JOURNAL OF DIGITAL SYSTEM DEVELOPMENT

https://e-journal.uum.edu.my/index.php/jdsd

How to cite this article:
Vicky, T., Nur Sauri Yahaya & Nurulnadwan Binti Aziz (2025). Fluffy's Learning Journey: Design of an Interactive Animation for Game-Based English Learning. *Journal of Digital System Development, 3* (2), 15-31. https://doi.org/10.32890/jdsd2025.3.2.2

FLUFFY'S LEARNING JOURNEY: DESIGN OF AN INTERACTIVE ANIMATION FOR GAME-BASED ENGLISH LEARNING

[1]Teh Vicky, [2]Nur Sauri Yahaya & [3]Nurulnadwan Binti Aziz

[1&2]School of Multimedia Technology and Communication, Universiti Utara Malaysia

[3]Universiti Teknologi Mara Cawangan Terengganu

[1]Corresponding author: teh_vicky@smmtc.uum.edu.my

Received: 17/7/2025 *Revised: 5/8/2025* *Accepted: 12/8/2025* *Published: 30/10/2025*

ABSTRACT

In recent years, interactive animation has become a standard teaching method in classrooms, especially with game-based learning, as traditional methods are less effective for this generation of students. Interactive media learning is absent for standard two students at SJK(C) Ave Maria Convent Ipoh, and the students are relatively weak in English due to their reliance on their mother tongue. The purpose of this project is to develop a game-based interactive animation to serve as a teaching tool for English teachers and engage students' learning interests. The application was developed based on the Standard 2 syllabus using the SuperMinds textbook, covering Chapters 5 to 9. The design and development process of Fluffy's Learning Journey followed the ADDIE model, encompassing five key stages: Analysis, Design, Development, Implementation, and Evaluation. The evaluation phase was conducted in two parts: formative and summative assessments. Formative evaluation involved expert reviews to gather feedback for refining the application during its development. Summative evaluation, conducted post-development, aimed to collect user responses through an interview and observation with Standard 2 students in SJK(C) Ave Maria Convent Ipoh. The survey assessed the animation's performance in terms of effectiveness, ease of use, and overall user satisfaction. The results indicate that despite the introduction of the animation, many students were satisfied with learning English through the media. The findings affirm the satisfaction with Interactive Animation and Game-Based English Learning in enhancing motivation for learning the English language.

Keywords: Interactive animation development, English learning, Student experience enhancement, Game-based learning.

INTRODUCTION

In today's digital age, storytelling has evolved beyond static text and images. The interactive animation has emerged as a powerful tool to captivate audiences and deepen engagement (Hirsh-Pasek et al., 2015). By blending dynamic visuals, user participation, and immersive narratives, interactive animation transforms passive viewers into active participants, fostering a deeper emotional connection with the content. Developing an interactive animation enhances storytelling and engages users, resulting in a stronger emotional connection (Bakhtiary & Behzadi, 2023). Besides that, interactive animation allows users to interact with the content in real-time (Lee et al., 2018). Users will feel more engaged and delighted as they click and scroll through the animation. Developing a learning game is effective for learners who have issues with traditional teaching methods (Greipl et al., 2020). Using game learning impacts learners' engagement in their academics, especially for slow learners. The user can play games and learn simultaneously. The English language is an international language that connects East and West, North and South (RAO, 2019). In Malaysia, English is one of the primary languages, which means that all citizens begin learning English in kindergarten. The process of learning English should start from elementary school (Laksmi et al., 2021). In recent years, the evaluation of technology has brought media learning into the learning environment. Media learning is crucial in the education field, as it enhances student engagement and understanding. It benefits both teachers and students by incorporating media learning into the classroom (Laksmi et al., 2021). Media learning has changed the traditional models of education. As a result, game-based learning benefits both students and teachers in learning and teaching English. In SJK(C) Ave Maria Convent Ipoh, media learning has been provided for Standard 3 students (9 years old) through an interactive game stored on a CD. However, no media is provided for Standard 2 Students (8 years old). Furthermore, CDs are being eliminated because nearly all modern PCs lack disk drives. Two students in the standard two class also needed interactive media learning. Given that many students enjoy watching YouTube and singing along with their teacher, this indicates a strong preference for interactive media in the classroom. Furthermore, as this school is a Chinese primary school, students primarily communicate in Mandarin in their daily lives, which contributes to their relative weakness in English proficiency. Additionally, this generation of learners tends to show low interest in traditional textbooks. Teachers have observed that students often doodle in their books or become distracted during lessons instead of focusing on the text. Therefore, interactive media learning is essential for capturing and maintaining students' attention. The current lack of engaging and centralised digital learning tools hinders students' ability to stay focused and motivated in learning English. In response, this study aims to leverage mobile technology by developing an interactive animation embedded with game-based learning elements to enhance English language acquisition among young learners.

The Interactive Animation with Game-Based Learning, such as Fluffy's Learning Journey, was developed primarily to support English teachers as a teaching aid while enhancing students' engagement in learning. This project integrates interactive animation with a quiz-based game, allowing students to learn and play simultaneously. It specifically addresses gaps in existing English teaching methods by presenting English questions through engaging animated storytelling. In line with advancements in educational technology, it is important to utilise digital tools effectively to maximise their benefits. The integration of media in the learning process offers significant advantages for both students and educators. Moreover, the use of interactive technology is expected to positively influence students' active participation and motivation in the classroom.

BACKGROUND AND RELATED WORKS

The rise of digital learning tools has transformed early childhood education, with interactive media proving particularly effective in engaging young learners. Studies in multimedia learning suggest that combining visuals, narration, and interactivity enhances knowledge retention more effectively than passive methods (Mayer, 2014). Furthermore, Piaget's constructivist theory (1950) emphasises that children learn best through active exploration, such as a principle that game-based learning (GBL) leverages by allowing experimentation, problem-solving, and immediate feedback. On top of that, industry reports underscore the demand for innovation. For instance, 70% of educators believe storytelling boosts comprehension in young learners (Joan Ganz Cooney Centre, 2020), yet fewer than 30% of apps integrate narrative-driven gameplay. Similarly, a study by Common Sense Media (2023) found that children spend 60% more time on apps featuring character-driven journeys compared to those with static quizzes. The development of the Interactive Animation with Game-Based Learning-Fluffy's Learning Journey is deeply rooted in analysing existing media learning tools designed to assist children in their learning process. Several existing media learnings across various platforms offer valuable insights into both the potential and limitations of developing compelling interactive animations.

The Fantasy Run, developed by the LearnEnglish Kids site, is a simple game-based interactive animation that allows users to learn and play simultaneously. It provides essential functions such as game introduction, game instructions, praising phrases, and sound effects. The key features include providing different phrases of praise for each victory (Fantasy Run, 2023). However, while valuable, it falls short in offering a limited storyline, inconsistent buttons, and a lack of character interaction. The AdaptedMind, developed by Gloworld LLC, is a game-based interactive animation with a comprehensive storyline designed for children's learning journey. AdaptedMind offers personalised learning tailored to children's needs, enhancing their learning skills. Despite its strengths, AdaptedMind lacks dedicated navigation features, limiting its usefulness for physical campus navigation (AdaptedMind, 2010). On the other hand, Teach Your Monster to Read, launched in November 2020, is a game-based interactive animation partnership with Roehampton University. It aligns with children's learning status across three stages of their reading adventure, matching letters and sounds in their learning journey (Teach Your Monster to Read, 2020). However, it suffers from some unclear stage instructions and requires a subscription. On the other hand, MES Games, launched in 2002 and developed by Mark, offers a wide range of English learning activities, including grammar games, vocabulary, spelling, reading, and more (MES Games, 2002). However, it had many problems, such as poor layout design, no game introduction, no lead character, no storyline, unsuitable fonts, and inconsistent buttons. As mentioned by Monkey Isle (2020), the game helps users enhance their understanding of adjectives, prefixes, suffixes, synonyms, and antonyms. Teachers use this game in the classroom to engage ESL learners. However, the content is too bad, lacking encouraging phrases and a storyline.

Fluffy's Learning Journey addresses these gaps by merging interactive animation with pedagogical game design to create a holistic learning experience. First, it employs immersive storytelling through a progressive narrative where children help Fluffy, the protagonist, solve problems through contextualising learning objectives within an engaging plot. Second, the project incorporates tactile and adaptive mechanics, including drag-and-drop puzzles, voice commands, and dynamically scaled difficulty levels, to accommodate diverse learning paces and styles. Finally, it prioritises emotional engagement by using animated feedback (e.g., Fluffy's reactions to user choices), a design grounded in Bandura's (1977) social learning theory to foster empathy, motivation, and persistence. Together, these features bridge the divide between education and entertainment, offering a child-centred approach that aligns with both

developmental psychology and modern edtech innovation. Table 1 presents a comparison of key features found in related previous works, highlighting their strengths and limitations.

Table 1

Related Works

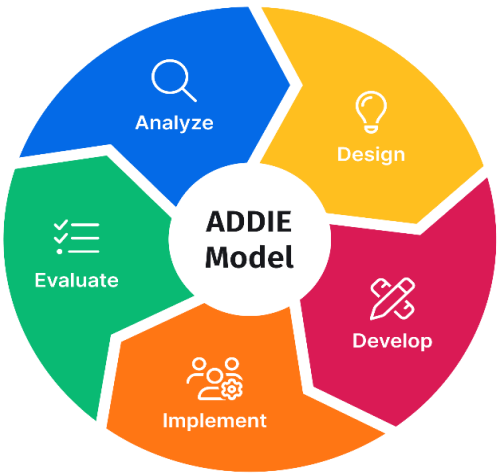
No.	Features	Fantasy Run	AdaptedMind	Teach Your Monster to Read	MES Games	Monkey Isle	Fluffy's Learning Journey
1.	Game Introduction	√	√	√			√
2.	Lead character		√	√			√
3.	Storyline		√	√			√
4.	How to Play Button	√	√	√	√	√	√
5.	Encouraging narration	√	√	√	√		√
6.	Consistentcy		√	√		√	√
7.	Suitable Fonts&Colour		√			√	√
8.	Background music	√		√		√	√
Total number of features		4	7	7	2	4	8

METHODOLOGY

The ADDIE model is a systematic instructional design framework used to guide the creation and refinement of educational programs (Hashimoto et al., 2025). It comprises five key phases: Analysis, Design, Development, Implementation, and Evaluation (Kamnardsiri et al., 2024). In the Analysis phase, the focus is on identifying the specific needs, goals, and constraints of the project. This involves understanding the target audience, defining the problem or gap, and gathering relevant data to inform the design process. The Design phase follows, where a detailed plan is crafted, outlining how the product will meet the identified needs. This includes developing design characters, animation background and defining the user experience. On the other hand, the Development phase involves building the product according to the design specifications. This includes creating content, coding, and integrating features, resulting in a functioning prototype or final version. During the Implementation phase, the product is deployed to users, and efforts are made to ensure effective usage. This includes launching the application, conducting training sessions, and providing user support. Finally, the Evaluation phase assesses the product's effectiveness and performance. This involves gathering user feedback and analysing the product's impact to identify strengths, weaknesses, and areas for improvement. By following the ADDIE model, developers can ensure a structured, iterative approach that enhances the quality and effectiveness of the final product. Figure 1 shows the five phases of the ADDIE model applied in this study.

Figure 1

The Phases of the ADDIE Methodology



Analysis

The analysis phase focuses on recognising and defining the problem, delivering a clear problem statement, and developing a solution aligned with the project's objectives. The analysis phase begins with a needs analysis to identify problems, causes, and solutions related to developing a multimedia project to support English learning for Standard 2 students at SJK(C) Ave Maria Convent Ipoh, aligned with the school syllabus. Interviews, surveys and questionnaires were conducted to gather insights from both clients and users. The interview will be conducted with three participants, including the English teacher of SJK(C) Ave Maria Convent Ipoh. Through the interview sessions, we understand the current situation of the teaching environment, identify the challenges faced, and gather their suggestions for content and design. The survey and Questionnaire will be conducted using printed Google Forms with 30 Standard 2 students. The students' preferences and interests were identified through a Google Form. Furthermore, the problems with the current teaching methods were identified to support the project problem statement through a systematic review matrix, using data from six journal articles, as shown in Table 2.

Table 2

Literature Review Matrix: Summarising Relevant Studies for Problem Statement

	Paper Title	Country	Aim	Method	Result & finding
1.	Use of interactive media to improve understanding of the English language for children (2020)	Malaysia	To determine whether learning activities using interactive media align with the topics, we need to enhance preschool students' understanding.	● Experimental study ● Control Group ● n=20	**Problems:** ● An ineffective teaching method results in less interaction between students and teachers ● Students are less motivated to learn since they cannot understand English. **Solutions:** ● Utilise interactive media technology to teach English ● CDs, YouTube

2.	Analysis of Video Animation Media Development Requirements from a Constructivist Perspective (2022)	Indonesia	To identify the need for developing an animation as a teaching tool for students.	● Survey and Questionnaire ● n=90	**Problems:** ● Students are not interested in traditional and static types of learning materials **Solutions:** ● Constructivist-based animated video media is essential as a motivator for students' learning. ● Students need engaging learning materials to increase learning motivation.
3.	The Contribution Of 2D Animation In Digital Games with A Tangible Interface (2020)	Portugal	To analyse how TUI can enhance children's engagement.	● Field studies	**Problems:** ● Outdated teaching methods restrict students' ability to engage with digital content. ● Limit students' learning experience. **Solutions:** ● When creating content for children, it is essential to be careful.
4.	The use of animated videos as learning media for young learners to improve EFL Students' Motivation in Learning English (2021)	Indonesia	To investigate how animation videos can impact students' interest in learning English.	● Research method	**Problems:** ● Lack of effective learning methods. ● Students' lack of understanding in online classes without using any learning media. **Solutions:** ● Use animation and video to enhance learning. ● To help students learn English effectively, teachers should choose suitable media for learning.
5.	How to Make Use of Animation to Improve Primary School Students' English Achievement (2020)	Indonesia	To identify the role of animation in students' engagement in learning English.	● Field investigation ● n=39	**Problems:** ● Teaching first-grade students is different from higher grades ● Low level of English proficiency ● Lack of understanding of the importance of English ● Old-fashioned teaching method ● Students' hands-on skills are weak **Solutions:** ● Focus on the environment around the children ● Implement motion media
6.	English Grammar On the	Indonesia	To identify the effectiveness of game-based	● Research and developme	**Problems:** ● An inconsistent grammar syllabus confuses students

2013 Curriculum : The Development of Game-Based Learning Multimedia (2018)	learning, multimedia can enhance student learning outcomes.	nt ● ADDIE model	when learning basic grammar. ● The lack of digital learning resources limits students' learning of grammar ideas. **Solutions:** ● Implement multimedia game-based learning to improve students' achievement.

Design and Development

Initially, the process begins with pre-production, where ideas are translated into storyboards and animatics to visualise the sequence of actions and timing. Once the storyboard is finalised, the production phase begins with the creation of vector-based artwork directly within Adobe Animate. For the design phase, the project was developed based on data collected from interviews and surveys conducted with both teachers and students using questionnaires. The design is based on teacher preferences, such as using simple graphics and text, and allows students to choose the project's design elements, including animation themes, colours, and fonts. The characters were designed using Adobe Illustrator. A three-view character design was created, including front, back, and side full-body views. Different facial expressions were also developed during this phase. The character view is shown in Figure 2.

Figure 2

Character Design: Fluffy and Fifi

After creating the character, bone rigging was applied to it in Adobe Animate. The digital bones ensure that the characters can move smoothly and naturally, mimicking human-like movements. This technique helps bring the characters to life with more realistic and fluid animations. The rigging process for the characters is shown in Figure 3. The background of each level features a different and unique theme. The backgrounds are first drawn in Adobe Illustrator and then imported into Adobe Animate as the background of the animation. The background is shown in Figure 4.

Figure 3

Character Bone Rigging: Fluffy and Fifi

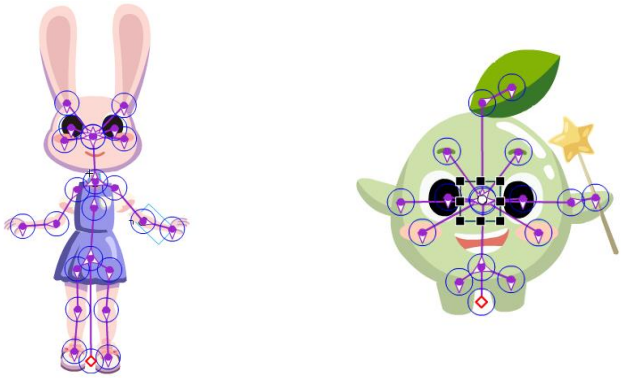
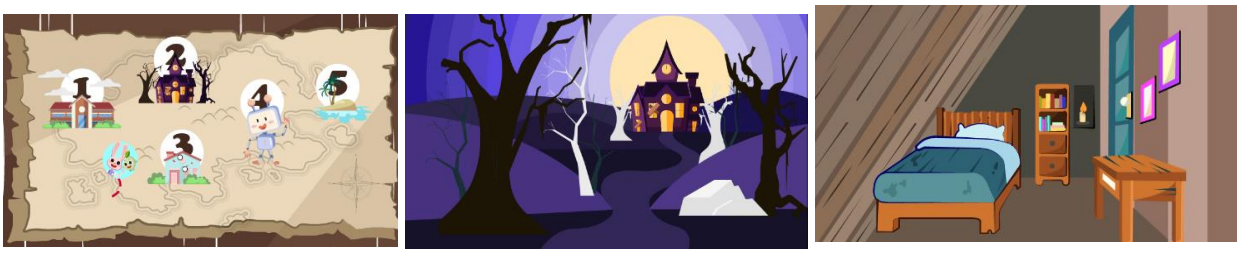


Figure 4

Background for Levels 1,2, and 3



Development

During the Development phase, ActionScript was employed as the core scripting tool to add interactivity to the buttons in Interactive Animation with Game-Based English Learning: Fluffy's Learning Journey. ActionScript is a robust scripting language in Adobe Animate that enables the creation of dynamic, interactive elements and precise control over animation behaviour. Scripts were assigned to objects on the stage, allowing for programmed responses to user actions such as mouse clicks, movements, and keyboard inputs. This scripting capability was essential in developing interactive components like menus, quizzes, and navigational controls that respond to user engagement. Using event listeners and functions, ActionScript effectively manages timelines, variables, and even external content, ensuring smooth navigation and logical flow within the application. It also enables developers to create a responsive user interface that enhances usability. In this project, ActionScript is crucial for implementing interactive navigation buttons, allowing users to move between sections of the animation seamlessly. These interactions contributed to a visually engaging and functionally rich experience, making the learning journey more intuitive and enjoyable. The button functions and scripting details are illustrated in Figures 5 and 6.

Figure 5

'Play' button and 'How to Play' button in the Landing Page

Figure 6

'Play' button and 'Close' button in Game Instruction Page

Furthermore, all characters and objects used throughout the animation are first designed in Adobe Illustrator and then imported into Adobe Animate for animation and interactivity. Creating visual assets in Illustrator offers greater precision and flexibility, allowing designers to produce clean, scalable vector graphics. This method is more efficient than drawing directly within Adobe Animate, as it enables better organisation and management of visual elements. By preparing the assets in Illustrator beforehand, the number of objects processed within each scene in Adobe Animate is significantly reduced, which helps optimise performance and ensures smoother playback during animation.

Implementation

The implementation phase involves selecting a suitable platform to run the multimedia project. For this purpose, VLC Media Player is used to play the final animation. VLC is chosen for its compatibility with a wide range of video formats and codecs, including proprietary ones like H.264, ensuring smooth playback across different systems. The animation is saved in the SWF (Small Web Format) file type, as it offers a standardised method for embedding multimedia elements such as audio, video, and interactivity. Upon launching the project, users are greeted with a **Landing Page** as shown in Figure 7, which features two interactive buttons: **'How to Play'** and **'Play'**. Selecting the 'How to Play' button triggers a pop-up window containing game instructions, helping users understand the mechanics and objectives as shown in Figure 7. After reading the instructions and clicking the 'Close' button, users are returned to the landing page. Choosing the 'Play' button initiates the animation, starting with the **Character Introduction Page** as shown in Figure 8, which sets the stage for the learning journey titled *Interactive Animation with Game-Based English Learning – Fluffy's Learning Journey*.

Figure 7

Landing Page and How to Play Page

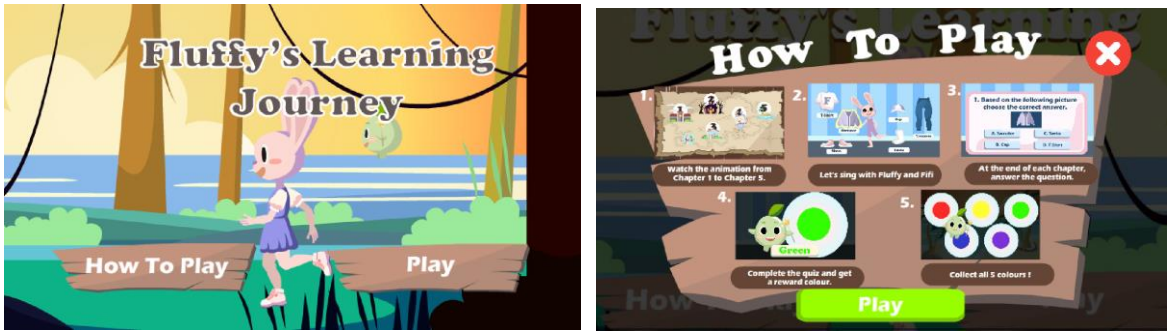


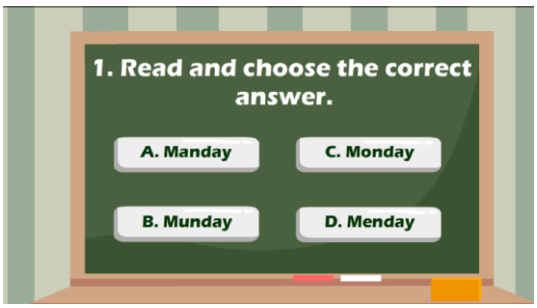
Figure 8

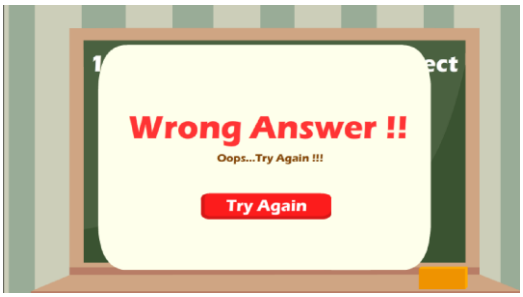
Character Introduction Page

After the character's introduction, users are directed to a **Progress Page**, which displays the level they are about to begin. Each level starts with a Level Introduction, offering a brief preview of the learning objectives and content to be covered. To enhance engagement, a unique Theme Song automatically plays, setting the mood for the level. Once the song ends, the Main Characters appear on screen to prompt the user that it is time to begin the interactive segment. This leads to the **Quiz Page** as shown in Figure 9, where users respond to questions by selecting from clickable answer buttons. If an incorrect answer is chosen, a Pop-Up Alert notifies the user and provides a 'Try Again' button, encouraging repeated attempts as shown in Figure 9. Upon selecting the correct answer, a Success Alert is displayed along with a 'Next' button that navigates to the Victory Page. Here, users are rewarded with a Colour Token for completing the level. The application then continues to the next level, maintaining the same structure but introducing a new theme song and animation to ensure variety and sustained interest. This structured flow repeats across all five levels. At the end of the final level, users will have collected five unique colours. The experience concludes with a **Goodbye Session Page**, where the main characters return to thank the user and announce the end of the animation.

Figure 9

Quiz Page and Pop-up Window





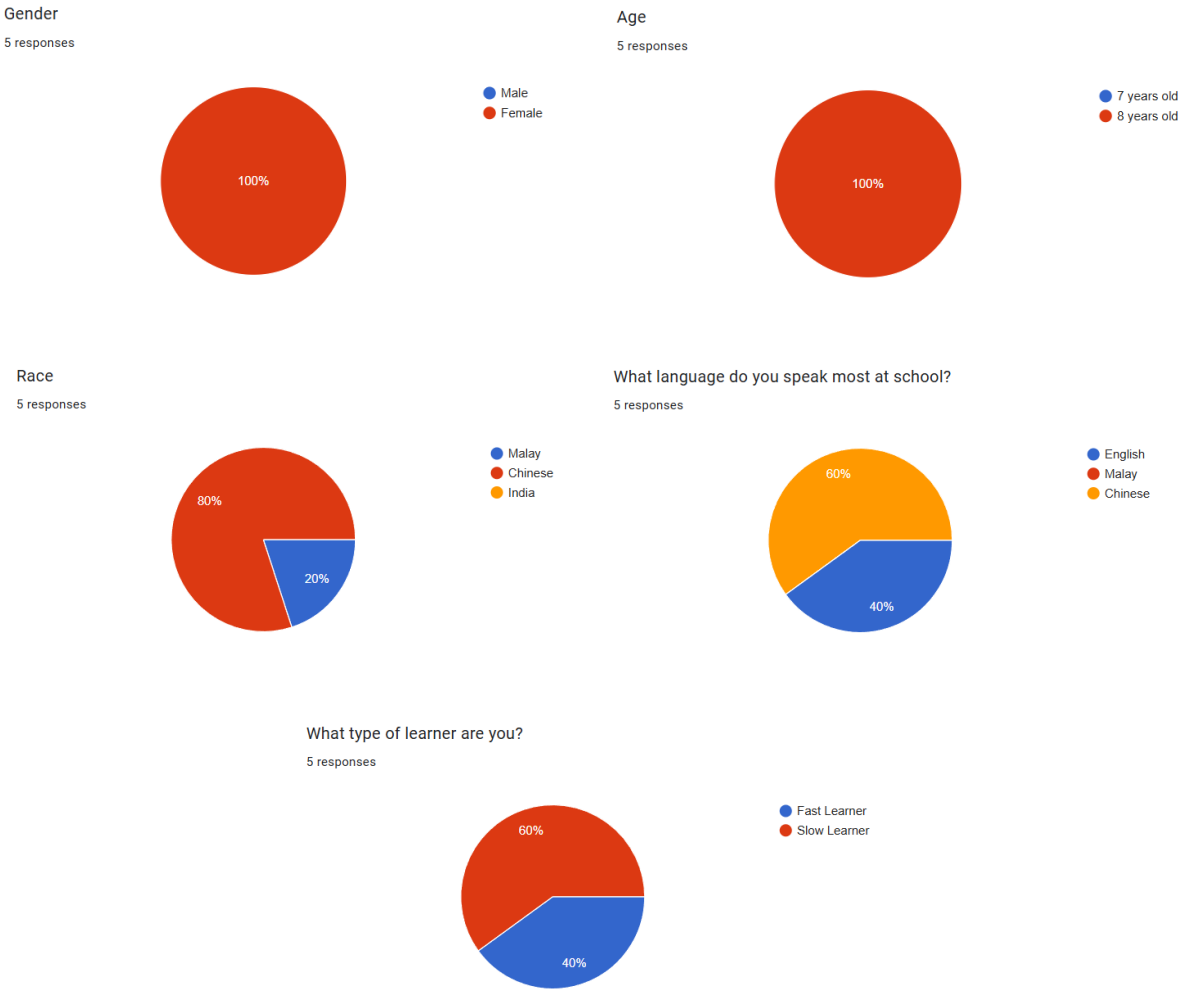
Evaluation

The evaluation phase consists of two stages: formative evaluation and summative evaluation. Formative evaluation is an ongoing assessment conducted during the development of the Interactive Animation with Game-Based English Learning-Fluffy's Learning Journey to ensure both quality and progress. This evaluation employs a qualitative approach, specifically through face-to-face interviews with experts. The assessment focuses on three key aspects: multimedia design, usability, and content. Experts provide feedback on each of these areas, helping to identify strengths and weaknesses of the application. This feedback is crucial for refining the interactive animation and enhancing the overall user experience. It serves as a basis for making improvements and ensuring the application meets the needs and expectations of its users. On the other hand, the summative evaluation occurs after the development of the interactive animation, and it aims to gather data based on user responses (Vittorini et al., 2021). This phase employs a qualitative approach. Face-to-face interviews and observations were conducted with five Standard 2 students at SJK(C) Ave Maria Convent Ipoh, who are the target users. The purpose of this evaluation is to assess the interactive animation's performance in terms of usefulness, effectiveness, ease of use, and satisfaction. Seventeen closed and open-ended questions are prepared to ensure that the questions are suitable to ask based on the DSKP learning standard. This structured feedback provides valuable insights into the interactive animation's effectiveness and identifies areas for potential improvement. Although the number of respondents is limited, this sample size is deemed sufficient for an initial prototype evaluation in educational multimedia development. The qualitative nature of the study focuses on gathering rich, user-centred insights rather than generalising to a larger population. According to Nielsen (1994), testing with five users can uncover most usability issues, making it a practical and widely accepted approach in early-stage design evaluations. Furthermore, the selected students represented a mix of slow and fast learners, ensuring a diverse range of feedback within the core target group. The summative findings were also complemented by a formative evaluation with expert reviewers, providing triangulated evidence on the animation's effectiveness, usability, and engagement. Due to ethical and logistical considerations involving young children, which include the need for parental consent, school coordination, and short attention spans, a small sample was both appropriate and manageable. Future studies may involve larger-scale testing to validate these findings further.

The Respondent's Demographic Information

Figure 10

Results of Demographic



Based on Figure 10, the data were collected from a group of Standard 2 students at SJK(C) Ave Maria Convent Ipoh, an all-girls type primary school. As such, all participants were female and 8 years old, reflecting the actual demographic composition of the school. Many students were Chinese (80%), followed by Malay students (20%), which is consistent with the typical racial composition of the school. In terms of language use, 60% of the students primarily spoke Chinese at home, while 40% used English, indicating that Chinese is the dominant language in their daily communication. Notably, 60% of the participants were identified as slow learners and 40% as fast learners. This mix provided a balanced representation for evaluating the usability and accessibility of the interactive animation across different learning abilities.

RESULT OF EVALUATION

The evaluation of the Interactive Animation with Game-Based English Learning: Fluffy's Learning Journey emphasises effectiveness, ease of use, and overall user satisfaction, as these criteria are critical for determining the application's effectiveness and success. The following series of inquiries evaluated the animation's perceived effectiveness in providing thorough details about learning English with this interactive tool.

Table 3

Results of Effectiveness

		Respondent 1	Respondent 2	Respondent 3	Respondent 4	Respondent 5
1.	Did you understand the story in the animation?	Yes! I like the story. It is fun to play the game with Fluffy.	Yes, I understand the whole story! It is so exciting!	Yes! I love the story. I want to play again!	Yes. I want to play again.	I can understand because I learn all the songs before.
2.	Did the animation help you learn English words?	Yes, because the song helps me learn the words.	No, the words are easy. I already know them from before.	Yes, I like to sing with Fifi. The words are fun.	Yes. I love to sing together!	Yes. I learn new words with the song.
3.	Can you say or use the English words after answering the quiz?	I can say some words, but I forgot a few.	Yes, I can say all of them. I got all the quizzes correct.	Yes, all the words are easy. I can say them fast!	Maybe. I need to think a bit before I say.	I think yes, but not every word. I need more time.
4.	Do you remember what you learned from the animation?	I remember we learn about the bedroom and kitchen!	Yes, I remember the robot part and the fun song!	Yes. We learned the songs in class before.	Yes, I learned how to make a robot!	Yes, I remember many parts of the animation.

The findings from the evaluation, as presented in Table 3, indicate a positive user response toward the effectiveness of Interactive Animation with Game-Based English Learning: Fluffy's Learning Journey. All five respondents agreed that the animation's storyline was straightforward to understand. The majority (four out of five) reported that the animation helped them learn new English words, with several participants highlighting the engaging nature of the theme song as a memorable learning aid. One respondent noted prior familiarity with the vocabulary, which may have influenced their response. When asked whether they could use or say the English words after completing the quiz, two respondents responded affirmatively. At the same time, three expressed uncertainties, suggesting the need for repeated exposure to reinforce learning. Importantly, all respondents confirmed that they remembered what they had learned through the animation. These results suggest that the animation was educationally effective, user-friendly, and motivating. Its integration of music, interactive quizzes, and character-driven storytelling supported language retention and user engagement, particularly when used in conjunction with classroom instruction.

Table 4

Results of Ease of Use

		Respondent 1	Respondent 2	Respondent 3	Respondent 4	Respondent 5
1.	Is the animation easy to play and use?	Yes. I can click all the buttons.	Yes. I can play by myself.	Yes. This is so easy.	Yes. I want to play again.	It is easy for me.
2.	Can you follow the instructions in the game?	Yes. The game tells me what to do clearly.	Yes. It is easy to understand.	Yes, I can follow. The game shows me how.	Yes. I do not even need the instructions.	Yes. I can follow.
3.	Is it easy to choose and press the buttons?	Yes, the buttons are big. I can find them fast.	Yes. I finished one level in less than 30 seconds!	Yes. The buttons are nice and easy to press.	Yes. I press the buttons quickly.	Yes. I can choose and click the answers fast.
4.	Did you need help to play the game?	I need help in Level 5	No. The game is too easy for me!	No. I can play without help.	Yes. I need help with some levels.	No, I do not need help. I can do it all by myself.

The results presented in Table 4 indicate that Interactive Animation with Game-Based English Learning: Fluffy's Learning Journey is highly user-friendly and accessible for young learners. All five respondents agreed that the animation was easy to play and use, and they were able to follow the instructions without difficulty. In addition, all participants confirmed that the buttons were easy to choose and press, highlighting the intuitive design of the interface. While three respondents required no assistance to play the game, two mentioned needing some help, suggesting a minor variation in user independence. Overall, the findings demonstrate that the interactive animation was easy to use, requiring minimal support and offering a smooth, straightforward experience even for users with limited digital skills.

Table 5

Results of Overall User Satisfaction

		Respondent 1	Respondent 2	Respondent 3	Respondent 4	Respondent 5
1.	Do you like the interactive animation?	Yes. I like it because it is cute and not too fast.	Yes! It is fun and easy to play.	Yes. The animation is colourful and fun!	Yes. I like it because I can take my time.	Yes! It is friendly and easy to understand.
2.	Which part do you like the most?	I like the song part. I can sing with Fluffy and Fifi.	I like the quiz. I can answer very fast.	I like the part when they show the rooms and sing.	I like it when it builds the robot. That part is cool.	I love to sing together with Fluffy and Fifi.

3.	Do you want to play the game again?	Yes. I want to try again slowly.	Yes! I want to play again and get full marks!	Yes! I want to play again and explore more!	Yes, I want to play again to improve my performance.	Yes, I want to try again and remember more.
4.	Would you tell your friends to try this game?	Yes. I will tell them if they like singing games.	Yes, I already told my friends in class. They will love it!	Yes. I think my friends will enjoy it too.	Yes. I need to try again before I tell them.	Yes. I want my best friend to try with me.

As presented in Table 5, the evaluation of user satisfaction revealed a high level of enjoyment and positive reception among the five participants. All respondents indicated that they enjoyed playing the interactive animation, responding positively to the question *"Do you like the interactive animation?"*. When asked *"Which part do you like the most?"*, three respondents highlighted the sing-along scenes with the characters, showing strong engagement with the musical elements. One respondent favoured the quiz section, while another expressed enjoyment for the robot-themed content in Level 3, suggesting that different aspects of the animation appealed to various user preferences. Furthermore, all five respondents stated that they would like to play the game again and confirmed that they would recommend it to their friends, reflecting a strong overall impression. These findings indicate that Interactive Animation with Game-Based English Learning: Fluffy's Learning Journey successfully met users' expectations by providing an enjoyable, engaging, and shareable learning experience, contributing to its overall effectiveness as a game-based educational tool.

Constraint and limitation

Several limitations were identified during the development and implementation of Interactive Animation with Game-Based English Learning: Fluffy's Learning Journey, which should be considered for future improvement. One major constraint is the absence of essential navigation buttons such as *Home, Back, Play*, *Pause*, and *Skip* on every scene. This omission was due to the large file size, as the animation consists of over 70 scenes, each containing multiple layers and numerous assets in the library. Adding more interactive elements caused system instability, leading to file corruption. To mitigate this, the frame rate is initially set at 60 frames per second (fps), which needs to be reduced to 12–20 fps to optimise performance and improve compatibility across devices. However, a more robust solution would involve restructuring the animation to support a complete navigation interface without compromising stability. Another significant limitation is the animation's reliance on Adobe Flash for playback. Since Adobe officially discontinued Flash in 2020, the animation can only be run on older computers that still support the Flash Player environment. This presents a major compatibility issue for modern users. To address this, the project should undergo a technical upgrade, converting its scripting from ActionScript to JavaScript and exporting it as an HTML5-based application. This would allow the animation to be hosted on the web and accessed through modern browsers and devices without the need for legacy software, thereby enhancing accessibility and long-term usability.

CONCLUSION

In conclusion, the Interactive Animation with Game-Based English Learning: Fluffy's Learning Journey is a thoughtfully designed educational tool explicitly tailored for Standard 2 students at SJK(C) Ave Maria Convent Ipoh. Its main objective is to assist English teachers by providing an engaging teaching aid that captures students' learning interests. The project combines interactive animation with a quiz game, allowing the students to learn and play simultaneously. The project addresses gaps in current English

teaching methods by integrating English questions into animated storytelling, enhancing students' understanding through contextual learning. The use of media for learning purposes will bring benefits for students and teachers. It considers the significant impacts on students' active participation when incorporating technology into this project. The Interactive Animation with Game-Based English Learning is not only a facilitation tool for teachers but also a learning tool for student to improve their English language skills. Features, such as the integrated quiz session, allow students to review content learned through the animation. The animation's implementation of the content aligned with the Standard 2 SuperMinds textbook, effectively connecting textbook material into real-life contexts, and offering a fun, motivating learning environment.

For future work, the Interactive Animation with Game-Based English Learning can be improved by adding important navigation buttons, such as Home, Back, Play, Pause, and Skip, on every scene to make it easier for users to control the experience. To address system crashes caused by too many scenes, the animation will be divided into smaller parts or levels, with each part saved as a separate file and loaded only when needed. This will help reduce memory usage and improve performance. Instead of using many different scenes, symbols and labelled frames will be used to control the animation more efficiently with simple coding. Large files like music and images will also be stored separately and loaded when needed to keep the main file small. Now, the animation runs on VLC Media Player, but relying on only one media player is not practical. It should also be tested on other players such as Windows Media Player, KMPlayer, and PotPlayer. To make it more accessible and modern, the animation will be converted into HTML5 format using JavaScript, allowing it to run directly in web browsers like Chrome or Firefox. This upgrade will make it easier for teachers and students to access the animation on any device, and it can also be shared through websites or learning platforms. These improvements will make the animation more user-friendly, stable, and effective as a digital English learning tool for Standard 2 students.

ACKNOWLEDGMENT

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

REFERENCES

Bakhtiary, M. J., & Behzadi, M. (2023*). Digital Storytelling: Unleashing the Power of Narrative in the Digital Age*. The Second International Conference on Industrial Marketing, 1–32.

Bandura, A., & Walters, R. H. (1977). Social Learning Theory (Vol. 1, pp. 141–154). Englewood Cliffs, NJ: Prentice Hall.

Common Sense Media. (2023). *The use of educational technology among young children: Trends and impacts*. https://www.commonsensemedia.org

Greipl, S., Moeller, K., & Ninaus, M. (2020). Potentials and Limits of Game-Based Learning. International *Journal of Technology Enhanced Learning, 12*(4), 363–389.

Hashimoto, M., Nakamura, N., & Sato, N. (2025). Development process of a learning program to improve health literacy in social eating situations for adolescents with food allergies. *Journal of Pediatric Health Care*. https://doi.org/10.1016/j.pedhc.2025.02.005

Hirsh-Pasek, K., Zosh, J. M., Golinkoff, R. M., Gray, J. H., Robb, M. B., & Kaufman, J. (2015). Putting education in "educational" apps: Lessons from the science of learning. *Psychological Science in the Public Interest, 16*(1), 3–34. https://doi.org/10.1177/1529100615569721

Joan Ganz Cooney Centre. (2020). *Interactive storytelling in children's educational media: A market and impact analysis*. Sesame Workshop. https://joanganzcooneycenter.org

Kamnardsiri, T., Kumfu, S., Munkhetvit, P., Boripuntakul, S., & Sungkarat, S. (2024). Home-Based, Low-Intensity, Gamification-Based, Interactive Physical-Cognitive training for older adults using the ADDIE model: Design, development, and Evaluation of user experience. *JMIR Serious Games, 12*, e59141. https://doi.org/10.2196/59141

Laksmi, N. K. P., Yasa, I. K. A., & Mirayani, K. A. M. (2021). The Use of Animation Video as Learning Media for Young Learners to Improve EFL Students' Motivation in Learning English. *Lingua: Jurnal Pendidikan Bahasa, 17*(1), 42-52. 10.34005

Mayer, R. E. (2014). *The Cambridge handbook of multimedia learning* (2nd ed.). Cambridge University Press. https://doi.org/10.1017/CBO9781139547369

Nielsen, J. (1994). Estimating the number of subjects needed for a thinking-aloud test. *International Journal of Human-Computer Studies, 41*(3), 385–397

Lee, K., Lee, S., & Lee, J. (2018). Interactive Character Animation by Learning Multi-Objective Control. *ACM Transactions on Graphics, 37*(6), 1–10. https://doi.org/10.1145/3272127.3275071

Piaget, J. (2005). *The psychology of intelligence*. Routledge

RAO, P. S. (2019). The Role of English as A Global Language. *Research Journal of English (RJOE), 4*(1), 65–79.