

Implementation of AI in Animated Health Education Film to Overcome Hospital Anxiety

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ABSTRACT

Children's fear of going to hospitals is a common emotional barrier that can interfere with medical treatment and early health education. This research addresses that issue by developing an animated educational film using artificial intelligence (AI) to help children aged 6–9 overcome their anxiety about medical environments. The purpose of this study is to produce a multimedia-based health education tool that is emotionally engaging, educationally effective, and technically efficient. The film development followed the Multimedia Development Life Cycle (MDLC), consisting of six stages: concept, design, material collecting, assembly, testing, and distribution. Several AI-based tools were integrated, including ChatGPT for scriptwriting and visual prompting, Kling AI for animation and lip-syncing, ElevenLabs for AI-generated voice-over, and CapCut for final editing. The result is a 7-minute 2D animation titled "Mengatasi Ketakutan Berobat ke Rumah Sakit", which introduces child-friendly characters and a relatable storyline to reduce fear and improve comprehension of hospitals. User testing was conducted on five children aged 8–12, showing a noticeable decrease in hospital-related fear and increased verbal engagement with the topic. Most participants found the animation enjoyable and easy to follow. The findings suggest that AI-supported animation can be an effective medium for health education in children. While the outcome met the expected goals, future research is recommended to include larger participant groups and validated psychological assessment tools for more robust evaluation.

INTRODUCTION

Children's fear when receiving medical treatment at hospitals is a common phenomenon that requires serious attention. Factors such as unfamiliar hospital environments, frightening medical equipment, and unpleasant medical experiences can trigger anxiety in children. This condition often leads to resistance toward medical procedures and may even worsen their health status (Aisyah et al., 2021). Unfortunately, educational approaches specifically designed to reduce children's fear of hospitals are still rarely developed in a targeted manner.

One approach that is increasingly used in children's health education is animated media. Animation is considered effective in delivering messages in an engaging and easy-to-understand way, especially for young children. A study by (Sagitaa et al., 2022) reported a significant increase in elementary students' understanding of obesity-related topics after being educated through animated and visual media.

In addition to improving knowledge, animated content has also proven effective in fostering positive emotional engagement. (Putri et al., 2021) observed a significant improvement in students' knowledge scores about oral health after watching 2D animations. Similarly, (Luthfia et al., 2022) found that interactive animation was more engaging than leaflets in a stunting prevention program in West Lombok. These findings indicate that animated media holds strong potential for enhancing both comprehension and emotional resonance in children.

However, most existing studies still focus on cognitive improvements such as knowledge and understanding, rather than on affective aspects like fear or anxiety. (Mardiah et al., 2024) noted that while animation can improve patient attitudes and understanding, no study has directly examined its impact on reducing children's fear in hospitals. Likewise, (Aisyah et al., 2021) in their scoping review, emphasized the need for more emotionally responsive animated content that aligns with children's psychological conditions.

With advancements in technology, artificial intelligence (AI) has started to be utilized in the production of educational media. AI enables automated script generation, synthetic voice creation, and personalized digital animation. According to (Ahmad Hawary et al., 2024), the use of AI accelerates the production of educational content while enhancing the presentation quality. Furthermore, (Luthfia et al., 2022) highlighted that integrating technology into educational media increases user engagement and appeal, especially among children.

Based on this background, this study aims to design and implement an AI-based educational animated film specifically developed to reduce children's fear when visiting hospitals. In addition to focusing on educational content,



this animation is also intended to address emotional aspects by using narratives and visuals that resonate with children's real-life experiences. Referring to the findings of (Mardiah et al., 2024) and (Fahrezi et al., 2024), this study is expected to contribute to the development of more innovative and effective technology-based educational media tailored for Indonesian children.

LITERATURE REVIEW

Animated media has proven effective in children's health education. (Mulyani S & El Hayatl, 2025) stated that animated videos can enhance elementary school students' understanding of healthy living habits. Similarly, (Krisnanto et al., 2025) demonstrated a significant increase in preschool children's knowledge about dental health after watching digital animation.

In addition to increasing knowledge, animation also influences behavior. (Nurfitriani & Kurniasari, 2023) found improved understanding of balanced nutrition among teenagers who learned through animated videos. Rahmatiani and (Nur Oktaviani & Karjatin, 2023) observed similar results among elementary students, with positive changes in their healthy eating habits.

Animation has also been effective in educating children about disease prevention. (Herawati et al., 2021) reported improved understanding among elementary students in preventing diarrhea after watching an animated film. (Ana Faizah et al., 2024) found that animation was more effective than leaflets in delivering health education to coastal children.

However, most existing studies focus only on cognitive aspects such as knowledge enhancement, not on affective aspects such as anxiety or fear. (Putri et al., 2021) and (Sagitaa et al., 2022) only assessed knowledge improvement, without evaluating the emotional impact of animation on children's fear of hospitals. This indicates a research gap regarding the emotional effects of animated media.

The use of AI in educational animation remains rare. (Subekti et al., 2018) employed interactive software for dental education, but without utilizing AI. (Krisnanto et al., 2025) also have not integrated AI into their animation production. So far, no research has specifically combined AI to create educational content aimed at addressing children's fear of hospitals.

Therefore, this study is designed to develop an AI-based educational animated film that targets both cognitive and emotional aspects. With references from the aforementioned studies, this animation is expected to serve as a more personal, innovative, and effective educational medium for Indonesian children.

METHOD

This research applied a Research and Development (R&D) approach in the form of designing educational media based on animation supported by artificial intelligence (AI). This method was chosen because it is well-suited for creating creative multimedia products while allowing for systematic documentation of the development process (Suyanto & Haryono, 2020). Furthermore, this approach facilitates narrative exploration and design decisions based on qualitative data.

To develop the system, the study adopted the Multimedia Development Life Cycle (MDLC) model, which consists of six main stages: concept, design, material collecting, assembly, testing, and distribution (Kusnandar & Diah, 2020). MDLC was selected due to its ability to structure multimedia content production in a flexible and organized manner.

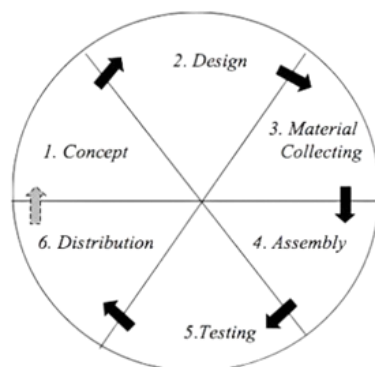


Figure 1. Multimedia Development Life Cycle (MDLC) Method

In the concept stage, the educational objectives, target users (children aged 6–9), visual style, and language tone were defined. The main theme was “Overcoming the Fear of Going to the Hospital,” supported by AI tools such as ChatGPT, Kling AI, ElevenLabs, and CapCut.

The design stage included scriptwriting (with ChatGPT), creating storyboards, designing characters and backgrounds, and mapping narration and sound. The visual design was adapted to children's psychology, considering



factors such as character expressions, colors, and scene duration.

In the material collecting stage, supporting assets such as illustrations, sound effects, and text-to-speech narration generated by ElevenLabs were gathered. Some illustrations were also created using AI-based visual prompt tools.

The assembly stage involved the core production process, where visuals, voiceovers, subtitles, and transitions were integrated into a complete animated film using Kling AI and CapCut.

During the testing phase, the product was tested with a small group of children aged 6–10 to evaluate its appeal, clarity, and audiovisual synchronization. Feedback from this phase was used to improve the final product.

The final distribution stage was carried out on limited platforms as documentation of the creative outcome. This stage highlights the potential of AI-supported educational media to be efficiently distributed and sustained.

RESULT

General Overview of Implementation

In this chapter, the author presents a comprehensive overview of the implementation results of the educational animated film project titled “*Overcoming the Fear of Going to the Hospital*”, aimed at children aged 6–9 years. The implementation outcomes are described from the UI/UX design stage, multimedia development process, to comprehensive testing across various devices and user groups. The presentation is arranged systematically to allow objective analysis of the entire process and outcomes, in accordance with the **MDLC method** and modern multimedia system development principles.

UI/UX Design Process

UI/UX design is a critical step in determining user engagement and the effectiveness of learning through animated media. The design focus is directed toward **easy navigation, child-friendly visuals**, and the use of **colors and characters that stimulate curiosity while reducing children's fear of hospitals**.

This design approach refers to the principles of **User-Centered Design** and **Child Psychology in Media**, emphasizing a visual, audio, and **story-driven** approach to ensure that the animation is both engaging and emotionally supportive for young viewers.

Table 1. Elements of UI/UX Design

Element	Description
Color Palette	Soft tones such as light blue, pastel green, and bright yellow to convey calmness and cheerfulness.
Characters	Friendly cartoon-style design with clear expressions and open body posture, easily relatable to Indonesian children.
Backgrounds	Hospital environments visualized as clean, bright, and friendly, avoiding scary or clinical elements.
Typography	Large rounded fonts with high contrast, all subtitles presented in uppercase for clarity.
Transitions	Smooth animations between segments with no sudden or startling effects.
Audio	Calm narration with emotional tones, pleasant background music, and no startling sound effects.
Navigation	Linear story flow without branching choices to help children follow the message easily.

Note: The design prioritizes emotion design, simplicity, and visual clarity, in accordance with the latest research recommendations on children's educational media.

Pre-Production

This stage involves the planning and early preparation before the actual production of the animated film begins. It is a crucial phase as it determines the direction of the storyline, visual structure, and the style of information delivery to be used. This stage includes concept development, scriptwriting, character design, voice casting, and the creation of a storyboard to serve as a production guide.

Animation Concept Development

The concept of the animated film is “*Overcoming the Fear of Going to the Hospital*”, presented with an educational and empathetic approach. The primary goal of this animation is to provide a **positive and enjoyable perspective** on the hospital experience for children, helping them overcome fear of medical staff and basic medical procedures.

The main character is a young boy named **Raka**, who is initially afraid of seeking medical treatment. He is later guided by an **imaginative character (a talking doll)** and friendly medical personnel who help change his perception.



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Character / Cast Design

The characters are designed in a colorful, child-friendly **3D cartoon style**. Their appearance is crafted to foster **emotional connection** with the audience and to reinforce the delivery of the educational message effectively.

Table 2. Technical Specifications of the Final Animation

Parameter	Details
File Format	MP4
Resolution	Full HD (1920 × 1080)
Frame Rate	30 FPS
Audio	Stereo, 44.1 kHz
Duration	7 minutes
File Compression	H.264, ~400–500 MB
Compatibility	Android, iOS, Windows, MacOS, Smart TV
Tools Used	ChatGPT, Kling AI, ElevenLabs, CapCut

Storyboard

The storyboard serves as a visual guide that outlines the sequence of key scenes in the animation, complete with information on camera movements, dialogue, and character expressions. Creating a storyboard is essential to ensure that the storyline flows logically and is visually communicative.

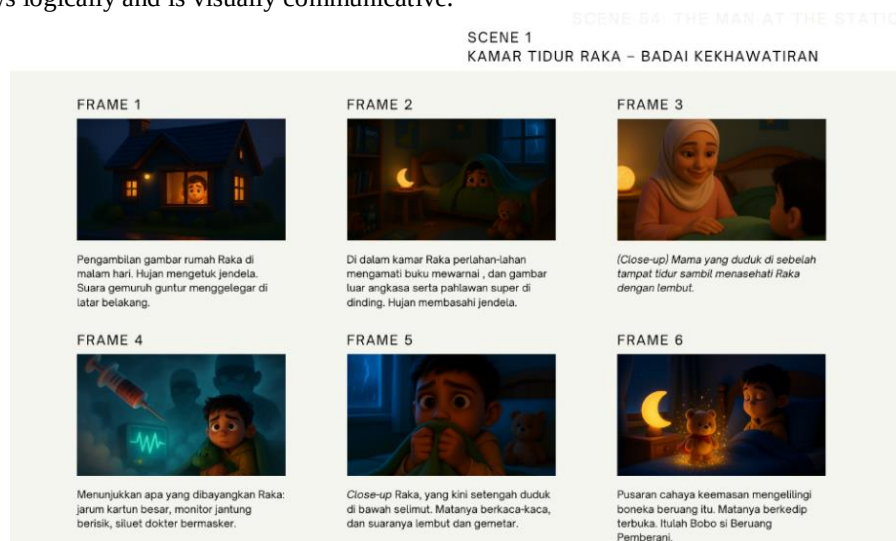


Figure 2. Storyboard

Descriptive Prompt Development Using ChatGPT

The initial step begins with the development of the script and detailed visual descriptions (prompts). ChatGPT is utilized to assist the researcher in constructing the storyline, character dialogues, and descriptions of characters and the atmosphere of each scene. Beyond writing the script and descriptive text, ChatGPT also contributes by providing visual recommendations aligned with child psychology—such as friendly facial expressions, brightly colored backgrounds, and child-appropriate character designs.

The resulting descriptive prompts are then used as input for AI-based visual applications to generate **illustrative images of characters and backgrounds**, which will later be animated. Thus, ChatGPT functions not only as a text assistant but also as a **creative partner** in the development of core visual elements.

Create a complete script for a long animation about 20 minutes long with a health education theme. The story focuses on a child who is afraid to go to the hospital. Show how the child learns to understand that the hospital is a safe place and important for his health. Use interesting characters and child-friendly visuals. The story must contain educational values, emotions, and positive resolutions. Add dialogues that are easy for children aged 6–10 years old to understand. Colorful 3D cartoon animation style. Main character: A child named Raka (boy). Moral message: The hospital is not a scary place, but a place to be healthy and heal.

Figure 2. Composing Descriptive Prompts

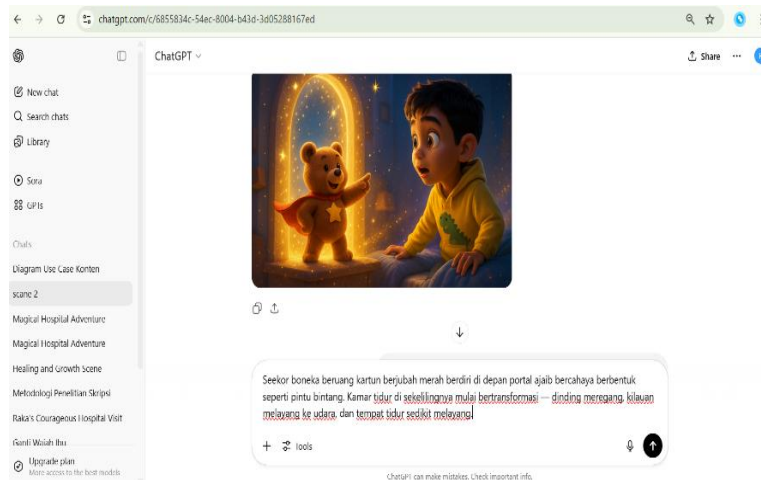


Figure 3. Composing Descriptive Prompts

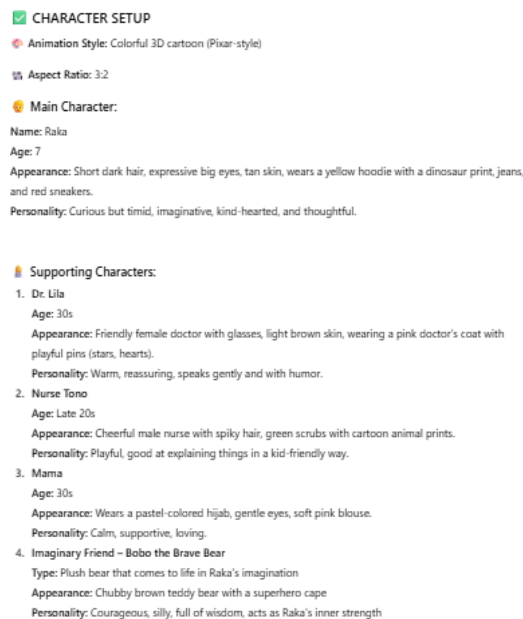


Figure 4. Composing Descriptive Prompts

Processing Illustrations into Animation Using Kling AI

The character and background illustrations created with the help of prompts from ChatGPT were then processed into animation using Kling AI. This technology is capable of converting static images into moving animations with body movements, facial expressions, and smooth and dynamic visual transitions. Each scene was animated based on a pre-arranged storyboard sequence. In addition to motion animation, Kling AI was also used to automatically perform lip sync. By analyzing phoneme patterns from voice recordings, Kling AI matched the characters' mouth movements to make them appear as if they were speaking naturally. Although this process was automated, researchers still made manual adjustments if discrepancies were found in the synchronization of voice and mouth movements to ensure optimal animation quality.

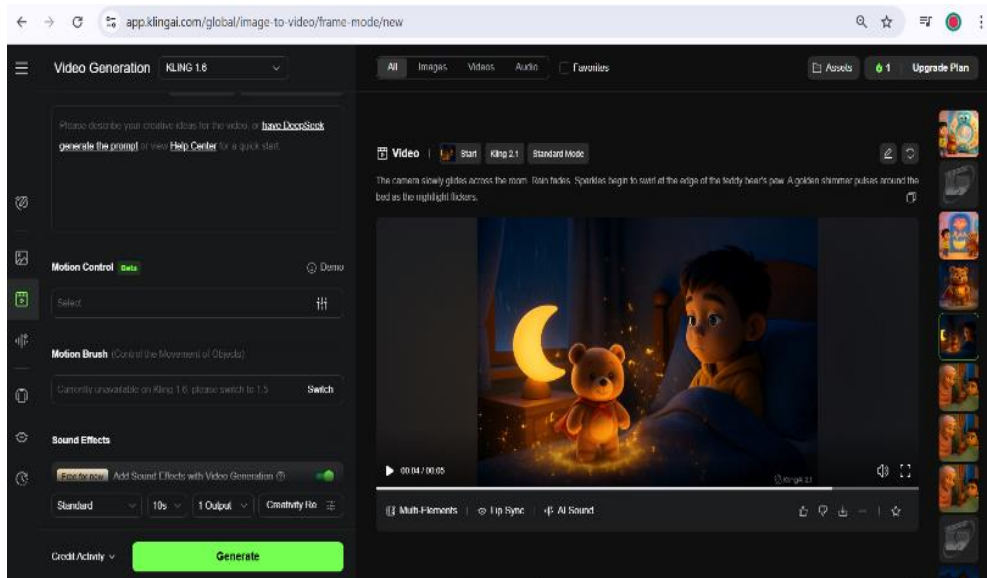


Figure 5. Processing Illustrations into Animation

Voice-Over Generation Using ElevenLabs

After the visuals have been animated, the next stage is the voice-over process (narration and character dialogues). The researcher utilized ElevenLabs, an AI-based text-to-speech application capable of generating digital voices with intonation and emotional depth appropriate for children's characters.

Each voice is carefully matched to the type of character, the mood of the scene, and the emotional needs of the storyline—ensuring that the audio complements the visual narrative and enhances viewer engagement, especially for the target audience of young children aged 6–9 years.

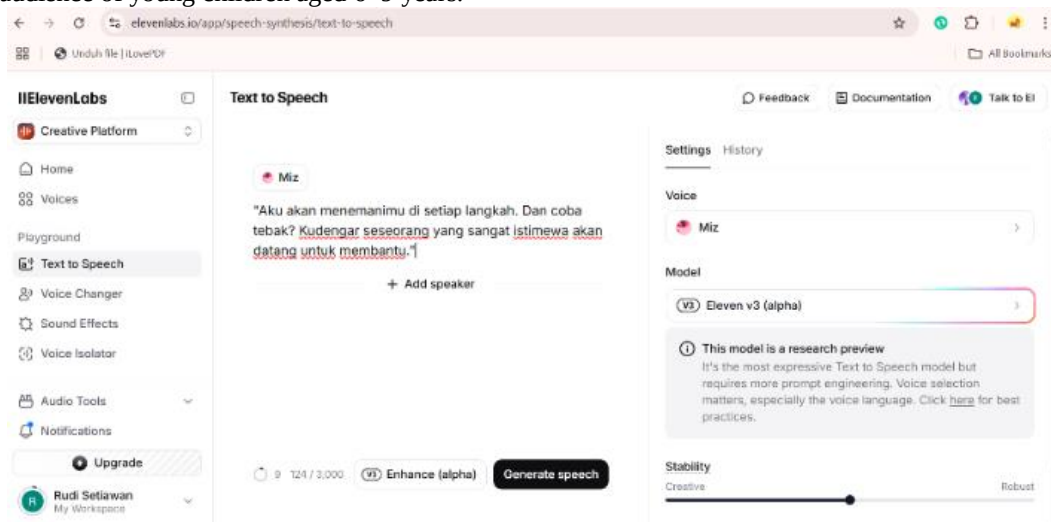


Figure 6. Voice Over

Lip Sync Synchronization Process Using Kling AI

Kling AI was utilized to automatically perform lip synchronization (lip sync) for the animated characters. By analyzing the phoneme patterns from the recorded voices, Kling AI matches them with the characters' mouth movements, making them appear as if they are speaking naturally.

Although the synchronization process is largely automated, the researcher still conducted **manual adjustments** whenever mismatches were identified, ensuring that the final result maintains a high level of realism and supports the emotional clarity of the dialogue.

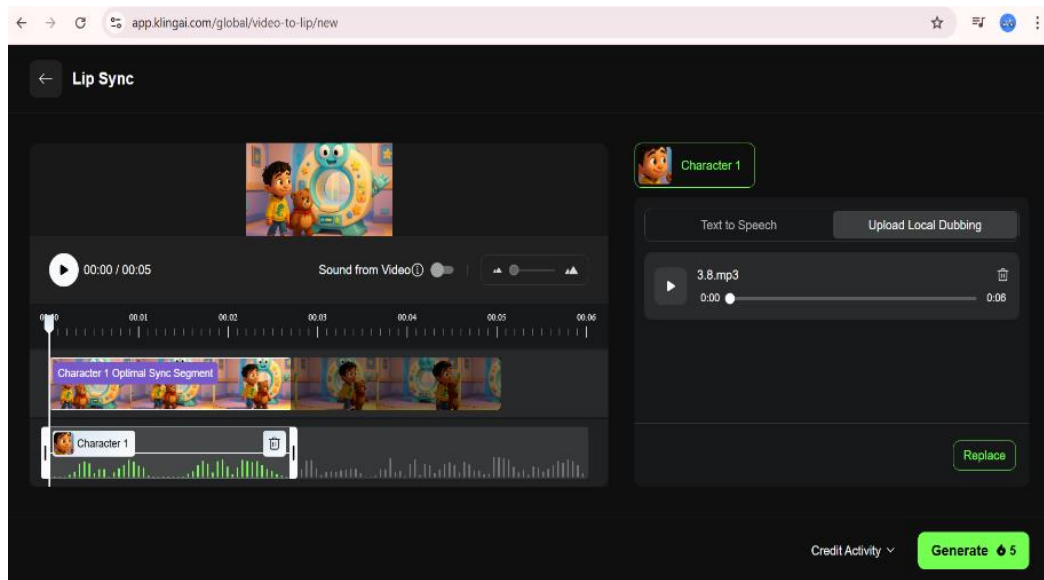


Figure 7. Lip sync synchronization

Final Editing and Compilation Using CapCut

After completing all visual, audio, and lip sync synchronization elements, the next stage involved assembling and refining the entire animation video using the CapCut application. CapCut was selected due to its AI-powered features, which support efficient editing while maintaining a professional look and a child-friendly atmosphere.

The editing process included adjusting scene transitions, adding background music, refining sound effects, and incorporating visual enhancements such as animated text, stickers, and filters appropriate for children aged 6–9. This final step ensured the animation was engaging, coherent, and ready for distribution as an educational media product.



Figure 8. Final Editing and Compilation

DISCUSSION

The results of the development and testing of the animated educational film "Mengatasi Ketakutan Berobat ke Rumah Sakit" show that integrating artificial intelligence in multimedia learning content is not only technically feasible but also pedagogically effective. The project demonstrates that animation—when properly designed for children—can serve as an impactful tool to address emotional challenges such as medical anxiety.

From the UI/UX perspective, the use of cheerful colors, friendly characters, and smooth transitions contributed significantly to user engagement. Children responded positively to the visual elements, consistent with the findings of (Luthfia et al., 2022), who noted that animation design aligned with child psychology increases learning motivation and emotional comfort. The implementation of large, legible fonts and emotionally attuned voice narration also supported cognitive accessibility, especially for early-age learners.

The animation was produced using multiple AI tools that significantly accelerated the production process. ChatGPT assisted in scriptwriting and visual prompting, Kling AI converted illustrations into animated motion with automated lip-sync, and ElevenLabs generated realistic and child-appropriate voice narration. CapCut was used to finalize editing with minimal manual effort. This workflow confirms that AI can support not only efficiency but also



creativity in multimedia development, especially for small teams or solo creators.

The user testing results further validate the educational and emotional effectiveness of the animation. After viewing the video, the majority of children showed decreased fear of hospitals and improved comprehension of medical environments. Compared to pre-watching responses, children demonstrated increased verbal engagement and were able to explain the film's message.

However, the study has limitations. The number of participants was relatively small (five children), and data were collected through observational and simple pre-post response methods, not standardized psychological instruments. Additionally, the age range (8–12 years) slightly exceeds the original target of 6–9 years, due to participant availability. While this does not negate the findings, it may affect generalizability.

Another consideration is the testing environment, which was semi-structured and potentially influenced by the presence of adults (researcher/guardian), possibly leading to reactivity bias. Despite this, consistent behavioral indicators such as smiling, questioning, and mimicry suggest genuine emotional impact.

In conclusion, the study contributes to the growing field of AI-assisted educational media by demonstrating how AI can be integrated into both content development and pedagogical design to meet emotional and cognitive needs. The animation developed in this study not only delivered educational messages but also humanized healthcare experiences for children

CONCLUSION

This research concludes that the development of animated health education media using artificial intelligence is both technically feasible and educationally effective. Through the use of AI tools such as ChatGPT, Kling AI, ElevenLabs, and CapCut, a 7-minute animated film titled "Overcoming the Fear of Going to the Hospital" was successfully produced and tested. The animation demonstrated positive outcomes in reducing fear of hospitals among children and increasing their understanding of medical environments.

The study also revealed the importance of UI/UX design in creating emotionally safe and engaging educational media for children. Elements such as soft color palettes, friendly characters, child-oriented narration, and simple linear navigation contributed significantly to the animation's success.

However, the research is not without limitations. The sample size was small (five participants), and the data collection methods were limited to basic pre- and post-test comparisons and observation, without using standardized psychological instruments. Furthermore, the target age range in practice extended slightly beyond the design parameters due to availability constraints.

For future studies, it is recommended to involve a larger and more diverse sample group, apply validated psychological measurement tools, and explore real-time interactivity or gamification elements to enhance engagement. Researchers and educators may also consider the use of AI-based animation as a cost-effective and scalable alternative for producing localized health education content, especially for underserved communities.

Overall, this study contributes to the growing body of literature on AI-assisted educational media and highlights its potential as a human-centered solution for addressing emotional and cognitive barriers in child health education.

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