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Physics Learning Video: Forming Pancasila Learner Profiles in Physics Learning

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Abstract

Pancasila learner profiles can be implemented in physics learning. This article publishes the results of research and development of physics learning videos. This physics learning video presents physics lessons that shape the Pancasila learner profile. Physics content is a wave that is presented contextually. This learning physics video use research and development of the Lee & Owens model. Product feasibility was assessed using a questionnaire by experts. The components assessed are the feasibility of the physics content, the feasibility of the learning process, the feasibility of the wave concept physics learning media in -learning videos. Sequentially get an assessment of 93.75%, 98.0%, 99.0%. The The implementation of the learning process on learning video products has facilitated the formation of Pancasila learner profiles. Overall, it can be concluded that the resulting physics learning video is very appropriate to be used to form a profile of Pancasila students.

Keywords: Pancasila learner profiles, video learning, physics, wave

INTRODUCTION

The demands of learners in the digital era must have the skills: communication, collaboration, critical thinking, problem solving, creativity and innovation (Lai 2011; Warsah 2021; Fahrorrozi 2022). The learning process leads to the process of developing independent students in thinking (Cahaya 2022). Teachers must develop teaching materials and learning content that are integrated with Pancasila values. The learning process must build the character of Pancasila students (Dwiningrum 2022)

The Pancasila Student Profile is a competency and character that needs to be built in every individual student in Indonesia. Learning directs educational policies to be student-centred or oriented (Irawati 2022). The government's policy is to initiate the Pancasila Student Profile (Rusnaini 2021). The government has determined 6 dimensions of the Pancasila student profile, namely (1) faith and piety to God Almighty, (2) global diversity, (3) independence, (4) mutual cooperation, (5) critical thinking, and (6) creative. Physics learning must train thinking skills developed in the Pancasila learner profile. . The development of this profile will develop students into individuals who are intelligent and have character and are able to face the challenges of the 21st century (Irawati 2022). There is a strong correlation between students' 21st century skills and their abilities in learning physics (Soh 2010).

Lack of media learning resources can hinder the achievement of the goals of the learning process. It is necessary to apply a strategy in the learning process that utilizes learning media as a tool in conveying it. The use of computer technology and devices can be used as media in learning (Firmadani 2020, Grant 2019).

Video media can help expedite the learning process. Students can first see and absorb learning content through video (Mettoliang 2022). Video can be a medium for explaining difficult and abstract physics material. Videos can show phenomena that cannot be seen become real, big events become small, even events that are far away become closer to students who are learning (Hafizah 2020). Learning using video-based media should become commonplace in educational settings (Yoon 2021). Learning videos can attract students' interest in learning. Video learning facilitates students in the learning process. Learning videos based on learning principles can qualify very well. The learning videos can be implemented as supporting learning activities to create more interesting and fun activities (Adhipertama 2020). Studies from several references recommend that the learning process be designed by combining micro-learning sessions (micro-content) each no more than 15 minutes (Diaz Redondo 2021).

The traditional learning system does not motivate students to learn fast and make creative minds. A successful learning process can provide knowledge regularly and keep it in the memory of students as long as possible. The learning provides a new teaching paradigm that allows knowledge and information to be divided into small pieces and conveyed to students. The Micro learning can make the subjects studied easy to understand and remember for a longer period of time (Mohammed 2018).

The micro-learning is a relatively new and emerging global topic involving authors, affiliates and funding sponsors from various countries. The micro-learning can mature and develop into a critical mainstream issue in the future or become a mainstream trend on its own. The micro learning as a promising research direction (Leong 2020).

METHODS

This learning video product development research uses the Lee & Owen model. The Lee & Owen model is suitable for producing technology-based learning products.

Research Design

The learning video published in this article is the result of development research. The model used is the research and development model proposed by Lee and Owens (2004).

Need Assessment

Literature analysis and field analysis were carried out to get the right form of learning videos used in physics learning. For physics content, an analysis is carried out on how wave content is taught, what media needs to be displayed in learning videos.

Front end Analysis

An in-depth analysis of the learning video media that will be developed is carried out. Some of the analysis carried out: audience analysis of learning video users, required technology analysis, situation analysis that must be considered, supporting tax analysis, critical analysis of the form of learning video, objective analysis of the developed learning video, issue analysis of video development current learning, media analysis that will be featured in learning videos, extend-data analysis and cost analysis in making learning video media.

Design Learning Video

Making storyboards from learning video content. Wave content is designed that is relevant to learning physics in high school physics. Physics content that will be presented with a simple and interesting learning concept. Several natural phenomena that are relevant to the concept of waves are displayed. Students will be invited to think critically and creatively in analysis the concept of waves from relevant natural phenomena.

Development Learning Video

Development of learning videos into easy-to-understand physics learning media so that they are interesting as independent learning materials. The videos are developed with a duration of 15 minutes. In the early part, learning was developed to understand the concept of waves from the phenomenon of water ripples. In the second part a video of mathematical calculations of wave content is developed. In the third part, a video of solving sample questions about waves is developed.

Implementation Learning Video

Produced a learning video about learning physics at school. The video has shown the learning process to understand wave content in high school. The video already displays good audio visual and can be used. Videos need to get reviews from experts for feasibility as a source of independent learning for high school students which will shape 21st century competencies and profiles of Pancasila learners.

Evaluation Learning Video

The resulting videos are evaluated for their feasibility by experts. Feasibility in terms of learning media, feasibility in terms of physics content, feasibility of the learning process. The feasibility of the learning process assesses the pedagogic aspect and the formation of a Pancasila learner profile. The parts that were not yet feasible were refined until they were declared to meet the eligibility standards. After the learning video product for this wave content was declared feasible, a limited trial was conducted on high school students. Students give their perceptions of the resulting learning video media.

Instrumentation Research

Physics content feasibility questionnaire

The questionnaire was developed to assess: the accuracy of the presented waveform content, the accuracy of mathematical concepts in analyzing waveform content, the accuracy of the examples of questions presented, the ease of language used and not multiple interpretations.

Learning feasibility questionnaire

Questionnaires were developed to assess learning design, the implementation of contextual approaches in presenting physics content, the implementation of learning processes that shape 21st century competence and the profile of Pancasila learner's.

Feasibility of learning video media questionnaire

Questionnaires were developed to assess media display design, ease of use of learning videos, audio visual clarity in learning video.

Analyze Data

This study uses a continuum score scale of five. Percentage of the feasibility result score is calculated using the formula (Sugiyono 2015).

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

Information:
Minimum percentage : 20%
Maximum percentage : 100%
Range of Intervals : (100% - 20%)/5 = 16%

Thus, it is found that the percentage of validation results into the Likert scale interpretation is as follows:

TABLE 1. Interpretation of the Four-Continuum Scale Used for Product Feasibility

Interval	Categories
P < 36%	Very Inadequate
36% ≤ P < 52%	Less Eligible
52% ≤ P < 68%	Decent Enough
68% ≤ P < 84%	Eligible
84% ≤ P	Very Eligible

RESULTS AND DISCUSSION

In the development of micro learning videos, the YouTube platform is used as a place to share learning videos so that learning videos can be accessed by students. Every micro learning video produced generally consists of an opening, content, and closing. The presentation of the wave concept uses a contextual approach to build 21st century competencies and profiles of Pancasila learners.

Product research

In the opening section begins with a question about the phenomenon of waves in everyday life. as part of the constructivism stage and in order to attract attention and build student curiosity, then it is continued by greeting and conveying the purpose of the learning video

In the content section, the concept of a contextual approach is used. The concept of waves is presented in a coherent manner starting from building knowledge from the relevant natural phenomena presented at the beginning. The analysis is presented by using animation to model daily events that have been given at the beginning of the video. Finally, the closing part of the video contains the conclusions that have been learned in the video and information about the video that will be watched next. The learning videos developed are 3 videos, along with a description of the discussion on each part of the video developed.

Video Part 1

Video part 1 is the opening part for the topic of sound and light waves. In the learning video part 1 students are invited to recall about waves before discussing sound and light waves in another video. The following is a detailed breakdown of the contents of video part 1 which can also be seen more clearly when accessing the following link (https://bit.ly/Video1Gelombang). 1) Explain the definition of waves using the phenomenon of water ripples on the surface of the lake; 2) Providing knowledge about types of waves based on their nature and types of waves based on their propagation direction; 3) Provide an explanation of the magnitude in sound waves which in this learning video include wavelength, period, frequency, velocity, and amplitude.

Video Part 2

This section is the first video tutorial on sound waves. In this video students are again introduced to sound waves, where in the previous video students have been provided with knowledge about waves. The following is a detailed breakdown of the contents of video part 2 which can also be seen more clearly when accessing the following link (https://bit.ly/Video2GelombangBunyi). 1) Provide an explanation regarding the definition of sound waves by using the phenomenon of a phone-cell in vibrate mode which can still be heard making sounds when there is an incoming notification; 2) Enter the explanation regarding the magnitude of sound waves in more detail than the previous video, namely

amplitude and frequency; 3) Provide an explanation regarding the next quantity, namely sound intensity which in its explanation includes the human ability to hear sounds based on their intensity level.

Video Part 3

This is the final part of the sound wave material, namely a video that contains solving questions with detailed content from video part 3, namely helping to solve seven questions based on the material given in videos 1 and 2. Video part 3 can also be seen more clearly when accessing the following link This (https://bit.ly/Video5GelombangBunyi).

Description of eligibility product

The data obtained in this research article are based on the results of the material feasibility test by material experts, the media feasibility test by media experts, and the learning feasibility test by learning experts.

TABLE 2. Feasibility Content of Waves on Learning Videos

Aspects Assessed	Percentage	Interpretation
The accuracy of the presented waveform content,	94%	Very Eligible
The accuracy of mathematical concepts in analysing wave form content,	95%	Very Eligible
The accuracy of the examples of questions presented,	86%	Very Eligible
The ease of language used and not multiple interpretations	100%	Very Eligible

TABLE 3. Feasibility Learning Process of Waves on Learning Videos

Aspects Assessed	Percentage	Interpretation
The developed to assess learning design,	100 %	Very Eligible
The implementation of contextual approaches in presenting physics content,	97 %	Very Eligible
The implementation of learning processes that shape 21st century competence and the profile of Pancasila learner's	98%	Very Eligible

TABLE 4. Feasibility Learning Media of Waves on Learning Videos

Aspects Assessed	Percentage	Interpretation
The developed to assess media display design	98%	Very Eligible
The ease of use of micro learning videos	100%	Very Eligible
The audio visual clarity in micro learning video	100%	Very Eligible

Discussions

The resulting micro learning video media has fulfilled 6 Pancasila student profiles in Physics learning (Irawati 2022). The initial part of the wave video displays a natural phenomenon in the form of ripples on the surface of the water due to periodic water drops. The video also invites students to observe how wave phenomena appear on the surface of the water. An animation is also shown about waves on the surface of the water not propagating matter. This stage of concept analysis helps build critical thinking skills and creativity. The video also invites students to think that the regularity of physical phenomena that appears is a form of God's power in controlling events in nature. This section is a form of physics study in gratitude for God's creation. The process of studying the concept of physics from natural phenomena will lead students to think in global diversity. Students who are trained to study events in nature need to be analyzed in order to obtain useful concepts. Different perspectives will foster the nature of global diversity. Students are also trained to be able to learn independently by analyzing the natural phenomena they see. Students are also trained to think critically and grow their creativity in learning physics concepts that are relevant to the natural phenomena they observe.

CONCLUSION

The learning video media for the concept of waves has been produced. The resulting media is appropriate in terms of physics content, learning process and learning media. The learning video media already displays learning processes that are relevant to 21st century competencies and form Pancasila learner profiles. The learning physics using video media trains critical thinking skills, creativity and independent learning that are expected in the Panacasila learner profile.

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