

Adventure Time: Dilo World – An Adventure Game with Educational Elements for Kids

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ABSTRACT

Received: 2 March 2025
Revised: 23 March 2025
Accepted: 24 March 2025
Available online: 1 April 2025

Keywords:

Educational Game, 2D Platformer, Game-Based Learning, Interactive Learning, Gamification, Adventure Game, Game Development, Godot Engine, Children's Education

The rapid development of the gaming industry has led to the integration of entertainment and education in game design. *Adventure Time: Dilo World* is a 2D platformer educational game aimed at enhancing children's learning through interactive and engaging gameplay. The game features three distinct levels, each representing a different season—summer, autumn, and winter—with unique challenges and enemies. Players navigate through these environments, overcoming obstacles and answering educational questions to unlock treasure chests containing rewards. Developed using the Godot game engine, the game incorporates a structured game flow, interactive controls, and visually appealing graphics to maintain engagement. The educational content focuses on mathematics, Indonesian history, and English, making it a valuable learning tool for children aged 7-12 years. The gameplay mechanics encourage problem-solving, critical thinking, and perseverance, reinforcing cognitive development in a fun and interactive manner. The results of this study highlight the effectiveness of game-based learning in improving children's educational engagement. Future development may include additional levels, new enemies, multiplayer options, and expanded educational material to further enhance its impact. Overall, *Adventure Time: Dilo World* demonstrates that gamification can be a powerful tool in supporting educational growth, making learning an enjoyable experience.

1. INTRODUCTION

The rapid advancement of computer games has led to a highly competitive gaming industry, with developers striving to create more immersive and engaging experiences for players. Initially designed as a form of entertainment or leisure activity, games have evolved into tools that foster creativity and intellectual development. Nowadays, gaming has become an integral part of modern lifestyles, enjoyed not only by children but also by teenagers and adults across different demographics.

One of the popular game genres is the side-scrolling or side-scroller game, which features two-dimensional (2D) gameplay where characters move left and right to achieve specific objectives. A well-known example of this genre is *Super Mario Bros.*, a game that has remained iconic in the history of video games. This type of gameplay remains popular due to its simple yet engaging mechanics, making it an ideal format for both entertainment and educational purposes.

Recognizing the potential of 2D games in education, *Adventure Time: Dilo World* is designed as a 2D adventure platformer with an educational theme. In this game, players explore an island to find a treasure chest, but before unlocking it, they must answer educational questions. By integrating interactive learning elements, this game not only provides entertainment but also enhances cognitive skills such as problem-solving, logical reasoning, and creativity.

Developed using the Godot game engine, *Adventure Time: Dilo World* is designed to be accessible across multiple platforms, including Windows, macOS, Linux, Android, iOS, and HTML5. The target audience for this game is children aged 7-12 years, aligning with their cognitive and emotional development. Through engaging gameplay, the game aims to support children's learning in a fun and interactive manner, fostering essential skills that contribute to their educational growth.

This study discusses the development process, game mechanics, and potential impact of *Adventure Time: Dilo World* as an educational adventure game. By analyzing the effectiveness of 2D platformer games in enhancing learning experiences, this research aims to provide insights for future educational game development and encourage further exploration of game-based learning methodologies.

2. METHOD AND MODELS

2.1 Game Flow Summary

The game flow of *Adventure Time: Dilo World* follows a structured navigation system, as illustrated in the flowchart. The main menu provides several options, including:

1. Play: Allows players to start the game.
2. Sound: Enables or disables background music and sound effects.

3. Quit: Exits the game.
4. Info: Displays game instructions and controls.

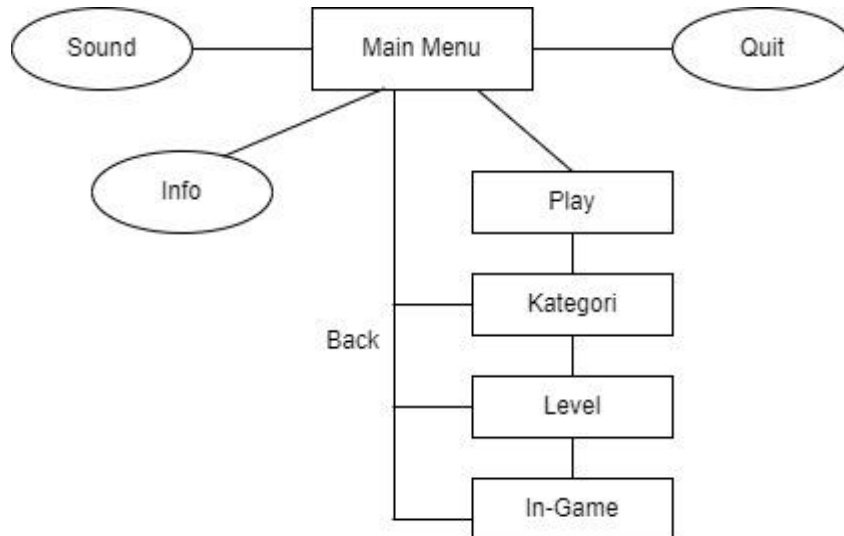


Figure 1. Game Flowchart

When the player selects "Play," they proceed through a sequence of selections: **Category** → **Level** → **In-Game**, ensuring a smooth and organized progression.

2.2 Look and Feel

The game incorporates different seasonal themes for each level to provide a dynamic visual experience:

1. Level 1 (Summer): Features bright, cheerful colors with green trees, a sunny background, and vibrant landscapes, creating a lively and energetic atmosphere.
2. Level 2 (Autumn): Displays warm hues such as orange, deep red, golden yellow, and brown. The background showcases a forest with falling leaves, evoking a peaceful and sentimental mood.
3. Level 3 (Winter): Represents a snowy environment with white-covered landscapes, mountain peaks, and snow-laden trees. The color palette consists of white, dark blue, gray, and brown, creating a cold yet serene ambiance.

Adventure Time: Dilo World is designed as a single-player adventure game. The primary goal is to explore different levels, solve educational challenges, and unlock treasure chests.

This educational game is tailored to help elementary school children (ages 7-12) enhance their knowledge in subjects such as mathematics, Indonesian history, Indonesian language, and English. The in-game questions are presented in English to improve language comprehension and cognitive skills. Currently, the game consists of three levels, with potential expansions planned for future development.

2.3 Game Design

The game employs a 2D cartoon-style design to appeal to children and maintain a fun, engaging atmosphere. The visual elements, including backgrounds, characters, and interactive objects, reflect various seasonal themes (summer, autumn, and winter). Each level features background music that aligns with its respective seasonal theme, enhancing the immersive experience for players.

Dilo: The protagonist, tasked with exploring the island, solving puzzles, and collecting treasure.



Figure 2. Main Character Dilo

Rino: A gray rhino-like creature that serves as an obstacle for players.



Figure 3. Enemy Character Rino

Angry Pig: A fierce red pig that moves aggressively to challenge the player.



Figure 4. Enemy Character Angry Pig

Radish: A round, root-like enemy with a pink and white color scheme, presenting another unique challenge in the game.



Figure 5. Enemy Character Radish

2.4 Gameplay

The game interface consists of interactive buttons and controls:

1. Play: Starts the game.
2. Sound: Toggles background music and sound effects.
3. Quit: Exits the game.
4. Info: Displays gameplay instructions.

Character Controls

1. Right Arrow: Moves the character to the right.
2. Left Arrow: Moves the character to the left.
3. Up Arrow: Makes the character jump.

Game Mechanics

1. Gold Collection: Players must collect gold coins to increase their score.
2. Answering Questions: To unlock treasure chests, players must correctly answer educational questions.
3. Enemy Avoidance: Players must avoid enemies to prevent losing lives.
4. Exit Game: Players can quit the game at any time by pressing the "Quit" button.

3. RESULT AND DISCUSSION

Figure 6 displays the main menu screen of the game *Adventure Time: Dilo World*. The background is designed with a bright blue sky and an ocean with small islands, creating a fresh and enjoyable atmosphere. In the center of the screen, the game title *Adventure Time: Dilo World* is presented in an adventure-themed font. Below the title, there are three main buttons: Play, Info, and Quit, allowing players to start the game, view the game guide, or exit.

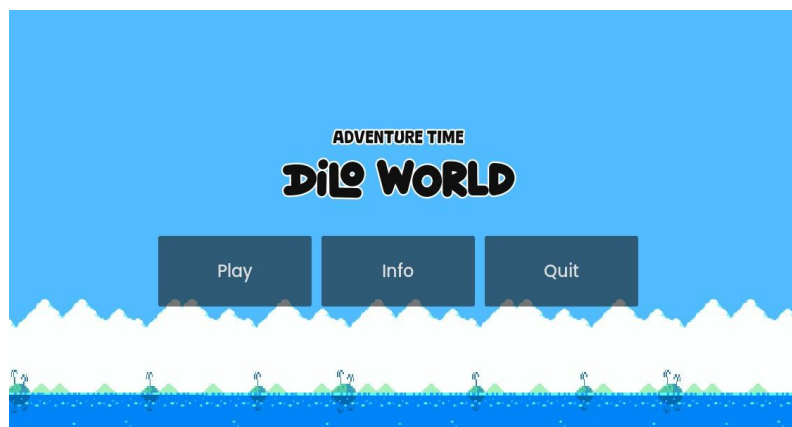


Figure 6. Main Menu

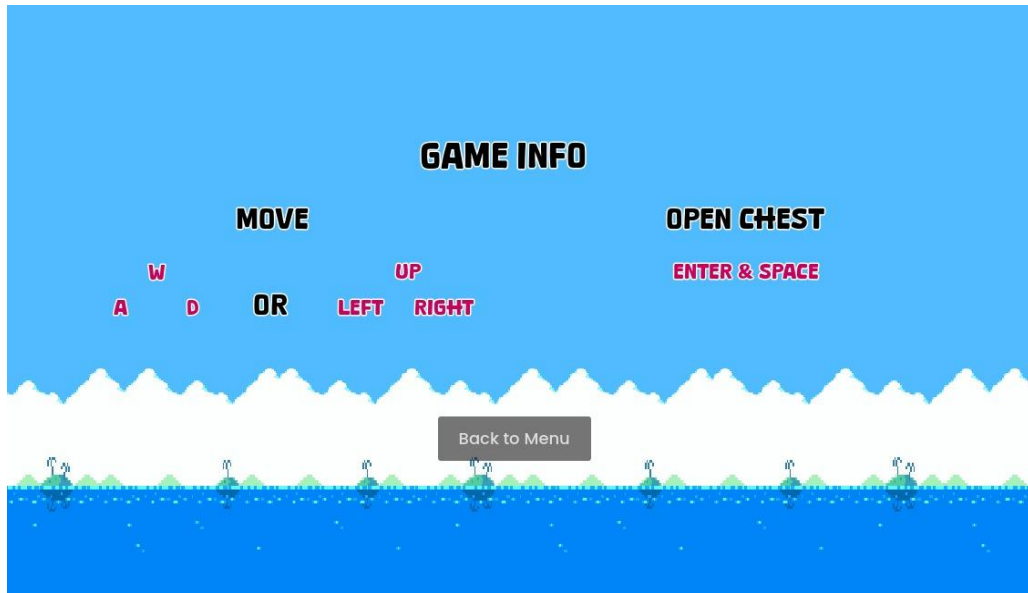


Figure 7. Game Info

Figure 7 shows the Game Info screen in *Adventure Time: Dilo World*, which appears when the "Info" button is clicked in the main menu. The background remains consistent with the main menu, featuring a bright blue sky and an ocean with small islands. The screen provides game control instructions, with movement controls displayed on the left: players can move using either the W, A, D keys or the Arrow keys (Left, Right, Up). On the right side, it explains that treasure chests can be opened using the Enter or Space key. At the bottom center, there is a "Back to Menu" button, allowing players to return to the main menu after viewing the instructions.

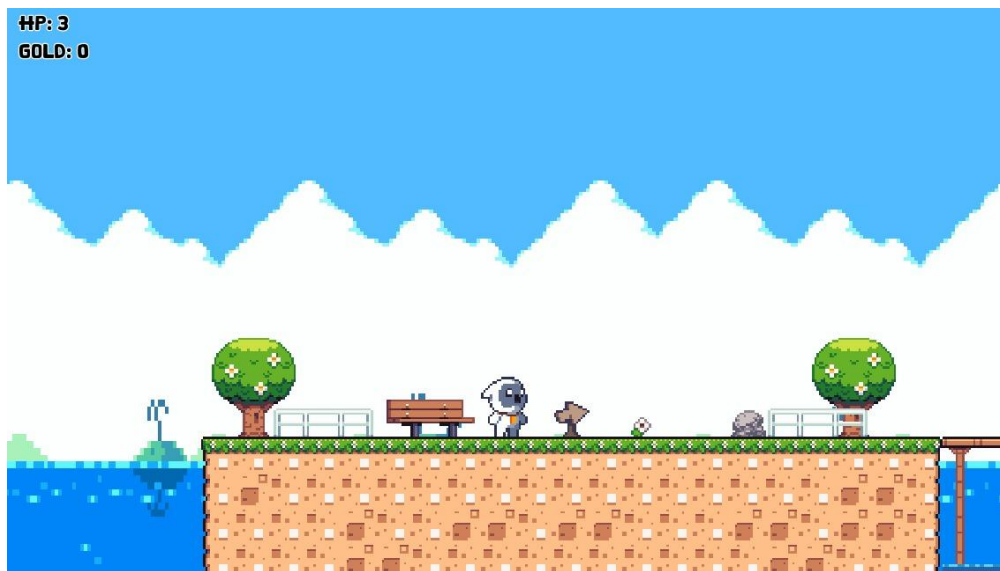


Figure 8. Level 1

Figure 8 showcases Level 1 of *Adventure Time: Dilo World*, set in a summer-themed environment. The background features a bright blue sky with fluffy white clouds, green trees, and a pixelated terrain design, creating a lively and engaging atmosphere. In this level, the player must explore the area to find hidden coin chests while overcoming various obstacles. If the player falls off the platform, they will be reset to the starting point. Once the player finds a coin chest, they must correctly answer a series of educational questions before unlocking the chest and progressing further in the game.



Figure 9. Level 2

Figure 9 depicts Level 2 of *Adventure Time: Dilo World*, where the season transitions to autumn. The environment is characterized by warm colors, including shades of orange, brown, and red, with falling leaves and mountainous terrain in the background, creating a calm yet adventurous atmosphere. The gameplay mechanics remain similar to the previous level, requiring the player to explore the area, avoid obstacles, and find hidden coin chests. However, this level introduces new challenges and different enemy types, making it more engaging and increasing the difficulty as the player progresses.

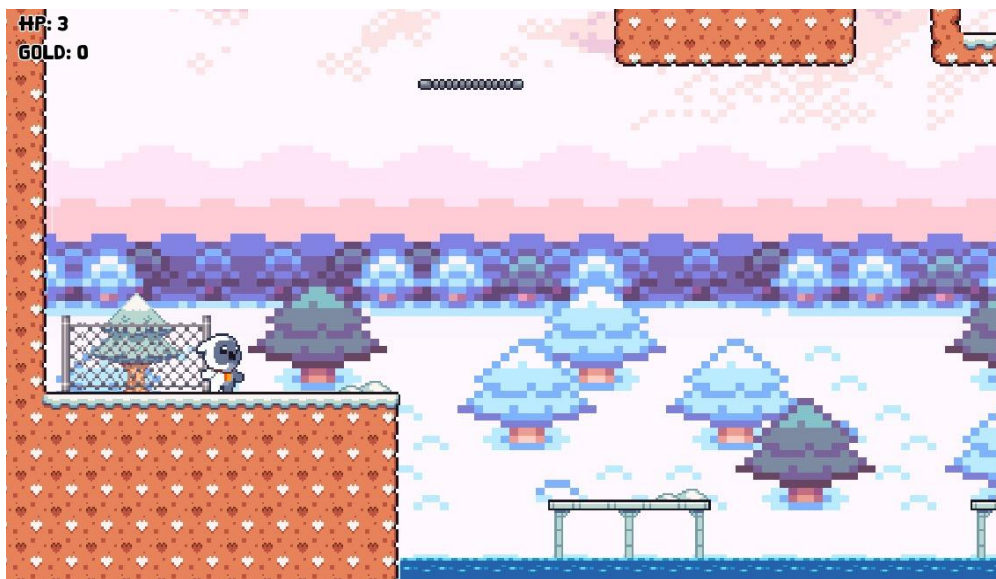


Figure 10. Level 3

Figure 10 represents Level 3 of *Adventure Time: Dilo World*, where the season has changed to winter. The environment is covered in snow, featuring frosty blue and white hues, snow-covered trees, and icy terrain, creating a cold yet serene atmosphere. The gameplay remains consistent with the previous levels, requiring the player to navigate through the world, avoid obstacles, and find the hidden coin chest. However, this level presents more challenging obstacles, making it the most difficult stage in the game. Players must carefully maneuver through the slippery terrain and increased hazards to progress and complete the adventure..

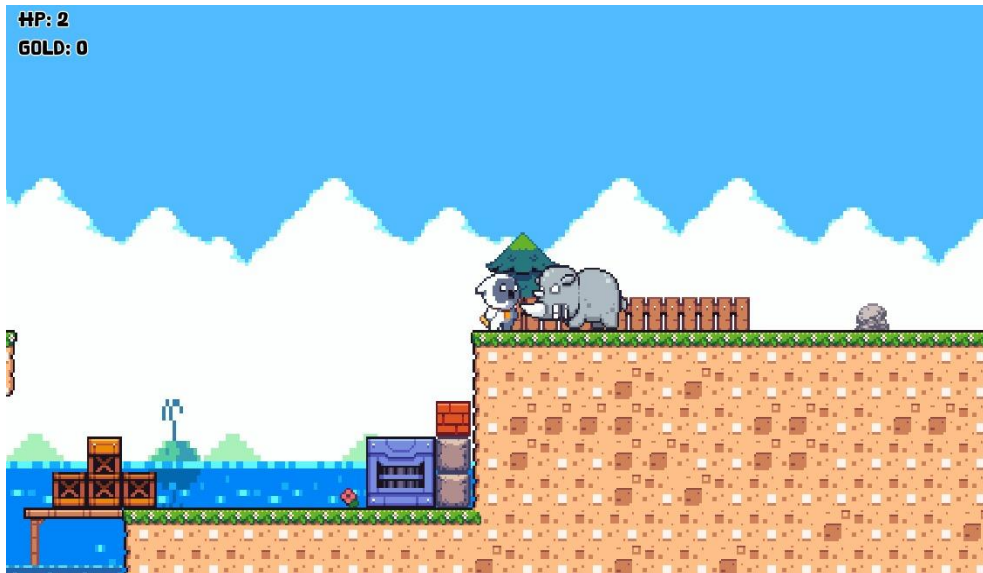


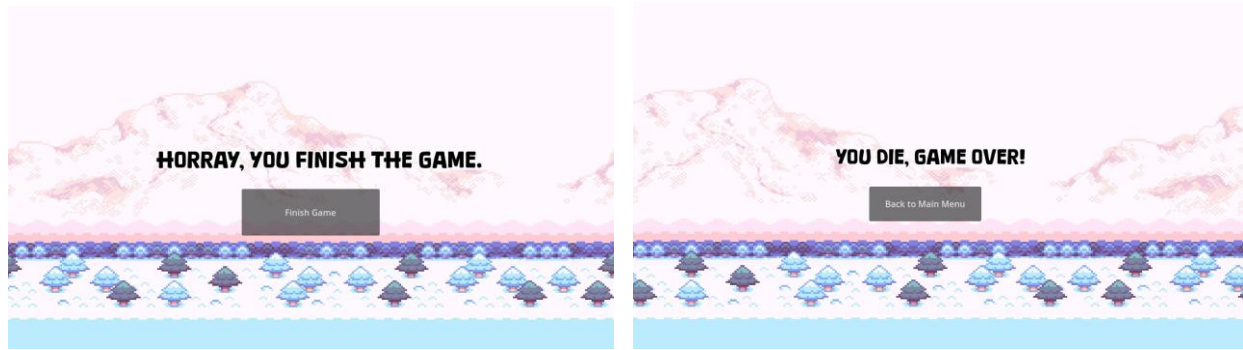
Figure 11. Enemy Character Encounter

During gameplay in each level, the player will encounter various enemy characters that act as obstacles. To obtain the gold stored in the treasure chest, the main character, Dilo, must face challenges posed by these enemies. If Dilo comes into contact with an enemy, the player will lose health points (HP), and in some cases, may be forced to restart the level from the beginning. These enemies add an extra layer of difficulty, requiring players to strategize their movements, avoid attacks, and carefully navigate the terrain to successfully complete the adventure.

. When the player successfully avoids or overcomes enemy attacks, they will discover a treasure chest. However, to open the chest, the player must first answer an educational question. The question is presented in a multiple-choice format, and only by selecting the correct answer will the chest unlock, rewarding the player with gold. This mechanic adds an interactive learning element to the game, reinforcing educational content while maintaining an engaging gameplay experience. Thus, players must demonstrate both skill and knowledge to progress through the game.



Figure 11. Chest Box Question



Gambar 12. End Game Screen

The game provides two possible outcomes based on the player's performance:

1. Victory Screen (Game Completed)

If the player successfully overcomes all challenges and completes every level, the "Hooray, You Finish the Game" screen appears. This screen serves as a congratulatory message, rewarding the player's effort and skill in finishing the game. A "Finish Game" button is available, allowing the player to exit or restart if desired.

2. Game Over Screen

If the player's health depletes entirely due to enemy attacks or falling into hazards, the "You Die, Game Over!" screen is displayed. This screen informs the player that the game session has ended. A "Back to Main Menu" button is provided, allowing the player to return to the main menu and restart the game from the beginning.

These two endings provide a clear indication of the player's performance, ensuring a structured and engaging gameplay experience.

4. CONCLUSION

Adventure Time: Dilo World is a 2D educational adventure game designed to enhance learning through interactive gameplay. By incorporating seasonal level designs, engaging platformer mechanics, and educational challenges, the game successfully blends entertainment with learning, making it suitable for children aged 7-12 years.

The game consists of three levels, each representing a different season—summer, autumn, and winter—providing a visually dynamic and immersive experience. Players must navigate through these environments, overcoming obstacles, avoiding enemies, and solving educational questions to progress and unlock treasure chests containing gold. The single-player mode ensures a focused learning experience, reinforcing subjects such as mathematics, Indonesian history, and English through in-game quizzes.

Developed using the Godot game engine, the game is accessible across multiple platforms, ensuring broad usability. The structured game flow, intuitive controls, and engaging challenges contribute to an enjoyable yet meaningful gaming experience. Additionally, the game encourages problem-solving, critical thinking, and perseverance in young players.

Future developments could include additional levels, new enemy types, expanded educational content, and multiplayer features to further enhance engagement and learning outcomes. Overall, *Adventure Time: Dilo World* demonstrates the potential of game-based learning as an effective educational tool, making learning fun, interactive, and rewarding for young players.

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