IMMERSIVE NARRATIVE GAMES FOR SUPPORTING ANTI-BULLYING

(Undergraduate Thesis)

By

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FACULTY OF MATHEMATICS AND NATURAL SCIENCE

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ABSTRACT

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The integration of immersive narrative-driven games as a medium for addressing societal challenges, such as bullying, which in Indonesia is prevalent at alarmingly high rates, represents a relatively novel application of computer science in the realm of education. This study investigates the potential of a visual novel created using the Ren'Py platform to educate and foster prosocial behavior among high school and university students. The research employed the Research and Development (R&D) methodology to design, test, and refine the game as it garners feedback from respondents aged 15–21 years. Interactive fiction, like video games, has a unique place in how it can simulate complex emotional and social dynamics, enabling players to navigate and influence narratives that parallel real-world issues. Data analysis revealed that the game enhanced players' awareness and preparedness to address bullying, with significant engagement stemming from the freedom of choice and character-driven storytelling.

Keywords: bullying, visual novel, prosocial

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STATEMENT

I, the person signing this statement, would like to declare that my thesis entitled "Immersive Narrative Games for Supporting Anti-Bullying" is a work entirely of my own doing and is not the work of others. Every single word inside this document has followed the rules of conduct of University of Lampung's thesis writing guidelines. If at any point in the future it is proven that this thesis was an act of plagiarism or written by someone else, I declare my willingness to accept the consequence to be stripped of my title as an undergraduate.

Bandar Lampung, March 5th, 2025

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The author was born in Surabaya, East Java Province, on February 10, 2000. She has been residing with her parents, M. Gilas Kurniawan B. and Ernie Hendrawaty. She is recognized as the eldest of three siblings.

Her early education was begun at Tunas Mekar Indonesia Kindergarten in Bandarlampung. Her junior high school education was undertaken at State Junior High School One (SMP Negeri Satu) Bandarlampung, followed by her senior high school education, which was completed at State Senior High School One (SMA Negeri Satu) Bandarlampung. In 2018, she was admitted to the University of Lampung through the SBMPTN program.

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MOTTO

"Sadness and happiness are things that can be created."
(Nadhira)

DEDICATIONS

I dedicate this thesis to God Almighty, Allah SWT, whose blessings have enabled me to complete this work.

My deepest gratitude is extended to my beloved parents, whose unwavering support and encouragement have sustained me throughout the years of writing this thesis. Thank you for your unconditional love, guidance, and acceptance.

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To the Computer Science Family Year of 2018,
And to my esteemed Alma Mater, the University of Lampung,
This work is humbly dedicated.

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CHAPTER I
INTRODUCTION

1.1 Overview

According to the American Psychological Association's Dictionary of Psychology, "Bullying" is a form of aggressive behavior in which someone intentionally and repeatedly causes another person injury or discomfort. Other scholarly definitions of bullying include a "systematic abuse of power", or "unwanted, aggressive behavior among school aged children that involves a real or perceived power imbalance" (Wolke & Lereya, 2015; Juvonen & Graham, 2014or wherein they also characterize it with an element of repetition to differentiate from more typical interpersonal conflict (Smith, et al., 2002).

According to the results of a poll by PISA in 2022, some 25% of girls and 30% of boys in Indonesia reported having been on the receiving end of bullying acts at least a few times a month. Meanwhile, according to an UNICEF survey in 2020, bullying has taken place in the digital format as well, referred to as 'cyberbullying', including methods like verbal harassment through digital chats, sharing confidential information and images of the victim without their consent, among others. Up to 45% of the children polled claimed they have had experiences in which they are cyberbullied. It is suggested that the rapid advances in technology provided new avenues through which people can participate in bullying, whether as the aggressor or the victim, such in social media sites like Instagram and Twitter (Nugraheni, 2021).

Bullying is also correlated to a higher suicide risk, mental health issues, and a lower academic performance (Hertz, et al., 2013). A paper published by J Can Acad Child Adolesc Psychiatry assert that bullying has a relationship linking between it and feelings of suicidal ideation in young adults of 18 years of age.

Currently, at this time the phenomenon of cyberbullying is well-known in part due to some infamous cases of it resulting in death (Nugraheni, 2021). The impact of the widespread adoption of technology in spreading antisocial sentiments to an uncontrollable degree, magnifying and amplifying misconceptions and harmful beliefs – such as racism, sexism, xenophobia, and classism, among other beliefs - with a wider reach and easier accessibility than ever before, potentially affecting a virtually incalculable amount of bullying unprecedented compared to past eras where social media and other internet platforms had not yet dominated our everyday society (Setiawan, et al., 2020).

Despite the potential and actual harm the advancement of technology has been documented to have in exacerbating and popularizing bullying, the alternative that technology can rather be used to discourage such behaviour and to redirect such actions and mindset into a prosocial action instead has not been studied in full depth for the subject of bullying specifically, such as by Moukram, et al., (2022), and, Rahma, et al., (2023), meaning studies breaching this topic have only come into fruition relatively recently in the context of the long-continued era of gaming and video games viewed as works of entertainment and not necessarily a teaching assistant to social-related subjects.

There have been research done and games/applications made about the positive impact of such technology on other subjects, however, including encouraging self-care activity in general or to develop better habits to manage one's health in people suffering from physical conditions like cancer diagnosis (Peyrachon, & Rébillard, 2023) or diabetes, (Brady et al., 2023). For the field of education specifically, Zachary Lloyd in 2023 conducted tests interested in the potential of these games in the context of school education, and an expriment explored the potential benefits of the use of a narrative-based game to teach subjects to students pursuing education in universities an attempt to be more inclusive towards students who may struggle with more traditional methods of teaching such as instructional pamphlets, lectures, or slideshow presentation (Siagian, & Palupi, 2024).

However, overall, the studies regarding the impact of messaging prosocial behaviour and other learning subjects through a game-like experience often centre

the audience that the target of the message being delivered would be relatively young children (Passmore & Holder, 2014.), or in their pre-teens at most (Viccari, et al., 2024).

In particular, research has indicated that people, especially in the teenager and up group age, more readily respond to the expectation to be prosocial through either having prosocial role models in their lives or by witnessing prosocial behavior in the media they experience and engage in (Greitemeyer, 2021), rather than merely being moralized and have it dictated to them what good behavior is.

Therefore, the research in this paper does not merely focus on the role of narrative games (visual novels) as education material, but the matter of what and how to present the messaging that the intended demographic of the software, which skews slightly older, would receive well and leave an impact, when otherwise it wouldn't if it had been in a product for a younger age group. This includes the aspect of narration, background music, and graphics, among others.

Research has been conducted on the differences of digital media such as video games from traditional media) in communicating towards the players (Caroux, Loïc. 2023). Although usually focused on traditional subject areas such as reading literacy or mathematics (Siagian & Palupi, 2024), who explored the benefits of combining learning and entertainment when teaching college classes about technological history, among other traditional subjects like English and mathematics, geography and natural sciences, (Utoyo, 2021), experiments have been carried out using narrative games to educate about more sensitive, complex and socially-minded topics, regarding the impact of narrative visual novel game to help broach subject of violence in interpersonal relationships including romantic ones and to dissuade such behaviour (Bowen et al, 2014).

Although the results reported show the positive results of this method, the unique advantages and benefits, alongside possible shortcomings, provided by games as teaching tools have not been deeply discussed.

There are already video games used to test interactions in video games in relation to prosocial behaviour in real life. They are made on various platforms and devices,

such as Unreal engine, Godot engine and mobile support on Android. They prioritize interactivity as a method to gauge social behavior, but the use of Ren'py as a platform was chosen because Ren'py allows focusing on interactivity and the importance of narrative at the same time, at neither expense, with minimal gaming proficiency expected from the target audience and a fairly simple user interface that nevertheless belies extensive freedom and possibilities for the developer to create and adjust the product through user feedback or implement their suggestions.

Based on this review of the studies available, it is clear modern media has an impact in educating students of varying age groups regarding key school subjects such as English or Mathematics. However, the studies that have been conducted so far are still limited on the subject of discouraging anti-social behaviour and channeling them into more prosocial behaviour. Generally these studies aims to analyze the impact of modern media on young children over other demographic based on age, also older children may come with certain challenges not found in teaching younger children, who may be more susceptible to suggestions presented by the game, or, in the case of older children, they may struggle to grasp the message intended using traditional means of education about social awareness.

1.2 Research Questions

Based on the information given above, the structural form of the problem this research aims to tackle include:

1. Can a narratively-focused text-based game be constructed in a way that can be utilized to educate high school and university students about social issues and encourage them to enact prosocial behavior?
2. Is the final result of the text-based game effective in supplementing the traditional methods of informing students to the dangers and consequences of bullying?

1.3 Scope of Research

The scope of this research can be defined as follows:

1. The research will be done using the research and development method

2. The game will be created using the open-source software engine Ren'Py, involving the programming language Python.

1.4 Research Goals

The goal of this research includes the following:

1. To be aware of the effectiveness of a narratively-based game experience to teach teenagers aged 15/16+ more awareness to the problem of bullying in society
2. Comparing the effectiveness of the game to more 'traditional' way of informing students to the danger and prohibition of bullying to see what can be improved – in particular, of the young adult demographic cohort of 15+.

1.5 Research Benefits

1. Develop a software visual novel game that is both engaging on a narrative level and able to supplement more traditional methods of teaching in educational institutions about the subject of bullying to relatively older children.
2. Help spread information in prohibition of bullying and promoting pro-social traits in a format that is potentially more engaging for the target audience of high school and college whose messages they will be more willing to take to heart.
3. Adding to the currently available and ongoing studies regarding the benefits of using modern media in educating about social behaviour such as encouraging prosocial behaviour and dissuading bullying.

CHAPTER II
LITERATURE REVIEW

2.1 New Media

New media are communication technologies that enable or enhance interaction between users as well as interaction between users and content. Examples of new media include blogs, wikis, online social networking, virtual worlds, video games (with or without multiplayer support) and other social media platform. Although these examples contain a sizable involvement of the user with interacting with the content presented in the products, a narratively-focused video game not only provides interactivity, but also allows the player to relate their own feelings and experiences as depicted in the narrative of the game through a protagonist/narrator role.

2.2 Video Game

A videogame refers to all types of entertainment software presented through gaming consoles or devices, encompassing various genres such as online gaming involving real-time gameplay and interactions with other players over the Internet (Cheng, et al., 2018)**.**

As video games is a relatively wide umbrella term, it is important to note that a video game is a medium rather than a genre of its own. In fact, video games encompass a vast array of genres, such action games, first person shooters, turn based role playing games, and, relevantly to this topic of research, narratively-focused games that prioritize story and atmosphere.

According to the state governor of American English, the power of videogames, and the reason for their exceptional growth, comes from videogames being the first form of media that is dynamic, as opposed to traditional forms of media like books and music, which are defined as being consumptive, unchanged by their consumers. When two different people watch the same movie, they will walk out having

experienced the same ending. Unlike movies, or comic books, or other media for that matter, video games react to the user and their behaviour. As the user plays the game, the game changes too. Never more is this effectively communicated by the genre of game of narrative games or visual novels; games which explicitly sideline the aspect of gameplay such as jumping through levels or killing enemies to prioritize the importance of making choices that directly impact the outcome of the story presented within the game.

2.3 Bullying

Bullying is defined as “a repeated and deliberate pattern of aggressive or hurtful behavior targeting individuals perceived as less powerful” (Waseem & Nickerson, 2023). It manifests in various forms, including physical aggression, verbal harassment, social exclusion, and cyberbullying, each exhibiting distinct characteristics (Asatiani & Tsereteli, 2020). In recent decades, bullying has become a pervasive issue, particularly in educational and digital environments.

Several risk factors increase the likelihood of an individual being targeted by bullying. These include race, socioeconomic status, disability, and other perceived differences (Malecki et al., 2020; Waseem & Nickerson, 2023; Sapouna et al., 2022). Bullying has been identified as a significant contributor to adverse mental health outcomes, such as depression, anxiety, suicidal ideation, and issues related to trust and self-esteem. Additionally, it is associated with negative academic outcomes, including reduced performance and disengagement from school (Man et al., 2022).

Historically, bullying has often been trivialized or regarded as a normative part of childhood development—a so-called "rite of passage." However, contemporary research strongly refutes this perception, emphasizing the long-term psychological and educational harm it can cause. Individuals perceived as "different"—such as those from racial, religious, or ethnic minorities, immigrants, refugees, people with disabilities or distinctive physical features, and younger or more vulnerable children—are disproportionately at risk of being bullied (Waseem & Nickerson, 2023).

2.4 Interactive Fiction

Interactive fiction—also referred to as text adventures—is a form of digital storytelling that simulates interactive environments through text-based interfaces. These systems, often considered a subgenre of games, invite users to input commands via text parsers in order to control characters and influence narrative outcomes, including the plot itself (Montfort & Urbano, 2006). According to Yale (2022), interactive fiction encompasses various formats such as "choose-your-own-adventure" stories, text adventures, graphic adventures, and, most relevant to this study, visual novels. Desilets (1999) emphasizes that interactive fiction, due to its problem-solving orientation, sustains user engagement and fosters continuous, systematic, and consciously planned metacognitive activity.

2.5 Visual Novel/ Narrative Games

Visual novels are a genre of video games that typically have little game play elements and a greater focus on the storyline (Geest, 2015). A visual novel is the name for a genre which presents a narrative story in the form of a software that has support for making choices to influence the story. Visual novels unlike most games are not gameplay-oriented, rather the interactivity of the choices format is used to strengthen and prioritize the story of the visual novel. A great emphasis is placed on the atmosphere and visual presentation of the story. Fitting soundtracks are often included to enhance the intended emotional responses to the story. Visual novels have similarities to choose your own adventure books, also a form of interactive fiction.

2.6 Ren’py

Ren’py, as disclosed within its official website, is a platform based on Python programming language which is specifically designed to create narrative-based games. Although deceptively simple at first glance, Ren’py supports a plethora of functionalities to enhance the performance and playing experience of a narrative-based game such as insertion of CG illustrated backgrounds, character portraits, implementation of background music, a branching choice path leading to different endings and other things both in the playing experience and the visual experience.

Ren'py is free and open source, for even monetized products, which makes it attractive to use for both amateurs and commercial developers.

A sizable catalogue of visual novels and similar games have been made using Ren'py, numbering in the thousands, according to the official website for Ren'py support, making it a popular choice for amateurs and professionals alike, with extensive tutorials provided to help out both type of users.

2.7 Python

Python is a programming language that is widely used in various aspects of software development. Python is a general-purpose language, meaning it can be used to create a variety of different programs and isn't specialized for any specific problems. Python was created by Guido van Russom in 31. It was intended to emphasize code readability and utilization of significant indentation. Python serves as the backbone of Ren'py and is responsible for directing the game to do as intended by the programmer.

2.8 Prosocial Behaviour

Prosocial behavior refers to a range of positive behaviors including positive interactions (e.g., friendly play or peaceful conflict resolutions), altruism (e.g., sharing, offering help), and behaviors that reduce **stereotypes** (Piotrowski & Valkenburg, 2015). Also, another definition of prosocial behaviour is an acr that generally benefit other people or society as a whole (Eisenberg, et al., 2015).

Pro social behaviors are those planned to encourage other individuals. Pro social conduct or behavior is described in relation to emotions, and welfare of other individuals and for our own selves (Kaur, 2019).

2.9 Research And Development Method

The game will be developed using the Research and Development method. The research and development method were created by Borg & Gall (1983)**.** The Research and Development (R&D) method consists of analytical research with product testing to measure the effectiveness of the product in achieving its stated goals.

The R&D Method of Steps, written up by Borg and Gall themselves, proposes ten steps in conducting the Research and Development Method, which will be elaborated on below.

1. Research and Information Collection

   The research is started by studying the related literatures, need analysis, and framework preparation.

2. Planning

   It includes formulating skills and expertise regarding the problem of the research, formulating objectives of each stage, and designing research steps and necessary feasibility study.

3. Developing Preliminary Form of Product

   In this step, the preliminary educational product, some referred to as 'trial product', is developed by preparing and evaluating the supporting components, and also its guidelines and manuals.

4. Preliminary Field Testing

   The preliminary product is tested in limited scale to some selected parties(3-4) through interview, questionnaire or observation to gain and analyze the data for next step.

5. Revising Main Product

   The preliminary/trial product is revised using the data gained in step four. The revision is likely to be done more than once depending on the results of trial product. The revision is ready for wilder testing.

6. Main Field Testing

   This step is also called main testing in which the revised educational product is tested on a wider scale to many parties (5-15). The data are commonly collected by qualitative methods. Some products need to be carried out in an experimental research design to get data of feedback for the next field testing.

7. Revising Operational Product

   The revised product in this step is revised again based on the gained data in step six. The product is then developed as an operational model design to be validated.

8. Operational Field Testing

   The validation of operational model is conducted to massive parties (30-40) through interview, observation, or questionnaire. The data are the basis for revising the product in the final step. It is intended to ensure whether the model is completely set for use in educational fields without the researchers as the counsellors.

9. Revising Final Product

   The product is completely revised by the gained data in step eight and launched as the final educational product.

10. Disseminating and Implementing

    The product dissemination is conducted to public especially in education field through seminars, publication, or presentation to related stakeholders. The flow of R&D method steps is organized in the following chart in Figure 2.1.

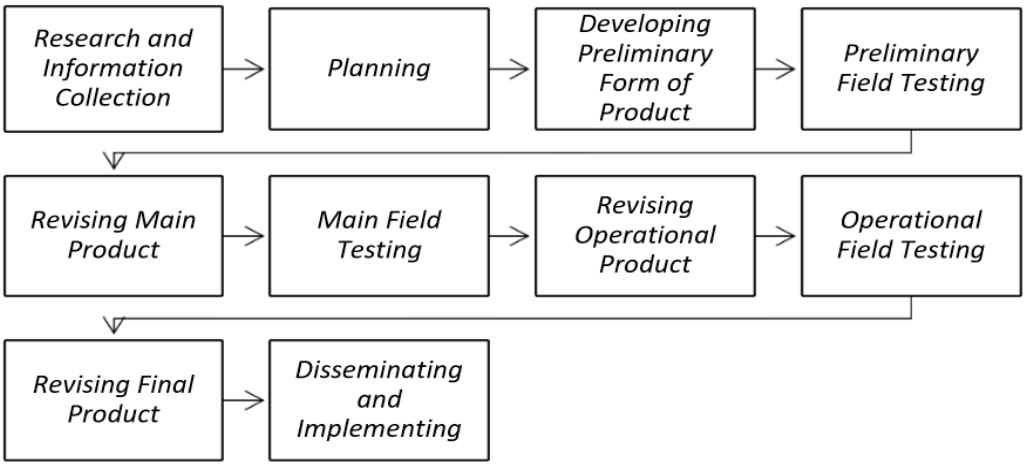

Figure 2.1 R&D method steps

2.10 Prior Research

Researches relevant to the one currently engaged with the author of this paper include:

1. **The Effect of Prosocial Video Games on Prosocial Behaviors: International Evidence from Correlation, Longitudinal, and Experimental Studies (2009)**

This research was done to middle-school aged children of different nationalities and upbringing to test the influence of games that display prosocial events or actions to encourage the player to do prosocial behavior in the real world. The study concluded, from three separate analysis, that there is a positive influence emanated from games which show prosocial behaviour to encourage such actions in real life.

2. **Does a prosocial decision in video games lead to increased prosocial real-life behavior? The impact of reward and reasoning (Glena H. Iten, Julia Ayumi Bopp , Clemens Steiner , Klaus Opwis , Elisa D. Mekler , 2018)**

Research conducted to investigate possible links between parasocial decision-making options in games to encourage the player to behave parasocially in real life. The results suggest an influence between parasocial decision-making in games and emulating such behaviour in their daily life.

3. **Effects of Prosocial Video Games on Prosocial Thoughts and Prosocial Behaviors (Hua li and Qian Zhang, 2022)**

Research conducted to analyze the different impact given to children of kindergartener-age by a prosocial (PVG) game and a Netral (NVG) game. Results were that brief exposure of children to a PVG increased their prosocial thoughts and prosocial behaviors. These findings suggest that increasing PVG exposure and training prosocial thoughts were effective ways to promote the positive development of prosocial behavior during early childhood.

4. **Playing Prosocial Video Games Increases Empathy and Decreases Schadenfreude (Tobias Greitemeyer, Silvia Osswald, Markus Brauer, 2010)**

Research conducted partly out of the scarcity of research regarding positive effects of non-violent video games, compared to violent, antisocial, or Netral ones. Research successfully found a connection between prosocial video games, in this case, *Lemmings,* with a decrease in antisocial thoughts including schadenfreude (satisfaction for someone else's misfortune).

5. **Playing Prosocial Video Games Increases the Accessibility of Prosocial Thoughts (Tobias Greitemeyer, Silvia Osswald, 2011)**

Research which suggests that after playing a prosocial video game, the prosocial tendencies can stay even after the game has already been finished. These results provide support to the predictive validity of the General Learning Model (Buckley & Anderson, 2006) for the effects of exposure to prosocial media on social tendencies. In particular, the study refers to the accessibility of prosocial thoughts, which means the ability to recall prosocial tendencies already existing within the person.

6. **Pembuatan Game Visual Novel Sebagai Media Perkuliahan Menggunakan Ren'Py Berbasis Android (Rudi Eko Sanjaya Siagian, Retno Palupi, 2024)**

Research done to try and create a visual novel game as educational material for college students using Ren'py and the waterfall method. The study takes care to create a product that can be opened and played on mobile devices, which most college students are familiar with using.

7. **The dark and bright side of video game consumption: Effects of violent and prosocial video games (Tobias Greitemeyer, 2022)**

Research which concludes that overall, whether video games have a negative or positive influence on others depends heavily on their content.

8. **Kinder Learns: An Educational Visual Novel Game as Knowledge Enhancement Tool for Early Childhood Education (Manuel B. Garcia, October 2020)**

Study proposing to develop a digital educational game called "Kinder Learns" by using visual novels as the game design and K to 12 Kindergarten Curriculum Guide of the Department of Education as the game content, and to investigate its impact as an educational tool for preschoolers and educators. The result supports the acceptance of the game as an educational tool for knowledge enhancement in preschool.

9. **7-Day Math: A Mobile Visual Novel Game for Mathematics Education (Jennie Florensia, Alethea Suryadibrata, 2023)**

This study aimed to develop a mobile visual novel game for mathematics subjects, especially definite integral in order to increase interest in learning mathematics. The results showed that the application was able to increase students' interest in learning mathematics.

10. A (Visual) Novel Route to Learning: A Taxonomy of Teaching Strategies in Visual Novels (Janelynn Camingue, Edward Melcer, Elin Carstensdottir, 2020)

This study surveyed 31 educational Visual Novels, identifying five key teaching strategies: Teaching Through Choice, Scripted Sequences, Mini-games, Exploration, and Non-interactive Teaching. These dimensions highlight essential design considerations for enhancing learning through Visual Novels. The findings emphasize that interactive elements in Visual Novels can significantly impact engagement and knowledge retention. Understanding these strategies can help developers create more effective educational games tailored to diverse learning needs.

11. Prosocial video game as an intimate partner violence prevention tool among youth: A randomised controlled trial (Daniel Boduszek, etc 2019)

The objective of this study was to assess the effectiveness of a context-specific, prosocial video game, Jesse, in increasing affective and cognitive responsiveness (empathy) towards victims of intimate partner violence (IPV) among children and adolescents (N = 172, age range 9-17 years, M = 12.27, SD = 2.26). A randomised controlled trial was conducted in seven schools in Barbados.

12. Video games as virtual teachers: Prosocial video game use by children and adolescents from different socioeconomic groups is associated with increased empathy and prosocial behaviour (Brian Harrington, Michael F O'Connell, 2016)

A study found that prosocial video games boost empathy and helpful behavior in children and teens across all socioeconomic groups, showing their potential as virtual teachers.

13. Perancangan dan Pembuatan Visual Novel Sejarah KH. Ahmad Dahlan Sebagai Media Pembelajaran Berbasis Android

Study proposing to create a python-based (ren'py) visual novel game to educate students about the history, life and accomplishments of Ahmad Dalan. The creation of this game uses the MDLC method, which consists of concept, design, material collection, compilation and creation, testing, then disseminating. After all stages are completed, the results show that this game is able to tell stories and provide learning about Ahmad Dahlan.

CHAPTER III
METHODOLOGY

3.1 Type of Research

This research period was spread over a few different stages. Information collection was done through publicly-available sources like the internet and through published studies. During the planning stages it was settled for the game to be a visual novel. Various concepts were created in the StarUML program to visualize the intended trajectory of the prorotype game. Ren'py was used to command the system to summon scripts and images alongside music to properly set the atmosphere of the game.

During the trial phase, respondents were requested to play the game and express their takeaways from it. These respondents came from mostly the intended target audience of 16-year-olds and above. These respondents also mostly came from University of Lampung, University of Pendidikan Indonesia, and Tunas Mekar Indonesia Senior High School. The product is then taken in for further development after taking into account the criticisms and commendation of the reviewers. This process is repeated a few times with a bigger sample of reviewers every time.

3.2 Place and Time of Research

The research was conducted at the Department of Computer Science, Faculty of Mathematics and Natural Sciences (FMIPA), University of Lampung. As for Research Time, this research was conducted in June 2024 in the thirteenth odd semester until completion in August 2024.

3.3 Assistive Equipment

The research is supplemented by tools, which are hardware and software used in developing the product and collecting the data and results related to the product.

3.3.1 Hardware

The hardware utilized in creating this project is a Personal Laptop including a CPU processor, a webcam, a mouse and keyboard, and a widescreen monitor.

a) Processor : 12th Gen Intel(R) Core(TM) i5-12500H 2.50GHz .
b) Memory Size : 16GB RAM 512GB SSD.
c) System Type : 64-bit operating system, x64-based processor.

3.3.2 Software

The software utilized in the creation and development of this project is mainly Visual Studio to edit Python code. The Ren'py engine is used with Python as a backbone.

a) Operating system : Windows 11 Home Single Language.
b) Web Browser : Firefox.
c) Text Editor : Visual Studio Code.
d) Engine : Ren'py.
e) Programming language : Python
f) SPSS
g) StarUML

3.4 Research Flow

The research process was conducted in sequential stages, as illustrated in Figure 3.1. It began with a literature review, followed by game programming, then survey implementation, and concluded with analysis and final evaluation. Each phase contributed to refining the project towards its final development.

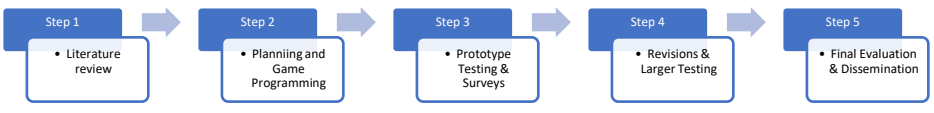

Figure 3.1 Research flow

1. Research and information collection consists of consulting available material and resources as instruction to build the eventual product. Data obtained by this method includes library books, internet videos, and academic paper site.
2. Planning stage is the creation of a blueprint or a schematic for the project intended to tackle the issues raised by the data that has been analyzed. This is also when the project is broken up into several stages each with their respective goals and to take measure and account for the limitations or potential hindrances of the research.
3. The preliminary version of the product, called a test or a prototype is created based on the research material already gathered.
4. The preliminary testing of the prototype/preliminary version of the product is done with a small team to obtain their feedback and suggestions that could be taken going forward to create a better version of the test product. This gathering of data may be accomplished through surveys and interviews with the testers.
5. The product is then revised after taking the data obtained in the previous step, taking user feedback and interviews into account. This process may take some time and be done more than once in order to comply with user demands or fixing bugs.
6. The revised product is then tested to a larger sample of people who will give their input. The data from this step are commonly collected by qualitative method.
7. The product is revised once more after taking into account the feedback given by the second, larger tester group. The product is then developed as an operational model design to be validated.
8. Once again, this revised version of the product is tested by a much bigger sample of audience, through interviews, observations, or surveys. The data gathered here will become crucial in influencing the final revisions to the product, making sure of its quality and that it works fully functionally as intended.

9. The product is revised for the complete and final time with the gained data in step eight taken into account and launched as the final version of the product.
10. The product dissemination is conducted to public for its relevant fields, through seminars, publication, or presentation to related stakeholders. (Included within this breakdown are screenshots depicting the development and implementation of the product through the Visual Studio program.)

Various commands were entered into the Ren'py code in visual studio code to create the game. For instance, "scene" refers to, literally, a scene within the game that will be viewed by the player. Variables such as music, background images, and character portraits are set in the beginning of the code by assigning them a name and then connecting them to an asset found within the game code's assets folder.

"Menu" refers to when the player is prompted to make a choice to affect the story. Summoning the menu brings up options pre-set within the game for the user to pick. "Jump" refers to forcing the program to switch to a different scene. When a transition is needed, "fade" is commanded so there is no sudden jump between one scene and the next.

Within the game, there are two numerical values labeled a certain way that will shift depending on either the choices made during the game, or completely randomized using Ren'py's number random generator. These values affect the ending of the game and the statistic revealed after the ending respectively.

At the beginning of the game, the variable "bullying" is set at an initial value of zero. This variable will continue to increase when the player chooses the crueler options presented rather than the ones that are either pitying or avoidant. If the variable reaches a certain threshold (9) the player will be locked into the second ending of the game. Otherwise, the player will receive the first ending.

Also at the beginning of the game, the variable "random" is also set. This variable is completely randomized by ren'py's randomized number generator feature. It is akin to a dice roll done by the program. The commands for "show" and "play" refer to calling an asset within the game's folder to show the background scenery, the

background music, and the font used throughout the game. Figure 3.2 shows the depicting the planned trajectory of the software being created based on the literature review relevant to the intentions and subject of the planned software, creating the preliminary version.

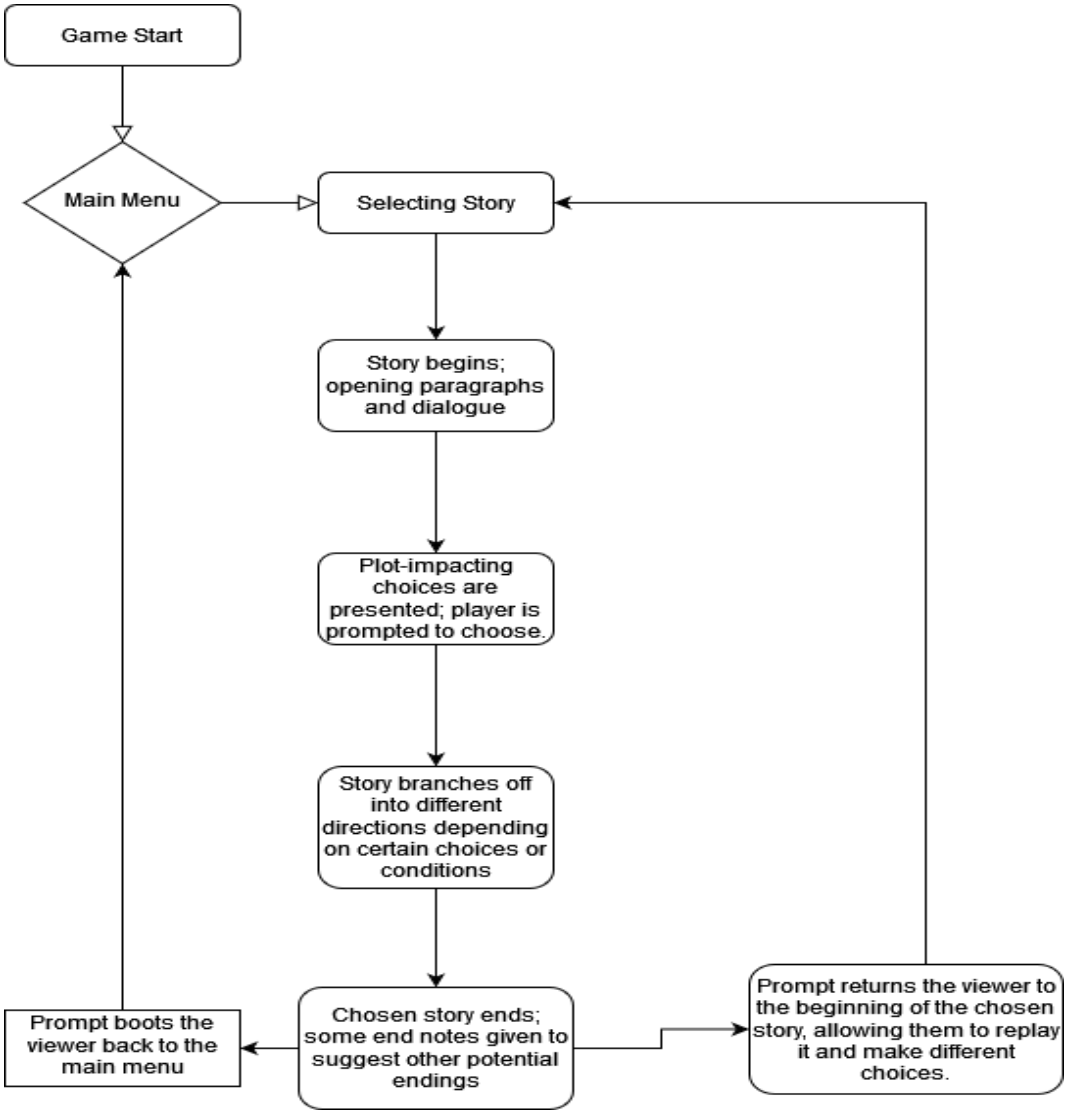

Figure 3.2 Diagram of planned trajectory of interaction between player and game

During the preliminary testing of the software, a survey alongside the link to the game was distributed to youths averaging the target audience (16, 17+). The survey's platform was Google Forms and the game's platform was on desktop. This was to gauge their reaction and receptiveness to the approach chosen in creating

and writing the narrative game. The questionnaire covered demographics and experiences with bullying, both real and fictional.

1. Label 1 freedom

   The player feels the freedom to influence the storyline of the game as they wish.
2. Label 2 control

   The player feels in control of the protagonist.
3. Label 3 choices

   The players feel adequacy in the number of choices prompted to them in the game.
4. Label 4 understanding

   The game sufficiently, improved their understanding on the topic of bullying.
5. Label 5 conviction

   The player feels more confident in taking the right steps to either stop or de-escalate incident of bullying in real world.
6. Label 6 character development

   The player is satisfied with the development of the character they are controlling in the game.
7. Label 7 emotion

   The player developed an emotional connection with the characters depicted in the game.
8. Label 8 empathy

   The player experienced the feeling of empathizing with the victim of the bully.
9. Lebel 9 relativity

   The player felt familiar with the setting of the game and the events and characters portrayed in the story.
10. Label 10 effectivity

    The game helped the player understand the perspective of a victim of bullying.
11. Level 11 ability

    The game helped convince the player that they can and should intervene during an incident of real life bullying.
12. Level 12 viewpoint

    The game helped shift the opinions of the player regarding the topic of bullying.

For the product's second revision, user feedback was taken into account, including suggestions that the game needed more endings or that the player character should be given more freedom to express themselves as a character and his role in the narrative. Visual concerns were also considered to make the game more aesthetically engaging. After these changes were implemented, further testing for user feedback was conducted with results recorded for any future revisions made on the game.

The first step is to set up a Ren'py program. The Ren'py program comes with a template for a basic visual novel. However, if you wish to create a visual novel of your own, it is necessary to know the basic commands that Ren'py will recognize, such as setting a background image for the scenes, or displaying choices that will raise or lower the chances for the player to reach a certain ending.

Establishing this foundational structure is the first stage in the game development process. At this point, the pre-existing template must be substantially modified to suit the needs of the intended project. The default template becomes visible once the programmer launches a new Ren'Py project, providing a visual and functional starting point for customization.

Figure 3.3 Base template Ren'py game

Second, uploading the resources and assets with the intent for them to replace the default pre-set templates' assets. This includes fonts and images, even music.

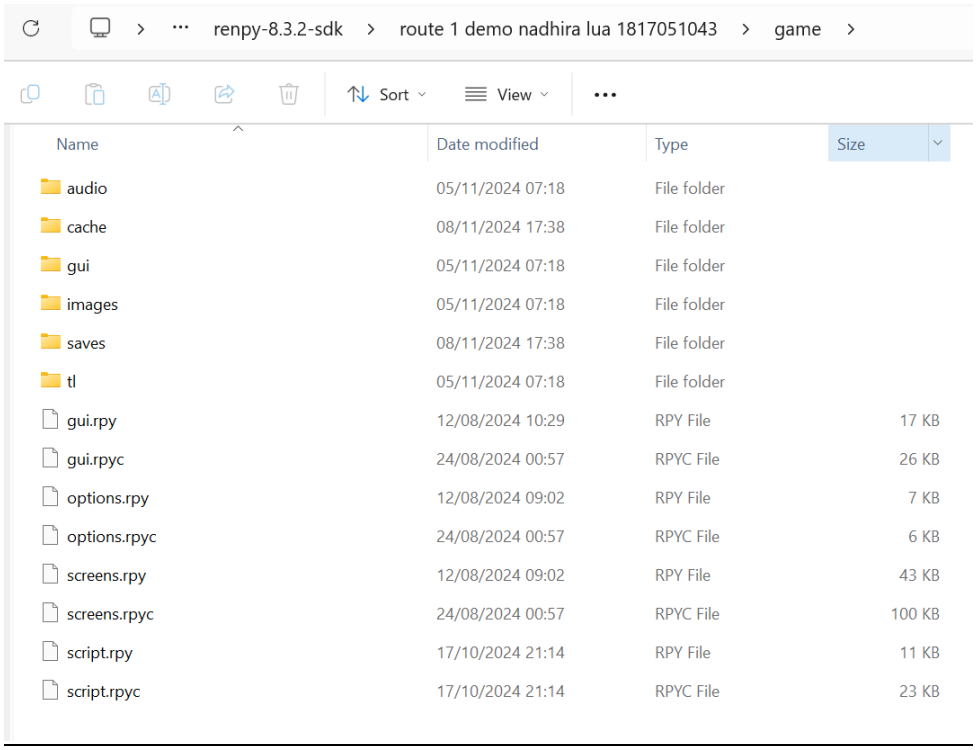

Figure 3.4 Ren'py game assets

Now, the third stage is to set Ren'py so that it properly calls the necessary assets. This is done by setting up certain variables that call upon the asset placed in their necessary folder. Figure 3.5 shows the visual novel looks so far, using custom fonts and background images and music running throughout.

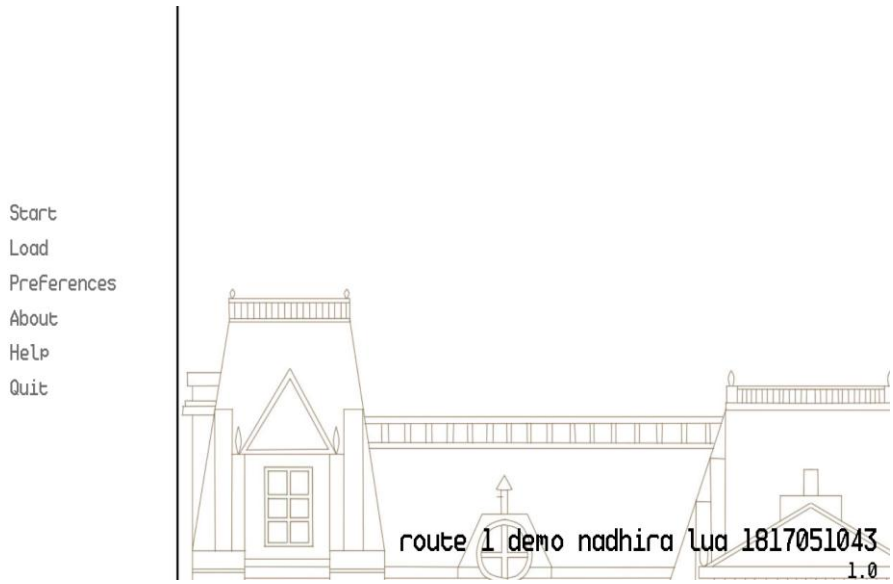

Figure 3.5 User interface showing the title screen of the game

Figure 3.6 Screenshot of the typical gameplay experience of playing a single route of the game

Figure 3.7 Screenshot of a decision-making part of the gameplay

3.5 Data Analysis

The questionnaire distributed to the testers was a simple scaling questionnaire alongside a space to put their final impressions or suggestions about the game in a comment. The scaling questionnaire ranges from the scale of 1 to 5, with 1 generally meaning “strongly disagree” and 5 meaning “strongly agree”.

The game was tested on a group of 30 students ranging from the ages to 14 to 20+ and the data is processed with the SPSS progam. Most respondents skew towards young college students in their middle or late years of academia, and general disparity about the gender identity of the students are relatively negligible. There are conflicting answers regarding the specificity of students’ prior familiarity or habit generally playing video games, but almost all reported having a habit, often or otherwise, in playing video games per week.

CHAPTER V
CONCLUSIONS, SUGGESTIONS, AND FEEDBACK

5.1 Conclusion

The reactions from the respondents have shown that although a narratively-based video game can encourage them to think of the subject of bullying and be less likely to participate in bullying in the future, further adjustments are needed to give the players more options, more of a sense of feeling of connection with the characters depicted, and possibly a better visual and auditory presentation to make the game look polished. The surveyed people have also expressed specific complaints or suggestions about the game being too barebones in its presentation or too short and lacking in substance.

At this point in time, we cannot conclusively state that a narratively-based game will be able to replace more traditional educational methods for discouraging bullying. However, possible artistic direction such as a choice-based system, the ability to play as the aggressor in the game rather than the victim, may be able to still include the game as a potentially valuable supplement to traditional methods of education.

5.2 Suggestions and Feedback

Generally reviewers have shown that they would prefer if the game had more options, more ending-deciding scenes, more content, and an ability to play multiple routes starring different characters and situations to depict the various types of bullying that real people experience. Also, a mobile version should be considered due to its ease of accessibility to the target audience as opposed to forcing them to play on computer devices or laptops.

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