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Dinosaurs in 2D Animation: An Innovative Learning Strategy to Improve Natural History Comprehension Skills in Indonesia

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ABSTRACT

This research aims to develop 2D animation-based learning media about dinosaurs to enrich students' understanding of natural history. The development method used is MDLC (Multimedia Development Life Cycle) which includes six stages, namely concept, design, material collection, creation, testing, and distribution. The testing process involved alpha and beta tests to assess the quality of the animation in terms of visual and audio, as well as the accuracy of the information. The response from the audience was overall positive, with 85% stating that the animation made it easier to understand the material and added to their knowledge about dinosaurs. In addition, 90% of respondents rated the information conveyed in this animated video as accurate and reliable. The results show that 2D animation is not only able to attract attention, but also be an effective medium in conveying complex learning materials in a simple manner. Recommendations for further research are to add interactive elements and explore the use of 3D animation or augmented reality (AR) technology for a more immersive learning experience.

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1. INTRODUCTION

In today's era of technological advancement, 2D animation has become an effective form of learning media to convey complex information in an interesting and easy-to-understand way. One topic that is of great interest to many people, especially children, is dinosaurs. In the context of natural history learning, the use of 2D animation can be considered as an innovative strategy to enhance understanding of these prehistoric creatures (Shebastian et al., 2020).

Dinosaurs have played an important role in Earth's natural history and continue to be an interesting object of study. The choice of dinosaurs as a focus of study is based not only on their popularity, but also their potential to enhance understanding of key events in natural evolution (Husnul & Diana, 2021). By using 2D animation, dinosaurs can be visually presented, providing a more immersive learning experience for learners (Rahim et al., 2023).

Learning about natural history often faces several challenges such as lack of visual appeal, material complexity, and differences in student learning styles (Prasetya et al., 2022). To overcome this, an approach is needed that can resolve these challenges and create a learning environment that facilitates better understanding. One approach is to use 2D animation as a visual representation to help students understand natural history concepts more effectively and engagingly.

However, while 2D animations may be considered engaging, it is unclear how their use can specifically improve natural history comprehension skills (Arta Jaya et al., 2020). Studies that specifically evaluate the effectiveness of 2D animations in learning may not have detailed the suitability and effectiveness of 2D animations for various subject matter (Lim & Diny Anggriani Adnas, 2023) (Welly Desriyati, 2021) (Saraswati & Mertayasa, 2020). Based on the explanation above, the author will develop video learning media about 2D animation and find out the effectiveness of the learning media built using a qualitative approach. This is because the author found that there are things that have not been studied in previous studies. Such as the absence of related applications to develop 2D animation videos in accordance with what the author wants.

Therefore, the author uses applied methods with the MDLC framework and qualitative methods with interview techniques. This is done by the author to get responses and input from respondents regarding the learning videos that have been made and watched. Therefore, the author analyses that by making this 2D animation video, the author can make an informative and good 2D animation with current applications.

2. METHODS

This research used two different approaches: an applied approach and a qualitative approach. The applied approach uses the MDLC (Multimedia Development Life Cycle) cycle model framework which is Luther's version of the development method and developed by Sutopo consisting of 6 stages, namely concept, design, material collection, creation, testing, and distribution (Mustika, 2018).

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2.1. Development Method

At the development stage, the animation development will be made using the steps of the 6 stages of the MDLC (Multimedia Development Life Cycle) model in Figure 1.

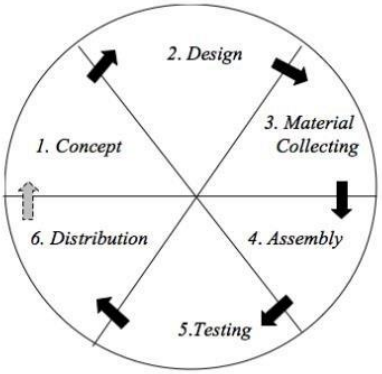

Figure 1. Multimedia Development Life Cycle

At the concept stage, the author makes a 2D animation video concept or an overview for learning media that will be used in making 2D animation videos. Planning analysis must be done to get an overview and what must be done to determine the solution to the problem so that the author can clearly determine the objectives, material concepts and learning media concepts. Then the author enters the design stage, where the author first makes a storyboard, script, and all supporting elements to create 2D animation videos such as music, characters, images, information to create a clear and detailed 2D animation video. Next, the author collects and creates materials and assets that he wants to use to create 2D animations obtained from YouTube and Google and then combines them in Adobe Illustrator. After having and creating all the necessary assets and elements, the author creates 2D animation based on the design stages he has made using Adobe After Effect, Adobe Premiere Pro.

At this stage, the author also creates animations with Adobe After Effect and the final results in Adobe Premiere Pro. The video is made as good as possible in order to attract the attention of the audience. There are two tests that will be conducted in this research: alpha test, where the author will play the 2D animation video, and beta test, where a number of viewers participate in watching the 2D animation video. There are several lists of questions that can be seen in the table below:

Table 1. Interview Questions

No	Questions	Yes	No
1	What is the image/character and sound quality of the learning video?		
2	Does the learning video provide more insight into natural knowledge?		

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No	Questions	Yes	No
3.	Does the learning video successfully and clearly explain the natural knowledge of dinosaurs?		
4.	Does the learning video convey accurate and reliable information?		

The author then submits the final video to the supervisor for review. After obtaining the supervisor's approval, the video will be uploaded to the author's YouTube channel.

2.2. Analysis Method

After the author has completed the development stage of the learning video and the video has been watched by several people, the author will proceed to the analysis stage. This analysis aims to identify the strengths and weaknesses of the 2D animation video that has been made as well as to design improvement steps to make the learning video more effective and in line with the initial objectives. To obtain relevant information, the author collected data through in-depth interviews involving 15 respondents consisting of pupils and students. The respondents were selected based on their relevance to the context of using the learning video. The interviews were designed to gather direct feedback on the experience of watching the video, its strengths and weaknesses, and suggestions for improvement.

Interviews were chosen because they allow for in-depth and detailed data collection. Through direct interaction with respondents, the author was able to extract clearer and more relevant information, including an understanding of user needs. After the data from the interviews were collected, the author would process them by transcribing each interview and analysing the content of the data using a qualitative approach. This approach aims to identify relevant themes, patterns and meanings from participants' responses. This process involves coding the data, recognizing recurring patterns, and interpreting the interview results to devise corrective measures that can improve the quality of 2D animation learning videos.

3. RESULTS AND DISCUSSION

3.1. Concept

At this stage, the author designs the initial concept of the video, including an overview of the media to be used and the 2D animation theme applied. This concept is developed by exploring various references from prehistoric-themed animations. The concept of using sound effects, dubbing and transitions will help to create the desired atmosphere. This stage serves as a creative foundation in determining the direction of animation creation, including dinosaur details and the atmosphere to be displayed, as well as the technology used, which can also be a potential for further animation development.

3.2. Design

At the design stage, the author compiles each element in detail in order to get an overview of the video to be made, this planning can be done by setting the storyline neatly and

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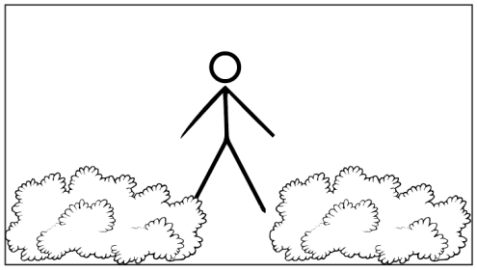
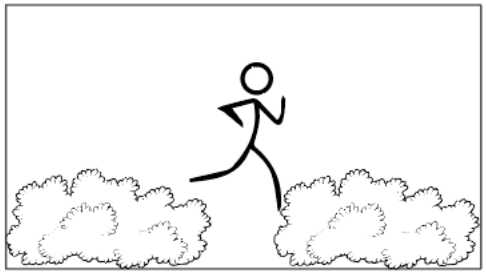
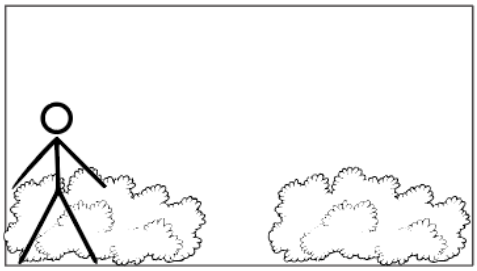
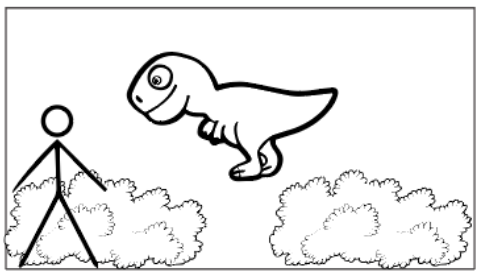
structured so that it is easily understood by the audience. The storyboard is made to explain in the following table:

Table 2. Story Board

No	Scene	Seq	Image	Duration	Description
1	1	1		30 Second	The main character introduces himself, what he is there for and describes the surrounding area
	1	2		5 Second	After Introducing The Main Character Walks Sideways
2	2	1		20 Second	After the character walks sideways, the main character enters from the left, and summons the dinosaur to be explained.
	2	2		6 Minutes	After the main character summons the dinosaur, the dinosaur enters in its own style, and the character immediately explains the dinosaur in detail.

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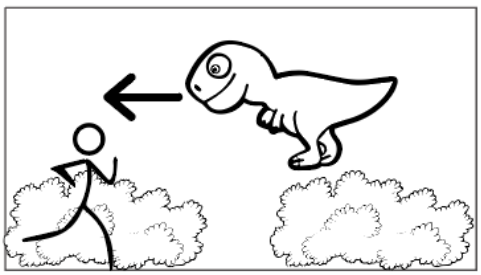
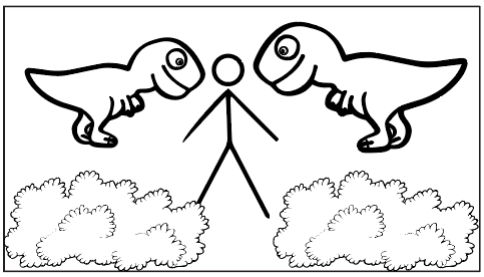
No	Scene	Seq	Image	Duration	Description
	2	3		20 Minutes	After describing the dinosaurs in detail, the main character and the dinosaurs walk in opposite directions.
3	3	1		1 Minutes	After all the dinosaurs are explained by the main character, followed by the closing with the appearance of all the dinosaurs

3.3. Material Collecting

The material collecting stage involves the process of collecting the necessary assets. The author collects materials such as:

1. Material Source: Image and video assets are obtained from free and public platforms, as well as some assets that are made independently with the Adobe Illustrator application,
2. Audio and music: Background music is obtained from free and uncopyrighted platforms that match the atmosphere of the animation. The collection of materials was done strictly to ensure quality so that the animation produced was in accordance with the original purpose of the concept. Each material is carefully animated to match the storyboard design that has been made so that the storyline remains consistent and the same.

3.4. Assembly

At the assembly stage. The author begins the process of assembling video elements in accordance with the storyboard design that has been compiled at the design stage. The result of the storyboard is a video with a 16:9 ratio.

Manufacturing Process

1. Adobe Illustrator: To create background, dinosaur, main character.
2. After Effect & Adobe Premier Pro: used to create animation and unify the animation results and provide back sound and subtitles to make it more interesting and in accordance with the storyboard that has been designed.

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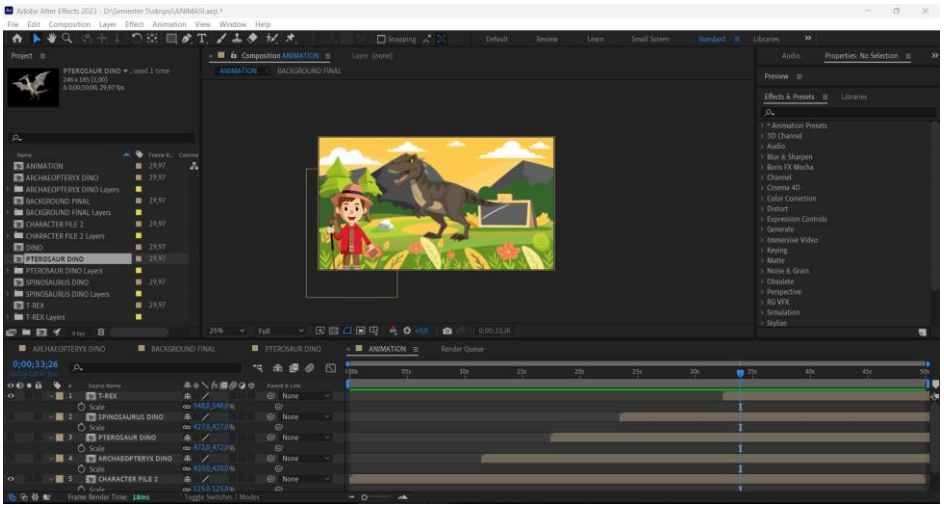

Figure 2. Animation Process in After Effect

Figure 3. Main Character Creation Process

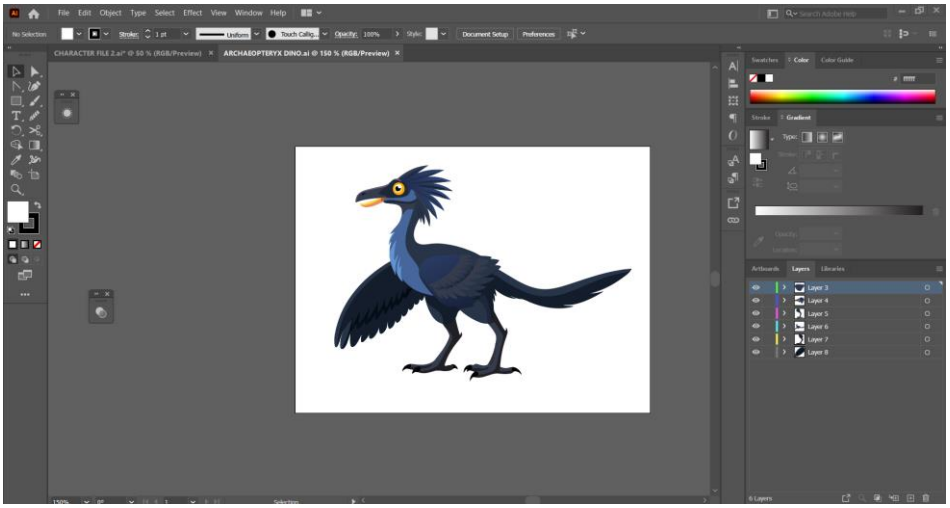

Figure 4. The Making Process of One of the Dinosaurs

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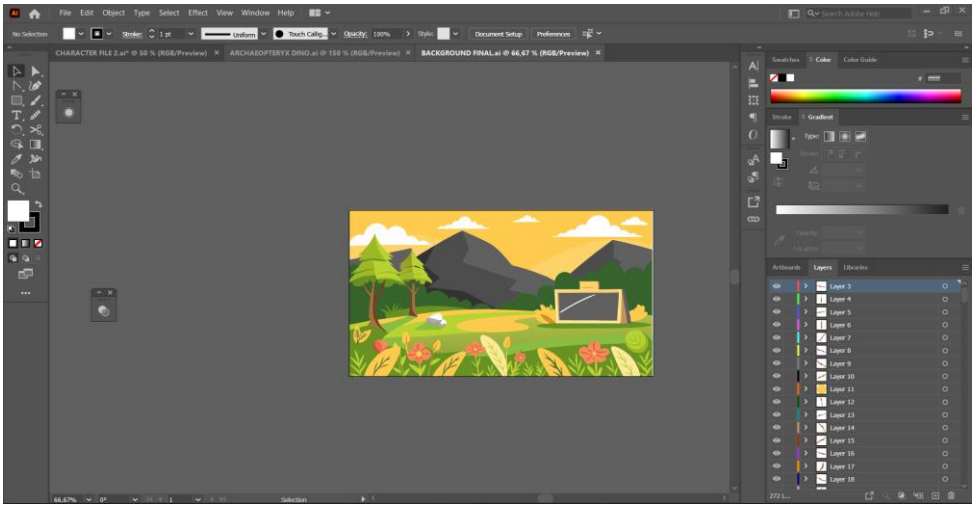

Figure 5. Background creation process

3.5. Testing

In the testing stage, the author tests 2 types:

1. Alpha Test: Testing is done individually by playing the animation and checking each scene whether it is perfect with the storyboard that has been created.
2. Beta Test: This test is carried out by bringing several participants to be the audience. The audience is asked to provide input and about the impression after watching 2D animation.

3.6. Distribution

After the video is finished and goes through several testing processes, the author submits the final result to the supervisor to be evaluated and get some input. After getting approval, the video will be uploaded to the author's YouTube application as a medium for disseminating 2D animation.

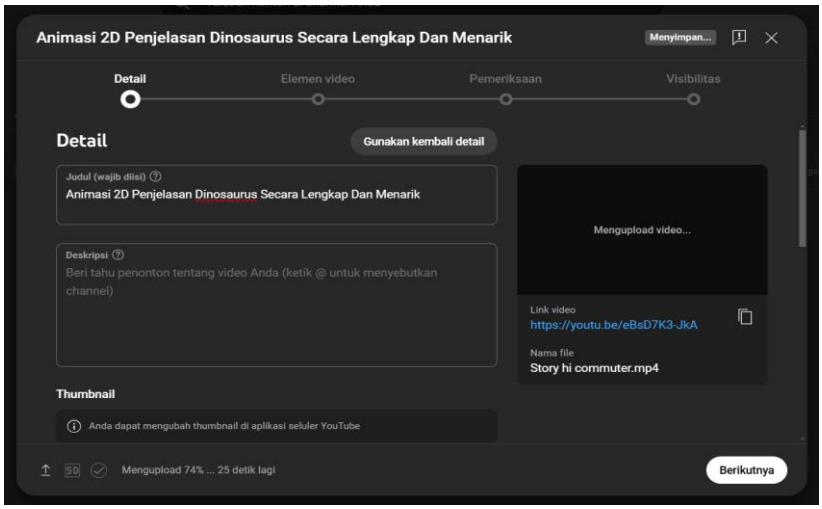

Figure 6. Video Distribution Through YouTube Platform

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3.7. Analysis

1. **Image/character and sound quality of the learning video**: Most viewers (80%) felt that the quality of the images and characters in the learning videos were very good, clear and detailed. The audio is very clear and synchronized with the animation, making the audience feel comfortable and interested in listening to the whole content.
2. **Providing more insight into natural knowledge**: As many as 75% of respondents felt that this learning video succeeded in providing new insights related to natural knowledge. The audience stated that the information presented was able to expand their knowledge in this field.
3. **Successfully explaining natural knowledge about dinosaurs**: Most viewers (85%) felt that the video was very effective in explaining dinosaur-related information. The explanations were considered easy to understand and delivered in an engaging manner, thus increasing viewers' interest in the topic.
4. **Accuracy and reliability of the information presented**: The majority of respondents (90%) found the information in the video to be accurate and reliable. They stated that the sources of information seemed credible and in line with the facts, making the video a reliable reference for learning about the topic.

4. CONCLUSION

This research aims to develop learning media in the form of 2D animation about dinosaurs to improve the understanding of natural history visually and interactively. Using the MDLC method and a qualitative approach through interviews, the research obtained feedback on the visual quality, audio, and effectiveness of the animation. The results showed a positive response from the audience, who found the animation accurate, easy to understand, and potential as a medium for learning complex topics.

This research confirms the importance of engaging and innovative learning design. Future development is recommended to add interactive features, such as quizzes or simulations, as well as exploring 3D animation and augmented reality (AR) technologies for a more dynamic learning experience.

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suggestions are highly expected for future improvements. Hopefully this work can be useful for the development of science and education.

AUTHORS' NOTE

Thank you for taking the time to read this piece. This article is the result of curiosity and dedication, with support from various parties who have provided inspiration and encouragement during the writing process. I hope this work can make a meaningful contribution to the world of education and open new insights for readers. I humbly accept constructive criticism and suggestions for future improvements. Hopefully this article will not only be a reading material, but also an inspiration to continue learning and innovating. Thank you for your support and appreciation.

REFERENCES

Arta Jaya, I. M. R., Darmawiguna, I. G. M., & Kesiman, M. W. A. (2020). Pengembangan Film Animasi 2 Dimensi " Sejarah Perang Jagaraga ." *Kumpulan Artikel Mahasiswa Pendidikan Teknik Informatika (Karmapati)*, *9*(3), 222–231.

Husnul, H. hafidhoh, & Diana, R. R. (2021). Nilai-Nilai Karakter Dalam Film Animasi the Good Dinosaur Dan Relevansinyaterhadap Perkembangan Anak Usia Dini. *Incrementapedia: Jurnal Pendidikan Anak Usia Dini*, *3*(02), 1–16. https://doi.org/10.36456/incrementapedia.vol3.no02.a3895

Lim, S., & Diny Anggriani Adnas. (2023). Analisis Efektivitas Animasi 2D terhadap Peran Orang Tua dalam Perilaku Gaming Anak. *Indonesian Journal of Early Childhood: Jurnal Dunia Anak Usia Dini*, *5*(1), 1–12. https://doi.org/10.35473/ijec.v5i1.2168

Prasetya, T. A., Yanti, R. D., Nurrahman, Z., & Aeni, A. N. (2022). Pemanfaatan Video Animasi WOL (way of life) sebagai Media Pembelajaran SKI siswa di Kelas 4 SD/MI. *Jurnal Pendidikan*, *6*, 16353–16359. https://www.jptam.org/index.php/jptam/article/view/5073%0Ahttps://www.jptam.org/index.php/jptam/article/download/5073/4291

Rahim, D. A., Eraku, S. S., & Mohamad, N. (2023). Pengembangan Media Pembelajaran Animasi Videoscribe Pada Mata Pelajaran Geografi Materi Pengelolaan Sumber Daya Alam Indonesia. *Geosfera: Jurnal Penelitian Geografi*, *1*(2), 63–71. https://doi.org/10.34312/geojpg.v1i2.17742

Saraswati, N. L. P. A., & Mertayasa, I. N. E. (2020). Pembelajaran praktikum kimia pada masa pandemi covid-19 : qualitative content analysis kecenderungan pemanfaatan teknologi daring. *Wahana Matematika Dan Sains: Jurnal Matematika, Sains, Dan Pembelajarannya*, *14*(2), 144–161. https://sinestesia.pustaka.my.id/journal/article/download/44/6/49

Shebastian, I. G. R., Putrama, I. M., & Suyasa, P. W. A. (2020). Pengembangan Media Pembelajaran Interaktif " Pengenalan Hewan Dan Tumbuhan " Pada Mata Metode

Gamefikasi Untuk Siswa Kelas Ii Di Sekolah Dasar. *Karmapati : Kumpulan Artikel Mahasiswa Pendidikan Teknik Informatika*, *9*(1), 8–20. https://ejournal.undiksha.ac.id/index.php/KP/article/view/23270

Welly Desriyati. (2021). Video Animasi 2D Pengenalan Bangun Datar Pada Pembelajaran Matematika. *Pixel :Jurnal Ilmiah Komputer Grafis*, *14*(2), 189–195. https://doi.org/10.51903/pixel.v14i2.556

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