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Developing 3D Animation Materials for EFL Vocabulary Courses

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*Muhammad Fahreza Hidayat, Hesty Widiastuty, Sri Normuliati,[123]
[123]Insititut Agama Islam Negeri Palangka Raya,Indonesia
Corresponding Author: reza33877@gmail.com

A B S T R A C T

Media in Education has an important role in helping to provide students with a better understanding of the learning material being studied. The purpose of this Research and Development project is to develop 3D animated video as a learning material that is both free of copyright violations and tailored meets needs of the students for EFL vocabulary classes. This Research and Development project employ Addie Model with questionnaires, interviews, expert validation, with both large and small group trials form the basis of development. The findings materials have great credentials and the media have good qualifications so that learning media can be used in learning process. This 3d video animation project hoped can help lecturers and teacher in the teaching and learning process and provide comprehensible learning media that for EFL students and a reference material for development in subsequent research.

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INTRODUCTION

One of crucial parts of mastering English is by becoming proficient in its vocabulary. (Syihabudin et al., 2021). One can comprehend texts, conversations, and other types of communication easier if they have an extensive vocabulary. The richer vocabulary that can be used in writing and speaking, the more words one knows. (Ahmadi & Guilan University, Guilan, Iran, 2018). This proficiency includes not just word meanings but also word context, synonyms, antonyms, and collocations.

Vocabulary is a crucial part of language proficiency for kids studying English. It results from vocabulary served as a fundamental component for kids acquiring the four language skills. (Alqahtani, 2015), referenced in (Elghotmy & Ghoneim 2016), supports it by stating that vocabulary is the total quantity of words required to convey and transmit pupils' thoughts. Following this assertion, it may be claimed that students must acquire a large vocabulary to learn English and interact with people efficiently.

Watching animated videos is a useful strategy for overcoming the difficulties associated with learning English. These movies frequently make it easier to comprehend the context and pick up new vocabulary by using simple vocabulary and attractive visuals. Additionally, Speaking and listening abilities can be enhanced by listening to pronunciation in a pleasant setting. Movies can be a useful tool for improving all language skills, including speaking, listening, reading, and writing, according to (Ardayati, 2018). Because 3d animated can captivate students' interest with attractive visuals, simple storytellers, and relatable characters, animated films are particularly effective. Compared to more conventional approaches like using textbooks or word lists, this is more interesting. 3d animated video can help students

*Corresponding Author: Maspufah, e-mail: reza33877@gmail.com
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gains new words and their usage through by showing them in direct environment and interactions. Animation has an interesting role as a teaching tool in the field of education. A particular scientific field's interest in learning and comprehension can be increased via animation. In addition, animation can help teachers present material to students and help in teaching and learning English. (Rosmiati, 2019).

The use of animated videos as a learning medium can significantly improve this vocabulary ability (Munir, 2016). The depictions provided by animated videos can help illustrate the nature, occurrence, and use of a word, for example animation video can visualize wors like "float" and help explain the difference between "spin" and "rotate". Because of the visualizable nature of video animation, this is why animated videos can help EFL students remember new words.(Teplá et al., 2022). Research shows that the use of animation media in learning foreign languages can significantly improve vocabulary mastery. For example, one study found that early childhood English vocabulary skills improved by 85% after using animated videos as a learning medium. (Rindawati et al., 2022) In addition, interactive animation media has been shown to be effective in introducing English vocabulary to children, making the learning process more engaging and interactive. The use of English-language animated films can also increase children's interest and enthusiasm in learning the language. (Indah & Muryanti, 2023). (Azzahra, 2023) Furthermore, other studies have shown that animation-based audio-visual media is more effective in improving vocabulary mastery than conventional methods without the use of such media. This suggests that the integration of animation media in foreign language learning can increase the effectiveness of learning compared to conventional methods. (Annisa & Muryanti, 2022)

Several studies have show how animation learning video could be implemented in the teaching and learning process. Students' interest in using animated videos as learning tools the results showed that pupils' speaking abilities have been improved due to animation videos, with an average pre-test rating being 21 and the post-test score being 41 (Kurniati, 2016). Conducted further research based on increased post-test scores, the study's findings indicated that animation movies successfully improved students' speaking abilities. (Diah's, 2021) The pupils requested to watch the animations again because the English lesson was so interesting. They liked the English lesson after seeing the videos, they wanted to watch them again to get better at learning the language. Text and pronunciation videos for the subject's vocabulary were included in the animations. The narrator of the animation helped her pronounce each word in every sentence in the video correctly so that students could hear the voice clearly, see the picture, and comprehend the text.

Previous studies have shown the importance of using educational materials when learning English. This was due to the fact that EFL students need to master the language in order to communicate with non-native speakers and pursue careers in education. Therefore, using 3D animated videos to teach EFL students could help them practice their English in a proper manner. According to pre-observational research conducted at IAIN Palangka Raya, students learned vocabulary using YouTube video learning resources. which instructional materials were not created by the institution or the lecturers themselves, and whose materials did not meet the demands and the need of IAIN Palangka Raya students. (Nerissa et al., 2020) stated that in order to assist some classroom activities, media is actually necessary. In addition, the use of engaging and interesting teaching media help tp increase students' motivation to learn.

The learning resources utilized in this study include the vocabulary material subject "Greeting And Verb." The study was conducted at IAIN Palangka Raya. Objective of the Research and Development (RnD) project is for create 3d animation video learning materials for EFL vocabulary courses in English Language Education Department of State Islamic Institute of Palangka Raya students by using Plotagon application. Plotagon Story is software that helps to create excellent and correct animation, including audio animation, so that the dialogue conveyed in the animation can heard clearly according to (Guzmán Gámez, 2019).

The study's conclusions carry both theoretical and practical ramifications for English instruction, especially in the field of English education., and are anticipated to be beneficial to

both teachers and students. Theoretically, this study is significant to contribute the development of an 3D animation vocabulary materials model that can be used to teach greeting and verb vocabulary to students of the Department of English Education IAIN Palangka Raya. Practically, This study aims to help develop 3d animation learning material for lecturers in vocabulary courses and provide copyright-free learning animations for English education study program at IAIN Palangka Raya. With the provision of this 3d animation vocabulary material, students will be more fun and easier in learning vocabulary and understand learning material more faster. With this research, other researchers can develop or improve existing products and also develop similar products, not only for students of the English Education Department but for other Faculty at IAIN Palangka Raya.

Based on this problem, the researcher aim to developing learning media with 3D animation contain teaching materials that is thought to be suitable and appropriate for EFL vocabulary courses which is in accordance with the latest syllabus and curriculum. With This Research, it Is Hoped provide 3d Animation for IAIN Palangka Raya that may help the process of teaching and learning. Animation that meets with student needs and is free of copyright.

METHOD

To develop a learning media animation for EFL students at IAIN Palangka Raya, researchers carried out this study. The ADDIE model includes this research to build a learning system, (Dick and Carry, 1996) developed the ADDIE paradigm (Drljača et al., n.d.). These were the steps: 1) Analysis: As a first step, researchers conducted interviews and distributed surveys during this phase. 2) Design: This step includes the design of learning media including animation design and relevant material content. 3) Development: At this stage the pre-design concept is created. 4) Implementation: at this phase, the goal of implementing or utilizing the media that was created to get feedbacks from users. 5) Evaluation: Based on the established goals for product development and the outcomes of the implementation, evaluation was done through field testing. (Molenda, 2003)

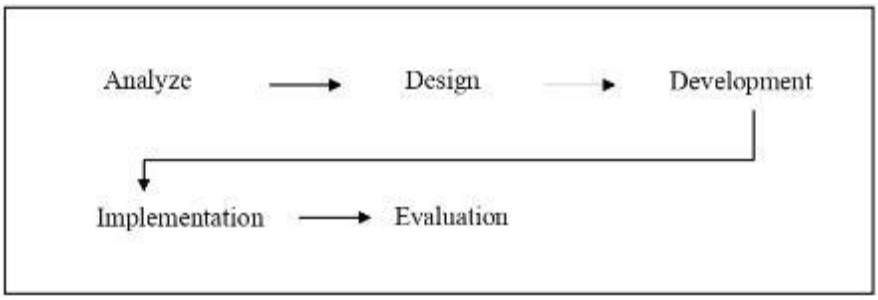

Figure 1. addie model

The Addie Model has the following stages: analysis, design, development, implementation, and evaluation. The step are :

Analysis : First step is needs of analysis is carried out by observation and direct interviews with lecturers in charge of the course (TBI 20.21). 1)Need analysis of the students was obtained from the questionnaire's results which contains questions about character options, outfits, character names, character genders, number of characters, background themes, duration, movements, voice actors, and video layout. 22 students filled out a questionnaire on the needs for the foundation of animation making. The results of the animation design were determined from the majority in filling out the questionnaire. 2)Material analysis that examines the vocabulary course (TBI 20.21), the 2nd and 3rd meetings are greetings and verb. 3)Data analysis technique calculated the findings of a questionnaire of media and material expert to determine feasibility the 3D animation. Following data collection, quantitative descriptive approaches were used for analysis.

The design stage in developing learning animations using Plotagon begins with the creation of product designs aligned with the content analysis. This process ensures that the design corresponds with the basic competencies, indicators, and learning objectives outlined in the vocabulary course syllabus (TBI 20.21) and is tailored to meet the needs of IAIN Palangka Raya students. At this stage, several essential tools and materials are prepared, including a mobile phone, the Plotagon app (available on the Playstore), character and background designs relevant to the content, and supportive materials such as images, audio clips, and background sounds. These elements contribute to both the visual and functional aspects of the animation. Additionally, a storyboard is created to outline the structure and flow of the animation before development begins.

In the development stage, the researcher starts by installing the Plotagon application and accessing the "Create Video" menu to initiate the animation process. The next step involves adding scenes to the animation, which is followed by the inclusion of suitable backgrounds—either from the free options or paid selections based on student preferences, such as school corridors, classrooms, and cafes. Characters are then created based on student needs, with attention to details such as skin tone, facial features, hairstyles, clothing, voice type, and character names. The characters developed for this animation include Mrs. English, Serena, Zeeya, Deden, and Reza. Once the characters are designed, they are inserted into the scenes, and dialogues are added using both recorded voices and Plotagon's built-in voice options to ensure variety and engagement. These scenes are organized to match the pre-designed storyboard, ensuring consistency with the learning objectives. Finally, the completed animation is exported as a video with subtitles through the download menu, and the final product is saved automatically in the phone's storage, ready to be used as an engaging educational resource.

Implemantation : Fourth is implementation, at this stage, the researcher validated the learning animation of greetings and verb material using a plotagon which was carried out with the validation of media and material experts. Experts fill out questionnaires and provide comments and suggestions on the development of learning animations. Experts are selected according to their fields and competencies.The media expert's validation assessment was carried out by a IAIN Palangka Raya lecturer Mr. R who are experts in the field of computers and communications dan material expert was conducted by Mr. J a lecturer of vocabulary course (TBI 20.21) who directly run syllabus and curriculum in the field who know what kind of material standards are needed. After being given an assessment, the results of animation development can be known for their feasibility. This development research employed a data analysis technique that involved gathering data using instruments according to the instrument points and then carrying out methods for research and development (Sugiyono, 2015). The steps taken to analyze the data are as follows.

Table 1. Likert Scale

Percentage%	Validity Categories	The Description.
76% – 100%	Very Valid	No Revision
56% - 75%	Valid	No Revision
40% - 55%	Less Valid	Revision
0% - 39%	Invalid	Revision

Following completion of the validation procedure, the outcome can be determined as follows:

$$(P = \sum x / \sum x_1 \times 100\%)$$

Description:

P = Percentage of Searched

$\sum x$ = overall Score

$\sum x_1$ = Total Maximum Scores

Experts in materials and media conduct validation, providing an evaluation in the form of recommendations and critiques of the product. Recommendations and critiques from media experts and materials experts were used to improve the product. The updated product was then put through another round of testing to maximize the best possible outcomes.

Evaluation : Fifth is evaluation stage, in this study is used a formative evaluation. Formative evaluation aims to find out or reduce errors that require improvement based on the results of media expert, material expert validation and field trials conducted in two phases: large group trials conducted by 22 students and small group trials conducted by 6 student.

FINDINGS AND DISSCUSION

Findings

The findings of student questionnaires,interviews with an English lecturer served as the basis for the animation video. Students IAIN Palangka Raya was given survey. Following the findings of the interviews and observations which carried out as first step of the development model. it is known that students and lecturers need animated videos to facilitate the learning process. Therefore, this study results in a product that is learning animation using plotagons, by raising greetings & verb material that is in accordance with the learning syllabus.

After interviewing with the lecturer in charge of the course and TBI Pupils. A questionnaire was gave to the pupils that contained the option of character, outfit, name of character,gender of character, numbers of character, background theme, duration, motion, dubber, and video layout. Each student chooses the choice of character, outfit, name of character, gender of character, numbers of character, background theme, duration, motion, dubber, and video layout based on the needs of the pupils. This demonstrates the way the educational materials developed suit the needs of the students.

The questionnaire's results used as guidelines to develop learning animation. Characters, outfit, name of character, gender of character, numbers of character, background color, duration, motion, dubber, and video layout. The majority of students' choices are used to create animation videos.

Following consultation with experts, the animation video learning materials were evaluated by experts or validators who are knowledgeable about media and material concepts.

A materials expert conducted the materials' validity assessment. A Likert scale survey generated the findings of this materials expert validation.

Table 2. Result Of Judgement Validity From Materials Expert

Indicator	Score					Validity
	5	4	3	2	1	
Relevance						
The the material's compatibility with the skills that need to be mastered		√				80%
The materials' suitability for vocabulary skills		√				80%
Depth of the description of the materials provided		√				80%
Completeness of the materials' description provided		√				80%
The materials' suitability with advances in science		√				80%
Relevance of assessment questions in regard to indicators		√				80%
Accuracy						
Accuracy of concepts and definitions of material in accordance with Communicative Language Teaching.	√					100%
The accuracy of facts about Greetings and Verb materials		√				80%
The accuracy of the questions is presented appropriately		√				80%
Image accuracy based on the material		√				80%

Accuracy of symbols and notation		√	80%
Completeness of Presentation			
Providing the competencies that students need to acquire		√	80%
Providing sample questions		√	80%
At the end of the learning activity, there is a practice question		√	80%
Study Systematics			
The material is presented sequentially from the title, introduction, content, and conclusion		√	80%
Presentation Conclusions (presentation of balanced material/related between discussion sub-materials)		√	80%
The material's explanation follows the progression of ideas from basic to complex		√	80%
Appropriateness of Presentation with Learning Demands			
Students' attention can be stimulated by the way the content is presented overall.	√		100%
The presentation of the material as a whole can encourage student interaction with learning resources		√	80%
The way the materials are presented collectively may inspire people to look for more information.		√	80%
Students may be inspired to expand their own knowledge by the way the content is presented overall.		√	80%
Students may be inspired to practice or follow to the reading's subject through the way the content is presented overall		√	80%
Appropriateness of Language			
Structure of sentences accuracy		√	80%
The accuracy of the use of language rules		√	80%
Continuity usage of terminology		√	80%
Continuity of using notations and symbols		√	80%
Continuity and integration during learning activities		√	60%
Orderliness and cohesiveness between learning activities			
Message readability		√	80%
Suitability of sentence making, with students' thinking stages		√	80%
Capability to motivate	√		100%
Suitability for students' intellectual development		√	80%
Suitability to the student's emotional level		√	80%
Total	130		81,25%

The outcome of the percentage computation of animation videos' feasibility is 81,25%. based on the opinion of the materials expert. The materials validation result is "Very Valid," it can be concluded. The material in this 3d animation is in accordance with the indicators, learning objectives and vocabulary levels for students. Therefore, the development of this 3d animation is declared “very valid” without any revision.

A media expert conducted the media's validity test. A questionnaire with a Likert scale was used to obtain the findings of this validation by media experts.

Table 2. Result Of Judgement Validity From Media Expert

Indicator	Score					Validity
	5	4	3	2	1	
Display Ascpect						
Text or writing readability (Subtitles)	√					100%
Precision in setting spacing, lines, paragraphs, and animated characters	√					100%
way moving media is presented is suitable and good	√					100%
The appropriateness in choosing font sizes and types		√				80%
Accuracy of text, animated characters, and video backgrounds' coloring adjustments		√				80%
Accuracy of background and video positioning	√					100%
The layout Accuracy so that it is easy to understand	√					100%
The language used is clear and communicative.	√					100%
The attractiveness design in the core of the materials		√				80%
Presentation Aspects						
The interaction between students and the media can be optimized		√				80%
Simple to operate and easy to use		√				80%
Each scene composition is complete and systematic		√				80%
When operating, the video speed	√					100%
The video can be play	√					80%
Video, Sound, and Image Aspects						
Videos, sounds, and images all relate to the subject matter of the English learning materials.	√					100%
Both sound and video are work well	√					100%
The video, music, and images are all clear and excellent	√					100%
The duration of the video is appropriate for first-semester students.		√				80%
Instructions						
Every piece of material has clear instructions.	√					100%
Clarity of pauses on each materials language transfer	√					100%
Consistency in the use of terms with the presentation materials	√					100%
Every video scene on the character has instructions.	√					100%
Total	98					89,09%

According to media experts' evaluations, the feasibility of developing 3d animation videos is 89.09%, which can be categorized as "Very Valid" in the table above. However, the product needs to be revised to improve the appearance of learning animations. Some of the inputs from media experts that need to be revised are, a) the font in the book creator needs to be improved, adjust the color and thickness, b) change the background color that is too dark, c) adjust the expression of each character to the atmosphere of the conversation. Comments and suggestions from the validation of data media experts are applied by researchers to

improve 3d animation products. So that later it can make it easier for students to apply it properly.

First, a need analysis is carried out by observation and direct interviews with lecturers in charge of the course (TBI 20.21). The first observation looked at how students responded to the media used by lecturers during learning. In an interview with the lecturer in charge of the course, Mrs. H, she explained that learning was carried out in the classroom, where the lecturer only used smart TVs, and also used power points and videos sourced from YouTube. Based on lecturer's explanation video sourced from youtube is does not meet the needs of students like, the course syllabus, or the learning objectives that have been established by the lecturers.

Second, Based on findings of the analysis which has been carried out, pupils need learning animation videos that are easy to access through gadgets and also easy to understand because they are in accordance with their needs and desires in accordance with the needs and learning objectives in accordance with the syllabus. Judging from these conditions, students prefer learning that is carried out in an interesting way and the selection of teaching materials that are electronic is easily accessible using mobile phones. So that in accordance with the needs of millennial generation students. The researchers looked for relevant passages, real materials, and activity drafts that were directly related to the subjects and would meet the needs of the students to make sure the quality of the animation movie. For the pupils, the researcher then created and organized the collected materials into full 3d animated videos.

Third, the reliability, validity, and quality of the video were verified through expert evaluation. An specialist with a focus on learning media and English resources made up this phase. Prior to the implementation phase, the modifications made by the experts served as resources for evaluation and enhancement.

Fourth, A field test was carried out to evaluate the viability of the media.22 pupils in 1st semester from vocabulary class (TBI 20.21) IAIN Palangka Raya is featured in this phase. After using media to facilitate learning and teaching activities, students were invited to provide suggestions for analyzing and assessing the media's quality and suitability.

According to the result of large groups trial, the results of the feasibility of animation videos percentage computation are 87,53%. The animation learning media validation result is "Very Valid," it may be concluded. Small groups trials also obtained the results of the assessment "very valid" with the results of 95,71%.

The validation assessment of small group trials was conducted by 6 students of english language education of IAIN Palangka Raya. The results of the general evaluation of animation videos obtained a validity score of 89.0% according to very valid criteria, which means that it can be used in teaching learning procces. The validation assessment of large group trial obtained a result of 87.53% conducted by 22 students. Students according to the results, students' interest and focus on learning English, particularly vocabulary material, can be greatly increased by use this learning animation material, Attractive animation and character display, appropriate and attractive color selection, readability of font type and size which makes it easy to use animation either in the classroom or independently.Additionally, based on the ADDIE implementation stage, students find it easier to understand the material and get better at vocabulary English especially about *greetings & Verb.* Based on these findings, in increasing student interest in learning and increasing student vocabulary skills. the exercises at the end of the learning animation help students understanding to the material. Students can use learning animation material videos tailored to student needs.

Disccussion

This video has greetings and verb materials as one of the material of vocabulary TBI 20.21 syllabus. With duration 5 minutes long. This 3d animation was created based to preferences of the needs of pupils obtained through questionnaires. Learning videos can be created using a variety of additional applications, such as (Diva Erlina Septiani et al., 2024) made learning videos using PowToon. However, in this study, Plotagon software was used to create 3D animated educational videos. The outcomes are certainly different. This study's learning video was created with full animation and a variety of characters that can grab

students' interest and stimulate their curiosity. While products (Diva Erlina Septiani et al., 2024) are simple educational 2D videos with music and visuals that take the shape of digital storytelling.

To assess the product's quality, researchers submitted it for validation to the validator. Furthermore, the results of the validity and user study show that the animated video in Vocabulary learning was feasible to use as a learning media. The research instrument used in the development of animated videos were the media and matreials expert questionnaire,. The instrument used a Likert scale, and Descriptive analysis and percentage computation were the methods employed in the data questionnaire analysis.

Then the researcher validates the animated videos that has been made. Validation was carried out by several parties. Among others, material and media expert. Validation has been performed in order to get suggestions or comments as input for product improvement. Validation is done by trying the animated videos, after that filling out a questionnaire containing statements about the animated videos. Media expert validation was a validation stage that determined the level of product feasibility in terms of the media displayed. The lecturer of the IAIN Palangka Raya Department Faculty of Education And Teacher Training carried out media expert validation. Media expert validation stated that the animated videos were very valid with a percentage of 89.0% for the 3d animation videos of greetings and verb.

Furthermore, The outcomes of material expert evaluation of the 3d animation media content with sufficient "very valid" criteria can be seen in table 2 obtained a validity score of 81,25%, this indicates that it is usable in teaching learning activity. (Ahdan et al., 2020) Stated that the objective of using media within teaching process intends to motivate pupils, coupled with the use of interesting multimedia, which will create comfort and enjoyment for students in learning, and Pupils are more likely to learn new topics in learning.

With the rapid development of technology, lecturers can use a variety of learning media, one of which is through YouTube. However, the video on youtube was made by someone other than the IAIN Palangka Raya agency (copyright) and the content of the material presented was not in accordance with syllabus and student needs. Therefore, the 3d animation video created for this study is ideal for interesting independent learning. for student,lecturer, and IAIN Palangka Raya. This 3D animation was developed according to the needs of students who are based on syllabus and free from copyright because the originality is maintained both in terms of appearance, backsound and content, material by using plotagon animation. According to (Sari et al., 2024) Classroom activities are made more interesting and pleasant using the 3D animation software Plotagon, the advantage of learning Plotagon animation is that it makes It makes the subject matter easier for pupils to understand and can increase pupils enthusiasm and motivation cause animation can be customized according to learning needs. This has been prepared for use in the teaching and learning English vocabulary after conducting feasibility testing.

CONCLUSIONS

Instructional media plays an important role as one of the key supports in education. The use of appropriate media can help deliver material more effectively, enhance students' understanding, and increase their motivation to learn. One effective example of instructional media is 3D animated video. Through engaging and interactive visualizations, 3D animation can explain complex concepts in a more concrete and easy-to-understand way, make the learning process more enjoyable, and assist students in retaining the material, especially in learning English vocabulary. This project provides theoretical contributions to the field of English language education, particularly in vocabulary learning through multimedia-based approaches. The project support the theory that learning facilitated by visual and animated media can enhance students' understanding, retention, and motivation, especially in acquiring foreign language vocabulary. Furthermore, the project reinforces principles of cognitive multimedia learning theory, which states that the combination of visuals, audio, and text can optimize information processing in the brain. Therefore, this project can serve as a reference

for future theoretical development related to the use of digital technology-based learning media in foreign language education. This project also offers several practical implications for educators, educational institutions, and instructional media developers. First, for teachers and lecturers, the developed 3D animation materials can be used as effective teaching aids in vocabulary learning, helping to increase student engagement, comprehension, and memory retention. Second, for educational institutions, particularly IAIN Palangka Raya, this product provides an innovative and copyright-free learning resource that aligns with the current curriculum and can be utilized in the long term. Third, for instructional media developers, this project serves as a model and inspiration for creating similar educational products that can be applied not only in EFL learning but also across other educational fields. However, this RnD project is not spared from shortcomings. Some of the shortcomings that researchers face are the lack of resources in the form of funds and technology needed to run the project so as to reduce several things that can be produced in the project such as the number of bitmaps that affect the quality of the product resolution and the lack of 3d model assets so that the depiction in the video is limited. It is recommended for further studies on the similar project on 3d animated video as a learning media for EFL students that there is sstudies that continues to be updated.

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