



Development of Online-Based Interactive Video Media using Teachmint Application for Natural Science Learning

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Abstract

Many challenges and online learning strategies require educators to innovate and adapt well. The media used so far is less interesting and less interactive. This research was conducted to see the effectiveness of interactive media learning video teachmint application in learning. This study was motivated by the low motivation and learning achievement of students. The learning method is teacher-centred, so learning seems monotonous, and students become passive in participating in learning. The purpose of this study was to describe the feasibility and effectiveness of teachmint application in learning. This research is a research & development (R&D) development, namely 4D which has 4 stages of flow, namely defining (define), designing (design), developing (development), and disseminating (disseminate). The data collection method in this research is by conducting observations, interviews, validation tests of media experts and material experts, questionnaires and pretest and post-test instruments. The results of the media expert validation test obtained a score of 93% with a very feasible category, the material expert test results obtained a score of 77.35% with a very feasible category. While the results of the effectiveness test of the pretest and post-test results with an average Gain Score of 0.74 with high criteria, the student response scored 87.96% of the category strongly agreed, while the teacher response scored an average score of 80% of the category strongly agreed. These results can be concluded that interactive video media with the teachmint application can be declared feasible for use in learning.

Keywords: online-based interactive media, teachmint application, natural science

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INTRODUCTION

Education is a field that does not escape the use of technology, both in planning, organising, implementing, and monitoring. Technology has made learning media more diverse in its forms and uses that assist educators in providing information to students (Bohlin et al., 2017). The advent of multimedia and technology has changed the way educators teach and learners learn. More effective way of delivering information and communicating with multimedia (Munir, 2015) Stating that the development of multimedia applications has now offered new insights into the learning process and can encourage a person to produce information and can encourage a person to produce new knowledge in an innovative way (Riyana & RI, 2018).

Based on the observation conducted at SMPN 5 Rangkasbitung, it was found that most educators used several methods, namely lectures, group discussions, and simulations. However, some educators revealed that there are some materials that even though they have been explained using verbal language and pictures, students still have difficulty understanding the description of the material presented by the educator. Learning in science material about cell organisation systems, students do not understand the material presented, the material is

abstract, making it difficult for students to understand if only using language. Seeing these problems, the researcher concluded to develop interactive multimedia in science subjects. According to research conducted by (Susano, 2023) that students gave positive responses to the teachmint application, quite effective and feasible to use in the learning process.

According H.W. Fowler in Rahman (2020) states that science is a systematic and formulated knowledge that deals with material symptoms and is based primarily on observation and deduction. Trianto (2020:136) says that science is a systematic collection of theories, its application is generally limited to natural phenomena, born and developed through scientific methods such as observation and experimentation and involves a scientific attitude. Rahim et al. (2022) The development of interactive media is based on the idea that learning activities take place well, effectively, and fun if supported by learning media that attracts the interest and attention of students, especially if it can be operated by students themselves. (Fikri & Madona, 2018) stated that when it comes to the concept of intelligence, children's growth is closely related to the theory of multiple-intelligence, which is the ability to solve problems or create products that are assessed in one or more cultural settings.

According to the National Education Association (NEA), media is a device that can be manipulated, heard, seen, and read along with instruments that are used both in the learning process that can be used both in the learning process that can affect the level of effectiveness of teaching material delivery Widyastuti et al.(2021). Simarmata (2022) stated that the benefits of learning media can be felt not only for students who enjoy material using various media but also by educators who can reduce the burden of explaining and can convey material in more detail to students.

Warsita (2008) stated that interactive learning is a method used by educators to create interactive and educational learning conditions, where there is good interaction between educators and students, or students and educators. Hamid et al. (2020) stated that interactive learning can make students able to adjust their abilities with other friends, students are able to learn independently and actively build their knowledge through observation, or questions they ask the educator. M. R. M. & Ramesh (2022) states Basically, online learning is a learning process using internet facilities that allows learners to participate in learning even without their physical presence in the classroom or the same place as the educator. Lidia Susanti (2021) states that online learning adopts the system used in offline learning which includes collaborative, communicative, effective learning, and the motivation of learners in learning something relevant.

Web-based learning is the process of learning using the potential of the global network or the internet to be accessed during the learning process which is flexible and can be used anywhere and anytime Prawiradilaga (2016). E-Learning is an electronic learning system, a form of information technology applied in the field of education in the form of a website that can be accessed anywhere and anytime (He et al., 2022). Research results Sammons, Lindorff, Ortega, & Kington (2016) stated that an inspiring teacher will make learners learn more, be able to collaborate using more varied learning strategies and learning that encourages motivation and stimulates creative thinking in students. Tuti Fatma Rahmawati et al. (2021) stated that as an educator, you must have the ability to manage and select fun online learning content. Designing appropriate online learning strategies and developing skills in using information and communication technology can be effectively implemented by learners. Digital technology offers exciting new opportunities for learning, learners can use hardware and software devices in operating learning media such as hand phones, tablets, and laptops.

The quality of education is closely related to the success in forming quality students, which will be the benchmark in the success of the learning process. Heldina Pristanti (2021) states that the learning process can also be described by the interaction of students with educators and with their environment which results in changes in behaviour that will provide a learning experience. Benta et al. (2015) states the learning process carried out by students determines learning achievement. Learning achievement can be interpreted as learning

outcomes that have been obtained due to learning activities that have been carried out. Based on the description that has been described, interactive video learning media teachmint application can be the right choice to create a virtual classroom and still run effectively and efficiently, which can be utilised by educators and students in the learning process interactively. The features owned by the teachmint application are all-in-one that can be operated by educators and students, in addition, it is hoped that there will also be motivation and attraction of students in following science subjects to the maximum, from the overall response of students that this application received a positive response, made it easy and fun. This research is in line with the class action research of Tuti Fatma Rahmawati et al., (2021) that learning using the teachmint application is easy and fun and can improve student learning achievement.

METHOD

This research is a Research & Development (R&D) development research with the 4-D model several stages, namely defining (Define), designing (Design), developing (Develop), Disseminating (Disseminate) (Agency, n.d.,1479). This development research aims to describe the feasibility and effectiveness of teachmint media palication for interactive learning videos, develop teaching materials or materials related to science subjects, conduct product trials, evaluate, and revise. The data obtained from the results of filling out a questionnaire from the research subject, namely SMPN 5 Rangaksbitung class VII students, the subjects of this study were 2 validators, one media expert and one material expert. data obtained from observation and interview questionnaire methods.

The research instruments submitted are instruments that have been validated by validators. The steps taken by researchers are making instruments, the media that has been made is tested by media experts and material experts to show the results of product revisions and material revisions are declared valid, then researchers continue the next research step.

O'Neill, (2008) stated that interactive media development has characteristics, namely digital, interactivity, hypersexuality, dispersion and virtuality. Wandah Wibawanto & Kreatif (2017) stated that interactive media development is one of the media that can be used to deliver learning materials to students effectively and efficiently.

Development research in the field of education focuses on the study of design and products such as media and learning processes. (Saputro, 2017) Similarly, development research according to Thiagarajan and Sammel (1974) states that the research and development (R&D) method is a research approach to produce a new product or improve existing products.

Trial subject

The research trial subjects involved were science learning practitioners (SMPN 5 Rangkasbitung Educators) and 31 seventh grade students. The trials studied were the quality and feasibility and effectiveness of interactive learning media using the teachmint application.

Research Instruments

Material feasibility instrument to assess the suitability of the material. The instrument is a questionnaire with a Likert scale. The answer value is very feasible with a score of 5, feasible score 4, quite feasible 3, less feasible 3 and not feasible 1.

Table 1. Likert scale

Rating Scale	Interpretation
5	Very decent
4	Worth it
3	Feasible enough
2	Less Feasible
1	Not Feasible

(Sugiyono, 2013)

The aspects assessed from material experts are aspects of the curriculum, material aspects and grammatical aspects. The media expert's feasibility instruments are aspects of media convenience, design/appearance aspects and subject suitability aspects.

Module Feasibility Validation Data Analysis

In the development of interactive learning media using qualitative descriptive data analysis techniques. Qualitative data obtained from observations, interviews, documentation, and data from experts as well as student respondents and teacher respondents who are used as guidelines for revising learning media. Quantitative data comes from the validation of media experts, material experts, and student responses and teacher responses. The percentage analysis formula according to Arikunto (2008: 216).

$$P = \frac{\sum x}{\sum xi} \times 100$$

P : Percentage

$\sum x$: total number of respondent answers

$\sum xi$: total number of ideal item values

100% : constant

Table 2. Criteria for questionnaire data Assessment Media Validator and Material Validator

Rating Scale	Interpretation
76%-100%	Very decent
56%-75 %	Worth it
40%-55 %	Feasible enough
20%- 39 %	Less Feasible
0%-19,99%	Not Feasible

Data analysis techniques other than testing from experts, are also used in testing the effectiveness of interactive video media data on the effectiveness of using interactive video media was obtained through pre-tests and post-tests given to students before and after using interactive video media in science learning. Normality Test Gain (N-Gain score) is the difference between the post-test score and the pre-test score.

Calculation formula: N-Gain Score:

$$N - Gain = \frac{Score\ Post\ Test - Skor\ Pre\ Test}{Score\ Ideal - Skor\ Pre\ Test}$$

Table 3. N-Gain

Range of Normalised Gain	Criteria
$<g><0,30$	Low
$0,70><g> \geq 0,30$	Medium
$<g> \geq 0,70$	High

RESULT AND DISCUSSION

Interactive video in science learning, this research uses the teachmint application, a product in the form of an online interactive learning video application. The advantages in the teachmint application are free, can be operated on a mobile phone or laptop can be used anytime and anywhere, can be installed on the play store Android and IOS operating systems and MAC features include: learner absences, online bord boards, record learning videos, unlimited participants, meeting time is not limited by duration, create tests, create homework download teaching materials and upload materials to be given to students, share screen teaching materials and many more advantages that exist in the teachmint application Research with the title study

of student opinions on the use of the teachmint application in mathematical logic courses by (Susano, 2023) received a positive response from the ease of use of the teachmint app.

Development Procedure

Define

(Suriansyah et al., 2022) Define defines the learning problems that need to be solved through learning modules or products and determines the characteristics of the model or product developed. In this analysis stage, the researchers distributed questionnaires to educators and students at SMPN 5 Rangkasbitung. (Diani Ayu Pratiwi et al., 2021) stated the curriculum analysis to the educator that is being used this is to determine the competencies in the media to be developed. The development of learning media will be centred on the science subject of cell organisation system material. The next stage is to formulate learning objectives, before compiling it is necessary to formulate the learning objectives and competencies to be learned. Analyse the characteristics of learners to adjust the needs of learners. Material analysis in this case is analysed by identifying, collecting, and selecting materials in the development process from students' books, educators' books, the internet and other sources.

Level of planning Desain (Design)

The next stage in the design stage of interactive multimedia learning media design consists of Core Competencies (KI) and Basic Competencies (KD) material, indicators, exercise material presented questions and evaluation. Then the researcher chooses the right media in the presentation in the form of images, text, audio, or video that will be displayed on the learning media. This type of video format can be played back on YouTube to facilitate learners in face-to-face or online learning processes.



Figure 1. Design options for science teaching materials page

The selection of learning media formats is adjusted to the results of identification that is adjusted to the learning material. The format used is an mp4 video player, which will be integrated with the creation of a link to YouTube. This video can be operated on laptops, mobile phones, personal computers, tablet PCs and devices that support the application can be downloaded on the Appstore and play store.

The prototype design is an initial design in the process of making interactive video learning media consisting of an initial page of opening slides and material content related to the subject of cell organisation systems. The stages of how to work with the teachmint application, preparation of devices such as smartphones, laptops or personal computers that are connected to stable internet. Open the browser visit the official website <https://teachmint.com> and enter the login menu the opening page display menu as shown below:

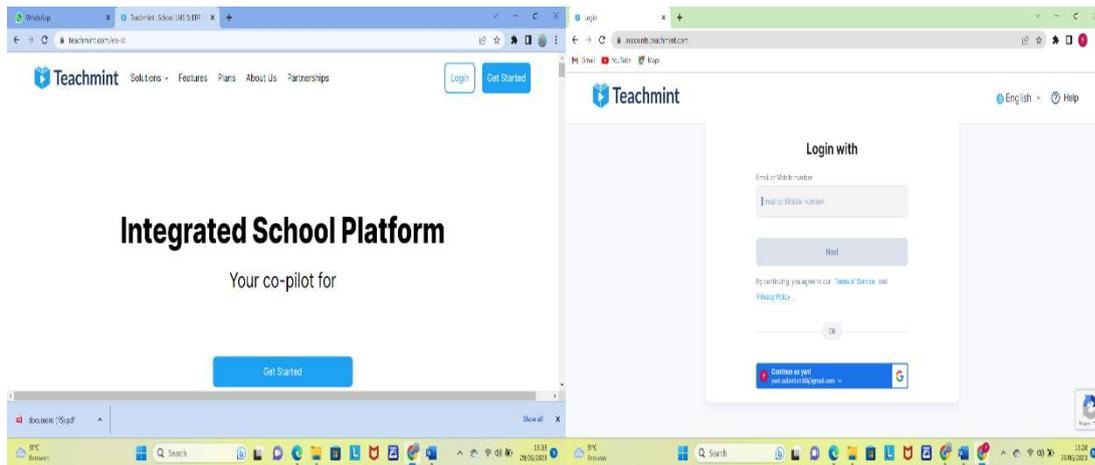


Figure 2. Home page Teachmint

Figure 3. Login Page

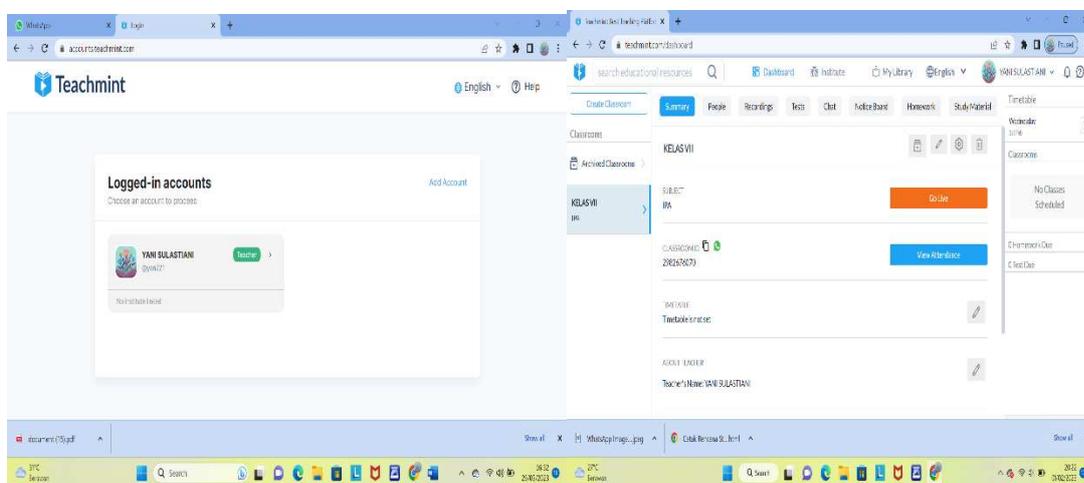


Figure. 4 Login Accounts Page

Figure 5. Dashboard Page

Develop

The next stage of development is feasibility testing from media experts and material experts (validators). The instrument given was filled in by media expert validators and material experts to obtain data from the results of filling out the questionnaire. Media expert validation is carried out by one media expert, this media expert validation has 3 aspects, namely aspects of media convenience, design / appearance aspects and aspects of subject suitability for media. Material expert validation is carried out by one material expert is a validation of the suitability of the content of the material contained in the learning media, the acquisition of validation scores from media expert validators, namely obtaining a percentage of 93% with a very feasible category. Material expert validation has 3 aspects, namely curriculum aspects, material aspects and grammar aspects, obtaining a percentage of 77.35% with a very feasible category, it can be concluded that the interactive learning video media teachmint application is declared valid.

The practicality test of the development was carried out in the field by experimenting with the use of media by educators and students in science learning classes. From filling out the questionnaire given to educators and testing the practicality response by giving a questionnaire given to one educator with a percentage of 80% with a strongly agreed category, it can be concluded that the interactive learning video media teachmint application is declared very practical. The practicality product test of students' responses to interactive video media products in the teachmint application obtained an average percentage of 87.96%, with the category strongly agreeing, it can be concluded that the interactive learning video media teachmint application is declared very practical.

Disseminate

The dissemination stage is carried out on students in class VII, it is known that during the learning process using the teachmint application video media is very good.

Table 4 results of student's activities in the learning process with interactive video media teachmint application

No	Assessment Aspects	Percentage
1.	Participate in class learning	86,67%
2.	Paying attention to the material	88,00%
3.	Paying Attention to Media	86,67%
4.	conducive class conditions	86,67%
5.	Have a discussion	90,67%
6.	Summarising Learning Materials	88,00%
Average		86,67%

Based on the data in table 4 that the learning activities of students during the learning process had an average percentage of 86.67%. Based on the results of the aspects assessed above, the learning process activities carried out were included in the active category and succeeded in improving students' learning achievement. Therefore, it can be concluded that the use of teachmint application media in learning at this stage of dissemination is considered very good and effective for use in the science learning process.

CONCLUSION

This development was carried out to see the feasibility and effectiveness of the interactive learning video of teachmint application for educators and students. This interactive video media development is very interesting and features that have not existed in other applications before. The teachmint app is a platform that innovates in interactive learning videos, to make it easier for educators and learners to learn anytime and anywhere effectively and efficiently. Educators and learners are given the ease of operating the application and can be installed on IOS, MAC and Android.

From the results of the development of this interactive video media, if the knowledge of educators and students in learning is getting better and has a positive or good effect on learning achievement, then this research is said to be effective for use in the interactive video learning process. However, on this occasion the researchers only focused on developing interactive video media.

RECOMMENDATION

From the results of the description above, it can be concluded that this application is effective for online learning. Because the features contained in the teachmint application can store all teaching materials can be well documented in the form of pdf, mp4, word and you tube video files. It is suggested that this application can be used for other subjects.

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