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Developing COVID-19 digital comic by using flip pdf professional as a learning media for tenth grade of senior high school

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ABSTRACT

The development of learning media in the form of COVID-19 digital comics using Flip PDF Professional is based on the background that the learning media used by SMA Negeri 2 Sekampung teachers are still in the form of textbooks and powerpoints, and there are still many students who do not understand the virus and educational material related to COVID-19, so it is necessary to develop a learning media innovation in the form of COVID-19 digital comics to make learning fun and not boring by combining viral material. Comics were chosen because its presentations are interesting, simple and have a storyline which contains complex messages and information. It can be presented briefly and equipped with communicative language that is dialogic and easy to understand by readers. This study aims to develop a COVID-19 digital comic learning media for tenth grade senior high school students. The method used in this study is research and development with the ADDIE development model which consists of five stages, namely analyze, design, development, implementation and evaluation. The results of product validation developed have been declared "very feasible" to be tested by validators, namely material expert validators and media experts, while the results of product trials developed have been declared "very good" by teachers and students, so that learning media in the form of digital comics can be used as an alternative learning media in the classroom.

INTRODUCTION

Advances in science and technology in the biology learning process are important, it is necessary to develop various interesting and innovative learning media, because in essence learning media are tools used to support the learning process, so that information and communication between teachers and students can be conveyed (Irwandani & Juariah, 2016). Based on the results of an interview with one of the class X biology teachers of SMA Negeri 2 Sekampung said that, in virus material there are still many students who do not understand virus material such as virus characteristics and virus morphology. Learning media that discuss education about COVID-19 have also not been used by teachers to provide education to students during the pandemic (Atsani, 2020; Karyono et al., 2020).

Needs analysis is carried out by providing questionnaires to students through google forms. The results of student responses are known that 90% think that learning biology on virus material is difficult material. Teachers in delivering viral learning materials in class are considered less attractive by students. Most students also responded that the learning media used by teachers was inadequate. Based on the results of the questionnaire, students think that education related to COVID-19 is very important, but many students do not know how to take preventive measures related to COVID-19. As many as 100% of students responded that they were very interested in developing learning media in the form of COVID-19 digital comics.

Visual learning media, especially images, can capture ideas or information contained in the material more clearly than just using writing or oral, especially in biology subjects in high school which are so complex, really need media that emphasizes more visual aspects, so that the message of the material can be conveyed (Damopolii & Nunaki, 2016; Nofitasari et al., 2019; Wurarah & Semuel, 2019). Comics are chosen because in their presentation they have an interesting nature, simple and have a storyline that contains complex messages and information but can be presented briefly and equipped with communicative language that is dialogical and easy to understand by readers (Azizul et al., 2020; Judge, 2018). Based on the form, comics are divided into 2 types, namely print comics and digital comics, as for the differences between the two types of comics in digital comics, the format used has been changed to digital and can be read using certain electronic media. Digital comics have many advantages, including being cheaper, more accessible, more durable and can be interactive, so they are more suitable for the current pandemic situation which uses more electronic media (Haka & Suhanda, 2018; Shahnaz et al., 2020).

The use of software that can be used to convert learning media into digital form one of them is Flip PDF Professional, because this software is not focused only on the form of writings but can contain other interactive media such as images, videos and audio that can make it an interesting and innovative learning media (Febriani et al., 2020; Kartono et al., 2020; Sriwahyuni et al., 2019). The purpose of developing learning media in the form of COVID-19 digital comics is expected to be able to provide useful knowledge for students that can support biology learning activities, especially in COVID-19 material which includes viral material, such as virus characteristics, virus structure/morphology and virus replication.

METHODS

The type of research used in this research is research and development. The development model used in the development of this COVID-19 digital comic is the ADDIE model. The stages consist of analyze (performance analysis, needs analysis and curriculum analysis), design (plot design, character design and scenario design), development (panel layout, recreating and publishing, product validation), implementation (product trial) and evaluation (evaluation and revision) (Siregar, 2019).

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Data collection instruments in this study consist of preliminary study instruments and expert validation instruments and product trials. Validation instruments for material experts assess aspects of learning, material and language. While the validation instrument for media experts assesses on visual aspects and cohesiveness (Wurarah & Semuel, 2019).

Data collection techniques in the development of COVID-19 digital comics use interviews, questionnaires and documentation. Qualitative data were obtained from interviews with biology subject teachers and class X students related to the learning media used, and obtained from suggestions and input from material expert validators and media experts and students in small group trials. Quantitative data is in the form of product quality assessments obtained from validation questionnaires given to material expert validators and media experts totaling one person each, as well as trial questionnaires given to teachers and students. Product quality assessment is ultimately descriptively translated into interval data using the Likert scale. The Likert scale uses attitude statements with a five-scale response choice so that the quantitative data is then analyzed (Barua, 2013).

The number of assessment items for the questionnaire of material expert validators and media experts is 20 items covering aspects of learning, material and language in material experts and visual aspects and integration in media experts (Ardiansah & Miftakhi, 2020). The score obtained from the material and media expert validator is made into a percentage to see the feasibility of the product in learning. The percentage obtained is then checked according to the category of validation results by experts (Table 1).

Table 1. Categories of material expert and media expert validation results

No	Value Scale	Shoes	Percentage	Validation Level
1	5	84 – 100	84% – 100%	Very Worth It
2	4	68 – 83,9	68% – 83,9%	Proper
3	3	52 – 67,9	52% – 67,9%	Pretty Decent
4	2	36 – 51,9	36% – 51,9%	Less Decent
5	1	20 – 35,9	20% – 35,9%	Very Less Feasible

The trial instrument for biology teachers and students consists of 20 and 10 assessment items, respectively. The percentage obtained is adjusted according to the category of trial assessment results for teachers and students (Table 2).

Table 2. Trial assessment categories for teachers and learners

No	Value Scale	Shoes	Percentage	Validation Level
1	5	84 – 100	84% – 100%	Excellent
2	4	68 – 83,9	68% – 83,9%	Good
3	3	52 – 67,9	52% – 67,9%	Enough
4	2	36 – 51,9	36% – 51,9%	Less
5	1	20 – 35,9	20% – 35,9%	Very Lacking

RESULTS AND DISCUSSION

Analyze

There are three stages carried out at the analysis stage, namely performance analysis, need analysis, and curriculum analysis (Ardiansah & Miftakhi, 2020; Siregar, 2019). The results of performance analysis through pre-survey activities in teacher interviews found that the learning media used by teachers were only in the form of package books and powerpoints, and learning media in the form of digital comics discussing COVID-19 education during this pandemic had not been used.

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The results of the needs analysis through a pre-survey at SMA Negeri 2 Sekampung, in the questionnaire given to students, it was found that virus material is material that is difficult to understand and the learning media used is still inadequate. Based on the questionnaire, as many as 100% of students are very interested in developing learning media in the form of digital comics containing COVID-19 education and virus materials. The results of curriculum analysis through pre-survey at SMA Negeri 2 Sekampung have implemented the revised 2013 curriculum, while for virus material is in class X odd semester with Basic Competencies (KD), namely 3.3 and 4.3.

Design

The design stage is the stage of designing digital comic products that will be made including (Hakim, 2018):

1. **Plot design**
   The first stage in designing or designing a COVID-19 digital comic is to determine the concept. After getting the concept in the design, the plot design or synopsis is carried out to determine the theme, storyline, characters and plot description in the COVID-19 digital comic that will be created.
2. **Character design**
   The creation of the physical appearance and personality required in the character design is adjusted to the information from the plot design.
3. **Screenplay**
   The screenplay arranged in this digital comic is simplified and becomes one with the storyboard creation process.

Development

At the development stage, the stages of making panel layouts (storyboards), recreating comics, publishing and expert validation are carried out to realize the digital comic designs that have been designed.

1. **Panel layout (Storyboard)**
   Making storyboards is done by making panels or boxes where characters and dialogues / word balloons in digital comics as well as initial sketches such as story backgrounds, which can be seen in Figure 1 below.

Figure 1. COVID-19 digital comic storyboard creation display

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2. Recreating comics

At the recreating comic stage, the coloring process is carried out in comics and the creation of digital comic components. Stages of recreating comics using Adobe Illustrator Cs 6 software. The following is a look at the digital comics that have been developed can be seen in Figure 2 below.

Figure 2. Front and back cover view of COVID-19 digital comics

3. Publishing

The next stage is publishing, namely the stage of uploading digital comics in PDF format using Flip PDF Professional so that they can be accessed via smartphones with link format and computers with exe format, the display of digital comics that have been published can be seen in Figure 3 below.

Figure 3. Display of COVID-19 digital comics on laptops (left) and *smartphones* (right)

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4. **Validation of material experts and media experts**

The development of COVID-19 digital comics has been completed, then validated by material expert validators (lecturers of the IAIN Metro Biology Tadris Study Program). The validation process was carried out twice and received suggestions for improvements to COVID-19 digital comic products. The results of the first material expert validation obtained a percentage of 75% and were included in the "feasible" category, then the results of the second material expert validation obtained a percentage of 93% and included in the "very feasible" category, digital comics developed already present media suitability with learning materials, material about viruses is easy to understand and presented simply, and the use of communicative language.

The next validation process, COVID-19 digital comic products are carried out by media expert validators (lecturers of the IAIN Metro Biology Tadris Study Program). The validation process was carried out twice and received suggestions for improvements to COVID-19 digital comic products. The results of the first media expert validation obtained a percentage of 83% and were included in the "feasible" category then the results of the second media expert validation obtained a percentage of 95% and included in the category of "very feasible", digital comics developed already present attractive character designs, clear storylines and easy use of comic media.

Implementation

COVID-19 digital comic products that have been declared feasible by material and media expert validators, then the products are carried out in the trial stage for biology subject teachers and students of SMA Negeri 2 Sekampung totaling 10 students. Product trials are carried out to see the good quality or not of the products developed so that the product is suitable for trial and use in schools (Ardiansah &; Miftakhi, 2020; Yunita &; Utami, 2021).

In the results of the teacher trial response, the percentage was 84% and included in the "very good" category, while in the results of the student trial response with a total of 10 students, the percentage was 96% and included in the "very good" category. The results are from the response of teachers and students that COVID-19 digital comic products using Flip PDF Professional get the "very good" category without any comments and suggestions, so the product is not tested again. This research shows that COVID-19 digital comics can be implemented as a learning medium to enliven and increase students' interest in the learning process. This is reflected in various positive responses from teachers and students during product trials.

Because of its electronic nature, digital comics can also be used as a learning medium in the classroom or independently. This mobility makes it easier for students to obtain a better quality of education (Hakim, 2018). Therefore, it will be very helpful for students, especially in today's learning that uses more online learning.

Evaluation

At the evaluation stage, a revision of COVID-19 digital comics was carried out based on comments and suggestions on the validation sheets of material experts and media experts and the results of teacher and student response trials. Revisions were made in order to obtain products in the form of digital comics that are suitable for use in learning (Nurhayati, 2019). Digital comic learning media that have been declared feasible can be disseminated and used by teachers in the learning process.

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CONCLUSION

Based on the results of research and development of COVID-19 digital comics using Flip PDF Professional as a learning medium for grade X high school students, it can be concluded that, the results of the product validation developed have been declared "very feasible" to be tested by validators with the results of 93% material expert validation and 95% media expert validation results, while the results of product trials developed have been declared "very good" with 84% teacher trial response results and The results of the student trial response were 96%. Based on these results, COVID-19 digital comic products using Flip PDF Professional can be used as a medium for fun and not monotonous learning by combining viral material.

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Authors' Note

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