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Documentary Video Media Development on Food Additives

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Abstract
In this era, technology is advancing and developing rapidly. Almost every minute or even second we are in direct contact with technology. In today's world of education, it is also inseparable from the role of technology. Students who on average have good technological literacy tend to get bored more quickly when learning runs conventionally. Regarding the function of learning media, it can be emphasized as follows: as a tool to streamline learning, accelerate the teaching and learning process, and improve the quality of the teaching and learning process. The purpose of this research is to produce a documentary video about food additives that is expected to be utilized for ease of learning. The method used in this research is research and development developed by Borg and Gall. This documentary video media development procedure goes through stages, namely: (1) Research and information gathering, (2) Product development planning, and (3) Initial Product Development. Data or information collection techniques using literature studies and field studies. Stages of video development by creating a storyboard using a video editor application. The next stage of learning videos is validated or evaluated by experts. This Documentary Video validation analysis uses descriptive methods through questionnaires. The results of the validation of this Documentary Video obtained an average score of 3.5 by entering the valid category. It can be concluded that this Video Documentary is suitable for use and can be followed up by looking at student responses.

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INTRODUCTION

In this era, technology is advancing and developing rapidly. Almost every minute or even second we are in direct contact with technology. According to Suryani et al (2018) the development of the digital world in education also has a significant influence on the interaction patterns of teachers and students. Students who on average have good technological literacy tend to get bored more quickly when learning runs conventionally. Gangne and Briggs (in Suryani et al 2018: 1) state that educational media are various types of components in the student environment that can stimulate students to learn. Learning Media, which contains information and knowledge, is generally used to make the learning process more effective and efficient (Pribadi 2017: 14).

The learning process carried out at school must be able to facilitate students to develop their competence in order to understand the surrounding nature scientifically. The success of educators in the learning process is highly dependent on the smooth interaction between educators and students, while students have the main task to learn from what is heard, seen, and done by students and educators. The relationship between learning and teaching is called learning. To carry out a quality and interesting learning process, teachers must make lesson

plans that are in accordance with the standards of the educational process that refer to the law. (Amali et al., 2019). Therefore, the use of media is expected to be one of the needs that can stimulate student understanding.

According to Munadi (2008) media can be divided into visual, audio, audio-visual and multimedia media. Both visual, audio, audio-visual and multimedia media play a big role in helping teachers convey content or information regarding subject matter. However, due to the lack of media that can be used to deliver teaching material, many teachers still persist in using conventional media such as textbooks, so that the media used provides less experience for students. Power point is also one of the learning media that is used quite often because power point media is felt to be enough to help teachers explain the material effectively because it is considered practical. However, power point media has disadvantages because not all material can be presented in power point form. Especially material that requires the delivery of an entire process supported by writing, sound, images and video simultaneously like video media. So the researchers designed learning media in the form of documentary videos on food additives which can explain to students the meaning of food additives, their various types along with concrete examples, and some abuses of substances that should not be used in food. The use of documentary media can be said to be more practical so that teachers can easily show examples of additives without having to bring the ingredients directly. Especially if these additives are difficult to find nearby.

In fact, students consume snacks more often, but many students do not know the chemical content contained in these snacks, whether natural or artificial chemicals. Students do not understand how to choose healthy snacks so that it has a bad impact on their health (Suci, 2009). This statement is supported by Judarwanto (in Titik 2014) students buy snacks according to their own preferences without thinking about the ingredients contained in them.

According to Sutardji (in Titik 2014) purchased snacks play an important role in providing energy and other nutritional intake for school-aged children. Children's snack consumption at school needs to be considered because children's activity is high. It is hoped that children's consumption of snacks can contribute energy and other nutrients that are useful for children's growth. Based on observations, it was found that students often buy snacks on the side of the road or packaged snacks without paying attention to health and the ingredients in the food. This happens because in general the snacks sold by traders or packaged snacks are made to be very attractive, both in terms of color, aroma and taste. To make it attractive, food manufacturers add additives to their products. The 2004 BPOM survey showed that 60% of school snacks did not meet quality and safety standards. The 2007 BPOM survey also proved that 45% of school snacks were dangerous snacks (BPOM, 2009).

The results of interviews with teachers revealed that students had difficulty understanding the material on food additives, especially on the names of synthetic additives in food. This can also be seen from student learning outcomes where the number of students who completed one class did not reach 50% in the 2018/2019 academic year. The lack of understanding among students includes the method used which is still conventional, namely lectures and rarely uses learning media. Based on the description above, the researcher finally decided to develop learning media in the form of documentary videos about food additives.

METHOD

This research uses research and development (R&D) methods. This research aims to produce learning media in the form of documentary videos on food additives which refer to the 2013 Curriculum. The research stages used are based on Gall and Borg which are presented in the following table:

Table 1. Research and Development Stages

Borg & Gall Key Steps	10 Borg & Gall Steps
Research and Information Colleting	1. Research and Information Gathering
Planning	2. Planning
Develop Preliminary Form of Product	3. Development of the Initial From of Product
Field Testing and Product Revision	4. Initial Field Test 5. Revisi Product Revision 6. Main Field Test 7. Operational Product Revision 8. Operational Field Test
Final Product Revision	9. Final Product Revision
Dissemination and Implementation	10. Dissemination and Implementation

This research aims to determine the level of feasibility of documentary video media on food additives which will later be used by students as a learning medium, therefore based on this aim the data analysis technique is based on the data that has been collected. The stage of conducting validation analysis for documentary film media refers to Khabibah (in Yamasari, 2010) with the following steps:

a. Create and analyze a feasibility assessment table for documentary video media.
b. Find the average of each criterion from the three validators using a formula :

   $K_{i=\frac{\sum_{h=l}^{5} Vhi}{3}}$

   Information :

   K_i : average criterion to-i
   V_{hi} : validator assessment results score to-h for criteria to-i
   i : criteria
   h : validator

   The results obtained are entered in the average column on the documentary video media validation sheet.
c. Find the average aspect with the formula :

$$A_i = \frac{\sum_{i=l}^{n} K_{ij}}{n}$$

   Information :

   A_i : average aspect to-i
   K_{ij} : average for acpect to-i criterria to-j
   N : Many criteria in aspects to-i
   i : aspect
   j : criteria
   ij :aspect to-i criteria to-j

   The results obtained are entered into the average column for each aspect on the documentary video media validation sheet.
d. Find the average total aspect validation using the formula:

$$RTV_{TK} = \frac{\sum_{i=l}^{3} A_i}{6}$$

   Information :

   RTV_{TK} : average total validity of documentary video media
   A_i : average of aspect to-i
   i : aspect

   The results obtained are written in the total average row.

e. Matching the total average with the validity criteria, that is :
$3 \leq RTV_{TK} \leq 4$ = Valid
$2 \leq RTV_{TK} < 3$ = Quite Valid
$1 \leq RTV_{TK} < 2$ = Invalid

After carrying out the validation stage and providing suggestions and improvements by the validator, the results are then applied to correct weaknesses in the documentary video. Then after the video has been corrected, its validity is calculated.

RESULTS AND DISCUSSION

In this section, the research data and discussion will be described, which will include: (1) Research and information gathering, (2) Product development planning, and (3) Initial Product Development.

Research and Information Gathering

This research and information gathering refers to the 2013 Curriculum. One of the concepts of Science-Chemistry at the junior high school / MTs level that needs to be mastered by students to achieve the competency standards set by the 2013 Curriculum is the concept of food additives. On the concept of seeing this, teachers are expected to develop their competencies which in turn can improve their abilities and creativity. One of them is by utilizing learning media to make the learning process more interesting.

Literature Study

At this stage, a literature study is carried out relating to how learning media in the form of video (audio visual) is easier to use and easy to understand. The following is a literature study that shows this:

a. Benny A. Pribadi (2017: 146) Video media is able to show objects and events with a high level of accuracy and realism. Video media has the ability to provide an interesting learning experience to learn. This ability allows the audience to conduct further discussions and attempt to solve a problem.

b. Imamah (2012), in her research that the achievement of learning outcomes in linking teaching materials with the environment in everyday life combined with animated videos increased the class average score from cycle I to cycle II by 10.71.

Based on the above studies, it can be concluded that the use of video media can help students understand and remember the material where this is supported by the cone of experience expressed by Edgar Dale which states that videos get 30% learning experience.

Field Study

In the field study and found several problems experienced at SMP Negeri 17 Pontianak, namely: From the results of interviews with teachers, students have difficulty in understanding food additives material, especially in understanding the names of synthetic additives in food. This is also seen from student learning outcomes where the number of students who completed in 1 class did not reach 50% in the 2018/2019 school year. In addition to the lack of understanding in students, the methods often used are also conventional, namely lectures and rarely utilize learning media.

Product Development Planning

Purpose of Product Use

Before starting to develop documentary videos on additives, first look at the Basic Potential (KD) in accordance with the 2013 Curriculum. KD on additive material is to explain the various additives in food and beverages and their impact on health. Apart from looking at KD, researchers also studied material from class VIII package books. The purpose of using the product in this study is so that students more easily understand what food additives both natural and artificial are often used and know the dangers when consuming synthetic additives excessively. So that students can be more careful and more careful in consuming instant foods and drinks and outside snacks.

Determination of Product Users

Junior high school students are included in the early adolescent category where the way of thinking is logical and concrete. Therefore, the documentary video displays the ingredients in real time. This documentary video is also used as one of the learning media to make it easier for teachers to explain.

Describe the Components of the Developed Product and the Development Process

Concept Analysis

The concept analysis carried out on food additives is carried out in accordance with the basic competencies based on the 2013 curriculum. As a reference for the concept of food additives in the development of documentary videos, literature from VII grade junior high school teaching materials is used, namely from package books and LKS.

Based on KD and learning objectives that must be achieved, the concept of material presented in the documentary video includes:

1) Definition of Additives

The concept of understanding additives is a basic concept that must be understood by students before studying various additives based on their uses and what dangers are caused if consumed excessively so that at the beginning of the documentary video starts from the definition of additives.

2) Various Additives and Examples

The concept of various kinds of additives and their examples is very important to be presented in the documentary video. This is because there are some students who do not know what are the examples of additives, especially artificial or synthetic additives.

3) Forms of Abuse

After knowing the definition of additives, their types and examples, it is necessary to present the abuse of substances that should not be used in food in the documentary video content section.

Development Process

After compiling what materials will be presented in the documentary video content, then prepare examples of additives that will be presented in the video starting with taking photos and recording food and substances that have been prepared. The preparation of this media begins with a design or display design made in the storyboard then goes through the editing process to make a series of documentary videos containing explanations and supported by visual displays. This editing process uses a video editor application, namely kineMaster.

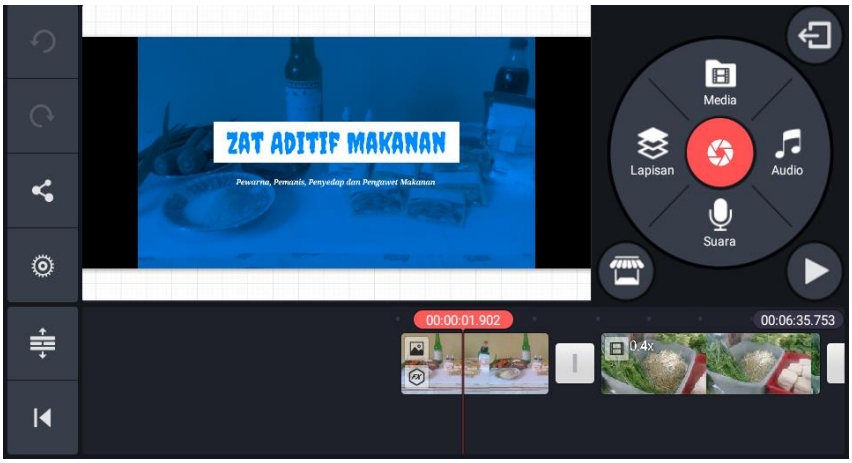

Figure 1. Documentary video editing process.

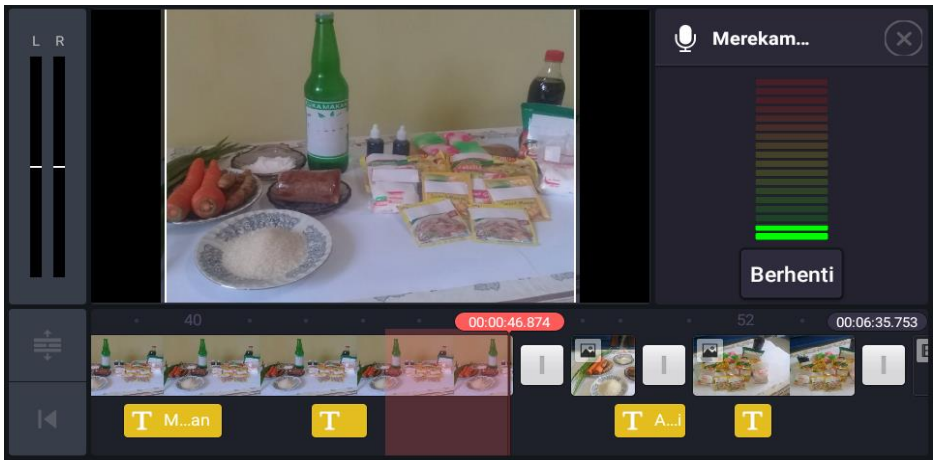

Figure 2. The process of recording sound on a video editing application.

After the documentary video product is completed, the initial product development stage is carried out, namely expert testing or validation. This expert test or validation is carried out to see the suitability of the documentary video being developed. The person who carries out expert testing or validation is called a validator. The validators who assessed the suitability of the documentary video consisted of two lecturers and one junior high school science-chemistry teacher. Based on the results of the validator's assessment of the documentary video, the following data was obtained:

Table 2. Results of Questionnaire for Feasibility Assessment of Documentary Media on Additive Material

No	Eligibility Assessment Criteria Documentary Video	Ki	Ai
	Organization		
1	The material used in documentary videos is in accordance with competency standards and basic competencies.	3,7	3,7
2	Documentary video media created in accordance with learning objectives.	3,7	
3	The systematic presentation is coherent so that the video is easy to understand.	3,7	
4	The substance of the material in the documentary video is in accordance with the correct concept (no misconceptions).	3,7	
	Duration		
5	The duration of the documentary video is not too long so it doesn't make students bored.	3,3	3,3

	Advantage		
6	Documentary video media makes it easier for teachers to convey material.	3,7	3,5
7	Documentary video media provides focused material regarding food additives to students.	3,3	
	Effectiveness of Display Design		
8	The size of the letters used can be clearly read from close up or from a distance.	3,7	
9	The color of the letters used can be clearly seen up close and from afar.	3,7	
10	The shape of the letters used can be clearly seen from up close or from afar.	3,7	
11	The color composition of the writing and the background color is appropriate so that the writing can be read and is not dazzling.	4	3,7
12	The images displayed are clear to see and have descriptions so they are easy to understand.	3,3	
13	The narrative conveyed is clear without making it difficult for the audience to understand.	4	
	Consistent		
14	Consistent in the use of words, terms and sentences.	3,3	3,3
15	Be consistent in the use of letter shapes and sizes.	3,3	
	Ease of Media Operation		
16	Documentary video media is easy to operate.	3,7	3,7
	RTV		**3,5**

Note: the questionnaire was adopted from Reny Zukni (2015) and adapted by the researcher

Viewed from the organizational aspect, it consists of four criteria, namely material, objectives, sequence and material concept. The material criteria and objectives for making this documentary video are adjusted to the 2013 curriculum syllabus. Then the criteria for the sequence of each part of the video show that needs to be paid attention to is how the presentation of the material is structured appropriately so that students can capture the information provided. Then the next criterion is whether the documentary video presented is in accordance with existing concepts so that students who watch it do not catch the wrong concept (no misconceptions). Based on the results of expert tests from the three validators, the value obtained is 3.7 and is classified as feasible.

The second aspect is seen from the duration aspect. In this aspect there is only one criterion, namely the duration of the documentary video to make you bored or not. According to Riyana (2007), human memory, concentration and boredom levels range between 15-20 minutes. This documentary video is 6 minutes 35 seconds long so it can be said that this documentary video is still within the time span of students' concentration and comprehension. On this criterion, a result of 3.3 was obtained and it was classified as feasible. However, what was obtained was not optimal because there were validators who gave suggestions to make the duration more effective.

The third aspect looked at is the benefit aspect. In this aspect, there are two criteria, namely making it easier for the teacher to deliver the material and providing focus on the material to students. From the results of the expert test, this documentary video media, from the average aspect results, obtained a score of 3.5, which is classified as adequate.

The next aspect is the fourth aspect where the thing that is assessed is the effectiveness of the display design. This aspect consists of the display of letter size, letter color, letter shape, writing color composition with background color, image display and narration. In this aspect, the average score obtained on the feasibility questionnaire was 3.7 and was classified as feasible.

The fifth aspect that is looked at is the consistency aspect, this aspect consists of two criteria, namely consistency in the use of words, terms and sentences and in the use of letter shapes and sizes. In this aspect, an average of 3.3 was obtained and it was classified as adequate. According to Poerwadarminta (2006) consistency is constant and does not change. Consistency in the use of words, terms and sentences is intended so that students are not confused by various terms or words.

The last aspect to look at is the aspect of ease in operating the media. In this aspect, an average of 3.7 was obtained and it was classified as adequate. The average score was achieved because documentary video media is easy to use if the school has supporting facilities to display this video. How to operate it is quite easy. So the overall average obtained is 3.5 which is included in the appropriate criteria.

After completing the expert test and assessing the suitability of documentary video media, the results of the feasibility questionnaire were revised and improved in accordance with the suggestions given by each validator. There are several product revisions (1) there is unclear narration because the recorded sound is filtered into cartoon animation sound so it is felt quite disturbing. (2) there is an error in stating the origin of brown sugar. Previously in the video, the narrator said that brown sugar comes from sugar palm trees. Then it was changed into a coconut tree. (3) there are several images that do not have written explanations/descriptions. (4) there is a misunderstanding of vinegar as a natural additive.

According to Kustandi (2013: 64) video is a tool that can present information, explain processes, explain complex concepts, teach skills, shorten or slow down time and influence attitudes. According to Daryanto (2011: 90) the benefits of using videos in learning will make the message conveyed more attractive. Daryanto (2011: 86) also said that students can absorb and remember material optimally, because students' absorption and memory will increase well if the process of obtaining information is initially through the senses of hearing and sight. If the absorption capacity for this material increases, it will affect learning outcomes.

This is in accordance with Erni Fatmawati's research regarding the Influence of Video-Based Learning Media on Learning. The results of this research show that there are differences in results between the control class and the experimental class. The research results show:

1) The average learning outcomes of control class students is 72.93 in the good category. 2) The average learning outcomes of experimental class students is 79.87 in the very good category. 3) The difference in the average learning outcomes of students in the control class and the experimental class using the t-test statistic, namely Separated Variance, obtained t = 5,932 and t table = 2.064 with a significance level of 0.05. So it can be concluded that learning outcomes increase in classes that use video-based learning media.

CONCLUSION

Based on the results of research and discussions that have been carried out by researchers, it can be concluded that documentary video media on food additives is suitable for use with an average feasibility validation result of 3.5 so that it can be used in science-chemistry learning as a learning medium and can be tested on student.

RECOMMENDATIONS

Based on the research obtained, it can be suggested that it is necessary to follow up on this research in order to see the response from students to the product being developed.

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BIBLIOGRAPHY

Amali, K., Kurniawati, Y., & Zulhiddah, Z. (2019). Pengembangan Lembar Kerja Peserta Didik Berbasis Sains Teknologi Masyarakat pada Pelajaran IPA di Sekolah Dasar. *Journal of Natural Science Integration,* 2 (2), 191-202.

Brata, V. B. (2007). *Videografi dan Sinematografi Praktis.* Semarang: PT. Elex Media Komputindo.

Daryanto. (2011). *Media Pembelajaran (Perannya Sangat Penting dalam Mencapai Tujuan Pembelajaran).* Yogyakarta : Gava Media.

Emzir. (2015). *Metodologi Penelitian Pendidikan Kuantitatif & Kualitatif.* Jakarta : Rajawali Pers.

Fatmawati, E., Karmin., & Sulistiyawati, R. S. (2018) Pengaruh Media Pembelajaran Berbasis Video Terhadap Hasil Belajar Siswa. *Jurnal Pendidikan Volume 12.*

Javandalasta, P. (2011). *Lima Hari Mahir Bikin Film*. Surabaya : MUMTAZ Media.

Kamilati, N. (2006). *Mengenal Kimia 2 : SMP/MTs KELAS VIII*. Jakarta : Yudisthira.

Krisno, A., Mucharam, T. T., & Mampuono. (2008). *Ilmu Pengetahuan Alam: SMP/MTs Kelas VIII*. Jakarta : Pusat Perbukuan Departemen Pendidikan Nasional.

Kustandi, C. (2013). *Media Pembelajaran Manual dan Digital.* Bogor : Ghalia Indonesia.

Noviami, R. R., Lisdiana. & Wulan, C. (2013). Pengembangan Media Digital Games Based Learning (DGBL) pada Pembelajaran Sistem Reproduksi Manusia di SMP. *Unnes Journal of Biology Education.* (1): 58-65.

Munadi, Y. (2008). Media Pembelajaran Sebuah Pendekatan Baru. Jakarta : Gaung Persada Perss.

Pribadi, B. A. (2017). *Media dan Teknologi Dalam Pembelajaran (Edisi Pertama).* Jakarta: Kencana.

Sadiman, A. S. dkk. (2009). *Media Pendidikan Pengertian, Pengembangan dan Pemanfaatannya***.** Jakarta: RajaGrafindo Persada.

Santyasa, I. W. (2007). *Landasan Konseptual Media Pembelajaran***.** Banjar Angkan: Universitas Pendidikan Ganesha.

Simangunsong, T. & Mukhtar. (2015). Pengembangan Media Pembelajaran Berbasis Multimedia pada Mata Pembelajaran IPA di SMP. *Jurnal Teknologi Informasi dan Komunikasi dalam Pendidikan*, 2 (1): 122-131.

Riyana, C. (2007). *Pedoman Pengembangan Media Video*. Bandung: Universitas Pendidikan Indonesia.

Rosyidah, A.N., Sudarmin., & Siadi, K. (2013). Pengembangan Modul IPA Berbasis Etnosains Zat Aditif dalam Bahan Makanan untuk Kelas VIII SMP Negeri 1 Pegandon Kendal. *Jurnal Pendidikan IPA*, 2 (1): 133-139.

Suci, E. S. (2009). Gambaran Perilaku Jajan Murid Sekolah Dasar di Jakarta. *Psikobuana,* 29-38.

Sudjana, N., & Rivai, A. (2011). *Media Pengajaran*. Bandung: Sinar Baru Algensindo.

Sukmadinata, N. S. (2010). *Metode Penelitian Pendidikan.* Bandung: PT Remaja Rosdakarya.

Supriatna, D. (2009). *Pengenalan Media Pembelajaran*. Jakarta: PPPPTK dan PLB.

Suryani, N., Setiawan, A., & Putria, A. (2018). *Media Pembelajaran Inovatif dan Pengembangannya*. Bandung : PT Remaja Rosdakarya.

Tim Abdi Guru. (2012). *IPA Terpadu untuk SMP/MTs KELAS VIII.* Jakarta : Erlangga.

Titik, N., & Wibowo, A. W. (2014). Pentingnya Memilih Jajanan Sehat Demi Kesehatan Anak. *Jurnal Inovasi dan Kewirausahaan*, 192-196.

Yamasari, Y. (2010). Pengembangan Media Pembelajaran Matematika Berbasis ICT yang Berkualitas. *Seminar Nasional Pascasarjana X-ITS*.