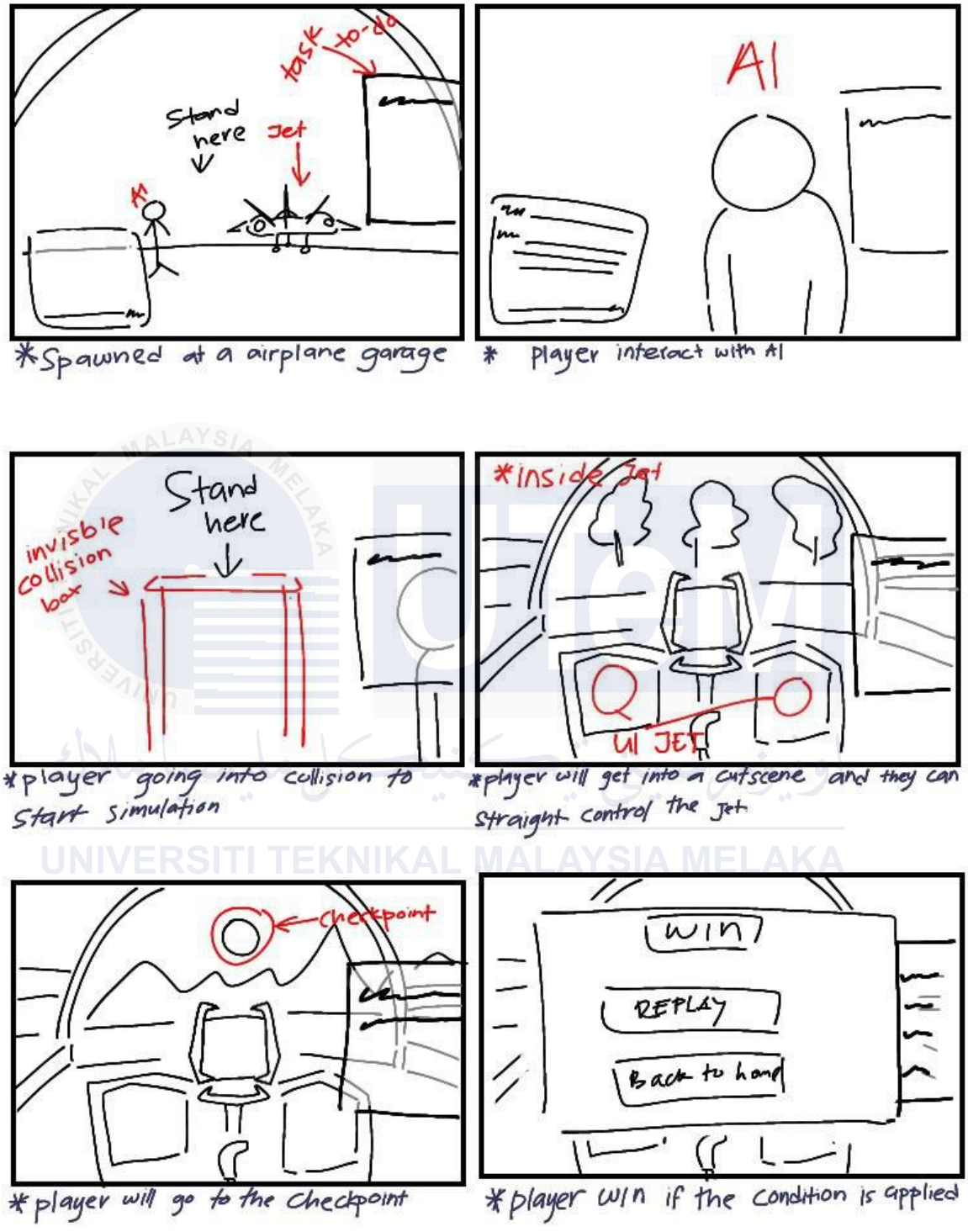

Figure 3. 3 Show sketch of Simventure Prototype

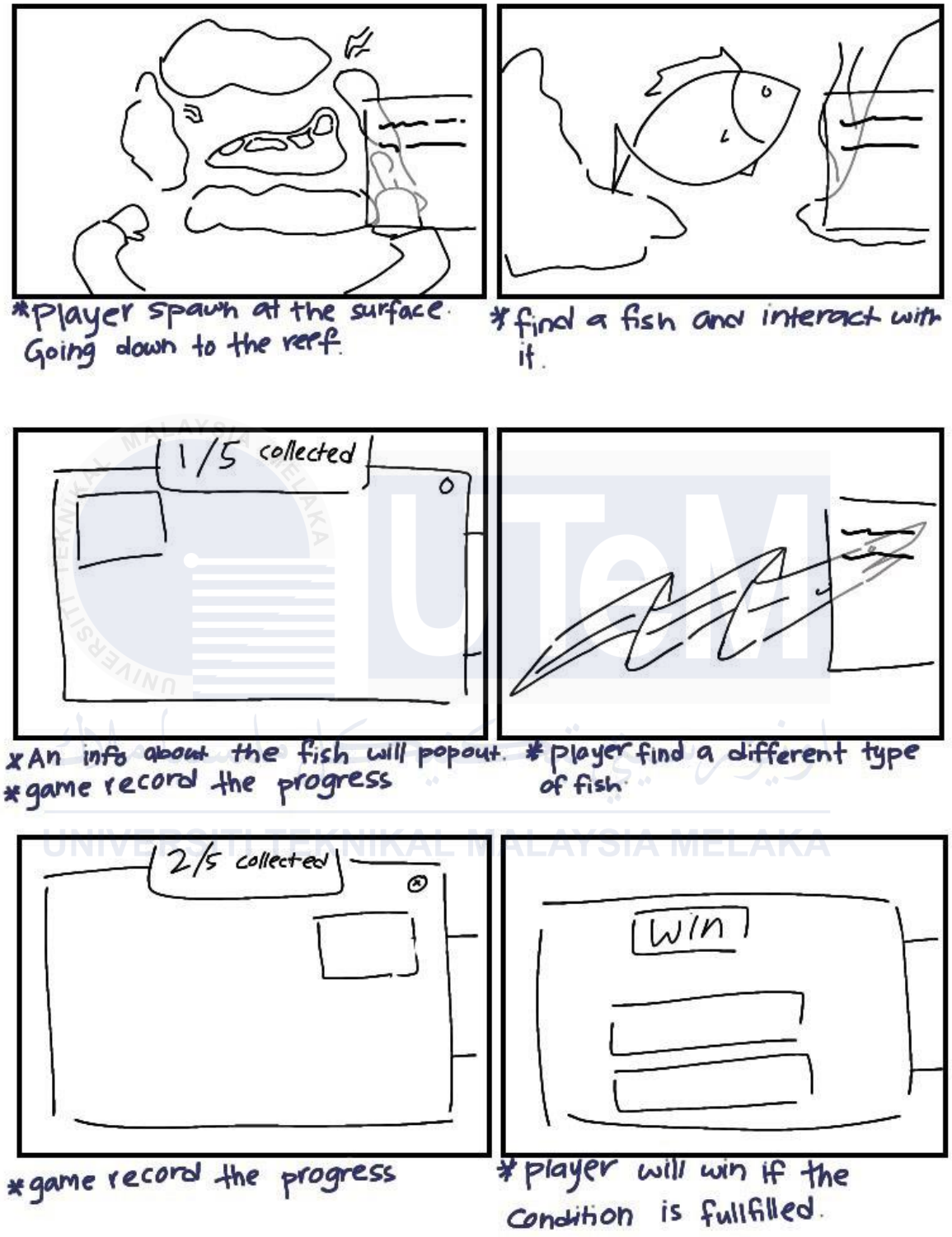

Figure 3. 4 Show sketch of Simventure Prototype

3.4.3 Simulation Flow

The game begins with player spawned in a small house that the player rented with her housemate, a job recruiter powered by AI using ConvAI named Nadia. The simulation flow will be followed as below.

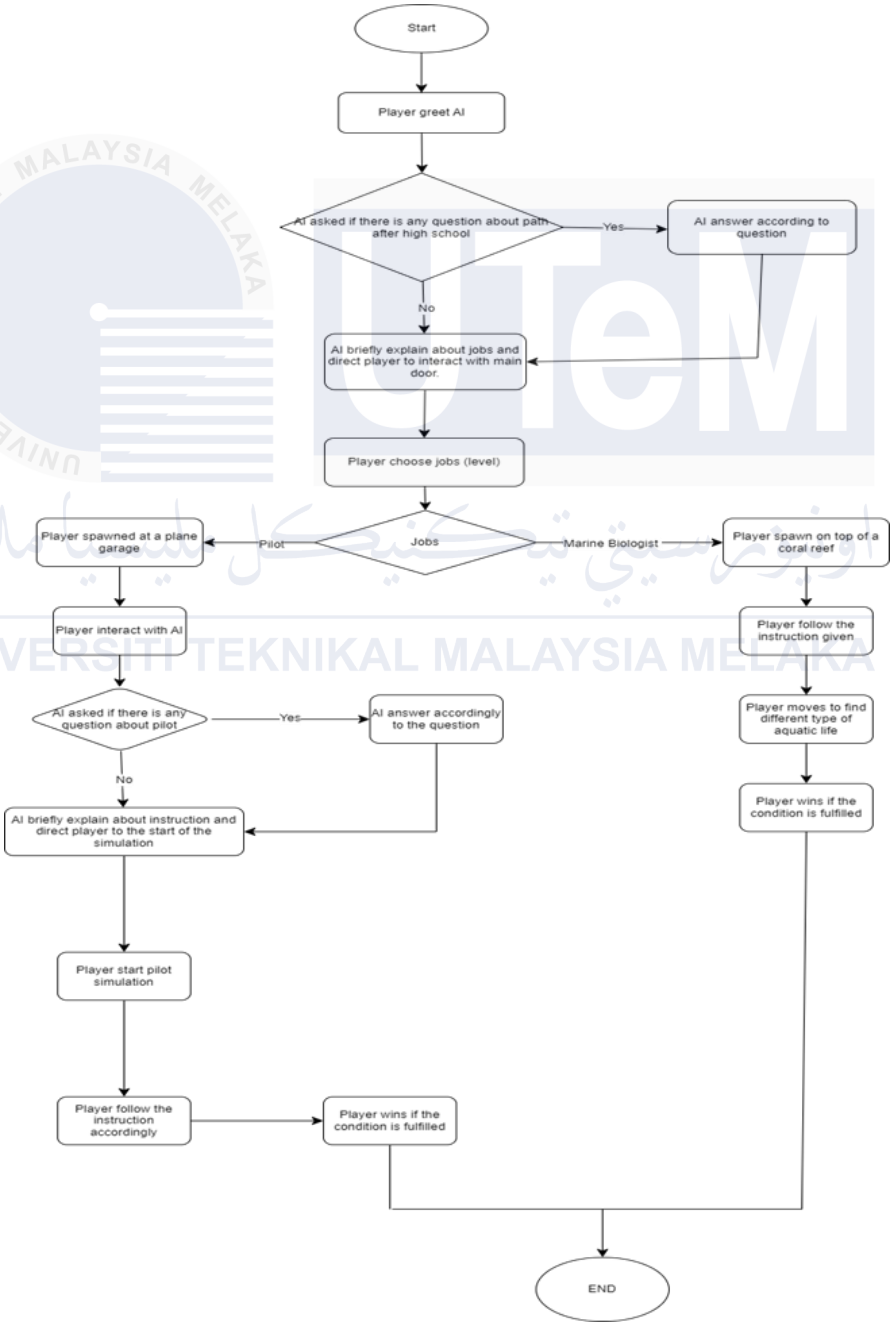

Figure 3. 5 Show the flow of the simulation

3.4.4 Style

The user interface (UI) of Simventure was designed with the specific goal of attracting and engaging high school students. The UI is a crucial aspect of the platform, as it sets the tone for the overall user experience and can significantly impact how students interact with the simulations. Several keys of strategies are constructed in making sure the UI really catches students' eye. Among them are:

Colour Scheme and Visual

The first step in designing an attractive UI was to select a colour scheme and visual style that would appeal to high school students. This project chose a bold and vibrant colour palette, featuring shades of blue and red. These colours are often associated with energy, creativity, and excitement, which are all qualities that are likely to resonate with high school students. However, need to keep in mind that too many shades of colour could give the opposite effect as it might overwhelm the player. In this case, a balanced approach should be the way.

Figure 3. 6 Some of the UI that are in development process in Adobe Illustrator 2020

The UI also incorporates a mix of icons, graphics, typography, and animations to create a dynamic and engaging visual experience. Icons are designed to be simple and easy to understand, while the graphics and animations are used to add visual interest and create a sense of movement. The target of this project is a high school student who were accustomed to social

media and how an app works, they are much more familiar with the icons that were used. Typography are important as well as it becomes the crucial part of visual design. It can guide the students' eyes to the most important elements first. Moon Get! Font become the main font in the UI part as it is a bold but easy-in-the-eye type of font. The other font such as Digital Dream and Espressonal also were used a bit in this project.

Simple and Intuitive Navigation

Simventure's user interface (UI) was designed with the digital habits of high school students in mind. The platform features a simple and intuitive navigation system that allows students to quickly and easily access the various simulations and features. This approach ensures that the platform is user-friendly and accessible, catering to the familiarity of high school students with social media and other digital platforms.

Figure 3. 7 Shows the sketch of Simventure main menu

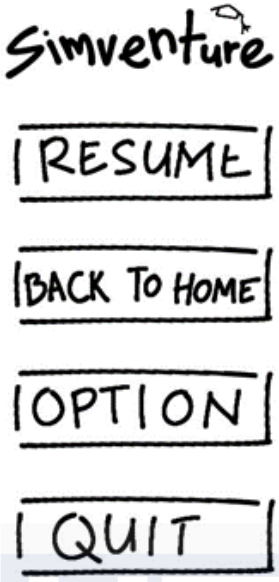

Figure 3. 8 Shows the sketch of Simventure pause menu

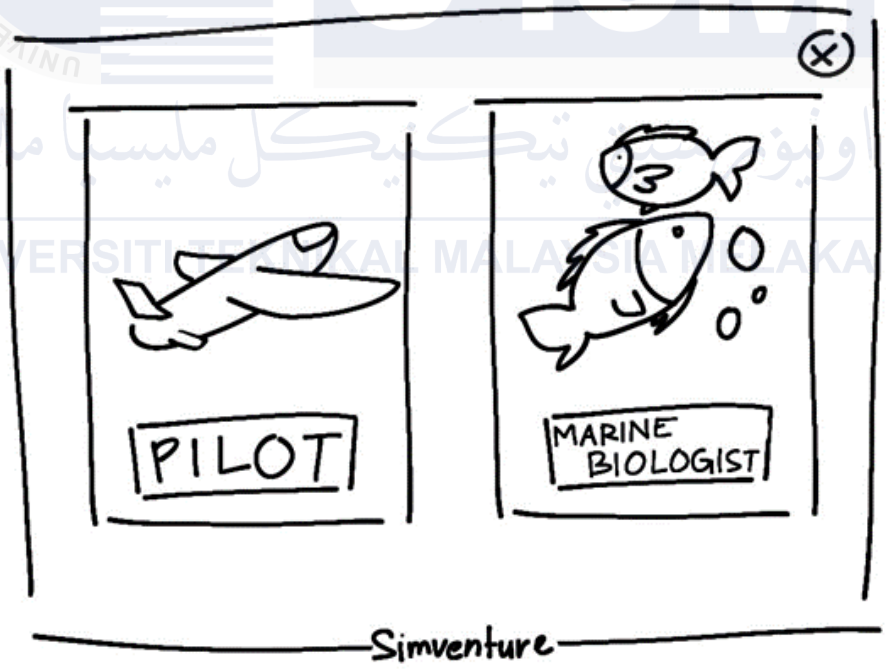

Figure 3. 9 Shows the sketch of Simventure level selector menu

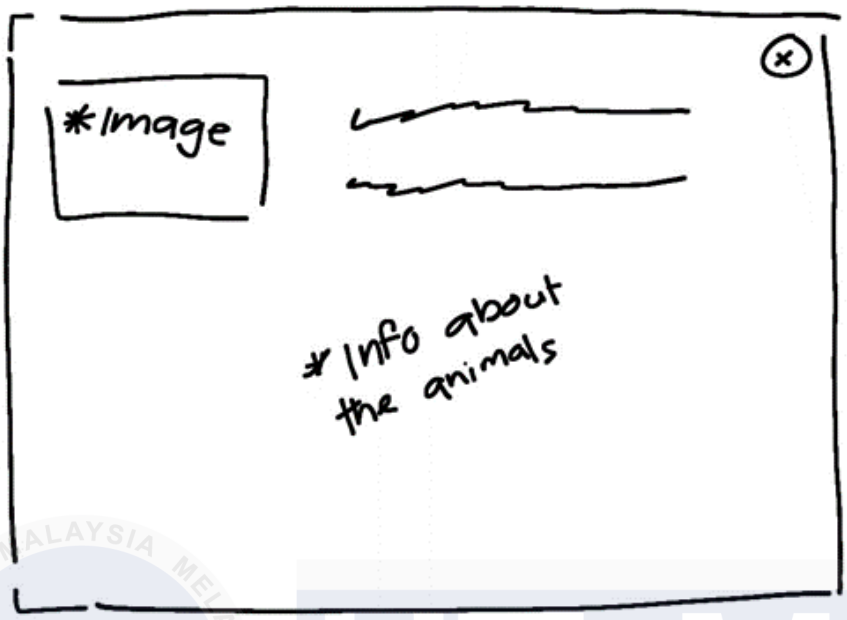

Figure 3. 10 Shows the sketch of data of a fish located in Marine Biologist level

The UI includes clear and concise labels that help students understand the different features and simulations available. This is particularly important for high school students who may have problems with learning. The clear labels ensure that students can easily navigate the platform and understand what each feature does, making it more likely that they will engage with the simulations.

3.4.5 NPC Driven by AI

In this simulation there were 2 AI NPC that were powered by ConvAI, a free developer platform designed to empower virtual world developers with the latest in Conversational AI. ConvAI allows developers to create virtual characters with advanced multimodal perception abilities, enabling them to integrate seamlessly into both virtual and real-world environments. The platform provides a versatile developer interface, allowing creators to quickly modify NPCs from backstory and knowledge to voice and personality.

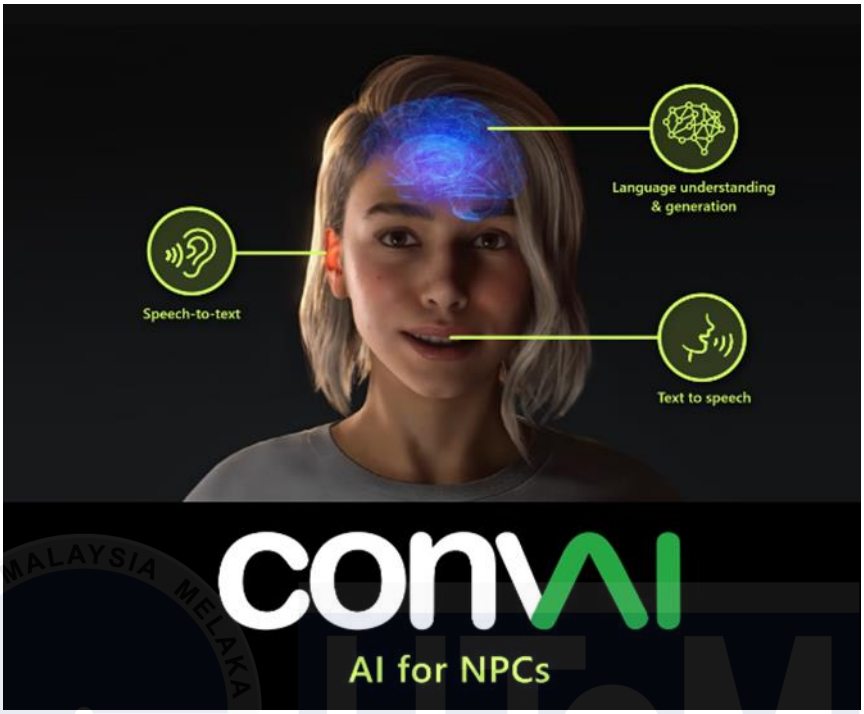

Figure 3. 11 Shows what convAI can do

ConvAI's AI-driven characters can perceive emotions and emote naturally, reflecting their feelings through voices and gestures, adding a layer of realism and immersion to the simulation experience. This is perfect for Simventure as it requires high level of immersion and realism to effectively guide high school students through career exploration. ConvAI's advanced conversational AI capabilities are well-suited to bring the virtual characters to life, fostering meaningful interactions and a sense of presence that is crucial for the success of the career guidance platform.

The two AI NPCs in the Simventure simulation were designed to serve as virtual mentors, drawing upon ConvAI's knowledge base to provide personalized advice and insights to the student users. These characters were imbued with distinct personalities, backgrounds, and areas of expertise, allowing them to offer a diverse range of perspectives and guidance tailored to the individual needs and interests of each student.

3.4.6 Material Collecting

This stage involves gathering and organizing the necessary materials, including 3D models of characters and environments, sounds, and other relevant elements, to create an immersive and engaging experience for users.

3D Models

To create high-quality 3D assets for Simventure, we will focus on obtaining both character and environment assets.

3D Environments

A meticulous research needs to be done in order to make sure that it replicates the real life as close as possible. Lots of picture were made as a reference to build the environment of the simulation. With help of internet, Google Maps and Google Images have become the main source of reference. To make sure the reference that were obtained is reliable, a trip to The Shore Oceanarium, Melaka were made to really capture details that might not be available through secondary sources. The layout, design and visual were taken note to ensure that the virtual representations would be as true to life as possible.

Figure 3. 12 pictures in The Shore Oceanarium that was taken from the internet

The same research was made for the pilot level as well but unfortunately, a trip to a private hangar cannot be done. This limitation was quickly resolved by observing and studying the hangar exterior from outside the Melaka International Airport located in Batu Berendam, Melaka. This approach provided sufficient visual and structural information necessary for the project's needs.

After that, the concepting of the maps begin to act as the inspiration kicks in. This involves creating rough sketches and detailed designs for the environments, including their layout, architecture, and other details. Big amount of creativity was used to envision the virtual world and create a visual representation of the environment. This step is crucial in setting the tone for the entire development process and ensuring that the final product meets the desired standards.

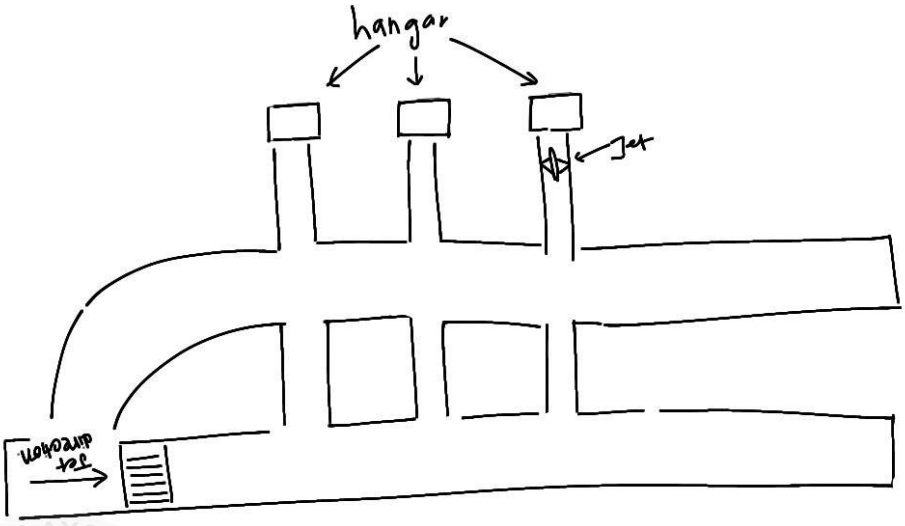

Figure 3. 13 Shows the sketch for Pilot map

Once the concept art is approved, the next step is modelling. This involves using 3D modelling software to create the 3D models of the environments. Blender were chosen as the 3D software as it is free and open-source.

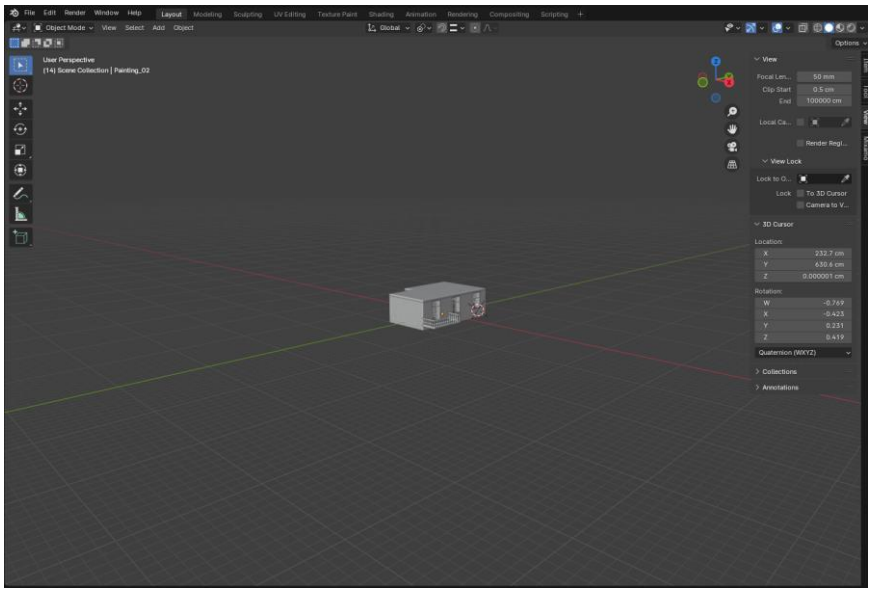

Figure 3. 14 Shows blender workspace

3D Characters

The creation of the character that will essentially be the player were made by leveraging Ready Player Me platform, a powerful that enables the customization that are needed for the character. The process of making 3D character in Ready Player Me platform can be broken don into the following steps:

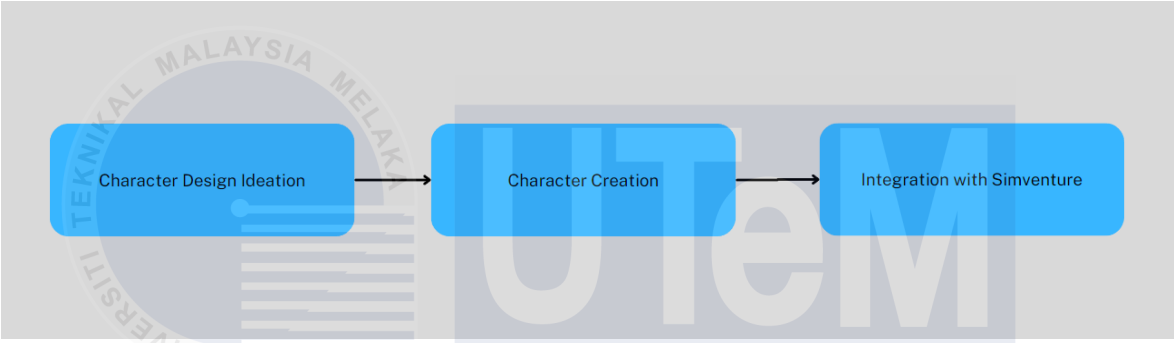

Figure 3. 15 Shows the step in making a character in Ready Player Me

The first step is to establish a clear vision for the characters that will inhabit the Simventure virtual world. This involves brainstorming and sketching out character concepts, considering factors such as age and gender. These initial design ideas will serve as a foundation for the 3D character creation process.

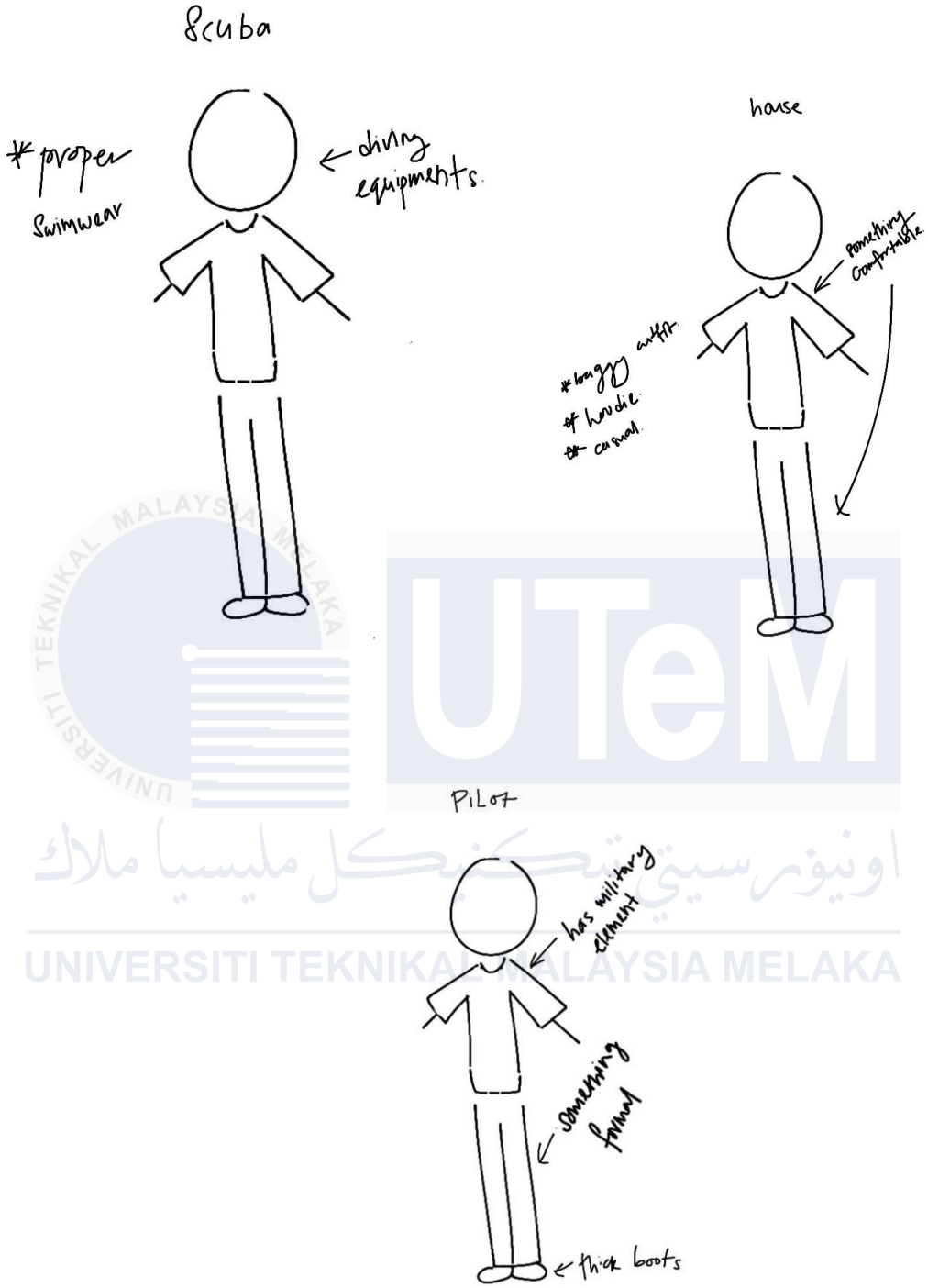

Figure 3. 16 Shows the sketches of what the character would dress according to the level

Using the Ready Player Me platform, the process of making 3D character begins. This involves selecting a base model that aligns with the desired character design, and then

customizing it through a wide range of options, including facial features, hairstyles, clothing, and accessories.

Figure 3. 17 Shows the customization that are available in Ready Player Me

The final step is to export it to .glb file as it's the only option that is available now. This process requires the conversion of the file type as Unreal Engine only accepts. FBX. To do that, the files were imported into Blender, a free and open-source 3D computer graphics software tool. From there, the files are exported back as .FBX by clicking the "Export as" button in Blender. This way, the files now are in .FBX format and ready to be import in Unreal Engine.

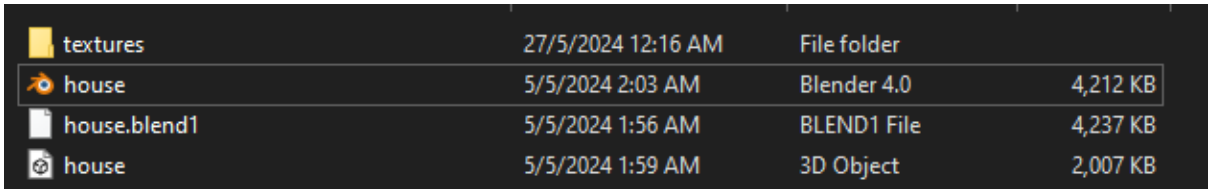

Figure 3. 18 Shows the file that are needed to make one character in this simulation

Sound

For a comprehensive 3D simulation, sound is very a crucial expect that lets the player immerse in it. It plays a vital role as it provides the auditory cue that enhances the overall realism and engagement.

As for instance, the sound that were used in this project mostly are sourced from various online platform, mostly Youtube. This way, it allowed the simulation to gain a wide access of high-quality audio for free. Below shows the list of audios that were sourced from the internet:

Table 3. 2 list of sounds that were used in this project

Source	Name	Category	Description
Youtube	Dosi & Aisake - Cruising | Lofi | NCS - Copyright Free Music	Ambient	Ambient sound at lobby
Youtube	Ambient_Airport	Ambient	Ambient sound of airport level
Youtube	PEACEFUL UNDERWATER Sounds for DEEP SLEEP 🌊 Deep OCEAN ASMR/Ambience	Ambient	Ambient sound of underwater level

Youtube	Air traffic control sound effect	Object Interaction	Radio sound when entering the jet
Freesound	Jet loop 01	Object Interaction	Jet sound when moving
Freesound	computer mouse clicks	Object Interaction	when clicking a button
Freesound	Footsteps sound	Object Interaction	When walking
Freesound	Ding 1	Object Interaction	When pass checkpoint

A meticulous step was taken to ensure the sound were played in the right time, syncing with the right event in the simulation. It also ensures that the background music seamlessly transition from one level to another level.

3.5 Development

The development stage of the ADDIE approach signifies a shift, from the framework of design to the actual creation of educational materials. In the context of the Simventure initiative, this phase holds importance as it involves crafting a simulation that aims to assist high school students in making informed career choices by immersing them in the practicalities of various professions.

Simventure strives to connect students' academic learning with the realm they are preparing to enter. Through simulating a professional's routines across career paths students can explore diverse avenues grasp both the challenges and rewards inherent in each profession

and make decisions grounded in real world experiences rather, than abstract theories. The development phase serves as the moment when Simventures vision materializes turning blueprints into interactive and captivating learning opportunities.

3.5.1 Hardware and Software

In order to start the development phase of this project, both hardware and software are checked thoroughly to make sure there is no problem in that aspect. Below is the list of what hardware and software that were used in this project.

Table 3. 3 List of software that were used in this project

Hardware	Software
Processor: AMD Ryzen 5 4500	Operating system: Windows 10 Pro
RAM: 16GB	Unreal Engine 5.3.2
Graphics Card: NVIDIA GeForce GTX 1660 Super	Blender 4.0.2
Storage: 256GB SDD	ConvAI API
-	Canva
-	Adobe Illustrator 2020
-	Ready Player Me API

3.5.2 Content Development

Unreal Engine allows for the incorporation of components that boost user involvement and educational significance. In Simventure, students have the opportunity to engage with virtual mentors powered by ConvAI, participate in decision making scenarios, and encounter human interactions. These engaging elements aim to replicate real life obstacles and ethical

dilemmas giving students a chance to hone their thinking, issue solving and interpersonal abilities in a virtual setting. Through participation, in these simulated experiences students acquire practical knowledge and build confidence, in navigating the intricacies of diverse career paths.

The content of this simulation was made using the software that were listed in table 3.3. As it stated, this project used Blender 4.0.2 as its 3D modelling software. This software allows the creation of environments and interactive elements that student will engage with. These models, being put together like puzzle pieces, simulate the real-world that were needed in this project thus, providing the necessary immersive experiences to learn. 3D model that were used like the hangar of the airport or the rented house were made with careful crafted, preserving the realistic aspect.

In addition, Canva was used to produce visually attractive info about the fishes for the marine biologist level in Simventure. This professional scenario is designed to immerse students, in the field of biology offering a captivating journey that showcases the duties and daily routines of a marine biologist. Through Canva, infographics featuring fish species and marine life information were crafted. These resources serve both a decorative role in the setting enriching the learning process by presenting easily accessible and visually engaging information.

Within Unreal Engine 5.3.2, these assets were made for the content that will be learned by student's in enriching their career knowledge. Each of it have their own specific role in order to make the experience much more immersive.

3.5.3 Programming

Features and interactions that were planned during the design phase are put into action. Simventure applications main functions are created using Unreal Engine 5.3.2 blueprints and C++. The blueprints feature in Unreal Engine makes game logic development easier as it only requires the developer to connect the nodes provided in the program according to their own ideas.

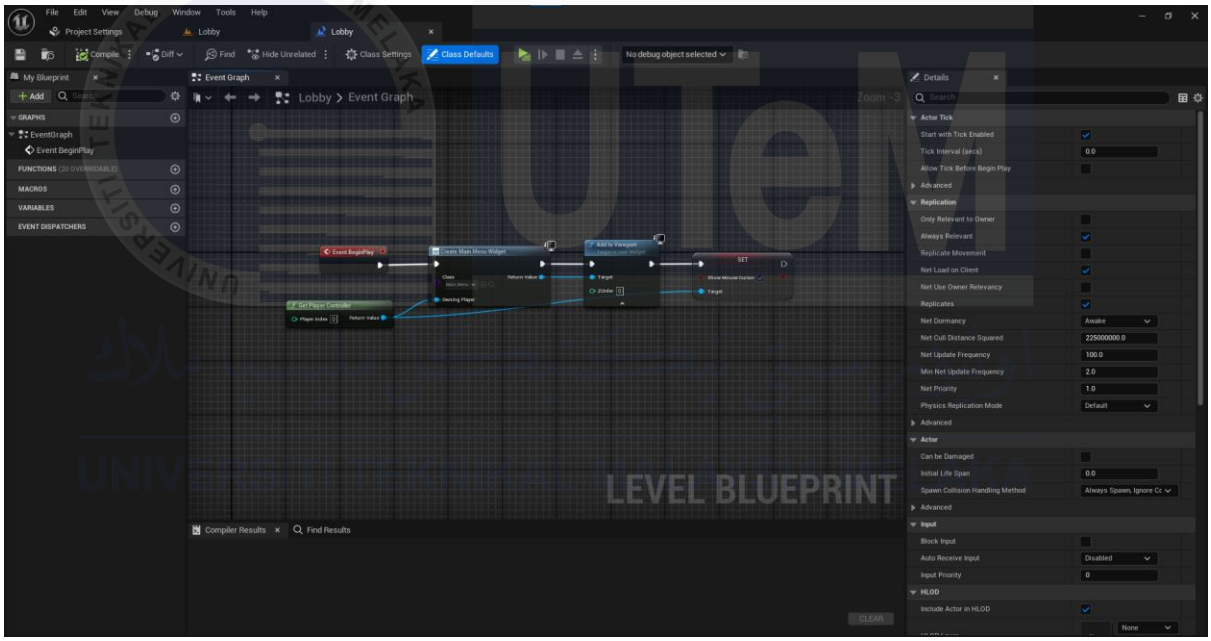

Figure 3. 19 Shows the typical workspace of blueprint in Unreal Engine 5.3.2

Establishing communication among software parts is vital for a seamless user experience. This includes data pipelines and managing real time interactions between the gaming engine, 3D models, AI systems and user commands. Debugging and fine tuning play a crucial role as this phase require the simulation to run seamlessly without any delays or interruptions.

3.6 Implementation

The implementation phase in this chapter will talk about on how to facilitate seamless integration of Simventure in educational environment. Using ADDIE methodology, this phase focuses on communication, environmental adjustment, and training. The following information would explain details of these key components, showing on how they were addressed to ensure successful deployment of Simventure

3.6.1 Communication

Communication are one of the vital steps in ensuring the implementation of Simventure a success. Distribution of comprehensive user guide as well as instructional manuals will be provided. This way, they were able to know what to do when handling Simventure.

3.6.2 Changes in the Physical Environment

The hardware specifications were taken in consideration as Simventure require a robust performance and operation to work smoothly. Computer with a decent build are enough to ensure this simulation work and if not, user could turn down the settings in the option menu but with the cost of lowered value in realism aspect.

A stable internet connection also in the list as Simventure rely on ConvAI API to make the conversation with the virtual mentor seems realistic. In addition of that too, user will require to provide enough space to facilitate the activities to let the student engage Simventure comfortably. With these adjustments, an optimized physical environment was created for Simventure.

3.6.3 Training Delivery

The aim in this step is to provide the educators with the requisite competencies and information in order to make Simventure works. Educators underwent intensive coaching sessions, covering the application navigation, integration with the curriculum and the common resolution if the simulation somehow have a problem. Through such training, educators have a good grasp of the tool and in position to aid the students sufficiently.

3.7 Evaluation

The evaluation phase of Simventure aims to test how well the simulation works, as well as to see the improvement that can be done in here. This involves evaluating the effect of this simulation, constant continuous learning, and integrating evaluation throughout the design within the ADDIE methodology framework.

3.7.1 Formal Evaluation

It is very crucial to evaluate Simventure as it become the evidence of its effectiveness in attaining its academic objectives. This also ensure that this project aligns with its objectives that were set up earlier. There is two evaluation that can be made which is quantitative analysis and qualitative analysis.

The method that was used to determine the quantitative analysis was System Usability Scale (SUS), a method developed by John Brooke in 1986. This method is a widely recognized questionnaire to evaluate the user experience in handling a product or a system. 10-item questionnaire with 5-point Likert scale for feedback response, from “Strongly Disagree” to “Strongly Agree”, were designed to capture different areas

of the system such as usability, ease of use, complexity, and how confidence the tester can use the product or system.

Calculating scores for SUS can range from 0 to 100. It involves a straightforward method to determine the scores but it needs to be done carefully as more participants answer the SUS, more complicated it can be because a lot of numbers can cause confusion during the calculation. Also, because of how the SUS questions alternate between bad and good to obtain more accurate responses, calculating the scores can be difficult as the odd-numbered questions have different way to calculate and so do the even-numbered questions.

1	2	3	4	5
Strongly disagree	Disagree	Neutral	Agree	Strongly agree

Figure 3. 20 Shows the corresponded score for Likert scale

For odd-numbered questions, add up the scores then subtract it with 5. For example, let's say that the total score for odd-numbered questions is 23, the calculation will then look like 23-5. Therefore, the total score for odd-numbered questions will be 18. For even-numbered questions, add up the scores too but this time, subtract the total scores with 25 to get the results for even-numbered questions. For example, if the total add-up score for even-numbered questions is 14, the calculation would look like 25-14. Therefore, the score for even-numbered questions is 11.

After calculating the even and odd scores, add up both scores to get the result of all 10 questions. Next, multiply the total of the results by 2.5 and that is the final score for the questionnaire. To illustrate the process of this calculation, an example of the table for SUS score calculation was presented below. P in the first column would represent the participants.

Table 3. 4 Shows example of how SUS score table calculation would look like

No.	**Q1**	**Q2**	**…**	**Q10**	**Scores**
P_1	4	1	…	1	22
P_2	5	3	…	3	24
…	…	…	…	…	…
Average SUS Score					…

To get the mean SUS score, add all final scores and divide them by the number of participants who answered the SUS survey. The result of this is the score for the project. On average, the score would be 68. If the score is above the average, it means the product is in good performance but if the score is below average, it means that the product requires a lot of improvements to provide the best experience to the users. Below is the general guideline on SUS score interpretation.

Table 3. 5 Shows the general guideline on SUS score interpretation

mean SUS score	Grade	Rating
Above 80.3	A	Excellent
68 – 80.3	B	Good
68	C	Average
51 - 68	D	Poor
Below 51	F	Awful

For qualitative analysis, it was done with the help of experts who have experience and qualifications in the related field. These experts would evaluate the products and give their feedback in qualitative analysis on how they can be improved, some insights on the problem that occurs during the experience, and motivation to keep the momentum going on.

3 experts were consulted in University Technical Malaysia Melaka (UTeM) in which 2 of them are lecturers from the Faculty of Information and Communication Technology (FTMK) who have expertise in terms of its technicality and 1 of them are lecturer from Center of Language Learning (CeLL) who has expertise in the education field. Another expert is the counselling teacher for SMK Munshi Abdullah, which has expertise in counselling.

A set of questions based on the User Experience (UX) dimensions were presented to the experts for them to answer using their experience after using Simventure. The Likert scale, from “Strongly Disagree” to “Strongly Agree”, was used to obtain the data and opinions of the experts. Below are the questions that were asked in the questionnaire.

Table 3. 6 Shows the questions that were asked in the expert evaluation questionnaire

No.	Questions
1	Does "Simventure" offer an engaging and interactive experience for high school students?
2	Are the game mechanics in "Simventure" effective in helping students explore career paths?
3	Is the user interface of "Simventure" intuitive and user-friendly for high school students?
4	Do the visual and audio elements in "Simventure" enhance the overall learning experience?
5	Does "Simventure" effectively balance educational content with engaging gameplay?

3.7.2 Continuous Learning

The long-term success of Simventure relied on establishing a culture of ongoing learning and enhancement. Therefore, loops of constant feedback were made to gather all of the user that were involved to give their views and experiences that they had undergone. The feedbacks that were received will went to a systematic review aim to improvise the simulation continuously. Constant update to the user will let them keep up with the newly added features that can help them integrating Simventure into the curriculum.

3.7.3 Integral Part of Each Step

The integration of evaluation at every step of the project make sure that it is an ongoing activity as opposed to be a one-time event. Pilot testing was carried out during the design and development stages to collect preliminary information as well as to enable continuous improvement processes through iterations. Such an approach enabled the process of improvement to respond promptly to users' feedback hence guaranteeing that the last deliverable met both learners' needs and teachers' expectations. Doing so helped ensure a high standard of both quality and relevance throughout the project lifecycle as evaluation would be continuously integrated.

3.8 Limitation of Proposed Methodology

Even while, the ADDIE methodology offers a strong framework for developing and executing simulation such as Simventure, it is important that some of these shortcomings be acknowledged to ensure a comprehensive understanding of the project's potential constraints. These include the following ones:

Time Constraint

The ADDIE method is time-consuming because it consists of a step-by-step and comprehensive way of doing things that consumes too much time. All the phases in the ADDIE design principles entail thorough scheduling, implementation as well as re-examination. This elongated schedule could postpone the finalization of a task especially when one has to keep making new changes due to feedback at any stage

Rigidity in Implementation

It can be difficult to modify ADDIE due to its structured form which may cause rigidity, leading to challenges in integrating with new emerging technologies or methodologies within project

lifecycle that was not planned originally. For example, there could arise some problems while combining these improvements into the design whenever they emerge midway through product development.

Evaluation Challenges

Although the evaluation stage is important for improvements to be made on continuous basis, it can sometimes be difficult to get an honest opinion that is all-inclusive. Critical feedback from teachers or students may fail especially if one wanted a negative comment, also surveys and group discussions may not encompass everything needed since they might not be thorough enough. Besides, determining the level at which intangible results like change in attitude occur or when someone has become more aware about what he/she wants in life is equally tough because these things are intrinsic and cannot be quantified easily.

3.9 Conclusion

This chapter outlines the systematic development of Simventure using the ADDIE methodology, focusing on Analysis, Design, Development, Implementation, and Evaluation phases. It stars with the analysis of the overall simulation; identifying the objectives and learning about the target group. Design and development phase discussed about the advanced software and hardware that are needed to create the educational simulation scenarios and content. Implementation revolved around the rigorous training and deployment that ensures the integration of Simventure in curriculum seamless. Evaluation phase give a result that conclude the simulation impact on it target through surveys, user feedback and analysis of the data obtained. Despite its structured approach, limitation of this methodology exists and need

to be acknowledged. Overall, the methodology facilitated the creation of Simventure that would likely to enhance students' career awareness and decision-making skills.

IMPLEMENTATION

4.1 Introduction

This chapter will illustrate on how the proposed methodology in chapter 3 were implemented in Simventure. Each of the detail of this phase will be presented.

4.2 Analysis

A strong foundation for the project is laid during the analysis phase. In other words, this phase is aimed lucidly at identifying the key factors around the whole idea of Simventure, a simulation that was meant to enhance career maturities of high school students. Through systematic analysis, an outline of the necessary steps was made to ensure our end goal was achieved.

4.3 Design

The design phase of Simventure is crucial in turning the insights and requirements identified during the analysis phase intangible work plans. This stage is mainly about producing the accurate blueprints and specifications that are needed in the virtual world.

4.3.1 Prototype Development

The initial form of Simventure acts as a tester for some ideas before more work goes into it. The design in this stage is very simple and the functionality in this stage is basic.

Figure 4. 1 Shows the initial NPC look in the workspace

Figure 4. 2 The empty house that were used as lobby for this simulation

Figure 4. 3 Pilot's Checkpoint

Figure 4. 4 Assets that were used in pilot map

4.3.2 Style

Style acts as medium to attract the user to be much more indulge in this game as it can sets the mood for the experience. This includes selecting colour scheme that resonates well with the user, enhancing the readability and focus. The aesthetic of this simulation was centralized to a one visual theme, captivating to see and easy to navigate. It also needed to be modern, professional and consistent throughout the project.

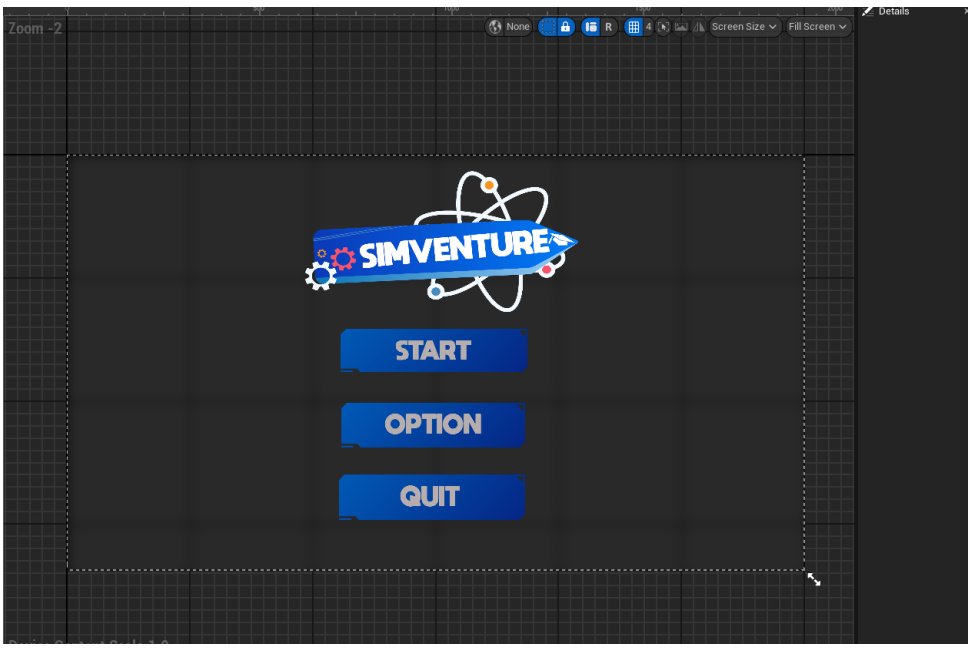

Figure 4. 5 Main menu of Simventure

Figure 4. 6 Level selector for Simventure

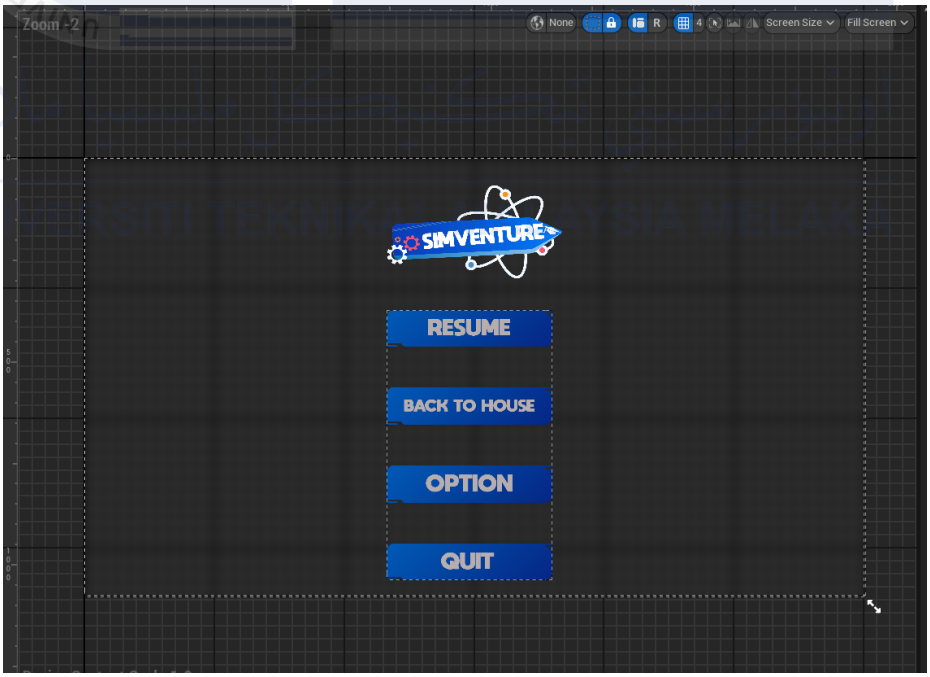

Figure 4. 7 Pause menu of Simventure

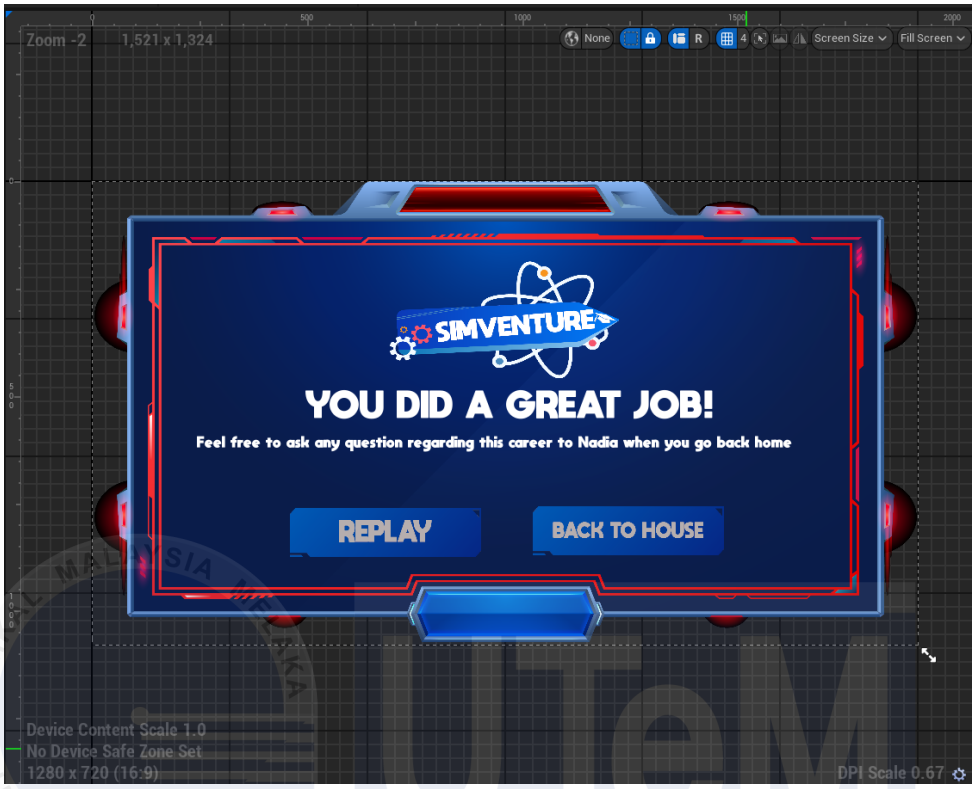

Figure 4. 8 A pop out that indicates the player successfully do their task for the career chosen

Engaging with the users have been the pin point of this project as it the base of this project in making it interactive and engaging. During the development, interactive elements were created to help the users to explore many aspects of this simulation and help them to control the virtual world. The layout of the interface aims to be straightforward and intuitive, allowing users to easily understand it.

4.3.3 NPC Driven by AI

To make it more realistic and interactive, the NPC within Simventure were driven by ConvAI. These NPCs will interact with player, with its realistic feedback, to simulate the real world and adding more depth to the realism aspect of this simulation.

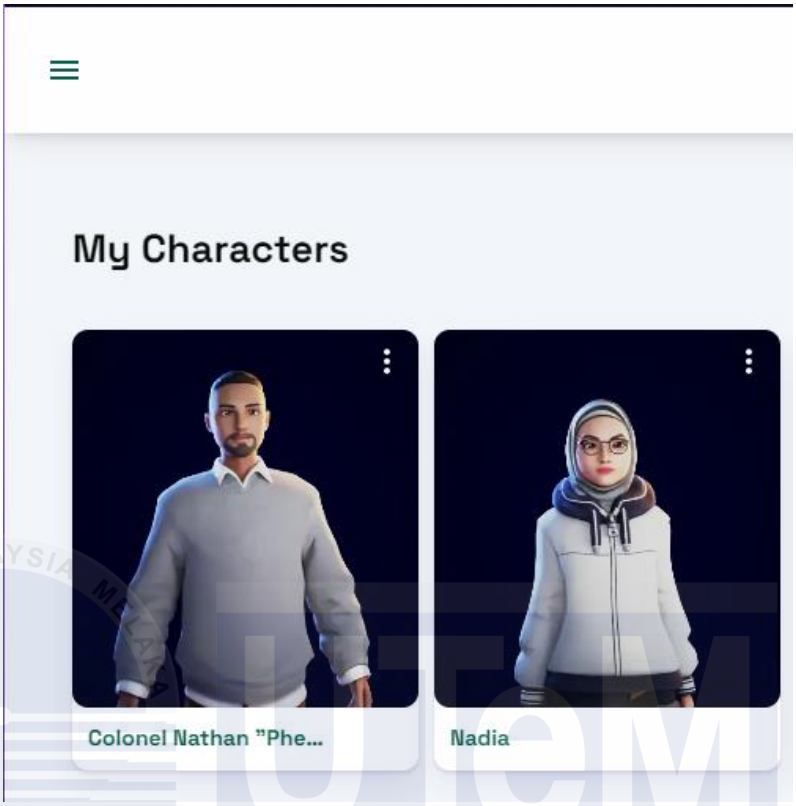

Figure 4. 9 The two NPCs that were made for this simulation

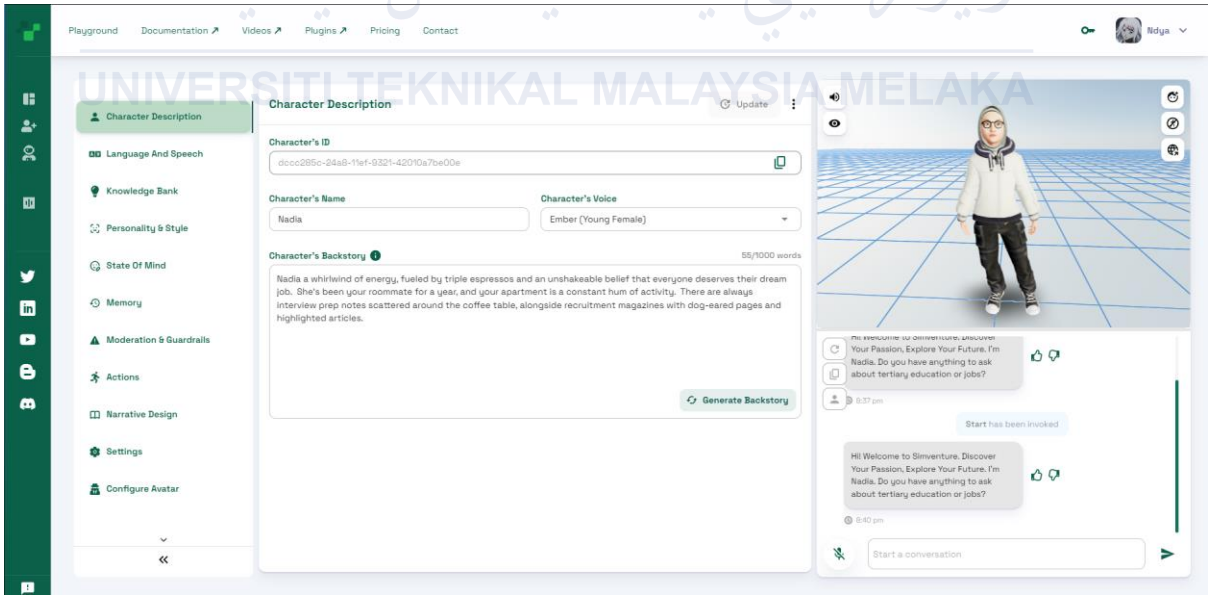

Figure 4. 10 Shows the main console of this NPC

The NPC were designed to answer the questions from player regarding the career path and the simulation that they will experience. Necessary knowledge about it were added in the

knowledge bank in the ConvAI web and it connects it to the NPC. The NPC also were designed to respond to the basic interaction a human can do like talking about favourite food and having a hobby.

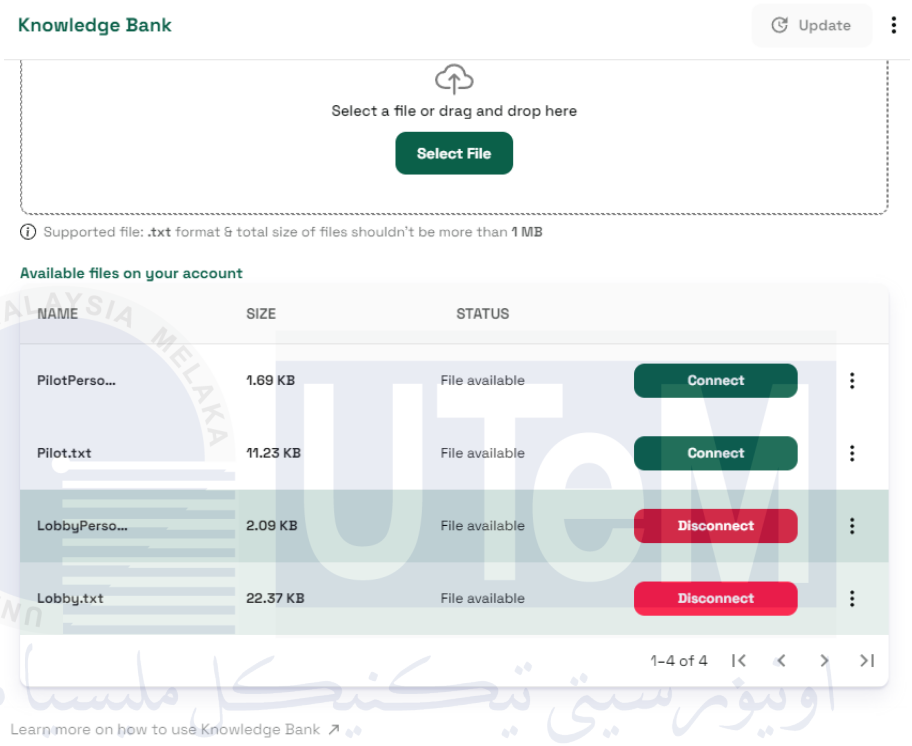

Figure 4. 11 Connected knowledge bank

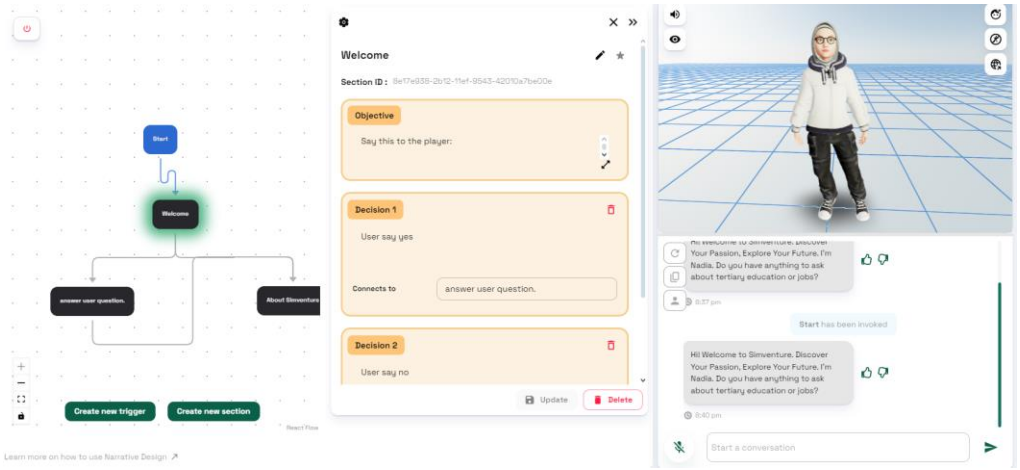

Figure 4. 12 The narrative design menu where the interaction can be plan ahead

4.3.4 Material Collecting

The final key in design phase involves collecting all of the necessary materials to be used in this simulation. This includes the 3D models for characters and environments, libraries of sound that are will be used, and educational content that would be integrated as well in Simventure.

Figure 4. 13 Fishes in Marine Biologist level

Figure 4. 14 Shows the character that were used by the players in different level

Figure 4. 15 part of the sound library used in Simventure

4.4 Development

During the development phase, the ideas and blueprints crafted in the analysis and design stages comes to life. This stage includes of linking the nodes and bringing together parts by parts to create an interactive experience. For Simventure, the focus in this development process is building the simulation setting, adding the functionalities and making sure the NPCs run smoothly to guarantee smooth system.

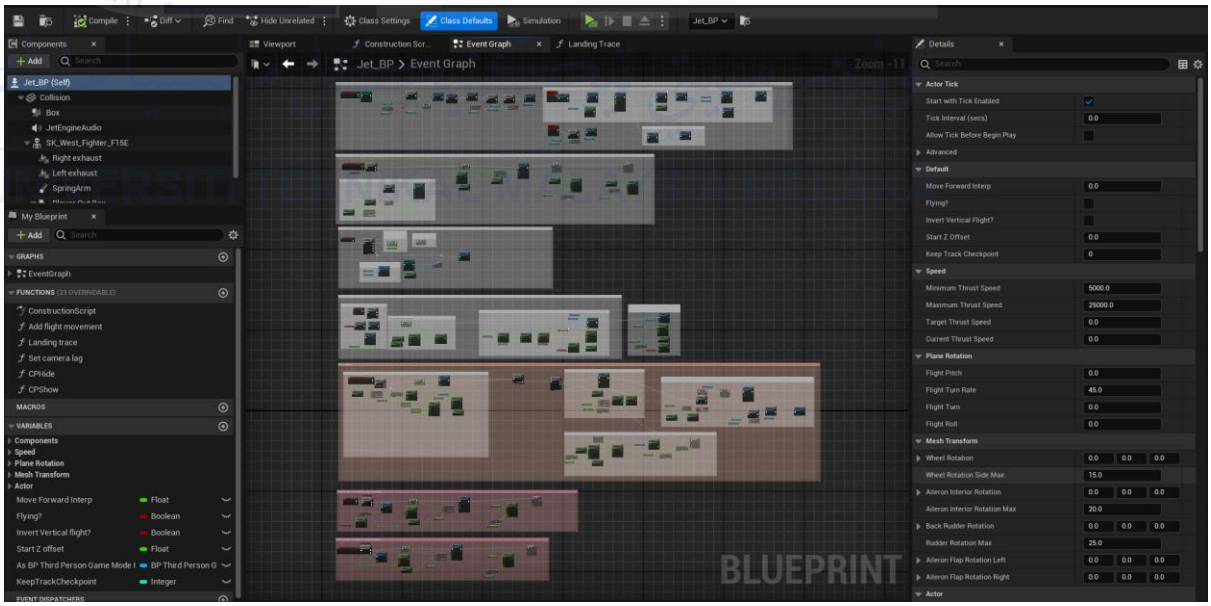

Figure 4. 16 The number of nodes that were needed in jet Blueprint

In figure 4.12, The nodes that were used in order to make the jet acts like a jet is massive. The picture above is only the main part of this blueprints. To achieve the realistic simulation of jet, several complex parts had to be carefully put together. These consisted of physics calculations,

control surfaces, engine dynamics and handling of the user inputs, all of which needed specific node configurations.

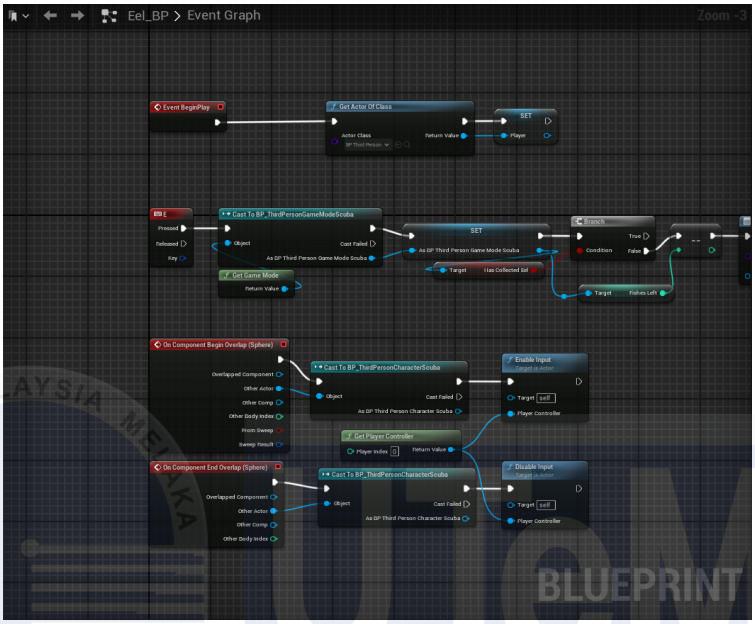

Figure 4. 17 Part of the nodes in one of the fishes

After the development and testing of individual components, they are combined into one system, producing Simventure. In this stage, all parts of the simulation must operate in harmony. The whole simulation program is checked to ensure it runs just like it is intended.

4.5 Summary

Chapter 4 delves into covering the practical steps taken during the implementation of Simventure, in which the main theoretical framework was shifted into a functional interactive simulation. The different aspects of implementation have been outlined and they include project analysis, project design and project development.

TESTING AND EVALUATION

5.1 Introduction

This chapter will cover a detailed process of how the testing for Simventure took place in a high school and what is the outcome of this testing. It will focus on the feedback that was given by the tester through a questionnaire, using System Usability Scale (SUS) to evaluate both users and experts while they are experiencing Simventure on their own. By capturing their responses, a deep understanding of how the system interacts, how effective the system in delivering its messages, how the system can be improved furthermore from the user perspective and so on can be obtained.

5.2 User Testing

User testing is a phase in this project where it is use to evaluate a product. In this case it is Simventure, by letting the target users for this product interact with it real time. The main objective of this phase is to get the first impressions, feedbacks, and understanding the product through the users to obtain the data that can help improve the product futhermore. It really helps the developing process of Simventure in catering the user's needs and behaviour. User testing is a crucial phase where it guarantees the product is user-friendly and meets the taget users expectation.

5.2.1 Process Overview

The user testing is set up in a small high school in Kulai, Johor. SMK Munshi Abdullah was picked as the testing center, with 15 students Form 4 and 1 teacher participating in evaluating the simulation. A room called "Bilik Wawasan" was

provided to make sure that a controlled environment can be achieved, ensuring that the student can focus and uninterrupted during the whole process.

It starts with a briefing session for the students on the purpose of this testing and what they would do later. During this part also, a brief explanation of what Simventure is, the goals of this project, and how it relates on the concerning real-life problems among high-school students nowadays were addressed to them. All of them confirmed that they understood and were excited to test it out.

After that, one-by-one of the students were making their ways to test out Simventure. This first-hand experience allowed them to control their decision, interact with the simulation, asking questions to the AI mentor and a lot of things that they are curious about. Monitorization were done on the side to ensure that they experienced the simulation smoothly.

After all of them played Simventure, the participants were asked to fill in the System Usability Scale (SUS) questionnaire. This step was the crucial part in this testing as it gave inputs and feedback on their experience, particularly about the usability of this simulation, User Interface (UI) first impression, and ease of navigation.

In conclusion, this testing opens up a new perspective on how Simventure can be improved and what features can be added from the genuine feedback that were gained during this phase. A lot of new idea and insights can make the simulation much more realistic and interactive to attract attention from the target users and delivers a high-quality product to them.

5.3 Test Implementation

This part of this thesis will delve into who is the target of this product and its details. Participants will answer a set of questions based on what has been discussed in Chapter 3 after playing the simulation and from there, the feedback will be gathered.

5.3.1 Participants

For quantitative test, a total of 15 students aged 16 years old from 4PA2 class of SMK Munshi Abdullah were selected as playtesters for this as they are free during the testing. 6 of them are boys and 9 of them are girls. A lot of them are new to Personal Computer (PC) games but did play mobile games so they do have some ideas on what to do in the simulation. They all have basic English proficiency but still be able to understand what the NPCs are talking about with some help from their teacher. While for qualitative test, 3 lecturers from University Technical Malaysia Melaka (UTeM) and 1 counselling teacher were chosen as experts. Refer to appendix C for the experts detail.

5.4 Test Results and Analysis

In this section, analysis was done using the data extracted from both quantitative and qualitative evaluations. This data then was used to determine whether the product succeeded in achieving its objective or not. It also serves as a second eye to the developers as it serves as a new perspective for them to make the product even better and to elevate the user experience (UX) even more.

5.4.1 Quantitative Evaluation

15 SUS survey respondents were obtained during the testing in SMK Munshi Abdullah and all of them had experience in handling Simventure before this. The table below shows the data from the SUS survey after they are done answering it.

Table 5.1 Analysis and result for SUS survey done

No.	Q_1	Q_2	Q_3	Q_4	Q_5	Q_6	Q_7	Q_8	Q_9	Q_{10}	Score
P_1	5	1	1	3	4	4	3	2	4	5	55
P_2	4	4	4	3	4	3	4	3	4	5	55
P_3	5	2	5	4	4	5	5	2	5	1	75
P_4	5	1	5	4	4	5	5	1	5	5	70
P_5	4	1	5	3	4	4	4	2	4	3	70
P_6	4	2	4	3	4	3	4	2	4	2	70
P_7	4	4	4	5	4	4	5	3	5	3	57.5
P_8	4	3	3	4	4	3	4	2	4	5	55
P_9	4	3	4	4	4	3	4	3	3	4	55
P_{10}	5	3	4	4	3	3	4	5	3	3	52.5
P_{11}	4	3	3	5	4	3	5	4	3	5	47.5
P_{12}	5	2	3	1	4	5	4	1	4	3	70
P_{13}	5	5	4	5	5	3	5	1	5	2	70
P_{14}	5	1	3	4	3	3	5	2	5	4	67.5
P_{15}	4	3	3	4	4	3	4	2	5	3	62.5
					Total score						932.5
					Mean SUS Score						62.17

With the mean SUS score reaching only 62.17, the results show that Simventure earned a grade of D with poor performance. With these, it is concluded that there is likely some issue with its user experience. Changes and improvements can be done in order to make the score much higher and for this to happen, some insights from the experts are really appreciated to deep down the problem of this product.

5.4.2 Qualitative Evaluation

In here, the results of the evaluation from the experts after experiencing Simventure first-hand were analyzed. Based on Likert scale, 1 indicates “Strongly Disagree”, 2 is “Disagree”, 3 is “Neutral”, 4 is “Agree” and 5 is “Strongly Agree”. Below are the answers from the experts based on the question in Table 5.3.

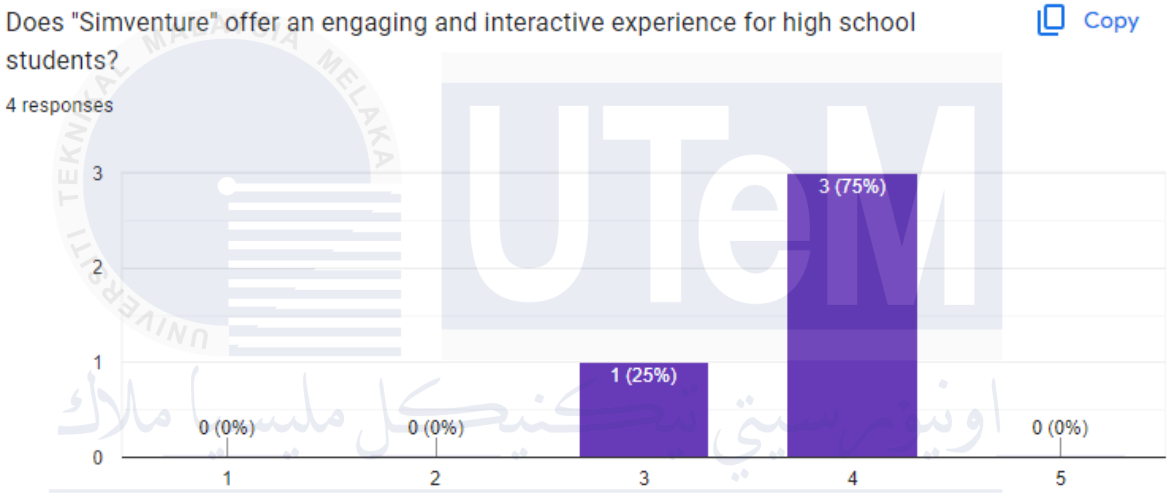

Figure 5.1 Results for 1st question

On the first question, the main focus on this does Simventure offers the engaging and interactive experience to the students. Based on Figure 5.1, 1 expert voted for neutral, and the rest of them voted for agree on this matter.

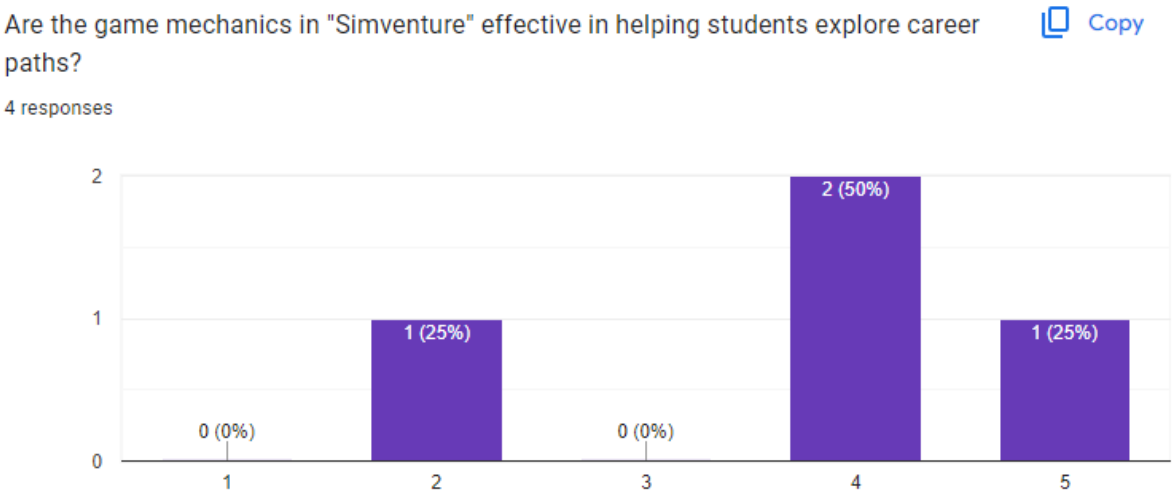

Figure 5.2 Results for 2nd question

The main focus of the second question is whether Simventure's game mechanics were effective in helping students explore more of career paths. 1 of them vote for disagree, 2 experts voted for agree and the rest voted for strongly agree.

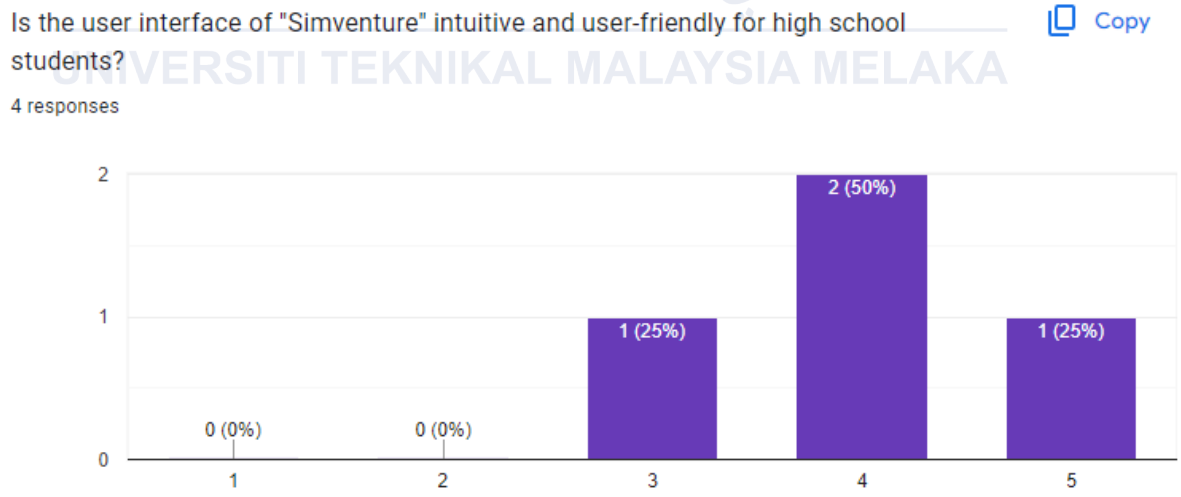

Figure 5.3 Results for 3rd question

Figure 5.3 asks whether the user interface (UI) of Simventure is good for the students. 1 of the experts is in neutral state for this, 2 of them say yes and the rest voted for strongly agree.

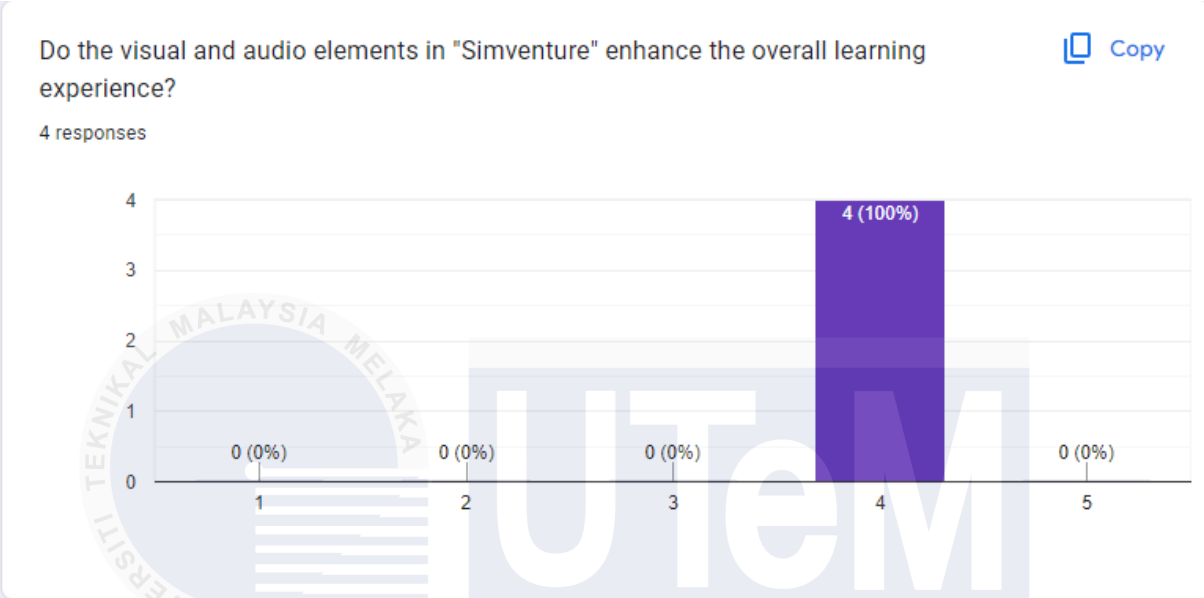

Figure 5.4 Results for 4th question

Based on Figure 5.4, according to all of the experts involved, they agree that the visual and audio aspect of Simventure enhances the whole learning process for the high school students.

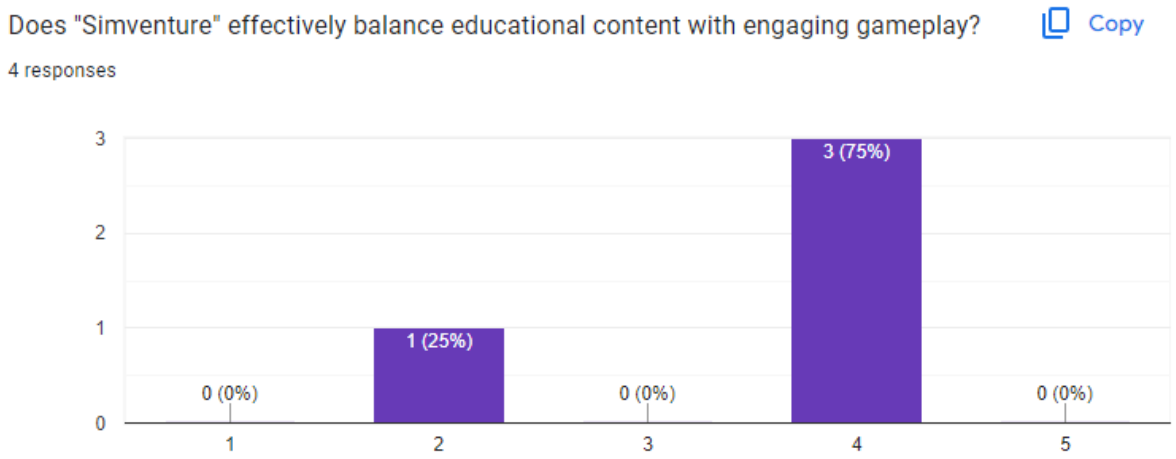

Figure 5.5 Results for 5th question

On the last question, 1 expert voted for “disagree” with this question while the rest say that they agree that Simventure effectively balance educational content with gameplay.

Some of them did give insights on how to solve the problems that they encounter during the expert review session. Expert 1 who has expertise in XR and Game Development shares his perspective and highlights what he thinks is the biggest problem of Simventure.

“Can focus more on generic matter. on tertiary education and career.”

-Expert 1-

He explains furthermore about his statement above by saying that Simventure might not have the information on a niche career path that the students want and might be helpful if the AI mentor in this project explains in an easy way for the students to understand. He also said that the mentor in this game can be improved by adding mouth movement or add some animations to it.

Moving on, expert 2 also shared her input regarding Simventure. Note that expert 2 is someone who has expertise in AI. Below is her feedback.

“Segment the question for the AI according to different student behaviors. By using these behaviors, the AI can produce responses that best suit them.”

-Expert 2-

She suggests to improve more on the AI behaviour and response towards the student based on what the AI can grasp the information about the students individually, based on how the student ask or answer the mentor’s question. She also touched on the topic of making the AI much livelier and more realistic to make the experience better.

For expert 3 who has expertise in educational technology add more suggestions on how to improve the experience. She said:

"Suggestion to improve on audio: video recognition."

-Expert 3-

She added more during the session verbally to look at a few websites that were using voice recognition as their main pivot like TTSFree and Speak and Improve. She emphasizes on this specific topic because of how she got problems while talking with the AI where the AI sometimes get a different input from what she intended to. From what the experts have reviewed, some common problem within this project has been identified and among them are lack of instruction especially in lobby, difficulty in controlling the avatar and general technical bugs occurred during the testing.

5.5 Conclusion

Overall, the testing was meant to see on how the product interact with the audience in early stage. The quantitative test was conduct with direct contact to the targeted users, which is high schools' student. The outcome of this test using SUS questionnaire turns out to be 62.17 and that falls in the "Poor" performance category, suggesting that a lot of improvements need to be done in order to cater users demand on a better user experience (UX). Meanwhile, the qualitative test was done by asking related field experts to try Simventure first hand and share their opinions on it. Many feedbacks were gathered and a lot of them are positives and encouragement from the experts. But many aspects of the simulation design needs to be improved just like it has been discussed in this chapter.

CONCLUSION AND DISCUSSION

6.1 Introduction

Entering this chapter, the summarized version of the prime findings from the study was analyzed to provide a thorough discussion of the results. The analysis of it was used to identify the strengths and weaknesses of this project as well as the limitations of this study. This gives an opportunity to explore more in depth in order to contribute to the existing body of knowledge.

This chapter also will state the improvements that can be made to elevate the project to new height for it to achieve the objective that were set earlier. Last but not least, through discussion, the contribution of Simventure in the future will be highlighted in hope that it can provide a deeper understanding of the impact and effectiveness that it can leave on high school students.

6.2 Observation of Strengths and Weaknesses

A few points from Simventure can be taken after the development and testing has been done and can be categorized between its strength and weaknesses. Understanding these aspects is important to evaluate the whole product in terms of effectiveness.

6.2.1 Strength

1. **Engaging and interactive experience**

Looking back at how the high school students react while playing Simventure proves that this project does attract their attention and interest in learning more about new career paths. They were excited when they knew that they can interact with the AI

mentor just like how they talk to another person in the real world. The realistic aspect of Simventure managed to capture their interest throughout the simulation.

2. User-friendly interface

The first thing right after opening Simventure is the main menu where the high school students have no problem reading and navigating through the experiences. It allows them to focus on the content rather than how to use the product. The consistency in design also helps big time because of how uniform all of the user interface is, they managed to quickly recognize the interactive elements and reduce the cognitive load.

3. Effective use of multimedia

Visual and audio play an important role in making the simulation feel real. This is to help them feel that they are experiencing it first-hand. Leveraging this aspect is an important part of how to make them feel much more interested in their future thus achieving the objectives of this project. Background noises are a big aspect of this as well as it contributes to making this realistic. Because of how it was put together strategically to set the tone and atmosphere of different scenarios, it makes it less suffocating and pressuring but instead, the students could roam around and explore more of the environment.

Infographics and visual aids helped in making the simulation a smooth experience as it helps in making the information easier to retain for the high school students. Lots of pictures and realistic graphics in the product help them to delve into it more. One thing that can be noticed during the testing is how information presented to them is very important and that causes them to learn much better.

6.2.2 Weaknesses

1. Technical issues and performance problems

One of the downsides of using Unreal Engine and making it as realistic as possible is that it requires a high-performance laptop and a lot of the high school students do not have that. Even with low settings, the simulation sometimes freezes and it messes up the experience for the students. This causes frustration and may disrupt their interest, potentially deterring them from fully engaging during the learning process. Other technical issues like bugs or the character got out of the map were also reported during the testing. These types of issues need to be fixed as soon as possible to prevent them from breaking the simulation experience.

2. Limited choice of career simulation

For now, the only career choices that have simulation are pilot and marine biologist. With only these two, the students have a very limited choice of simulations that they can experience. Sometimes, it does not cater to their interest as these two do not align with their interest. This also prevents them from getting first-hand information about the job they asked for from the AI mentor in the lobby. A lot of suggestions from them are about making more jobs available in the simulation and a broader array or career choices in the simulation are the only solution for this problem so that it continues to gain student interest this whole simulation walkthrough.

3. Accessibility limitation

The limitation of this simulation having only one language and that is English makes it a bit harder for the students who have a limited understanding of this language. Although the AI mentor in this simulation could practically change their language, the instructions and the user interface are still in English. They need some assistance ready for them to understand the content itself. Improving this aspect of design is important as it could exclude intended users who are non-native speakers or just have a limited amount of understanding of that language. Other than that, the text-to-speech functionality in this simulation is a bit problem because of how sometimes it cannot register the intended prompt as it should. This can disrupt to the whole realistic aspect of this simulation.

6.3 Proposition for Improvement

To elevate the simulation experience more into a higher level of quality, based on the suggestions that were given during the expert reviews and also inspiration from outside, it can be concluded to:

1. **Making the scope in ConvAI's data bank much more generic matter**

   Just like how it was suggested by Expert 1, the data bank can be refined more by making it more generic and suitable to all high school students as it will cover the basics that were needed for the student to step into the next phase in their life. If possible, make it visual as it can convey the messages much more clearly and easier to retain. Pack it up with a lot of information about tertiary education in Malaysia first and customize it to the liking of individual students as all of them have different passions.

2. **Improving the mentor AI overall**

This improvement is one of the top priorities because of how it contributes greatly to the realistic aspect of this simulation. For now, the mentor is only standing still and has no

mouth or eye movements. This disrupts the realistic experience because that is not how a normal human being behaves. The mentor also does not have any uses outside of the lobby. A lot more improvement can be made here. Some suggest that it is better if the mentor could guide us the whole game and no need for another mentor. Others said that more animations on the mentor need to be added. For example, the mentor's eye and mouth can be moved, the mentor can walk with students in the lobby, or the mentor can express their emotions by having more poses while answering students' questions. This solves the problem and elevates the realistic experience even more.

3. **Improve guidance and feedback**

When the student first spawns in the lobby, there is no clear instruction about what to do or where to go. This leaves them hanging and frustrates them but after exploring a bit more, they get the ideas after interacting with the mentor. The build-up frustration could cause them to lose interest quickly and to prevent that from happening again, a step-by-step guide need to be added in the early game so that the students know what they have to do. In here, a full walkthrough of functionality, features, controls and objectives can be explained to provide a clear simulation flow to them. This could make them much more confident in handling Simventure by themselves.

Other than that, the way the mentor guides the students by asking question to them can be improved. By using the objects around the house, this trivial quiz can be a lot more fun. For example, the mentor could ask the student to pick one painting around the house and analyze this student's interest based on what they choose. This type of quizzes can make this session much more engaging and less boring to the students and improve the overall experience.

4. **Add more career simulation choices**

The current version of Simventure only provides two options for job simulation to the students and this becomes a clear problem when the students ask for more choices so that they can explore more exciting paths. This could simply be solved by having different types of industries that are relevant and highly in demand in this technology era like engineering, computer science, renewable energy, or digital marketing. This could help the students to be prepared parallel with what the career world wants.

6.4 Contribution

Simventure has made significant contributions in reviving the students' interest in career paths. First of all, Simventure makes exploring a career much more engaging by giving the students first-hand experience in a safe environment where they can make mistakes and learn from them without worrying about big consequences on top of them. This can prepare them for the real world where slight mistakes can cause problems. Second, this project has introduced them to AI where in the future, AI will become a big helper, especially in the technology industry.

After that, Simventure does a great job of demonstrating an effective way of learning through educational technology. By using current trends of learning, the students had fun while gaining new knowledge. This increases the chance for them to retain the information much longer and better in the hope that technology-driven learning experiences could be the future of Malaysia.

6.5 Conclusion

To conclude, this project has been a challenge to complete but that journey is what makes this learning fruitful. Simventure has been a wonderful experience in the game development realm where almost everything is new—drawing from personal experience of having difficulties deciding what to be in the future, hoping that Simventure could be a useful tool for the future generation. While delivering an engaging and interactive simulation, the main objectives that were stated in introduction has been successfully achieved.

A lot of things need to be improved in the future because of how many technical issues and bugs happened while using Simventure but that does not mean the learning process stops there. As future updates are coming and lots of new APIs emerge from this rapid technology advancement, it's a guarantee that Simventure could provide a better experience for the students, and with that Simventure will continue to evolve and meet the diverse needs of students, helping them step into their next phase of life.

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APPENDICES

Appendix A: SUS Survey

System Usability Scale (SUS)

This section gathers your opinions on the usability and effectiveness of the Simventure system. Your responses will help us improve the simulation's design and functionality for future users.

1. I think that I would like to use Simventure frequently

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly Agree

2. I found that Simventure is unnecessarily complex

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly Agree

3. I thought Simventure was easy to use

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly Agree

4. I think that I would need the support of a technical person to be able use Simventure.

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly Agree

5. I found the various functions in Simventure is well integrated

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly Agree

6. I thought there was too much inconsistency in Simventure.

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly Agree

7. I would imagine that most people would learn to use Simventure very quickly

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly Agree

8. I found Simventure very cumbersome/ awkward to use

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly Agree

9. I felt very confident using the Simventure.

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly Agree

10. I needed to learn a lot of things before I could get going with Simventure.

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly Agree

Appendix B: Expert Evaluation Survey

Expert Evaluation

This is a project dedicated to helping high school students discover their ideal career paths. Your feedback is crucial in enhancing the effectiveness and impact of this program. Please take a few moments to evaluate the following aspects of the project. Your expertise is greatly appreciated.

* Indicates required question

1. Full Name *

2. Expertise In: *

3. Does "Simventure" offer an engaging and interactive experience for high school students? *

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly Agree

4. Are the game mechanics in "Simventure" effective in helping students explore career paths? *

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly Agree

5. Is the user interface of "Simventure" intuitive and user-friendly for high school students? *

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly Agree

6. Do the visual and audio elements in "Simventure" enhance the overall learning experience? *

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly Agree

7. Does "Simventure" effectively balance educational content with engaging gameplay? *

Mark only one oval.

	1	2	3	4	5	
Stro	◯	◯	◯	◯	◯	Strongly Agree

Appendix C: Experts Information

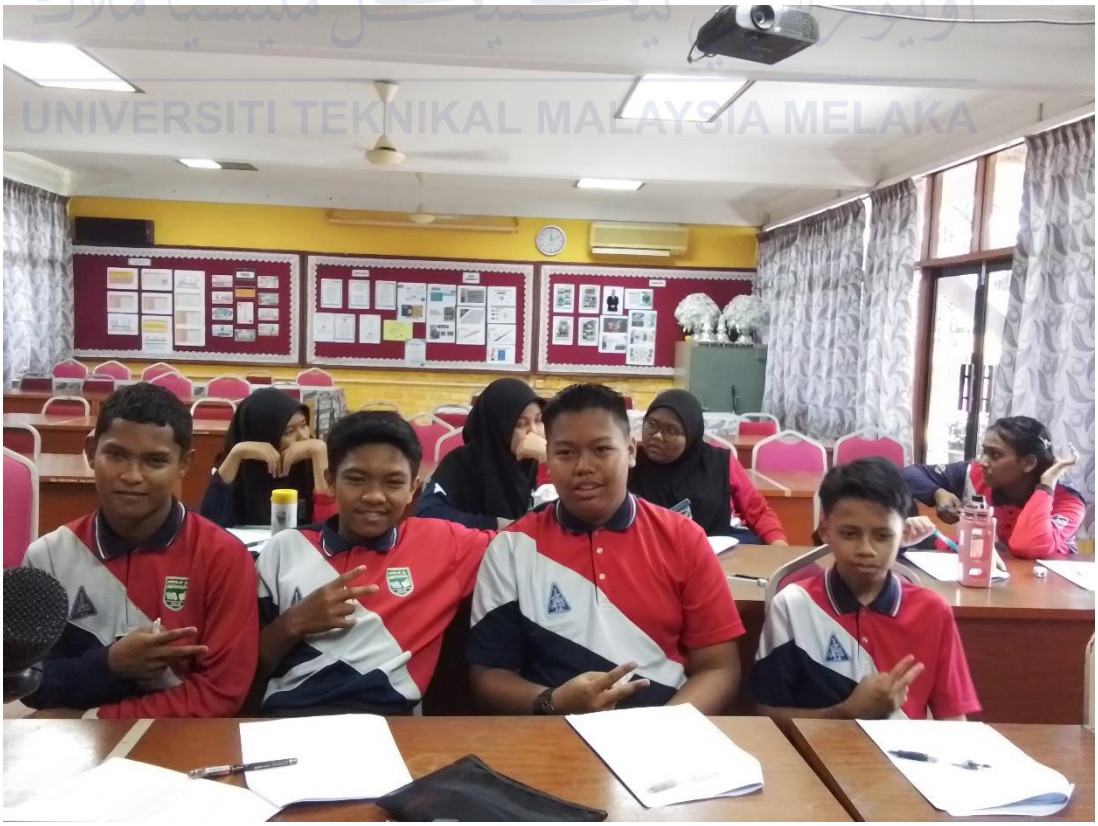
Name:	Nazreen bin Abdullasim
Expertise in:	XR and Game development
Position:	Lecturer
Organization:	University Technical Malaysia Melaka (UTeM)

Name:	Asniyani Nur Haidar Binti Abdullah
Expertise in:	AI
Position:	Lecturer
Organization:	University Technical Malaysia Melaka (UTeM)

Name:	Dr. Linda Khoo Mei Sui
Expertise in:	Educational technology
Position:	Lecturer
Organization:	University Technical Malaysia Melaka (UTeM)

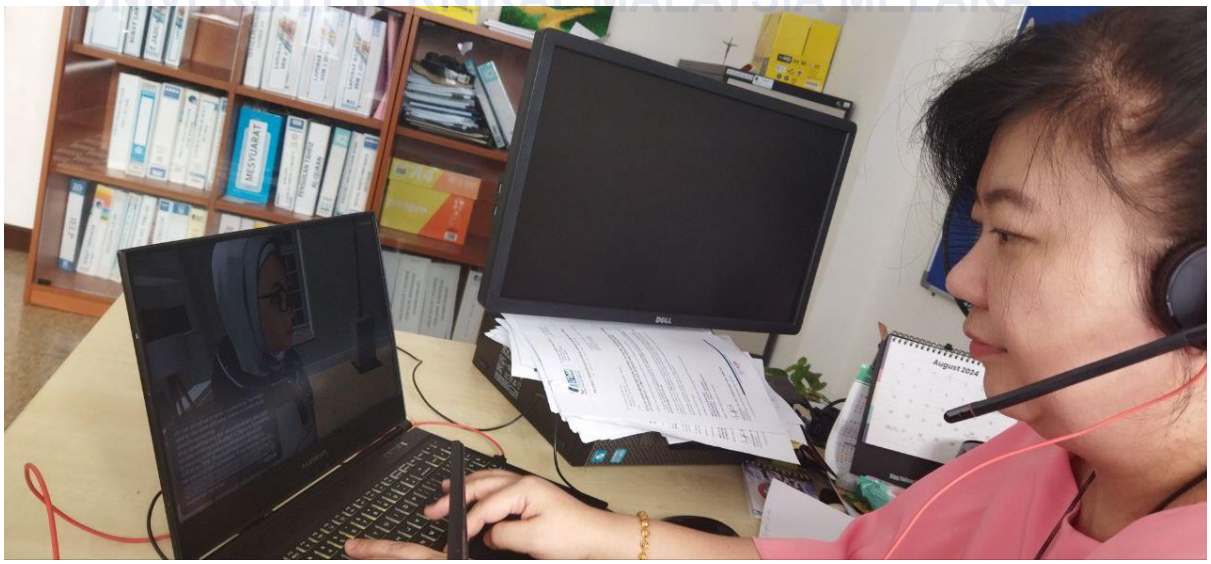
Name:	Nurulhana Binti Md Yusof
Expertise in:	Counselling Education
Position:	Counselling Teacher
Organization:	SMK Munshi Abdullah

Appendix D: Testing at SMK Munshi Abdullah




BLACK ROCKFISH

Appendix E: Expert Evaluation



Appendix G: Paperwork for testing

KERTAS PERLAKSANAAN KAJIAN KES

Tarikh:

6 Ogos 2024 / Selasa

Anjuran Bersama:

Unit Bimbingan dan Kaunseling SMK Munshi Abdullah

1.0 Pengenalan

Projek "Simventure" menggunakan pendekatan berasaskan penyelidikan yang menggabungkan teori perkembangan kerjaya dan analisis data untuk menyediakan alat dan sumber yang boleh membimbing pelajar dalam proses pemilihan kerjaya. Kajian terdahulu menunjukkan bahawa pendedahan awal kepada maklumat kerjaya yang komprehensif dapat meningkatkan kesedaran pelajar terhadap pilihan kerjaya dan membantu mereka membuat keputusan yang lebih baik. Dalam usaha untuk mencapai matlamat ini, kajian kes bakal dijalankan di Sekolah Menengah Kebangsaan Munshi Abdullah. Melalui ujian ini, data empirikal akan dikumpul untuk tujuan penyelidikan. Data yang diperolehi akan dianalisis untuk menilai keberkesanan projek "Simventure" dalam membantu pelajar membuat keputusan mengenai kerjaya mereka di masa hadapan.

2.0 Objektif

Projek ini diadakan dengan objektif untuk:

2.1 Mengkaji bagaimana platform *first-person* digunakan untuk penerokaan kerjaya mempengaruhi pilihan kerjaya graduan sekolah menengah.

2.2 Membangunkan platform *first-person* yang menarik dengan pelbagai simulasi kerjaya yang akan membantu pelajar mempelajari kemahiran pekerjaan secara langsung.

2.3 Menilai bagaimana platform *first-person* meningkatkan minat dan penglibatan pelajar dalam meneroka pelbagai laluan kerjaya.

3.0 Tarikh, Hari dan Masa Pelaksanaan

6 Ogos 2024 (Selasa), 11.30 pagi

4.0 Kumpulan Sasar

15 pelajar tingkatan 4

5.0 Aktiviti

Masa	Aktiviti
11.30 – 11.35	➢ Ketibaan pelajar dan guru berkenaan
11.35 – 12.25	➢ Pengenalan "simventure" kepada pelajar ➢ Penerangan cara bermain dengan simventure ➢ Ujian secara individu dengan pelajar ➢ Pengedaran kertas survey kepada pelajar untuk isi.
12.25 – 12.30	➢ Penghargaan kepada pelajar dan guru yang terlibat ➢ Penutup dan bersurai

6.0 Penutup

Dengan berakhirnya sesi ujian ini, diharapkan projek "Simventure" dapat memberi impak positif dan membantu pelajar sekolah menengah dalam membuat keputusan kerjaya yang bijak dan bermaklumat.