Research and Development in Education (RaDEn)

Research Article

Development of biology learning media based on video blogs (vlog) on environmental change topic

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Abstract: Until now, the use of technology-based media is still not optimally used to overcome problems in the biology learning process. The purpose of this study was to develop a vlog-based Biology learning media on environmental change topic and to test the validity and practicality of the media. This Research and Development (R&D) used the ADDIE development model. The learning media developed contains materials, videos, pictures and evaluations that allow students to learn independently. vlog-based Biology learning media developed and created using the Capcut application, then uploaded to the YouTube. The score from the results of the media expert's validation reached 72.9% in the valid category, while the material expert reached 86.8% with the very valid category. The vlog media was declared practical based on the assessment of teachers and students because it reached 77.65%. The vlog-based media that has been developed in this study is expected to be used as a learning media for teachers when teaching environmental change topic.

Keywords: biology learning problems, digital media, vlog media

Citation: Varisa , N., & Fikri, A. A. (2022). Development of biology learning media based on video blogs (vlog) on environmental change topic. *Research and Development in Education (RaDEn)*, 2(1), 33-39. https://doi.org/10.22219/raden.v2i1.22056

Received: 1 July 2022
Revised: 15 July 2022
Accepted: 20 July 2022
Published: 31 July 2022

1. Introduction

Currently information technology is developing very rapidly. The development of information technology also affects various aspects of human life. Technology and education are interconnected with each other, one of which is as a tool to facilitate learning facilities so that students more easily understand the material being studied (Hidayat et al., 2017; Lin & Wu, 2016; Tondeur et al., 2012). The development of science and technology in the era of globalization requires a comprehensive update in aspects of life, especially in the field of education. Educational reform at all levels is needed to increase the demand for quality education, the quality of education and also about the professionalism of educators which is also a discourse in the education field (Raja & Nagasubramani, 2018; Ryan & Bagley, 2015).

The main purpose of learning technology is to solve learning problems or facilitate learning activities. One of the applications of learning technology can be done through the development of learning media. Media can be used to provide concrete and precise knowledge that is easy to understand. Educational technology can increase the effectiveness of learning and make it easier to deliver educational materials (Widiansyah et al., 2018), improve students' learning outcome (Suprianto et al., 2019), and improve learning autonomy (Elmunsyah et al., 2019).

The use of technology-based learning media has not been fully embedded in students at SMA PGRI 02 Kayen, Central Java. The results of observations on December 13, 2021 showed that the vlog-based Biology learning media had not been used. The media that are often used by students are blackboard, chart, and torso. The learning method applied by educators uses more lecture and discussion methods, many students are only limited to studying theory. Students tend to be bored, thus making students passive in learning activities. The availability of supporting facilities for the use of learning media is very

supportive, such as the availability of Wi-Fi, LCD, computers (laptops) or smartphones owned by educators and students, and electricity for each class.

Students are used to using smartphones to open applications on smartphones, one of which is to open the YouTube application. Unfortunately, students still rarely watch learning vlogs, especially learning Biology. The environmental change material studies the causes of environmental damage. One example of environmental changes that occur in the form of natural disasters is flooding, so it is suitable to be used as vlog material. Vlogs are one of the popular contents that can be found on social media. Basically, the content of vlogs is opinions on various topics, talks about daily activities and often displays individual monologues on camera. Making a vlog is also relatively easy because it only relies on a recording device (smartphone) and talking about personal daily life, this is classified as a vlog. Therefore, vlogs can be used as learning media (Asmaningrum et al., 2021; Asnur et al., 2020; Daryono et al., 2021; Sari et al., 2022) to increase students' learning motivation (Syaparuddin & Elihami, 2020) and to create a fun classroom learning atmosphere (Karamina et al., 2020).

Several researchers have developed vlog-based media. However, this development research is still limited. The development of vlogs as learning media is still rarely done. Several developments were carried out to produce learning media in universities (Asmaningrum et al., 2021; Asnur et al., 2020; Daryono et al., 2021; Sari et al., 2022). Several other studies were conducted in secondary schools, but to provide learning media in science subjects in junior high schools (Awal et al., 2022; Latifah et al., 2021). Therefore, the purpose of this research is to develop a vlog-based media on environmental change material.

2. Materials and Methods

This Research and Development (R&D) uses the ADDIE model which consists of the Analyze, Design, Development, Implementation, and Evaluation stages. The product that will be developed in this research is a vlog of environmental change material. The stages carried out in the development of learning media in this study were only carried out until the third phase.

The Analyze (analysis) stage is carried out before developing learning media, the analysis carried out is an analysis of problems in learning and analysis of the needs for developing vlog-based learning media. This stage is carried out to determine the circumstances, needs and constraints that occur in learning which includes problem analysis and needs analysis.

The first stage is the stage of problem analysis in learning and needs analysis of the development of vlog-based learning media. After the analysis stage is the design stage. The design of learning indicators is in accordance with Basic Competencies on environmental change material, designing learning media to be developed and designing learning scenarios and learning evaluation designs. The next stage of development is the stage where the media that has been designed will be validated by material experts, media experts, biology teachers and tested on students.

The design stage is carried out by designing learning indicators in accordance with Basic Competencies on environmental change material and designing learning media to be developed and learning scenario designs and learning evaluation designs.

At the development stage, the media that has been designed will be validated by material experts, media experts, biology teachers and tested on students. After designing a new product, the next stage is the development stage. The development stage is validated by media experts and biological material experts. The purpose of testing the product to experts is to ask for criticism and suggestions from experts regarding the product developed before being applied to students. The subjects in this study were 31 students from class X MIPA at SMA PGRI 02 Kayen who would later be given a questionnaire response to the media and a validity test.

3. Results

Problem analysis is the first step taken by researchers. Based on the results of observations of the learning process carried out by researchers, it shows that the learning process is hampered due to the COVID-19 pandemic, and students feel bored when learning activities are carried out online.

Needs analysis is done by collecting various information in schools related to the needs of students and educators in the learning process. Based on the results of observations of Biology subject teachers conducted by researchers, it shows that when educators carry out the process of learning activities more often use conventional learning media such as using blackboards as media in Biology subjects, while the use of learning media using presentation media is rarely used. Facts in the field (schools) show that the availability of supporting facilities for using percentage learning media is very supportive, such as the availability of LCD projectors, computers (laptops) owned by educators, electricity for each class and supporting classrooms. Several other subject teachers use presentation media in the learning process.

Figure 1. Display of the developed vlog: (a) cover page; (b) opening page; (c) environmental change material content page; (d) page of contents of environmental change factors along with examples; (e) environmental pollution content page; (f) page containing environmental pollutants; (g) page of contents of various types of environmental pollution; (h) content pages for types of waste; and (i) closing page

The display of the developed vlog is presented in Figure 1. The front cover of the vlog contains identities such as the title and name of the vlogger. The opening page contains greetings, introduction to vloggers, and prayers. The environmental change material content page contains the notion of environmental change and apperception. The content page of factors of environmental change contains natural factors and human factors along with examples. The contents page of environmental pollution contains the definition of environmental pollution and various types of environmental pollution along with examples. The environmental pollutant content page contains biodegradable materials, non-biodegradable materials and examples. The contents page of various types of environmental pollution includes water pollution, air pollution, soil pollution. The types of waste content page contain liquid waste, solid waste, organic waste, recycled waste, hazardous waste, and waste recycling. Finally, the closing page contains apperception and closing greetings.

Before being validated by a material expert, the vlog has a story board, competence, and exposure by environmental experts. Furthermore, the media expert explained that

the voice of the speaker in the vlog was not clear, the vlog video transitions were intermittent, and the vlog did not have a learning goal. The results of the improvements based on media expert suggestions are presented in Figure 2.

Figure 2. Several changes or product revisions after being validated by media experts, including: (a) exposure by environmentalists; (b) improvements to the speaker's voice and back sound; (c) improved video transitions; and (d) addition of Biology learning objectives

The next stage is a practicality test involving subject teachers and students of class X MIPA. The results show that vlog-based Biology learning media can increase students' understanding of environmental change material, where students often use the YouTube application to meet the need for film and music entertainment that can be seen on YouTube.

The validity of the vlog-based Biology learning media on environmental change material was obtained from the results of media expert validation by filling out the instrument in the form of a media expert validation sheet. The results of the feasibility of the vlog-based Biology learning media at the validation stage by media experts got a feasibility result that reached 72.9%, (getting a suitable category for use). The results of the validation by material experts obtained the percentage of feasibility reaching 86.8% so that it was categorized as very suitable for use. Furthermore, the results of the practicality test reached 77.65% so that it was categorized as suitable for use.

4. Discussion

The use of vlog media is expected to optimize the biology learning process. The presence of learning media in the learning process has been reported to be able to increase students' understanding of biological concepts (Astuti & Nurcahyo, 2019; Sukenda et al., 2019; Susilo et al., 2021). The abstract nature of biological concepts needs to be presented into more contextual content to make it easier for students to learn. With optimal understanding of concepts, students will be able to improve their higher order thinking skills (Kamarulzaman et al., 2017).

The existence of digital media will also increase student interest in the learning process. Several studies have shown that the existence of digital media can increase students' motivation to learn the material being taught. Learning motivation is an important variable in the learning process (Filgona et al., 2020; Semenova, 2022; Stark, 2019). Learning motivation has also been reported to be a predictor of several other variables, such as academic performance (Atma et al., 2021; Steinmayr et al., 2019) to students' thinking skills (Fajari et al., 2020).

The existence of digital media also improves students' digital skills. By using vlogs, students can better take advantage of the development of digital information as a learning resource. In addition, with an optimal learning environment, teachers will easily improve other 21st Century skills during the learning process. Therefore, the product developed in this study is expected to be able to contribute positively to the quality of learning and the achievement of student competencies in the current era.

5. Conclusions

This research has succeeded in developing vlog-based learning media on environmental change materials through the ADDIE development model. The validation results from media experts and material experts respectively reached 72.9% (including the valid

category) and 86.8% (including the very valid category). The vlog media was also declared practical based on the assessments of teachers and students (77.65%).

It is hoped that the vlog from the development of this research can be used as a medium that supports environmental change material by teachers. In addition, it is also recommended that other research be carried out to improve the product development of this research. Experimental research that analyzes the effect of using vlog media on student competence also needs to be designed.

Author Contributions: Methodology, N. V. and A. A. F.; validation, N. V. and A. A. F.; analysis, N. V. and A. A. F.; writing—original draft preparation, N. V.; review and editing, A. A. F.)

Conflicts of Interest: Authors declare there are no conflicts of interest.

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