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Development of E-Learning Video Using a Contextual Approach to Distance Learning Static Fluid Discussion

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ABSTRACT

This research is motivated by the state of distance learning due to the pandemic which has drastically changed teaching and learning activities, so learning media that is suitable for the existing situation is needed. This study aims to develop and produce an e-learning video using a contextual approach to distance learning static fluid discussion. This study uses the Research and Development (R&D) method which refers to a 4D model. The instrument in this study was a questionnaire using the Likert scale. This e-learning video has passed the validation test with the proportion of material experts 93.8% and media experts 72%. Video trials were conducted on 35 students of class XI MIPA and 1 physics teacher at SMA Negeri 2 Tangerang with a proportion of 100% according to the teacher and 91% according to the student. This research has improved in terms of material but needs further development in terms of media and science process skills. Based on these results, obtained data that e-learning video that has been developed using a contextual approach to distance learning static fluid discussion is a suitable media for learning physics.

Keywords: learning videos, contextual approach, distance learning, static fluid

INTRODUCTION

Early 2020, Indonesia was shocked by a pandemic caused by the corona virus (COVID-19). The existence of this pandemic, has affected almost the entire country. Starting from the fields of economy, health, politics, to education. As in the journal entitled Philosophy of education in a new key: Education for justice now, written by Drousioti: The coronavirus pandemic (COVID-19) has changed people's lives and habits dramatically. The worldwide lockdown is causing unprecedented action, which seriously affects daily routines (Papastephanou, et al., 2020).

In RI Law No. 20 of 2003, concerning the National Education System, describes in detail the definition of national education, namely: as a conscious and planned effort to create an atmosphere of learning and the learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character and skills needed by him, society, nation and state. Many students have been affected by this pandemic. There are 978,503,100 students affected, 55.9% of the total students enrolled,

and 131 closures across the country (United Nations Educational, Scientific and Cultural Organization, 2020).

In fact, a school is not just a building with classes. School can be done remotely. Distance learning must overcome the limitations of distance, space, and time in the learning process. Therefore, distance learning has different characteristics from conventional education systems that are held face-to-face. This feature is physical isolation between teacher and student activities, and the absence of face-to-face meetings, which leads to limitations in the learning process in a face-to-face format.

To overcome the obstacles in implementing Distance Learning (DL) and to increase students' understanding, it is necessary to apply appropriate learning media. The success of in their journal entitled Development of Dynamic Fluid Learning Video Based on Contextual in Water Area for High School Students which developed videos with a contextual approach on the subject of Dynamic Fluid reached 94% and a practicality level of 84% suggested to do development on other subjects (Saparini, et al., 2020).

From the results of the Needs Analysis Survey that has been carried out, the latest learning at DL uses various platforms with different methods. Three of them are teleconferencing (88.7%) using Zoom or Google Meet, sharing of teaching materials and assignments using LMS (64.5%) such as Schoology or Google Classroom, and messaging applications (40.3%). The use of instructional media for text (69.4%), pictures (71%), and video (77.4%), however, the results of the survey regarding the learning media that are commonly used are mostly neutral (>33.9%) and some still feel incompatible and low effectiveness and efficiency (<10%). More than half of the respondents are comfortable and feel happy with the concept from contextual learning from real life situations. Many respondents experienced problems in understanding the material because distance learning conditions were considered less effective and efficient for them, this could happen because of the psychological condition of students that they had to be at home all the time. More than half of the respondents are not happy with the current DL.

Students' conceptions can be improved by conceptual changes. Learning that supports student conceptual change. The learning challenges students to explain concepts and lessons using their knowledge in real situations. From the above explanation, it can be said that Static Fluid is a material that contains interrelated concepts and involves calculations. Class XI students not only learn about Static Fluid, but they will also continue to Dynamic Fluid. When studying Fluid Static material, there are many phenomena that are often encountered on a daily basis. The selection of basic competencies as a focus for investigating is appropriate to be carried out with a contextual approach.

Based on the background above, it is considered interesting to research by taking the title Development of E-Learning Video Using a Contextual Approach to Distance Learning.

Problem of Research

In the journal entitled E-Learning during Lockdown of Covid-19 Pandemic: A Global Perspective, it revealed that the findings of this study reflect the impact of e-learning, student interest in using e-learning resources, and their performance (Radha, et al., 2020). This research

shows that e-learning has become very popular among students around the world in particular, during the lockdown period due to the COVID-19 pandemic. Then in the journal entitled COVID-19: A Massive Exposure Towards Web Based Learning argued that important factors in learning during this pandemic are: Students learn more now than conventional, important concepts can shared via video, and e-learning is the best choice during a pandemic (Mahalakshmi & Radha, 2020). Therefore, e-learning videos deserve to be developed as learning media during DL and e-learning videos provide efficient and effective learning.

Strategic steps are needed to reduce the impact. Of course, conventional learning cannot now be implemented, as an alternative, distance learning is an option. Distance learning has the main characteristic of being physically separated. However, the movement that was too sudden made the government catch up with further policies in order to run a good DL. In his research on the Management Model of XXI Century High Schools, Prasojo (2010) revealed several shortcomings of e-learning, namely: (1) lack of interaction between teachers and students or even between students themselves; (2) this lack of interaction can slow down the formation of values in the teaching and learning process; (3) the tendency to ignore academic or social aspects and vice versa encourage the growth of business / commercial aspects; (4) the teaching and learning process tends towards training rather than education; (5) the change in the role of teachers from previously mastering conventional learning techniques, now also required to know learning techniques that use ICT; (6) Students who do not have high learning motivation tend to fail; (7) not all places have internet facilities available; (8) lack of personnel who know and have internet skills; and (9) lack of mastery of computer languages. Analyzed from the shortcomings or weaknesses of e-learning, it can be concluded that the most prominent drawback is that the technology used is still not fully utilized by most teachers, and the role of this very important teacher can have a greater impact if it is not supported by media with an approach that is in accordance with distance learning. The development of learning media is considered useful for adding teacher references so that it is able to create a fun and better learning atmosphere.

Research Focus

In this reasearch, the problem that raised by author is how to developed learning media due to the pandemic impact and how to make learning media suitable for use on the subject of static fluids.

METHODOLOGY OF RESEARCH

General Background of Research

This research was conduct in SMAN 2 Kota Tangerang in Banten, located at Taman Makam Pahlawan Taruna street, sub-district Tangerang, Tangerang city. This research used the research and development method. The research and development model used in this research is the 4D model by Thiagarajan.

Subject of Research

Subject of this research is 35 high school students and 1 physics high school teacher in SMAN 2 Kota Tangerang.

Instrument and Procedures

Define Stage

By gathering information and identifying students' conditions and needs. The steps taken are literature study and questionnaire distribution. From this stage, clear objectives are made in the development of e-learning videos.

Design Stage

Developing products in accordance with the conditions and needs of students. The first step in development starts with determining the media and approach to be used. The choice of approach is done by analyzing the results of the first stage. After that, designing the product design, namely video. This process consists of 3 main stages, namely pre-production, production and post-production. Starting from the preparation of the material and script, the shooting process was carried out, to the editing process. After making e-learning videos, Student Worksheets are prepared to make it easier to manage student learning processes independently.

Develop Stage

After obtaining the initial design, an expert validation process is carried out. Product validation is carried out by media experts and material experts. The expert team fills in the assessment in the form of a questionnaire and provides input and comments regarding the product being developed for further modification, if there are still parts that are not in accordance with the standard, it is necessary to revise it according to the validator's input until the product is feasible to be tested.

Table 1. Material Validation Instrument Grid

No.	Assessment Aspect	Indicator	Number of Items
1.	Aspects of Learning	The material presented is relevant to Basic Competencies	1
		The material presented is in accordance with the learning objectives	1
		Presentation of material relevant to Distance Learning	1
		The accuracy of sentence structure and language is easy to understand	1
		Presentation of material in accordance with the contextual approach	1
2.	Content of the Material	The material is according to the student's ability level	1
		The material is in accordance with what is formulated	1
		Presentation of material arranged systematically	1

No.	Assessment Aspect	Indicator	Number of Items
		The material coverage relates to the themes discussed	1
		The material is clear and specific	1
		The illustrations used are in accordance with the material	1
		Examples of phenomena / technologies are given according to the material	1
		The images presented have the power to reinforce the concept of the material	1
		Total	13

(Source: Surono, 2011) modificated.

Table 2. Media Validation Instrument Grid

No.	Assessment Aspect	Indicator	Number of Items
1.	Display Interface	Text is legible and clear	1
		Selection of background graphics, background sound, and text color according to the theme	1
		Audio and video are of good quality and clear	1
2.	Product Programming	Contextual Approach	
		Modeling	1
		Questioning	1
		Learning Community	1
		Inquiry	1
		Constructivism	1
		Reflection	1
		Authentic Assessment	1
		Science Process Skills	
		Observation	1
		Classification	1
		Interpretation	1
		Prediction	1
		Make up questions	1
		Formulate a hypothesis	1
		Planning the experiment	1
		Using tools / materials	1
		Total	20

(Source: Surono, 2011 and Depdiknas, 2014) modificated.

Disseminate Stage

Furthermore, product trials are carried out by applying the product to the learning process to determine the quality of the product being developed. The trial was carried out by involving 35 class XI students as subjects and 1 physics teacher. The respondents are respondents from Tangerang City 2 Public Senior High School. Information collection is done using the results of distributed questionnaires which are then analyzed as input for product revisions to create products that are suitable for use as learning media.

The platform where the video is uploaded (YouTube) can be accessed anywhere and anytime with a smartphone or laptop. YouTube also has a facility to speed up/slow down videos, so students can take part in lessons according to their learning abilities.

To collect the data, the instrument used consisted of questioners that had been validated were expected to be obtained by the sample. This is the following table describes the problems and indicators:

Table 3. The Problems and Indicators of Product Trial

No.	Indicators
1	Content of the Material
2	Display and Program

(Source: Surono, 2011) modificated

Data Analysis

Likert scale contains statements about attitude objects. Subjects responded in 5 categories:

Table 4. Likert Scale

No.	Alternative Answers	Score Weight
1.	Strongly Agree	5
2.	Agree	4
3.	Enough	3
4.	Disagree	2
5.	Strongly Disagree	1

(Source: Sugiyono, 2015)

The calculation of the percentage of success of the product developed is calculated using a formula:

$$P = \frac{\text{Highest Percentage} - \text{Lowest Percentage}}{\text{Value Scale (instrument)}} \times 100\%$$

Minimum percentage: 20%

Maximum percentage: 100%

Interval Range: (100% -20%) / 5 = 16%

With the following interpretation:

Table 5. Interpretation of the Likert Scale

Percentage and Interpretation
20% ≤ Very Poor <36%
36% ≤ Inadequate <52%
52% ≤ Enough <78%
78% ≤ Eligible <84%
84% ≤ Very Eligible <100%

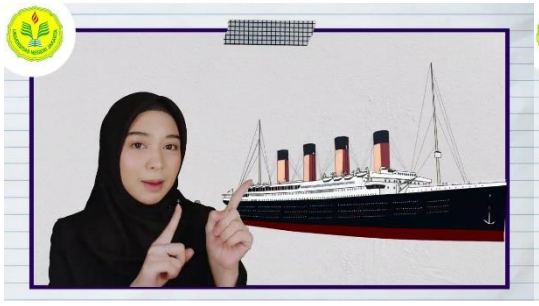
RESULTS AND DISCUSSION

The product is developed into a 10 minute 30 second learning video uploaded on YouTube. The video contains descriptions in accordance with contextual stages. Starting with opening, modelling, questioning, forming a learning community, inquiry, constructivism, to reflection. The video also comes with simple experiments and practice questions. Below are screenshots of the video in development:

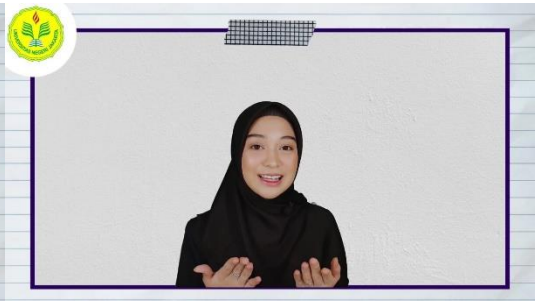
(a)

(b)

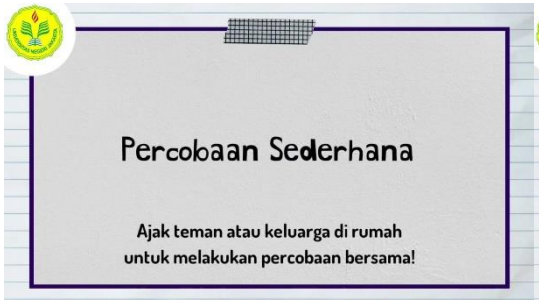
(c)



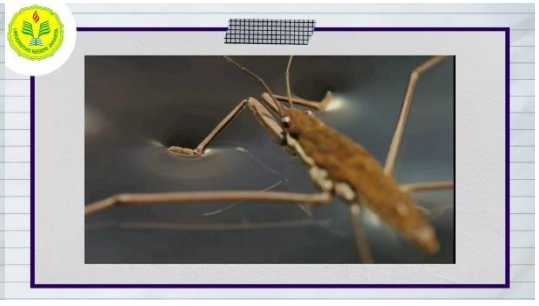
(d)



(e)



(f)



(g)

(h)

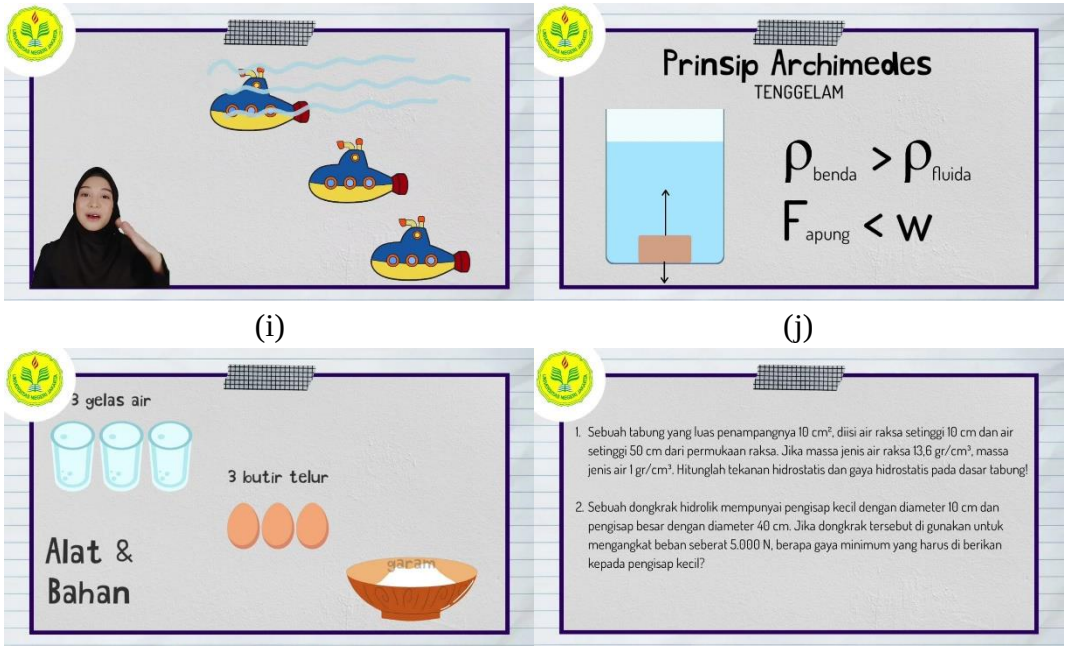


Figure 1. (a) cover, (b) opening, (c) modelling, (d) questioning, (e) forming a learning community, (f) inquiry, (g) constructivism, (h) reflection, (i) simple experiments, and (j) practice questions.

The development of learning media in the form of e-learning video using a contextual approach to far distance learning static fluid discussion completed with science process skills, begins with stimulating students to use a phenomenon from a famous film to increase student interest in watching videos so that students experience a disoriented dilemma by asking questions about existing physics concepts. Then students will be introduced to concept maps and know the purpose of learning. Students will be invited to form learning communities and carry out simple experiments to support science process skills. After that, students will be invited to think about the concept of static fluids in existing technologies. After showing various perspectives, material was presented to answer the formed questions and explain the concept more deeply. Then at the end of the video students will be given practice questions to sharpen their understanding of the concept and its application in several cases.

The results of the product validation test by experts produce the following data:

Table 6. Product validation test results by material experts

No.	Rated Aspect	Interpretation
1	Aspects of Learning	100%
2	Content of the Material	90%

Table 7. Product validation test results by media experts

No.	Rated Aspect	Interpretation
1	Display Interface	80%
2	Product Programming	70%

Based on the validation test, tests conducted by 2 experts obtained an average proportion of 80.6% with the interpretation of "Eligible". In previous research, Development

of Physics Learning Videos on Static Fluid Materials in High School that developed instructional videos at the validation test stage reached 83% according to material experts and 84.1% according to media experts (Nuzuliana, 2015). The material of the product being developed this time has increased but in the media, although it has an "Eligible" interpretation, the validation test by media experts is not as good as previous research. This happens because of the completeness of the science process skills which are not very eligible. However, that it can prove that the product developed is e-learning video using a contextual approach to far distance learning static fluid discussion completed with science process skills is suitable as a physics learning medium.

The results of product trials by teachers and students produced the following data:

Table 8. Product trial test results by teacher

No.	Rated Aspect	Interpretation
1	Content of the Material	100%
2	Display and Program	100%

Table 9. Product trial test results by students

No.	Rated Aspect	Interpretation
1	Content of the Material	89%
2	Display and Program	92%

Based on product trials conducted by teachers and students, an average proportion of 91.3% was obtained with an interpretation of "Very Eligible". In previous research, the Development of Dynamic Fluid Learning Video Based on Contextual in Water Area for High School Students that developed Dynamic Fluid Learning Video Based class XI SMA Negeri 1 Air Saleh has a practical level of 87% (Saparini, et al., 2020). In line with these studies, on this static fluid learning medium, the overall rate of product trials was increased with the same product types.so it can be said that the product developed is e-learning video using a contextual approach to far distance learning static fluid discussion completed with science process skills is suitable for use as a physics learning medium.

Development of Physics Learning Tools with Guided Inquiry Models to Train High School Students' Science Process Skills in Static Fluid Materials by Putri Ayuningtyas, Soegimin W.W, and Z.A. Imam Supardi (2015). Based on the results of the student response questionnaire analysis in the study, it was stated that most students responded to physics learning with a guided inquiry model to train students' science process skills as interesting and new learning. By using learning media with a different approach, the product developed this time is also equipped with science process skills. The products developed in this study received a positive response from students, even though with differences in learning situations and conditions, students were interested in learning that practiced their science process skills because it could be done independently and it was fun to practice directly.

Based on the results of validation tests and user trials, it shows that e-learning video using a contextual approach to far distance learning static fluid discussion completed with science process skills was developed accordingly as a supporting medium for learning physics in implementing Distance Learning and can be used as an alternative in physics learning.

independently by students who are not bound by time and space. With the resulting development of e-learning videos using a contextual approach to distance learning which can help students understand the material easily and pleasantly, and with examples that are easily taken from everyday life, this convenience can increase students' motivation to learn and is expected to provide innovation in learning physics in the future.

The research that has been done certainly has shortcomings, therefore to improve the quality of physics learning, there are suggestions that it is necessary to carry out further research on learning media using contextual videos with other learning materials, improving learning videos in terms of science process skills to make them more supportive of independent learning, use of applications for editing videos that are more professional in order to produce even better products, and multiply more contextual practice questions so that students can understand the concept more easily.

CONCLUSIONS

Based on the results of validation tests by material experts and media experts as well as the results of trials by high school educators and students, it can be seen that e-learning video using a contextual approach to distance learning static fluid discussion is suitable for learning media.

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