



Research article

Design and Development of the Adventure Game Kera Sakti Based on RPG Maker MV

Rinaldi ^{a,*}, Herwanto ^b,

^aKrisnadwipayana University, Department of Informatics Engineering, Kota Bekasi 13077, Indonesia

^bKrisnadwipayana University, Department of Informatics Engineering, Kota Bekasi 13077, Indonesia

email: ^{a,*} aldi3078@gmail.com, ^b herwanto@unkris.ac.id.

* Correspondence

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ABSTRACT

The rapid development of gaming technology has made games a popular entertainment medium, but it has also raised concerns regarding the negative impacts on user behavior, especially in games containing elements of violence. Therefore, it is necessary to develop games that are not only entertaining but also contain educational and moral values. This study aims to design and develop a Role-Playing Game (RPG)-based adventure game entitled "Kera Sakti" using RPG Maker MV. The method used is the Game Development Life Cycle (GDLC) which includes the stages of initiation, pre-production, production, testing, release, and post-production. The game developed is a 2D single-player game that integrates a storyline, characters, and rule-based mechanisms to regulate events and interactions in the game. The results of the study show that the game was successfully built with key features such as an interactive menu, a combat system, inventory, and a storyline containing moral values. Based on the test results, the game ran well and received a positive response from users. In conclusion, this game is able to provide an interesting playing experience while inserting an educational message to players. The contribution of this research lies in the application of the GDLC method in the development of simple RPG games which can be an alternative educational entertainment media and a reference for novice game developers.

1. INTRODUCTION

The development of digital technology, particularly in the gaming industry, has driven the transformation of games from mere entertainment media into interactive educational and learning tools[1]. Role-Playing Games (RPGs) have the advantage of providing narrative experiences, exploration, and interaction that can increase user engagement[2]. Various studies have shown that utilizing games in learning can increase user motivation, engagement, and critical thinking skills[3],[4]. However, on the other hand, uncontrolled use of games, especially those containing violent elements, has the potential to negatively impact players' behavior and moral development[5], [6].

Several previous studies have examined the development of RPG-based games as educational media. Research by Khasanova, G. (2025) showed that the use of RPGs can significantly increase student learning motivation[7]. Furthermore, Ishak, et al. (2023) developed an educational RPG game in a metaverse environment, which was proven to increase user engagement[8], [9]. Other studies have also confirmed that learning-based games can be an effective medium for enhancing conceptual understanding and providing a more interactive learning experience[10].

However, there is a research gap that still needs further study. This is the limited development of simple RPG games that focus not only on formal educational aspects but also integrate moral values into the storyline[4],[11]. Furthermore, most studies have not explicitly implemented structured game development methods such as the Game Development Life Cycle (GDLC), which encompasses the stages of initiation, pre-production, production, testing, release, and post-production[12], [13]. However, using the GDLC method can help produce a more systematic and directed development process[14].

Based on these challenges, this study aims to design and develop an RPG-based adventure game titled "Kera Sakti" using RPG Maker MV, applying the GDLC method. The game developed integrates entertainment elements and moral values through an interactive narrative approach. The main contribution of this research is the production of a simple yet structured 2D RPG game prototype through the GDLC stages and provides a reference for novice developers in creating story-based educational games that are easy to develop and implement.

2. METHODS

The Game Development Life Cycle (GDLC) is a systematic framework used to develop games from the conceptual stage to post-release evaluation[14]. This method was specifically designed because the game development process has different characteristics from the Software Development Life Cycle (SDLC), especially in aspects of creativity, interactive design, and user experience, as can be seen in Figure 1. In general, the GDLC consists of several main stages as follows:

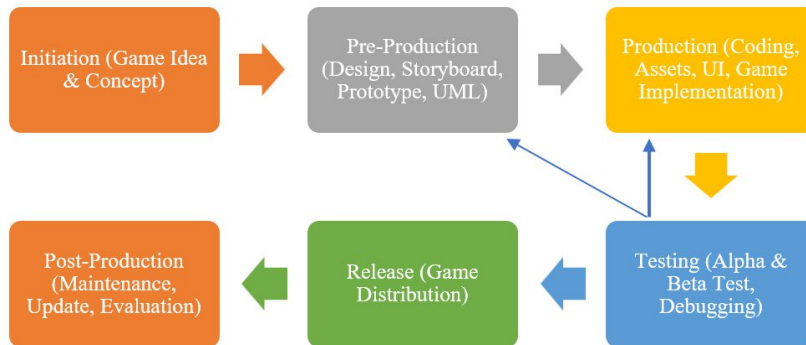


Figure 1. Game Development Life Cycle (GDLC) Stages

1. Initiation

The initial stage involves brainstorming and determining the game concept. This stage involves identifying the goals, target users, game genre, and a general overview of the gameplay. Ideas are then formalized in the form of a high-concept document or game design document (GDD).

2. Pre-production

The pre-production phase is the planning phase that aims to detail the game concept to be developed. This phase involves various activities, including storyboarding, character and environment design, initial prototype creation, and system design using Unified Modeling Language (UML) and gameplay mechanics. The pre-production phase plays a crucial role in validating the established concept and reducing the risk of failure during production.

3. Production

The production stage is the core phase of game development, where all assets and systems begin to be implemented based on the previously developed design. This stage involves the creation of assets in the form of graphics, audio, and animation, as well as the coding and implementation of gameplay mechanics. Furthermore, various system components are integrated, such as the user interface, database, and event system. Through this process, the game begins to take shape into an initial playable build as a basis for subsequent testing.

4. Testing

The testing stage aims to ensure the quality of the game before its release to users. Testing is carried out in two stages: alpha testing and beta testing. Alpha testing is conducted by developers to identify and fix initial errors, such as bugs and system inconsistencies. Next, beta testing is conducted by users to evaluate the gameplay experience, usability, and comfort when interacting with the game. This stage plays a crucial role in improving the overall quality, stability, and performance of the game before it reaches release.

5. Release

The release (deployment) stage is the process of publishing a game that has undergone testing and is deemed suitable for use by users. At this stage, the game is distributed to the intended platforms, such as PC, mobile, or web. In addition, the deployment stage also considers product readiness from a technical perspective, such as system performance and stability, as well as user readiness to access and run the game.

6. Post-Production

The post-production (maintenance & evaluation) phase is the final phase, focusing on evaluation and further development after the game's release. During this phase, various activities are carried out, such as bug fixes (maintenance), feature additions through updates/patches, and analysis of user feedback. This phase plays a crucial role in maintaining quality, improving performance, and ensuring the game's long-term sustainability.

3. RESULT

This section presents the results of the design and development process of the adventure game "Kera Sakti" based on RPG Maker MV which has been carried out based on the stages of the methodology used. The results obtained include the implementation of system design, character creation, storyline, and main features in the game. In addition, this section also discusses system performance, gameplay mechanisms, and the suitability of the implementation results with the established research objectives. Thus, the analysis presented is expected to provide an overview of the effectiveness of game development as an entertainment medium that also contains educational value. The following is the implementation of the design and development of the adventure game Kera Sakti using the Game Development Life Cycle (GDLC) methodology:

3.1. Initiation

The Initiation or Concept/Ideation stage is the initial phase in the game development process, focusing on the discovery, development, and refinement of the game's basic idea. This stage is crucial because it serves as the primary foundation that determines the direction, goals, and overall characteristics of the game being developed, as seen in Table 1.

Table 1. *Initiation Phase*

No	Aspect	Description	Output
1	Background	High usage of games and the need for games containing educational and moral values	Problem formulation
2	Development Objective	To develop an RPG game that provides entertainment as well as moral messages	Research objectives
3	Game Idea	Adventure game themed "Monkey King" with a storyline based on life values	Basic game concept
4	Genre	Role-Playing Game (RPG) with adventure elements	Game type
5	Target Users	Users aged ≥ 12 years who enjoy adventure games	User profile
6	Platform	Computer (desktop)	Implementation platform
7	Initial Gameplay	Exploration, NPC interaction, item collection, and battle system	Gameplay mechanics
8	Educational Value	Delivery of moral messages through storyline and characters	Added value of the game
9	References & Study	Analysis of similar RPG games and related literature	Theoretical foundation
10	Concept Document (GDD)	Preparation of initial game concept in a structured design document	Game Design Document (GDD)

3.2. Pre-production

The pre-production stage is the planning phase in game development, which aims to develop the detailed concepts established in the previous stage. This stage involves developing the system design, storyline, characters, and gameplay mechanics as a basis for further development.

3.2.1. Storyline design (storyboard)

Storyboard design is a crucial stage in game development, as it serves as a guide for structuring the storyline, character interactions, and the sequence of events that occur in the game. In this study, a storyboard was used to systematically depict the storyline of the adventure game "Kera Sakti" to ensure more focused gameplay and easier understanding for players, as seen in Table 2.




Table 2. Storyboard Design for the "Kera Sakti" Game




No	Scene	Story Description	Gameplay Objective	Output/Interaction
1	Opening	A monk finds and raises a monkey spirit from childhood to adulthood	Introduce the main character and background story	Opening cutscene
2	Initial Conflict	A buffalo demon slanders the gods and causes the monkey's master to be injured	Establish the main conflict	Dialogue and cutscene
3	Initial Mission	The monkey sets out on a journey seeking revenge	Start the main gameplay	Player begins exploration
4	Item Collection	The player collects crystals to unlock access to the next stage	Train exploration and item collection	Object interaction
5	Journey to the Sky Palace	The monkey travels to the sky world using a hot air balloon	Transition to a new level	Map transition
6	Realization	The gods reveal the truth about the buffalo demon's deception	Change the player's objective	Interactive dialogue
7	Main Mission	The monkey is tasked with stopping the buffalo demon	Define the main goal of the game	Main quest
8	Journey to the Enemy's Fortress	The player explores areas leading to the buffalo demon's base	Increase exploration challenges	Enemy encounters/battles
9	Final Battle	The monkey fights the buffalo demon in the main battle	Game climax	Battle system
10	Ending	The monkey saves his master and returns to the path of righteousness	Conclude the story	Ending cutscene

3.2.2. Character and Environment Design

Character and environment design are crucial aspects of game development, as they play a role in establishing a visual identity and atmosphere that supports the storyline, as seen in Table 3. In this study, the character and environment design for the game "Kera Sakti" was carried out to create an engaging, interactive gaming experience that aligns with the adventure theme.

Table 3. Main Character Design of Kera Sakti Adventure Game

No	Character Name	Role	Character Description	Main Abilities	Visual/Design
1	Monkey King	Main Character	A monkey raised by a monk, possessing strong determination and a kind heart	Physical attack, high speed	
2	Monk	Mentor	A teacher who raised and guided the Monkey King since childhood	Healing ability, quest giver	
3	God	Information Giver	A celestial being who knows the truth and provides guidance to the player	Provides hints and missions	

4	Buffalo Demon	Antagonist	The main enemy who slanders the gods and causes the central conflict	Strong attack, high defense	
5	Village NPC	Supporting	Additional characters who provide information or assistance to the player	Provides information and items	
6	Minor Enemies	Supporting Enemy	Enemies encountered by the player during the journey	Basic attacks	

3.2.3. Initial Prototype Development

The initial prototype developed for the game "Kera Sakti" aimed to test the game's basic concept and ensure the game's core mechanics were working properly before entering full development. Overall, the initial prototype for "Kera Sakti" included core components such as menus, maps, character systems, interactions, and combat, as seen in Figure 2. This prototype served as a testing basis to ensure the game's concept could be implemented effectively before further development in production.

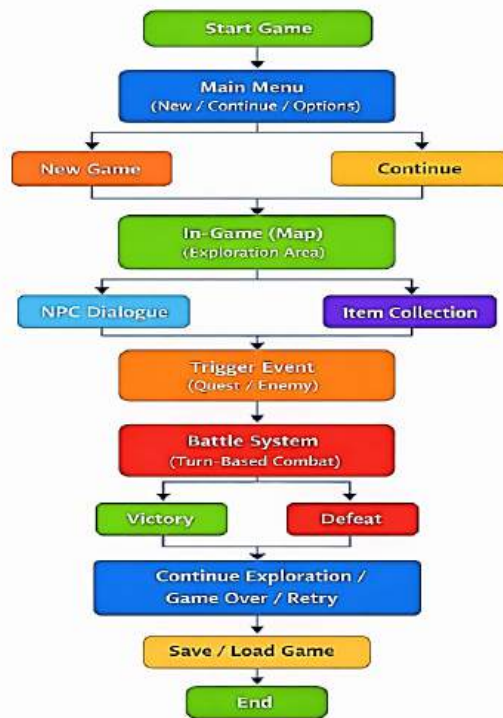


Figure 2. Flowchart of the Kera Sakti Game Prototype

3.2.4. System design

System design is a crucial stage in game development, aiming to define the overall structure and workflow of the system. This stage utilizes Unified Modeling Language (UML) modeling and gameplay mechanics design to describe the interactions between components and game mechanics in a structured manner, Figure 3.

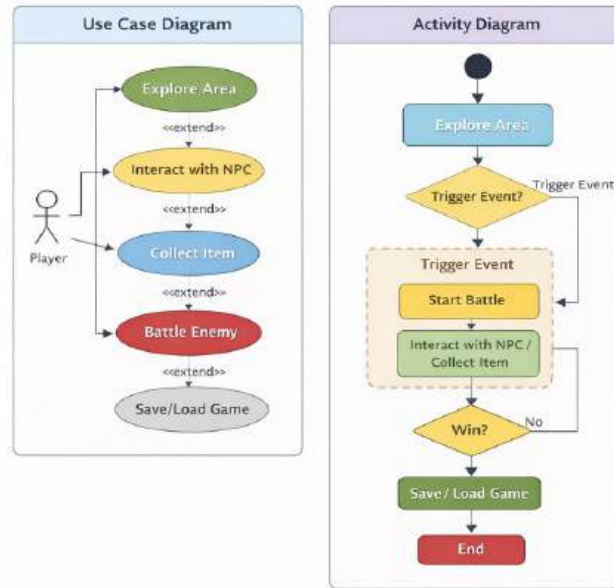


Figure 3. UML Diagram for the Game Kera Sakti

Gameplay mechanics are the rules and systems that govern how players interact with the game and how it progresses. In "Kera Sakti," the game mechanics are designed based on Role-Playing Games (RPGs), with an exploration, interaction, and combat approach. Players control the main character to explore various areas (maps), interact with Non-Playable Characters (NPCs), and collect items necessary to complete missions. Each interaction can trigger specific events that direct the storyline and game progression.

The battle system uses turn-based combat, where players and enemies take turns performing actions such as attacking or using items. The outcome of a battle affects the game's progression, allowing players to continue exploration if they win or restart if they lose.

Furthermore, the game features an inventory system for managing items and a save/load system for saving game progress. All of these mechanisms are designed to create an interactive, structured gaming experience that effectively supports the story's delivery.

3.3. Production

The production phase is the core phase of game development, where all the designs planned in the previous stages are implemented into a playable product. This phase involves asset creation, system coding, and the integration of all game components to form a complete gameplay. The entire production process is carried out using the features and tools available in the RPG Maker MV engine.



Figure 4. Storyboard: (a) Scene where the monk has cared for and taught the science of goodness to the growing monkey demon; (b) Scene where the buffalo demon is manipulated and instigated; (c) Scene of the journey to the god's palace by collecting crystals to get a hot air balloon.

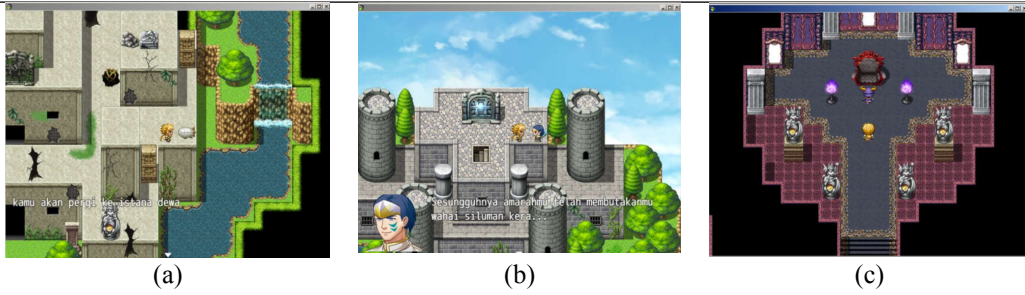


Figure 5. Storyboard: (a) Scene of the journey to the palace until moving to the map of the God's Palace; (b) Scene of the awakening by the god; (c) Scene of the journey to meet the buffalo spirit in his palace.



Figure 6. Story Board: (a) Scene Action; (b) Database

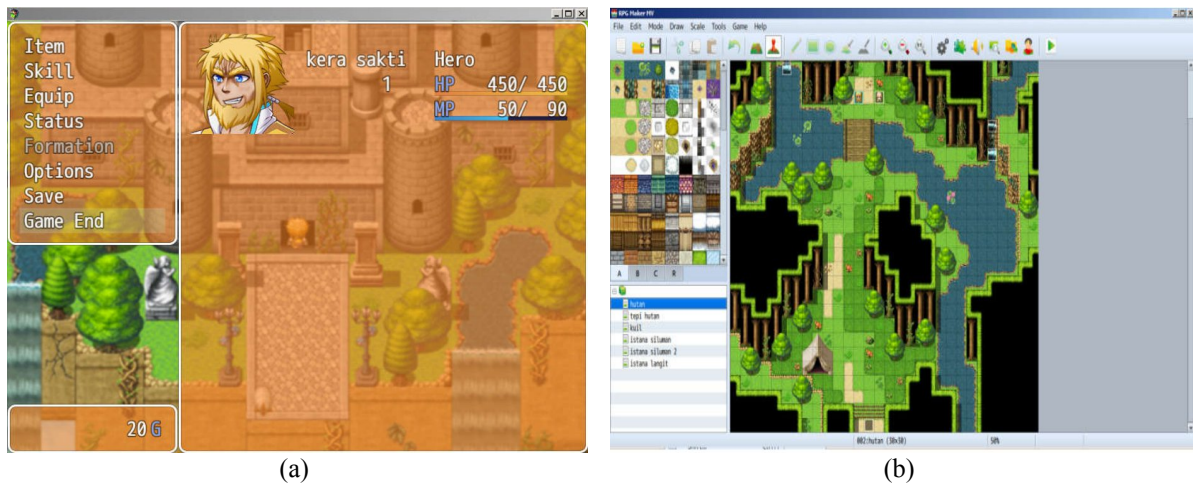


Figure 7. Story Board: (a) Menu view; (b) Map view



Figure 8. Battle view

3.4. Testing (Alpha & Beta Testing)

The testing phase is the process of ensuring that the developed game runs smoothly and meets its stated objectives. Testing is carried out in two stages: alpha testing and beta testing, Table 4-5. Alpha testing is conducted by developers to find and fix system errors, such as bugs, errors, and functional inconsistencies. Next, beta testing is conducted by users to evaluate the gameplay experience, ease of use, and comfort level of the game. The results of this phase are used as the basis for game improvements and refinements before release.

Table 4. Blackbox Testing Results of Kera Sakti Game

No	Feature Tested	Test Scenario	Input	Expected Output	Result
1	Main Menu	Select "New Game" menu	Click New Game	Game starts a new session	Valid
2	Main Menu	Select "Continue" menu	Click Continue	Game resumes saved progress	Valid
3	Options Menu	Adjust sound settings	Change volume	Game volume changes accordingly	Valid
4	Character Movement	Move character in a specific direction	Keyboard arrow keys	Character moves according to input	Valid
5	NPC Interaction	Interact with NPC	Press interaction button	NPC dialogue appears	Valid
6	Item Collection	Collect item on the map	Approach and click item	Item is added to inventory	Valid
7	Battle System	Initiate battle	Encounter enemy	Battle system is triggered	Valid
8	Battle System	Attack enemy	Select attack	Enemy HP decreases	Valid
9	Inventory System	Use item	Select item	Item effect is applied (e.g., HP increases)	Valid
10	Save Game	Save game progress	Select save	Game data is successfully saved	Valid
11	Load Game	Load saved game	Select load	Game loads the latest saved progress	Valid

Table 5. User Test Questionnaire Testing (n = 20 Respondents)

No	Evaluation Aspect	Number of Items	Total Score	Maximum Score	Average	Percentage (%)	Category
1	User Interface (UI)	4	344	400	4.30	86%	Very Good
2	Gameplay	4	328	400	4.10	82%	Good
3	Functionality	3	252	300	4.20	84%	Very Good
4	User Satisfaction	4	340	400	4.25	85%	Good
	Total	15	1264	1500	4.21	84.27%	Very Good

Calculation Description

- Number of Respondents = 20 people
- Maximum Score = Number of Items × Number of Respondents × Highest Score (5)
- Average = Total Score / (Number of Items × Number of Respondents)
- Percentage = (Average / 5) × 100%

Table 6. Score Interval Classification

Score Interval	Category
4.21 – 5.00	Very Good
3.41 – 4.20	Good
2.61 – 3.40	Fair
1.81 – 2.60	Poor

1.00 – 1.80 Very Poor

Based on Table 5, the results of testing 20 respondents showed that the game "Kera Sakti" obtained an average score of 4.21, with a percentage of 84.27%, which falls into the Very Good category. This indicates that the game developed satisfactorily meets the aspects of appearance, gameplay, functionality, and user satisfaction.

3.5. Release (Deployment)

The release or deployment stage is the final process in game development, where the application, having gone through the production and testing stages, is published for use by users. In this research, the game "Kera Sakti" was successfully deployed as a desktop-based application that can be run on any computer operating system. The deployment process was carried out using the export feature available in the RPG Maker MV engine, allowing the game to be packaged as an executable (.exe) file. This makes it easier for users to access and play the game without requiring complex additional installations. Furthermore, the game's file structure has been optimized to run stably on devices with standard specifications.

Based on the results of testing conducted in the previous stage, the developed game demonstrated good performance without any significant errors. Users were able to run all key features such as menus, exploration, interactions, and the combat system smoothly. This demonstrates that the deployment process was successful in accordance with the research objectives. Thus, the release stage not only produces a final product in the form of a ready-to-use game but also proves that the development of the game "Kera Sakti" has met the functional and eligibility requirements as an interactive entertainment medium with educational value.

3.6. Post-Production (Maintenance & Evaluation)

The post-production stage is the next phase after the release process, focusing on the maintenance and evaluation of the developed game. This stage analyzes system performance and user feedback to ensure the quality and sustainability of the application. Based on evaluation results obtained through testing and user questionnaires, the game "Kera Sakti" demonstrated a high level of satisfaction with the "very good" rating. Users assessed that the display, gameplay, and functionality performed well and provided an engaging gaming experience. However, some user feedback was received, such as adding level variations, increasing enemy complexity, and developing more diverse interactive features.

In the maintenance phase, minor bugs discovered during testing were fixed and performance optimized to ensure more stable game performance. Furthermore, the gameplay structure and storyline were evaluated to ensure they align with the initial research objectives, namely to provide entertainment with educational and moral values. Thus, the post-production stage makes a significant contribution to improving game quality through continuous evaluation and improvement. The results of this stage also serve as a basis for further development, so that the "Kera Sakti" game can continue to be refined in the future.

4. DISCUSSIONS

This section discusses the research results obtained through the system development and testing stages. The analysis focuses on evaluating game performance, the implementation's suitability to the planned design, and interpreting the results based on test data and user feedback.

Table 7. Comparison of Previous Research Related to Educational Games & GDLC

Author & Year	Game Type & Platform	Method	Educational Focus / Value	Main Results	Relevance & Differences with Kera sakti
Aryadinata & Zahmi, 2024[15]	Educational game (household objects), 2D	GDLC (6 phases)	Object recognition, children's cognitive & motor skills	Interactive game that helps children recognize household items	Both use GDLC; "Monkey King" adds RPG narrative and moral values beyond factual knowledge
Ariyana et al., 2022[16]	Batik motif educational game	GDLC	Cultural preservation (batik)	Game introduces batik motifs to children	Both focus on education & culture; "Monkey King" uses RPG

Farid & Khabibah, 2021[17]	RPG SPLDV Math, Android (RPG Maker MV)	Borg & Gall	Mathematics (SPLDV), motivation & learning outcomes	Valid, practical, and effective in improving learning outcomes	adventure and moral storytelling Both use RPG Maker MV; "Monkey King" focuses on adventure and moral values, not formal math
Prasetyo et al., 2021[18]	Educational game, Android (Unity)	GDLC (until beta)	Basic literacy for elementary students	Feasible and runs well (blackbox, 84.6% feasibility)	Both use GDLC; "Monkey King" emphasizes RPG storyline, battle, inventory, and moral messages
Hakim et al., 2023[19]	2D platform game "Elephant Adventure", Android	GDLC	Entertainment & patience training	Functional 100%, usability 90.34%	Both are 2D single-player GDLC games; "Monkey King" adds rule-based events and explicit moral education
Amin et al., 2023[12]	"Dungeon Code" educational game (algorithms & data structures)	GDLC	Algorithms & data structures	Functions run well, very good user evaluation	Confirms GDLC effectiveness; "Monkey King" focuses on moral-based RPG, not specific academic subjects
Rusmana et al., 2023[20]	English educational game "Tiny Man Genius"	GDLC	Vocabulary and writing skills	Improved learning scores, 68.8% users benefited	GDLC suitable for education; "Monkey King" fills gap in moral-based RPG beyond language learning
Baharuddin et al., 2024[21]	"Pet Venture Quest" (motor skills educational game)	GDLC	Motor skill development	Designed as a guideline for educational game development	Similar GDLC approach; "Monkey King" emphasizes narrative RPG and moral values

Based on Table 7, a comparison of previous research, it can be seen that most studies use the Game Development Life Cycle (GDLC) method in developing educational games, both on 2D and mobile platforms. This demonstrates that GDLC is an effective and systematic method for producing functional, interactive, and user-friendly games. Furthermore, the primary focus of previous research tends to be on delivering specific educational materials, such as introductions to objects, culture, mathematics, language, and algorithms. However, there is a tendency for the games developed to be oriented towards content-based learning with relatively simple gameplay mechanics that underemphasize narrative aspects and player emotional engagement. Although some studies have used the RPG genre and the RPG Maker MV engine, their implementation has focused on delivering formal learning materials, rather than developing an immersive gaming experience.

In this context, the "Kera Sakti" study offers a different approach by integrating RPG-based adventure elements, a narrative storyline, and moral values as a central component of the gameplay. Furthermore, the implementation of rule-based event mechanics and a more dynamic interaction system provides a more interactive gaming experience than previous research. Thus, this study not only strengthens the finding that GDLC is effective in educational game development, but also provides a new contribution by filling the research gap in the development of simple RPG games that prioritize storytelling and moral values, not just direct delivery of educational materials.

5. CONCLUSION

Based on the research results, it can be concluded that the development of the role-playing game (RPG)-based adventure game "Kera Sakti" using the Game Development Life Cycle (GDLC) method was successfully implemented through the stages of initiation, pre-production, production, testing, release, and post-production. Each stage was carried out systematically, resulting in a playable game that met the research objectives. The developed game has key features such as an interactive menu, exploration system, interaction with NPCs, a battle system, and inventory integrated into the storyline. Furthermore, the game emphasizes moral values through a narrative approach, thus serving not only as entertainment but also as an educational tool. Test results showed that the system ran well without any significant errors and received excellent user ratings based on the user test questionnaire. This indicates that the game has a high level of feasibility and acceptance. Thus, this research contributes to the development of simple yet interactive RPG-based educational games and can serve as a reference for developers in integrating storytelling elements and moral values into gameplay.

AUTHOR CONTRIBUTIONS

Rinaldi: Conceptualization, Data Curation, Methodology, Validation, Writing – Original Draft Preparation;
Herwanto: Project Administration, Writing – Review & Editing;

CONFLICT OF INTEREST

The authors declares that there is no conflict of interest between the authors or with research object in this paper.

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