

## 3D Animated Videos to Improve Student Knowledge at a Primary School in Malaysia

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### Abstract

This study aims to examine the usability and usefulness of the learning module for the development of 3D animated videos to improve student knowledge at SK Kepong Baru. The use of 3D animation technology is becoming increasingly important in education. An effective learning module is needed to ensure the enhancement of student knowledge. The findings indicate that the learning module for 3D animated video development is perceived as useful by students at SK Kepong Baru. They report positive feedback on the clarity of the module content and user satisfaction. However, there is room for improvement in the user interface of the module to ensure a more intuitive and user-friendly experience. Based on the study findings, suggestions for improvement include enhancing the user interface of the module to enhance the learning experience. Additionally, enriching the module content with project examples and additional resources can improve students' understanding of 3D animated video development. This study provides guidance to the school authorities in improving the quality of the learning module provided for 3D animated video development at SK Kepong Baru. By considering the suggested improvements, it is expected that the learning module will offer greater benefits in enhancing students' knowledge in this field.

**Keywords:** 3D Animation, Learning Module, Improve Knowledge, Usability and Usefulness

### Introduction

The learning module plays a crucial role as a comprehensive tool that guides students through the process of creating 3D animated videos. Its effectiveness lies in its ability to facilitate learning, provide clear instructions, and equip students with the necessary skills and knowledge. By ensuring the usability and usefulness of the learning module, educators can

optimize the learning experience and enable students to achieve better outcomes in the field of 3D animation (Mohtar et al., 2023).

The field of education has undergone rapid development with the integration of innovative technologies, particularly in the development of 3D animated videos (Nicolas, 2021). 3D animated videos offer a dynamic and captivating learning experience, enabling students to understand complex concepts more clearly and engagingly. In this context, the usability and usefulness of the specially designed learning module for the development of 3D animated videos play a crucial role in enhancing student knowledge (Farihah et al., 2023).

In addition, the learning module serves as a comprehensive tool that guides students through the process of creating 3D animated videos. Its effectiveness lies in its ability to facilitate learning, provide clear instructions, and equip students with the necessary skills and knowledge (Kasih et al., 2022). By ensuring the usability and usefulness of the learning module, educators can optimize the learning experience and enable students to achieve better outcomes in the field of 3D animation. However, to understand the impact of usability and usefulness of this learning module, a comprehensive assessment is required, taking into account factors such as user-friendliness, accessibility, clarity of instructions, and overall student satisfaction (Ramos et al., 2021). By examining these aspects, educators can identify usability and usefulness in the learning module and make necessary improvements to enhance student learning (Fidiastuti et al., 2021).

There are three main problems regarding the implementation of the module for design and development of 3D animated videos among students. First, lack of technical skills. Many students lack the necessary technical skills required for designing and developing 3D animated videos. They struggle with operating animation software, understanding the concepts of 3D modeling and animation, or utilizing the various tools and features effectively. Second, limited access to resources. Some students face challenges in accessing the required resources for practicing and sharpening their skills in 3D animation. This could include limited access to computers or software, lack of internet connectivity, or insufficient access to educational materials and tutorials. Third, low motivation and engagement. Students may exhibit lack of motivation and engagement when it comes to learning and applying 3D animation. The complex nature of the subject, combined with limited practical exposure, can result in students feeling overwhelmed or disinterested in the learning process. Finally, to address these problems, it is important to provide comprehensive training and support to students. This can involve offering technical workshops, providing access to necessary resources and software, fostering a creative and collaborative learning environment, and incorporating real-world applications of 3D animation to enhance student engagement and motivation.

3D animations is a notable visual media stage that brings a lot of visual highlights for students to work it out into their learning schedule. Every student has their own ecological factors and qualities that effect and impact their learning society. This challenge is handled by current learning advancements where they embrace engaging items for students that differ in styles, numbers and even network. 3D animated videos are visual media stage that is mostly utilized for creating homeroom showing materials, show slides, video and banner altering. This internet planning stage can be openly gotten to by each client and to chip away at their ventures separately and cooperatively. Additionally, organizations and promoting efforts have embraced this visual media stage to make convincing plans for their undertakings. Students can begin their visual plans without any preparation utilizing their own innovativeness and even use formats ready by the stage. Aside from that, their way of

learning can be more engaging with the utilization of movements in 3D animated videos. These conditions given by the visual media stage clears a connecting method of learning for students, particularly in higher organizations.

The cooperative element permits them to make undertaking information and result through numerous email sharing, altering continuously at the same time, and saving the tasks in different configurations. Students can separate significant data and content from learning, orchestrate and show them in fascinating styles and ideas, which consequently builds significant opportunity for growth for them to recall and apply in their learning schedule. Simultaneously, the infectious elements presented by visual media stages for learning lights inspirations among language students to keep up with their speed and progress during the most common way of accomplishing a fruitful language capability, which is helpful for their schooling and career life.

A literature review communicates the ongoing information relating to a specific space. This is finished by ordering the subject into various parcels and concentrating on each issue successively. Specialists should guarantee that their picked subject of examination is novel and pertinent to their field of study and in this paper, the field of language training is given significance and need. Writing surveys are directed by extricating data from articles, books, sections in books and even reports. Scientists while chipping away at this part of their review are permitted to conclude whether they need to keep or reject each recovered article. Composing a basic survey in this paper considers a few components of view. Basic audits permit scientists to assess each article utilizing explicit rules that fits the space of their picked investigations. A basic survey proves to be useful as it offers sociology specialists a reasonable and relevant perspective on all discoveries in their particular region in light of explicit standards.

Specialists can embrace incredibly careful overview and audit of all suitable and recovered reports and articles. A basic survey is finished by examining a specific book or article in subtleties of its thoughts, subjects and content of a particular theme. It permits scholars to give solid portrayal, investigation and understanding of data in regards to a specific subject that permit per users to see the article's worth and validity. Other than summing up and assessing the thoughts and data from articles, journalists likewise can reveal an insight into the examined subject according to their perspective and relate them to different hypothesis, ideas and approaches. Basic survey likewise centers around what the author definitely knows and desires to burn through more energy into adding their own utilization of investigation from what they have gained from related texts.

Guzzo et al. (1987) suggested moving toward the undertaking of leading a basic survey in a similar design as a quantitative report. This computes the three moves toward leading an investigation of basic survey, which are plan of the issue to be tended to, assortment and examination of the information and detailing of the outcomes (Guzzo et al., 1987). Continuing this, that the essayist or the specialist needs to plainly express the review targets, techniques and the rules that will be applied while doing the basic survey (Guzzo et al., 1987). This study utilizes these cases and significant components of basic audit to compose and examine the writing survey area connected with the planned exploration questions.

The point of leading this article on a basic survey is to look at the degree of utilizing visual media stages, for example, usability and usefulness of 3D animated videos to improve student knowledge at a primary school in Kepong. The issue in this study is tended to by planning the accompanying examination question: how much do late and regarded distributions manage the subject of use of 3D animated videos, for example, 3D animated videos to energize

learning and to improve students' knowledge in primary schools? This question can be separated into two principal subjects which are (1) visual media stage obliging internet growth opportunity and (2) the viability of design and development of 3D animated videos to improve student knowledge at a primary school in Malaysia. These two subjects were utilized to classify the articles that were recovered for this basic audit.

In general, 3D animated videos provide an effective learning tool as they offer an engaging, interactive, and efficient approach to presenting information, thereby enhancing knowledge retention (Kumar et al., 2023). Hence, to effectively enhance learning outcomes in this course, e-modules were employed as the primary learning resources. The utilization of e-modules presents a significant opportunity for students to comprehensively grasp the subject matter, thereby enhancing their knowledge and skills in disaster preparedness (Sumarmi et al., 2021). The selection of modules was driven by curriculum requirements and technological advancements, as they offer several advantages, including (i) convenient accessibility and flexibility for learning anytime and anywhere, (ii) the ability to present visually engaging and vibrant images, (iii) ease of customization, and (iv) seamless integration with other blended learning approaches (Ridwan et al., 2020). Thus, improved deep learning-based feature extraction for 3D animation.

According to Cao et al. (2022), this advancement in feature extraction methodology holds promise for improving the overall quality and realism of 3D animated characters and their expressions. The provision of the learning module demonstrates its usefulness. The utilization and implementation of time-independent multimedia components enable effective training and theoretically facilitate the learning process (Cigdem Benlice, 2021). The Learning Modules program comprises five key elements which are (i) structured pre-tutorial activities that guide students in addressing a problem, (ii) tutorials where tutors facilitate discussions related to the problem, (iii) post-tutorial quizzes that assess comprehension of the ideas presented in the problem, (iv) exam-focused review exercises consisting of model exercises and (v) example problems (Houghton, 2023). The proposed platform for processing and developing 3D animation data is structured into two modules: the learning module and the module for specifying requirements. The following section provide a detailed explanation of the design and implementation of these modules (Gao, 2022).

Lazebna and Prykhodko (2021) state that the use of visual media in learning influences learners' memory, visual, auditory, emotional and motor perception. Large number of information that are required for learners to read become more effective when they are summarized and presented in the form of infographics, pictures, points and graphics. The review also states that learners' motivations are increased with the use of online visual media platform during the process of learning, which helps them train their general educational skills. Language learning turn interesting when learners are able to display what they have acquired using presentation aids and sharing them with their peers. Online visual media fosters learners' communication skills, logical thinking and the ability to self-express in language learning. The application of visual media platforms in distance learning conditions is an effective way to create a positive impression on learners' learning process (Salehudin et al., 2021). Moreover, the use of visual media increases the quality of learning as it takes learners' convenience into account.

Online visual media tackles the challenges in e-learning and makes the learning process interactive, understands learners' needs, and tailors to the content of learners' needs and profiles (Kolesnikov, et al., 2019). Apart from qualitatively improving the teaching and learning process with the use of online visual media aids, learners' behaviour, cognition,

constructive skills and activism are promoted along with their independent thinking skills as they learn how to explore for necessary information in a critical space of time. Learners are able to perform better, contain stronger learning motivation and display more activeness in the learning process when the use of visual media are incorporated (Dineva, Nedeva, & Ducheveva, 2019). The prominence of using visual media platforms in the world of education allows learners to overcome constraints of the real world and provides them with the opportunity to explore domains of digital spaces. E-learning technologies prioritize the integration of visual media aids to bring forth an improved user experience and learners' independent learning zone.

Holography is an emerging technology with interesting educational potential. Although the cost of devices able to display holograms is significant, there are alternative methods for producing pseudo-holograms with far less cost, such as 3D LED fan displays (Emmanuel Fokides, 2023). Research regarding the impact of these devices on learning is limited. The implementation of a project in which we contrasted the learning outcomes produced are by their use of 3D models presented using the computers. Hence, students enjoyed the learning process, were motivated to learn, and felt that the pseudo-holograms facilitated their learning. On the basis of these results, we argue that 3D LED fan displays and pseudo-holograms offer positive learning experiences and an attractive method for presenting the learning content. Then again, as the relevant technology is still evolving, more studies are needed for establishing their educational value.

In addition, Loh Ngik Hoon (2019), stated that the increased scores prove that 3D technology can positively influence and enhance the knowledge gained during the student learning process. An illustration in the form of a 3D hologram animation was able to grab the students' interest and capture their attention. This paper contributes to the field of education by looking at the adoption of 3DH technology, which could effectively enhance student learning quality at an early stage. Moreover, One of the notable visual media stage, 3D animations, brings a lot of visual highlights right into it for students to work them into their learning schedule. Every students have their own ecological factors and qualities that effect and impact their learning society.

This challenge is handled by current learning advancements where they embrace engaging items for students that differ in styles, numbers and even network. 3D animated videos are visual media stage that is mostly utilized for creating homeroom showing materials, show slides, video and banner altering. This internet planning stage can be openly gotten to by each client and to chip away at their ventures separately and cooperatively. Additionally, organizations and promoting efforts have embraced this visual media stage to make convincing plans for their undertakings. Students can begin their visual plans without any preparation utilizing their own innovativeness and even use formats ready by the stage. Aside from that, their way of learning can be more engaging with the utilization of movements in 3D animated videos. These conditions given by the visual media stage clears a connecting method of learning for students particularly in higher organizations to improve their knowledges in primary schools.

### **Methodology**

As stated by Guzzo et al. (1987), it is important to do a comprehensive review of the literature to locate all extant studies relevant to the topic of review. To ensure that the retrieved articles fit within the domain of this study, a thorough and narrow search of all relating articles was regulated before particularly selecting appropriate and affiliated articles that

deals with the research question and themes of this study. As a start, the keywords related to the theme of design and development of 3D animated videos to improve student knowledge at a primary school in Malaysia. The proposed platform for processing and developing 3D animation data is structured into two modules: the learning module and the module for specifying requirements. The following section provide a detailed explanation of the design and implementation of these modules (Gao, 2022).

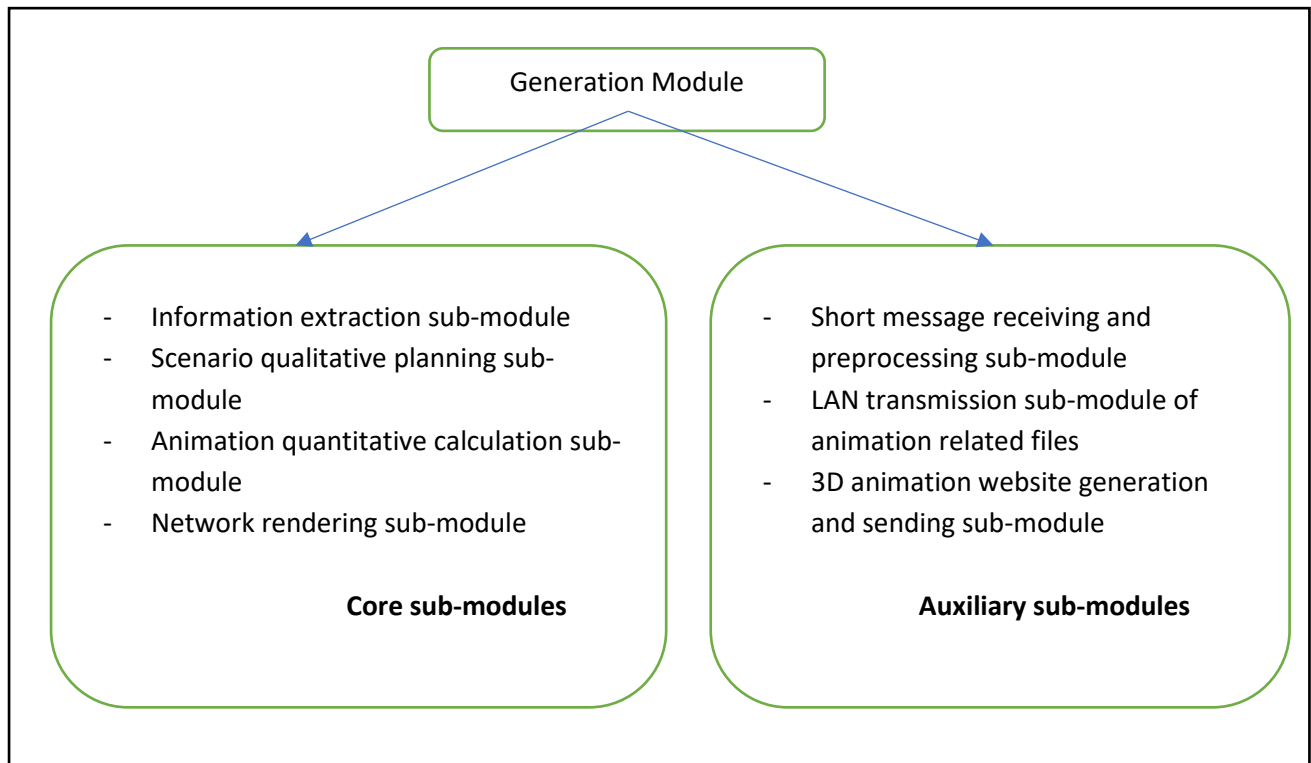


Figure 1. The generation module

The study aims to report the review of literature and present the conceptual framework on how to subsequently proceed to investigate the usability and usefulness of the learning module for the development of 3D animated videos at SK Kepong Baru. Three specific research questions will guide the investigation even from as early as this review of literature stage. The study will later in subsequent report of this study seeks to determine students perception of usability of the learning module. Hence, to focus on a wider use of usage of 3D animated videos instead of particular platforms such as videos, audio visual aids and infographics. This is because the 3D animated videos, that is used as a topic of discussion in this study contains various videos applications for every type of learners. The platform does not offer only a limited number and types of 3D animated videos and motions for individual and collaborative learning such as 'blippAr', FlipaClip, CapCut, Windows Movie Maker, iMovie, PowToon and of course YouTube.

Lastly, this study will utilize the questionnaire-based approach to validate the project-based learning module on the design and development of 3D animated videos. The module will fully follow a systematic process that includes analysis, design, development, implementation, and evaluation stages. However for the report in this article we will only present the findings of systematic review of literature that help us come out with the conceptual framework of the study. The project focuses on observing the students' workflow, starting from generating ideas

to the final assessment and testing of the animated videos. The target participants are students in grades four to six at SK Kepong Baru. The questionnaire is divided into four sections: Respondent Information, Application of Learning Theory, Module Usability, and Feedback or Suggestions. The collected data will be analysed using SPSS software, employing appropriate statistical method and this questionnaire-based research design help measure application analysis, perception, and research validity (Elsa & Anwar, 2021). These uncovered that the utilization of every one of the three examination systems were essential to get a legitimate area of strength for information understanding in the field of 3D enlivened recordings utilizing with respect to the hypothesis of moderation.

### **Results and Discussions**

Liu, Levina and Frolova (2020), reviewed that the engagement of 3D animated videos brought several positive impacts in the learning process, and in this case, the English language learning. Learners' attentions were activated and stabilized on the information provided for a longer time. Moreover, with greater intensity, learners' information perception and memorizing activity showed improvement. Learner's motivation and their interest to perform further study of a particular subject also increases with the involvement of 3D visual media. On the other hand, 3D animated videos tackle the challenges in e-learning and makes the learning process interactive, understands learners' needs, and tailors to the content of learners' needs and profiles (Kolesnikov, et al. 2019). Apart from qualitatively improving the teaching and learning process with the use of visual media aids, learners' behaviour, cognition, constructive skills and activism are promoted along with their independent thinking skills as they learn how to explore for necessary information in a critical space of time. Learners are able to perform better, contain stronger learning motivation and display more activeness in the learning process when the use of visual media are incorporated (Dineva, Nedeva & Ducheveva, 2019). The prominence of using media platforms in the world of education allows learners to overcome constrains of the real world and provides them with the opportunity to explore domains of digital spaces. E-learning technologies prioritize the integration of visual media aids to bring forth an improved user experience and learners' independent learning zone.

Figure 2 shows a proposed framework that concluded process of learners undergoing the stages of making the 3D animated videos modules usable and useful to improve student knowledge at a primary school in Malaysia. In a recurrent cycle of learning, learners' accomplishments and elements are represented at each stage. In addition, students actively participate in the learning process and acquire skills for critical and creative thinking. They utilize all of these acquired elements to create an interactive learning environment in which they use 3D animated videos as a platform to share knowledge with their built-in network. According to the reviews in this paper, various 3D animated platforms are used in this learning style of the 21st century. As a result, this usability and usefulness criteria stood out the most because it gives students in all fields of study the chance to use it for learning and sharing.

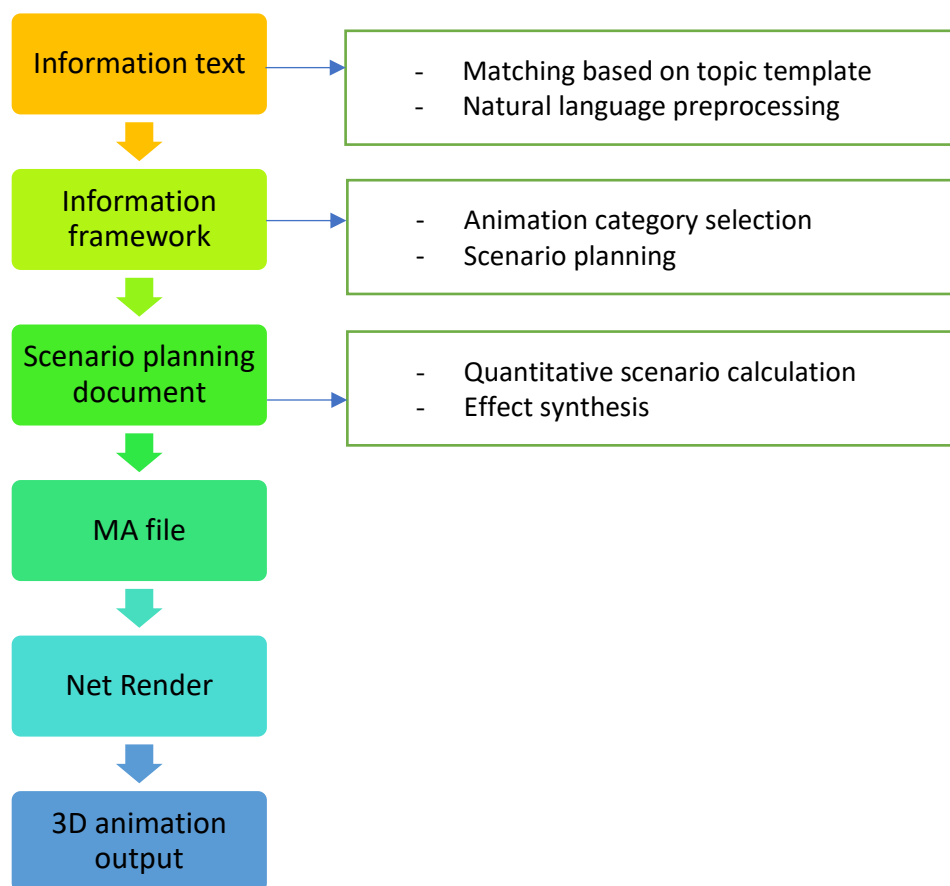


Figure 2. The flow chart of generation module

### Conclusions

The review of literature in this study is to help planning the design and development of usable and useful 3D animated videos to improve student knowledge at a primary school in Malaysia. The articles fundamentally surveyed in this paper concur that the utilization of 3D enlivened recordings assumes a part in students' inspiration, cooperation, expertise evaluation and making a venture base learning zone. In addition, the reviewed articles agree that the use of 3D animated video platforms in accordance with learners' modern needs and profiles. Since modern technologies are known to develop a large number of software with identical functions, features, and uses, the lack of studies that solely focus on 3D animated videos demonstrates the research gap. Thus, future work shall include the utilization of the 3D animated videos which will be referred by researchers while researching the field of technology use for learning and to improve knowledge of students in primary schools in Malaysia. Further examination is required, especially the mix of the 3D animated videos in improving undertaking learning on the grounds that the 3D vivified platform is a significant visual media to give fantastic opportunities for growth to students.

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