

Pre-Design of Infographic Based on The Structure And Mechanism of Virus Infection at Elementary School Levels in Ternate City

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ABSTRACT

During the COVID-19 pandemic and the new normal, teacher innovation is urgently needed to make their students not bored and stressed in the learning process, either virtual or face-to-face. In North Maluku, face-to-face learning has been carried out with simulations and strict protocols. Learning variations using Blended Learning become a general solution that is applied. Infographics are information graphics which are visual representations of a collection of data, information and designs. Infographics require a large amount of information in the form of writing or numbers and then converted into a simpler form, namely a combination of images and text that allows readers to quickly understand the meaning of a message or image itself. Various efforts to educate covid 19 both non-formally and formally have been carried out to prevent infection, social restrictions and the provision of social and medical assistance have been carried out by the government, but the public still does not have good awareness and discipline towards covid 19. This study aims to educate about the virus and its dangers, especially covid 19 through the development of infographic-based science teaching aids in elementary schools. Research Development with reference to 4D models with modifications. The results of the study indicate that infographic media is suitable for use as media material or science teaching aids, especially virus education for elementary school students. The use of infographics related to viruses and infection mechanisms can be used in various ways in online and offline learning for elementary school students

KEYWORDS

Infografis
Learning media
Elementary school

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1. Introduction

In the era of 4.0, there are many choices of IT-based media from simple to sophisticated. The development of innovative IT-based learning media is needed to improve the quality of learning (Subiyantoro & Nugroho, 2018). One of the innovative IT-based learning media is infographic media. Infographics can be a new option for teachers in conveying lesson information to their students. When teachers use infographics as teaching aids, it is as if the teacher is telling a visual story to students. Infographics are information graphics which are visual representations of a collection of data, information and designs. Infographics require a large amount of information in the form of writing or numbers and then converted into a simpler form, namely a combination of images and text that allows readers to quickly understand the meaning of a message or image itself (Taufik, 2012; Umami et al., 2016).

Elementary school students need information media that can help in understanding information. In the learning process in the classroom, an image media can tell more stories than writing, an expression that we may have heard. This expression can be true, because it is human nature that humans will be more interested in an image than writing that seems long and complicated (Rusmawan, 2013). In learning science in elementary schools, concepts and information related to virus and disease education need to be given as early education. Elementary school teachers must be able to innovate and be sensitive to the latest issues related to the COVID-19 pandemic information.

Good science learning must link science with students' daily lives. The use of learning media will increase students' learning experience, make students not bored, and provide interesting learning to students (Samatowa, 2007). To change students' thoughts and knowledge into scientific concepts, it is necessary to seek cognitive conflict strategies (Mariawan, 1997). Cognitive conflict is the main goal of conceptual change learning which is created so that students are not satisfied with the initial general concept they have and then accept a normative view that makes sense and is useful (Ozdemr and Clark, 2007). For example, the use of the global issue of the Covid-19 pandemic is a factual and problem-based phenomenon. From this phenomenon, students can be invited to learn and think together to understand and be able to be scientific related to covid 19.

Delivering learning messages requires a learning media so that the learning that takes place becomes easy and fun for students (Napitupulu & Julaga, 2014). If the media is designed and developed properly, then the function can be played by the media even without the presence of a teacher. For this reason, the use of learning media is very helpful for teachers in the learning process but must be considered by teachers before applying them in the classroom.

Furthermore, to study the structure of the virus and the mechanism of infection, a learning media that is appropriate to the cognitive level of elementary school students is needed. One of the learning media that can be used in science learning is infographics as teaching aids. According to Dimyati and Mudjiono (2006), in the teaching and learning process teaching aids are used with the aim of making the student learning process more effective and efficient. Teaching aids are used to train process skills such as observing, asking questions, formulating problems and hypotheses, interpreting data, drawing conclusions, and communicating in the form of practicum (Nur, 2011). This study aims to develop educational learning media for the virus and the COVID-19 pandemic through infographic media.

2. Method

This research is a descriptive study by describing the plan for the development of infographic media using the 4D development model (Thiagarajan, et al., 1974). Data collection was carried out by describing the steps of developing infographics with 4D models in science subjects in elementary schools which consisted of 4 main phases or stages, namely Define, Design, Development and Disseminate.

This study uses three data collection methods, namely Define by analyzing the material and depth of competence in the elementary school curriculum; Design by making infographic media as a product of development and learning media; Development by providing variations and enrichment of infographics related to Covid-19 education through product validation and dissemination by conducting limited trials and product publications. The data obtained from the validation sheet and limited trials in quantitative and qualitative descriptive analysis came from expert advice.

The formula used to process quantitative data according to Akbar and Sriwijaya (2011) is as follows.

$$V - ah = TSeTShx100\%$$

Information:

V-ah = Expert Validation/readability

TSe = Total score achieved

TSh = Total expected score

The results of the data analysis were then interpreted and concluded based on the criteria adapted from Akbar and Sriwijaya (2011).

Table 1. Infographic media eligibility qualifications

Percentage(%)	Criterion	Validity
85,01%-100,00%	Very valid	Valid or usable does not need to be revised
70,01%-85,00%	Valid	Valid or usable but needs to be revised
50,01%-70,00%	Enaugh valid	Less valid, it is recommended not to use it because it needs a major revision
01,00%-50,00%	Not valid	Invalid or should not be used

3. Results and Discussion

The presentation of trial data explains the results of the validity of product development in the form of infographic media for the concept of viruses, reproduction and transmission of viral diseases and vaccines in elementary school students. Where the results of the validity of the development of this infographic media will be explained six main things, including: development validity according to (1) subject content experts, (2) learning design experts, (3) learning media experts, (4) individual trials, (5) small group trials, and (6) field trials. In accordance with the product development model used in the development of infographic media, namely the 4D development model, there are 4 stages to go through. The stages in the implementation of research are:

a. Stage I Define

This stage is carried out to determine and define the development requirements. The condition in question is something that can show the basic needs of why it is necessary to develop an infographic media related to virus education during a pandemic for elementary school students. For this reason, 3 different analyzes are needed to be able to find the main problems that exist. The three types of analysis are: (1) needs analysis, (2) environmental/facility analysis, (3) subject matter analysis.

To analyze the needs of students, instruments were made to determine the needs of students. In this stage, researchers look for problems that exist at the level of elementary school students. Based on the results of document recording, it was found that the lowest average score for class V students was about the concept of viruses and prokes and vaccines. Based on the results of interviews with teachers found problems related to the abstract concept of the virus.

b. Stage II Design

In the design of infographic media according to Herliyani (2014) several concepts were designed, namely a) Design Concepts, b) Media Concepts, c) Manuscript Concepts. The target audience is aimed at the age range above 10 years. This infographic media aims for early education on the virus and the covid 19 pandemic. The concept of media is carried out to convey information into infographics, which is a type of media for images and numerical data as well as short videos or short animations related to efforts to concretize the virus concept. The infographic media product developed in this study was adopted and adapted from the Ministry of Health and cross-medical doctors.

c. Stage III Development

There are 3 stages in the development stage, namely (1) the production stage and (2) the implementation stage (3) Evaluation. In the Production stage, infographic media, the concept of virus and virus transmission and vaccines were developed into applicative learning media products developed in schools. At this stage produce infographic media products. In the production stage, the first activity carried out is the collection of materials or teaching materials, while these materials are obtained from information from the Ministry of Health and online cross-medical doctors. After the infographic media is complete, the next stage continues with product implementation. Furthermore, the implementation stage is intended to apply the effectiveness of the products that have been made in the field. In product implementation, the things that are done are product trials include: subject content experts, learning media experts, learning design experts, individual trials, small group trials and field trials. The individual test stage was carried out by 3 5th grade students with good learning outcomes, while the small group trial was carried out by 5th grade students with a total of 9 students with moderate learning outcomes.

The final stage of the assessment is carried out to validate the product that has been made through product expert testing. Product validation test aims to test the level of constancy of the product that has been made, while the effectiveness test aims to measure the level of effectiveness of the product made. At each stage of the development of the learning video there are evaluations and revisions made for the improvement of the resulting product. The assessment carried out is formative assessment, which is an assessment carried out throughout the media development process, and summative

assessment is an assessment carried out to determine whether or not the product developed in the learning process is effective by conducting an effectiveness test.

The results of data analysis on the development of learning videos will be presented with two things related to the results of product evaluation, including: (1) Analysis of the results of the validity of the development of learning videos, (2) Analysis of the effectiveness of developing learning videos. The results of the two data analysis will be described further, as follows:

The results of the validity of infographic media development according to subject content expert tests, learning design expert tests, learning media expert tests, individual trials, small group trials and field trials in more detail can be presented in Table 2.

Table 2. Percentage of Validity Results for Infographic Media Development

No	Test subject	Validity (%)	information
1	Concept expert	87,3	Very valid
2	Media expert	83,7	valid
3	Subject expert	85,1	valid
4	Individual trial	80,1	valid
5	Small group trial	80,3	valid
6	Field trial	-	-

Based on Table 2 above, it can be seen that the results of the validity of the development of infographic media as a whole obtain a valid percentage.

Research and development using the 4D Thiagarajan (1974) model was developed based on the need for early education about the concept of the virus and the covid 19 pandemic. The infographic learning media component contains 3 components, namely validity, practicality and effectiveness (Putri, et al., 2014). The purpose of the technique in research and development of infographic media is to determine the validity of the product, the practicality of the product to be used as a learning medium, and the effectiveness of the media in increasing students' understanding of the concept of the virus and the covid 19 pandemic.

Based on the criteria for the validity of quantitative descriptive analysis, infographic media that has been validated by material experts has very valid criteria with a value of 87.3%, while media experts have valid criteria with a value of 83.7%. 85.5%. The statement of product validity is the standard used to decide that the product is adequate for use (Ramdani and Iwan, 2011). The validity of the infographic media still requires further effectiveness testing, so it is important to analyze it qualitatively and optimally. This is in accordance with Nugraha, et al. (2013) teaching materials that have met the validity criteria can be continued to the next research stage. Practicality is a component of infographic media that needs to be done to produce a good product. The results of individual and small group trials show that the average value of each trial is 80.1%, which means that the practicality of infographic media is valid. According to Suryan, et al. (2014) teaching materials are said to be practical if the value of quantitative descriptive analysis is more than 70% and this infographic media is in the practical category. After knowing the practicality, then proceed to the next stage, namely field trials to determine the effectiveness of using infographic media. This is in line with research conducted by Nugraha, et al. (2013); Reizal, et al (2020) teaching materials that have met the practicality criteria can be continued to the next research stage.

Effectiveness criteria can be obtained from student learning outcomes. This research and development student learning outcomes obtained from the pretest and posttest scores. The use of learning outcomes to obtain the effectiveness of infographic media is in accordance with research conducted by (Sholihah, 2015; Sesya and Lisdiana, 2014). In the results of the small group trial, it is known that the percentage of ability to answer the test questions is 80.3%, while the field-scale trial has not been carried out. Based on Hake's (1999) criteria, the effectiveness criteria fall into the moderate criteria with a value. Effectiveness is obtained from product trials, while effectiveness is obtained from learning outcomes through pretest and posttest. The pretest is carried out before students carry out learning activities using infographic media, while the posttest is carried out after students carry out

learning activities using infographic media. Infographic media is declared effective if learning outcomes have increased after using the media (Taufik, 2012; Sesya and Lisdiana, 2014; Hersita, et al. 2020).

4. Conclusion

The infographic media for the concept of Virus and Pandemic covid 19 which was developed in this study has very valid criteria of 87.3% in terms of material, while the criteria for media are valid categories with a value of 83.7%. The development of infographic media as an alternative learning media for educating the concept of early childhood viruses can practically be used based on individual and small group trials. This research will still be continued at the stage of media design revision and large-scale trials to determine the practicality of media products.

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