COMP3180 – Final Project Report

Name: Dylan Wijesinghe
Student ID: 47292105
GitHub Username: DylanW-MQ

Table of Contents

1   Project Deliverables

My aim for the project is to create a template concept for the Action RPG genre in virtual reality for future developers to pick up, and analyse the user experience to locate the demands and expectations of the genre from the base template.

1.1   Unity Project (Portfolio Piece 1)

GitHub:
https://github.com/COMP3180-24s2/final-project-DylanW-MQ/tree/main/VR%20RPG%20Test

APK:
https://github.com/COMP3180-24s2/final-project-DylanW-MQ/blob/main/ActionRPGVRTemplateBuild.apk

A **Unity Project** containing a template implementation of the Action RPG VR concept. The template features three main mechanics:

- Movement – Continuous Movement and Turning
- Weapon Handling – Sword with Damageable Objects
- Battle System – Health System and Enemies

It also includes simulation scenes, each focusing on a game mechanic, which can be found in Scenes/Simulations. Figure 1 shows an in-game view of simulation part 3 that focuses on the battle system mechanic.
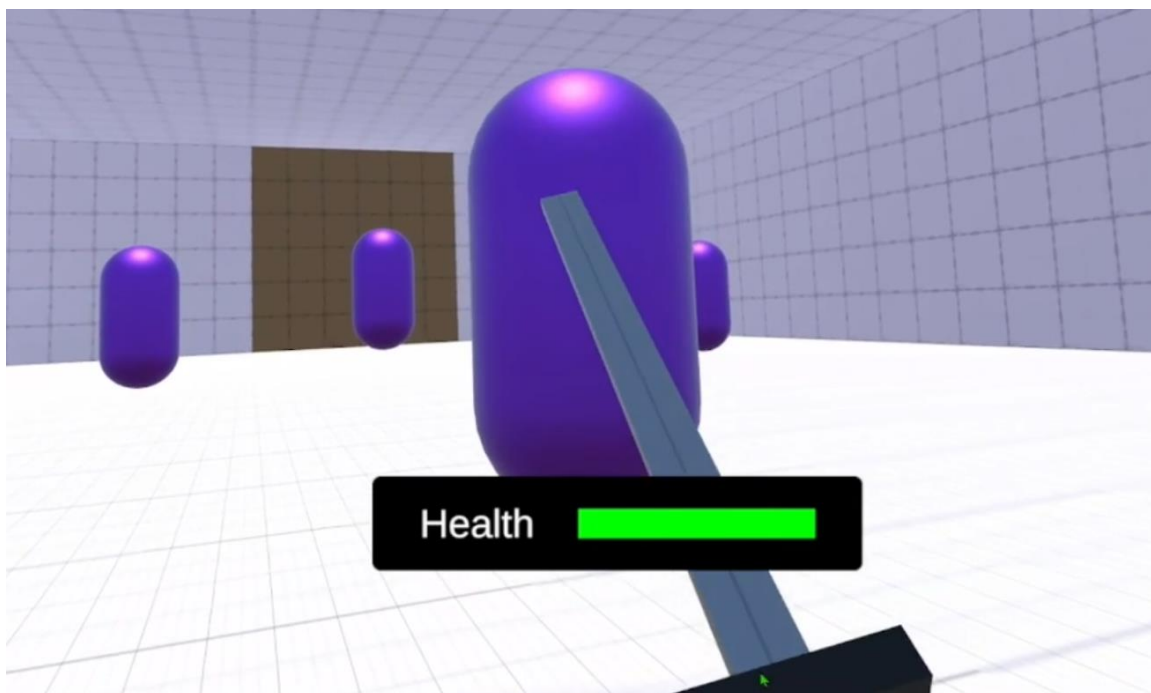

Figure 1: The game of the battle system simulation.

1.2   Game Design Document (Portfolio Piece 2)

https://github.com/COMP3180-24s2/final-project-DylanW-MQ/blob/main/documents/Action%20RPG%20in%20VR%20-%20Game%20Design%20Document.docx

The Game Design Document essentially documents the Action RPG VR template describing the objective, assets used, and main mechanics. This document is supposed to assist future developers in creating their games of the genre when picking up the template.

1.3 Games User Research Report (Portfolio Piece 3)

https://github.com/COMP3180-24s2/final-project-DylanW-MQ/blob/main/documents/Action%20RPG%20in%20VR%20-%20Games%20User%20Research%20Report.docx

The Games User Research Report documents the user experience based on the methodology for evaluating and has an analysis of results describing positives, negatives, and suggestions. More details on the report will be summarised in Section 3.

1.4 In-Game and GUR Demonstration Video (Portfolio Piece 4)

https://github.com/COMP3180-24s2/final-project-DylanW-MQ/blob/main/videos/Action%20RPG%20in%20VR%20-%20Demonstration%20Video.mp4

This video shows the demonstration of the Action RPG VR template and an explanation of the Games User Research evaluation.

1.5 Evaluation Data

https://github.com/COMP3180-24s2/final-project-DylanW-MQ/tree/main/evaluations

Forms:
https://github.com/COMP3180-24s2/final-project-DylanW-MQ/tree/main/forms

The evaluation data contains all the data from the consent form, surveys, and questionnaires from 8 participants. The survey spreadsheet contains detailed responses on game mechanics, the questionnaire spreadsheet contains scoring responses based on PENS and a consent spreadsheet contains demographic information. Links to the forms are also saved in the forms folder. More details on data will be summarised in Section 3.

Also, a note about the change from surveys, questionnaires, and interviews:
Surveys acted more like interviews, asking questions and gaining feedback. In the end, interviews were not considered in the deliverables, and instead only focused on demographics, surveys, and questionnaires.

2 Milestones

2.1 Up to Week 7

The first seven weeks were spent studying RPGs in virtual reality. It was discovered that due to complexities in VR projects compared to desktops according to Matteo311. Eventually, I created a list of deliverables.

2.2 Week 8

Looking back at the deliverables, I have realised that the work in completing the Unity project was too overwhelming and had many unnecessary features that hardly count as user

experience, and more so turning into a game. As such, I scrapped half of the features in the Unity build and left those that are important. Other than that, no progress on the Unity build was made.

2.3   Mid-session break

Due to COVID isolation for at least over a week, I unfortunately made little progress throughout the two weeks of break. I created a new Unity project using the XR template. A video footage was also recorded during the first playthrough of using Meta Quest 2 in Unity as seen in the videos folder with the file named FirstTimeInVR.

2.4   Week 9

A questionnaire form was created under the PENS guidelines which is scored based on Competence, Intuitive Controls, and Immersion.

I had delays in proceeding through the project due to complications with how the Locomotion Mediator works, leading to making some of the features as stretch goals such as ranged enemies and a health system.

2.5   Week 10

A test scene was created in Unity to test VR features which led to the defaulted controls for the simulation. Other functionalities have also been created alongside the test scene such as the sword, the health system, and melee enemies.

2.6   Week 11

Enemies were finally able to move and chase the player when they got close.

Afterwards, three scenes were created as a three-part simulation that focused on each mechanic per scene. Once all scenes were complete, they would be sent to a scene to congratulate them and request to take off the headset.

A survey form was created by the end of the week.

2.7   Week 12

Another form was created as a consent form for participants to sign and enter demographic information when needed.

I then ran playtests to evaluate the project, and it was working seamlessly. Not many participants were evaluated in the simulation, but in the end, I managed to get 8 participants by the end of the week.

The Game Design Document was created by the end of the week.

2.8   Week 13

I spent a lot of time creating the remaining deliverables such as the Games User Research Report, Demonstration Video, and the Final Report. I wish I had more time to work on adding more support in the template, but in the end, I was happy with what I have created.

3 Evaluation

The Games User Research Report documents the methodology, results, and analysis of the user experience of the template concept made on Action RPG.

The study took in 8 participants ideally aged between 20-24 years. In Graph 1, it is evident that all of them had substantial amounts of years in gaming and in Graph 2, some years in game development. Participants first signed a consent form which requested to enter their demographic information. They then playtested the simulation following the three mechanics, in which afterwards they completed a survey and PENS questionnaire.

The results are summarized as follows:

3.1 Positives

The template simulation was highly praised for the simplicity and easiness of controlling, leading to a high score in PENS Intuitive Controls as seen in Table 1. Participants were also prepared and completed the simulations without frustration. Although in the end, it got harder to complete, players were determined to finish the simulation, thus, it also led to a high score in PENS Competence as seen in Table 2.

3.2 Negatives

The template simulation lacked any storytelling, let alone any story elements as it focused on actions and mechanics. Graph 3 shows that participants did not have deep feelings for the game compared to reality, and Graph 4 shows that they were not reacting to events and characters as if they were real. In the end, PENS Immersion had a mediocre score as in Table 3. Additionally, one of the participants, Cameron Edmond, was left-handed, and due to the template limited to the sword on the right hand, he was forced to play mainly on the right hand. This was taken in the survey response based on the additional feedback on the sword.

"I also would have liked to be able to switch hands for my weapon, as I am left handed and so I got quite tired playing." – Cameron Edmond

Lastly, some participants had induced motion sickness throughout the simulation. While it was acknowledged in the risks on the consent form, it was not mitigated and led to uneasiness in the experience. Snap turning could have contributed to less motion sickness instead.

3.3 Suggestions

All participants were asked questions about what changes or additions they would include to the template, and so many interesting ideas were given that could improve their versions based on the template. To see all the details in response to the given questions on all mechanics, see the Survey data in the evaluations folder inside the repo.

Enemies should have more varieties in attacking instead of simply chasing the player and damaging them when getting close. Additionally, they should leave openings for the player to dodge attacks and counter when possible.

The sword should have more dynamics on damaging enemies and objects. For example, the faster the player swings the sword, the more damage it will deal. This also leaves room for applying knockback against enemies, meaning how far they will be pushed back when damaged.

Lastly, remove the cooldown on the sword and instead apply cooldown on top of enemies, so that the player can wait for the next hit against the enemy after damage instead of waiting on their sword. This allows the player to still hit other enemies while they wait.

From the suggestions mentioned above, participants were eager to add dynamics and complexities to the template to create entertainment and challenges. That way, it keeps the players entertained with challenges and varieties.

3.4   Conclusion

Gamers and developers seek highly demanding features over games in the Action RPG genre, including design and immersion. By creating an environment that the player can interact with, they will be essentially immersed into a virtual world where they can react to events that may not be real but are perceived as real. With that in mind, developers like the participants can create their ideas from the template and make their games on top of the template, hence, giving them a headstart in development.

4   Learning Reflection

1. **Understand** *the use of VR headsets to accomplish and accompany game development tasks for VR games, such as connecting and testing Unity games in Meta Quest.*

Over time, I slowly gained knowledge of the capabilities of Meta Quest and how it can be used in Unity. Originally, I did not own a VR headset and never interacted with game development on top of VR platforms. However, thanks to this advanced game development task, I was encouraged enough to buy a Meta Quest 2 and use it as a testing platform to create a Unity project. According to the advanced level, however, it did not count as an advanced learning goal as this was an 'Understanding' level. In the end, regardless, it taught me to extend game development over more platforms in case of future development.

2. **Evaluate** *the importance and use of Action RPGs in VR, utilising/explaining the practical use of three main mechanics: Combat, weapon (sword), and movement.*

I created a Unity build to provide a template concept that focuses on the three main mechanics. Originally UI was going to be one of the main mechanics to focus on, but led to being overwhelming in terms of attempting to create an inventory system. Hence, a battle system was focused on instead for a much simpler purpose.

In the end, I created a successful template build of the mechanics that were then used to evaluate the participants, gain feedback, and document the features in the Game Design Document. It did teach me a lesson to break down the mechanics into smaller tasks and check against time constraints.

3. **Analyse** *the user experience of virtual reality to understand what the user feels throughout the experience and aim to improve over future VR projects.*

After numerous evaluations and playtests on the template build, I have successfully gathered data based on demographics, surveys, and PENS questionnaires. They were then analysed and documented in the Games User Research Report, providing findings and trends over

positives, negatives, and suggestions on the template build. It has taught me to speak out to participants and handle playtests whenever necessary for development, which is important when gathering responses from the target audience.

4. ***Analyse*** *and mitigate known risks of virtual reality, such as motion sickness.*

Unfortunately, I never got to analyse the risks of virtual reality, but instead acknowledged the risks on the consent form, such as motion sickness and object obstructions. Participants induced motion sickness from the simulations, which has encouraged me to make safer options for participants' ease of use when simulating. When making future projects on virtual reality, mitigating risks will be necessary to keep players safe.

5   Industry Relevance and Future Work

Learning the experience of virtual reality is a step closer to the future of game development and emerging technology. By completing the portfolio pieces from this project, it should allow me to present the experiences of game development over virtual reality platforms, and make insightful and detailed documentation from data collations and analysis. In short, the learning goals that I have achieved should represent applicable skills for industries.

Additionally, the learning goals have pushed me further to conduct research and playtesting over projects that require analysis of the target audience. However, it was not a highly successful research project as participants struggled to immerse themselves in a virtual environment and induced motion sickness. They were later mentioned in the Games User Research Report, and hence, I should improve on mitigating known risks and issues of the project over self-learning to accomplish industry skills better.

In conclusion, this unit encouraged me to make my own decisions in studying and testing ways to extend the knowledge of what I have with game development. If given more time, the template would have more support and features to add variety, but as of now, I am happy with the results of the project.

6   Appendices

6.1   Supporting Data Graphs

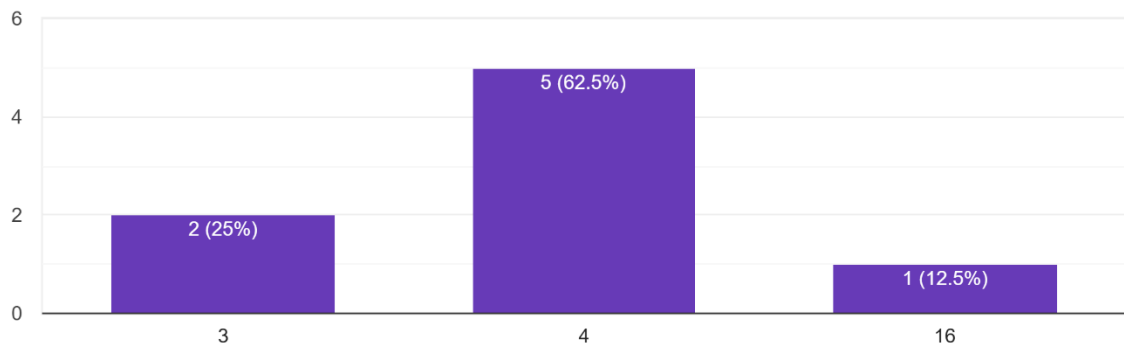How many years of experience have you had with gaming?
8 responses
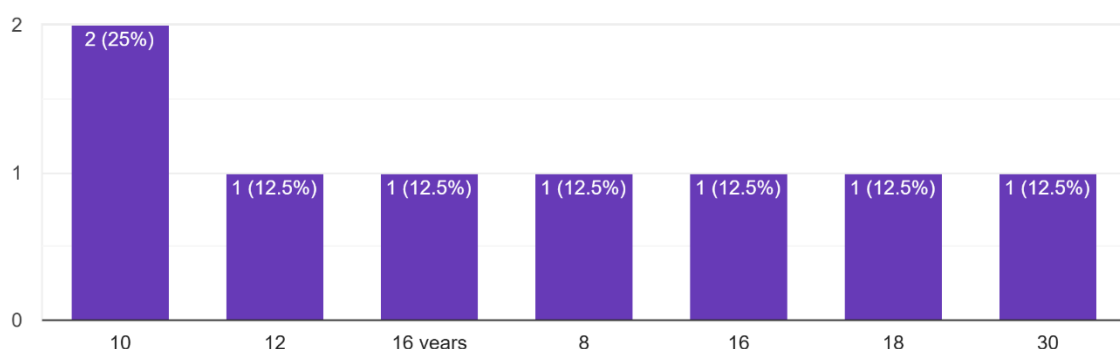
Graph 1: Frequency Bar graph showing years of experience in gaming.

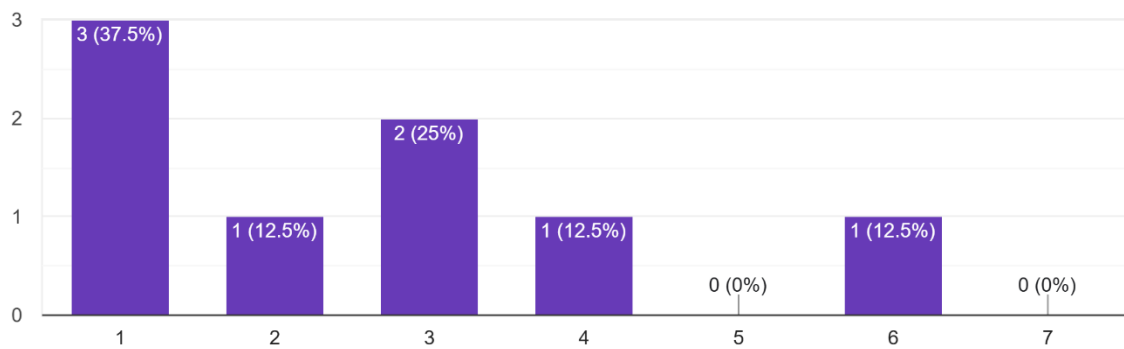How many years of experience have you had with game development?

8 responses

Graph 2: Frequency Bar graph showing years of experience in game development.

I experience feelings as deeply in the game as I have in real life.
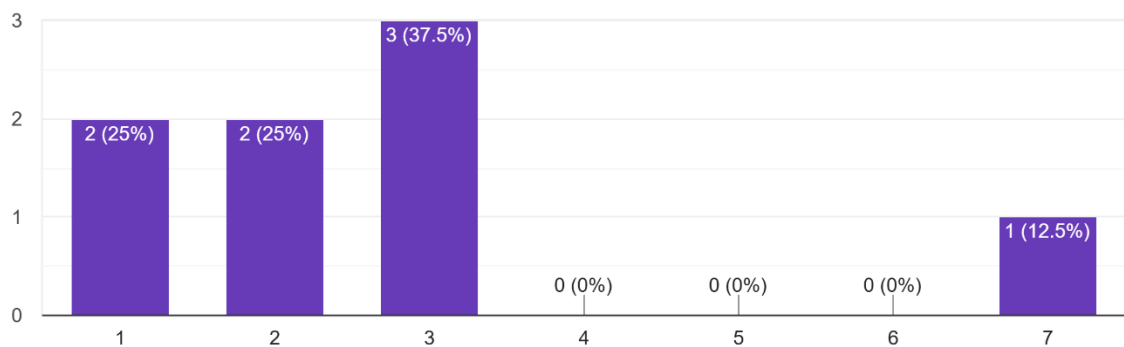
8 responses

Graph 3: Frequency Bar graph showing the 7-point score in experiencing feelings in VR compared to real life.

I had reactions to events and characters in the game as if they were real.

8 responses

Graph 4: Frequency Bar graph showing the 7-point score in reacting to VR events and characters as if they were real.

6.2 Supporting Data Tables

Learning the game controls was easy.	The game controls are intuitive.	When I wanted to do something in the game,
7	7	7
7	5	7
7	7	7
7	7	7
7	6	7
6	6	5
7	7	7
7	6	7
6.875	6.375	6.75

	Intuitive Controls Total	
	6.666666667	

Table 1: Table showing data of PENS Intuitive Controls with total average.

I feel competent at the game.	I feel very capable and effective when playing.	My ability to play the game is well matched
5	4	5
7	6	7
7	6	7
7	6	3
6	5	6
6	7	4
6	7	3
7	7	6
6.375	6	5.125

	Competence Total	
	5.833333333	

Table 2: Table showing data of PENS Competence with total average.

When playing the game, I feel transported t	Exploring the game world feels like taking a	When moving through the game world I fee	I am not impacted emotionally by events in t
6	5	5	5
6	4	7	7
5	5	5	4
6	5	4	2
5	3	3	7
4	2	3	5
2	1	2	1
4	3	3	4
4.75	3.5	4	4.375

The game was emotionally engaging.	I experience feelings as deeply in the game	When playing the game I feel as if I was pa	When I accomplished something in the gam	I had reactions to events and characters in
4	2	5	7	3
3	3	5	6	7
4	4	1	6	1
4	1	3	5	3
2	1	3	5	2
5	3	5	3	2
1	1	1	2	1
6	6	5	6	3
3.625	2.625	3.5	5	2.75

Immersion Total	
3.791666667	

Table 3: Table showing data of PENS Presence/Immersion with total average.

7 Statement on Generative AI use

No Generative AI has been used on all of the given deliverables and documents. All work has been handled by my work only.

8 References

Matteo311. (2023, July 22nd). The BEST VR RPG - We need Baldur's Gate 3 VR [Video]. YouTube. https://www.youtube.com/watch?v=0G1_0k1uWcA