DEVELOPMENT OF DIGITAL COMIC LEARNING MEDIA IN ECONOMICS SUBJECT FOR GRADE 10 SENIOR HIGH SCHOOL

[PENGEMBANGAN MEDIA BELAJAR KOMIK DIGITAL DALAM MATA PELAJARAN EKONOMI UNTUK KELAS 10 SEKOLAH MENENGAH ATAS]

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ABSTRACT

This study aims to produce digital learning media in the form of digital comics for economics subjects in senior high school grade 10 and equivalent to Demand and Supply subjects. The type of this research is development research. The research procedure uses the ADDIE model, which consists of five stages, including identification (analysis) stage, design stage, development stage, implementation stage, and evaluation stage. The software used in the development of digital comic media is Canva. Based on the results obtained, it can be concluded that economics learning, especially Demand and Supply materials based on digital comics is considered interesting and feasible to apply. This is proven by the results of the validation test of material experts, technological experts, and trials to 40 students who are in the good category. The average on the material expert validation test shows a good category with a score of 4.25. Technological experts indicate the category is quite good with a score of 3.75 while the trials on students were in the good category with a score of 4.0.

Keywords: Digital learning media; Digital comics; Economy education; Demand and supply; ADDIE model research and development.

ABSTRAK

Penelitian ini bertujuan untuk menghasilkan media pembelajaran digital berupa komik digital untuk mata pelajaran ekonomi kelas 10 SMA dan setara dengan mata pelajaran Permintaan dan Penawaran. Jenis penelitian ini adalah penelitian pengembangan. Prosedur penelitian menggunakan model ADDIE yang terdiridari lima tahap, meliputi tahap identifikasi (analisis), tahap desain, tahap pengembangan, tahap implementasi, dan tahap evaluasi. Perangkat lunak yang digunakan dalam pengembangan media komik digital adalah Canva. Berdasarkan hasil yang diperoleh, dapat disimpulkan bahwa pembelajaran ekonomi khususnya materi Permintaan dan Penawaran berbasis komik digital dinilai menarik dan layak untuk diterapkan. Hal ini dibuktikan dengan hasil uji validasi ahli materi, ahli teknologi, dan uji coba kepada 40 siswa yang berada pada kategori baik. Rata-rata pada uji validasi ahli materi menunjukkan kategori baik dengan skor 4,25. Pakar teknologi menunjukkan kategori cukup baik dengan skor 3,75, sedangkan uji coba pada siswa berada pada kategori baik dengan skor 4.0.

Kata Kunci: Media pembelajaran digital; Komik digital; Pendidikan ekonomi; Permintaan dan penawaran; Penelitian dan pengembangan model ADDIE.

Introduction

Technology continues to experience increasingly sophisticated developments from time to time. The development of this technology continues to enter human life and in almost all activities, humans need technology,. It is very clear that education today is different from education in the past where all activities were still carried out manually without the help of any technological tools. Educational institutions are expected to be able to create a superior and competitive future generation by integrating technology in learning.

At the beginning of 2020, the world was hit by the Covid-19 pandemic which had a considerable great impact on human life. As a result, all activities or the implementation of activities are limited by the government to prevent further spread of the virus. This causes teaching and learning activities to stop and educational institutions needed to carry out online teaching and learning activities (distance learning) by utilizing technology as a learning support tool.

The use of technology in learning is currently an alternative to be able to continue carrying out the learning process at the elementary, middle, and high school levels. However, in its implementation, students may find it difficult to understand materials and thus online delivery may affect the

quality of education. This can be caused by several things, such as students' indifference in learning from home, lack of parental role in guiding the children, lack of interesting learning activities presented by the teacher, and so on. Boredom during online learning can be felt because the learning presented is too monotonous, less varied in intonation use, and lacking direct interaction with friends or teacher (Pawicara and Conilie, 2020).
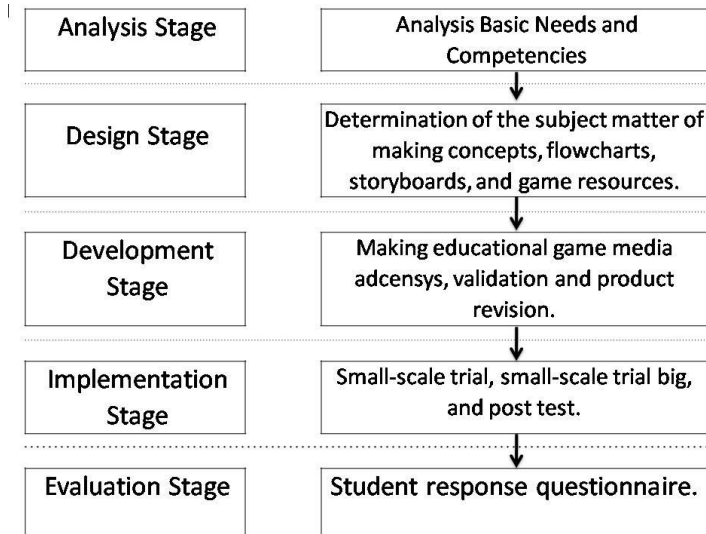
To improve the quality of education and student's learning outcomes, teachers can use digital media in the learning process. There are many digital media that can be used to support online learning, namely learning videos, digital images, podcasts, e-books, web-based applications, learning games, comics, and more. There are many fields and subjects that can apply appropriate learning media that make students more active. The existence of interesting learning media is one factor that makes students more focused (Luhsasi&Permatasari, 2020). Digital comics are one of the innovations in learning, in which it can integrate text, images, and learning videos, so it can be designed very attractively. The use of digital comic media can improve students' learning enthusiasm, as argued by Rahmatullah, et al (2020), it shows the feasibility level of digital comic learning media by 89.55% with a very decent category. In addition, there are responses given by students, where the interest in digital comics is 83.17% with very interesting criteria.

Therefore, the development of digital comic media as a learning medium is very important and suitable for use because besides its attractive appearance, many students have a special interest in comics. In addition, there is a possibility that the use of printed books will not be read by students due to their monotonous display. The presentation of comics is quite simple and very concise through a storyline that is based on subject matter of learning. Digital comics can also be read anytime and anywhere either by laptops, computers, and phone that are owned by most students nowadays.

Research method or approach of discussion

This research is a type of research and development. Research and development are one of the means for researchers in formulating the media to be developed, so the resulting product can be applied or implemented according to its use. Borg and Gall (2003) describe that research and development is a process carried out to develop and validate educational products that do not only include material objects, textbooks, and instructional films but also procedures and processes, such as teaching methods or methods of organizing instruction. This media development uses the ADDIE model, which consists of five stages, including identification stage

(analysis), design stage, development stage, implementation stage, and evaluation stage. Here's the chart regarding the outline of research procedures in media development with the ADDIE model:

Analysis Stage	Analysis Basic Needs and Competencies
Design Stage	Determination of the subject matter of making concepts, flowcharts, storyboards, and game resources.
Development Stage	Making educational game media adcensys, validation and product revision.
Implementation Stage	Small-scale trial, small-scale trial big, and post test.
Evaluation Stage	Student response questionnaire.

Figure1. Outline of Research Procedure

Based on these stages, this research will be carried out with expert tests and tests on students. The expert tests consist of a material expert test and a technology expert test. The questionnaire used in this study developed the existing questionnaire in the components and instruments for developing digital-based teaching materials (Kemendiknas, 2010, 18-21). There are five scales used in the questionnaire. Likert scale with a score 1 means strongly disagree and a score 5 means strongly agree. The feasibility of this product is measured from the results of expert tests and trials to students. The product draft will be tested by material and technology experts and revised according to the notes provided by the two experts. The next stage is a trial for Virgo Fidelis Bawen Senior High School students.

Results and discussion
Identification stage (Analysis)
The first stage in the ADDIE model is the identification or analysis stage to analyze the needs of media development and analyze the feasibility and requirements of the development of this learning media. Problems arise from the presence of Covid-19, which requires all community activities to be carried out virtually or using online technology. This also has an impact on the

world of education, where teachers must adapt to technology in a very short time for the smooth learning process. Based on research by Asmuni (2020), the implementation of online learning during the Covid-19 pandemic faces various problems, one of which is the weak mastery of information, technology, and communication, limited supervision by teachers, requiring teachers to improve competence in mastering information and technology. Therefore, it is very necessary to develop digital learning media as a support for learning activities.

In this study, researchers developed digital comics that can be used as an online learning medium. Previous research by Rahmatullah, et al (2020), gave the results that the feasibility of this digital comic learning media is in the very feasible category with very interesting criteria. The access of digital comic only requires a phone, laptop, or computer with the support of internet or internet data, so it is easily accessible by students.

In the subject matter of Demand and Supply, students are required to be able to explain the meaning of demand and supply, explain the factors that influence demand and supply, and explain the demand and supply functions and their assumptions. Therefore, the development of this digital comic media can meet or achieve the achievement indicators of competence in the subject matter of Demand and Supply.

Design stage

The second stage in the ADDIE model is the design stage or designing the concept and content in the media to be used. This stage can help researchers in preparing the development process, so that the media developed can be in accordance with the objectives that have been set and determined at this stage. The following are the steps taken by researchers in designing media digital comics.

1. **Storyboarding**

   In the first step, the researcher has made a sketch manually by drawing on a blank paper as an initial picture of the concept design and content that will be applied to digital comic media. This step can make it easier for researchers in the later stage of development, so the researchers are not confused in inserting content based on the subject matter to be discussed. The following is a storyboard made by the researchers.
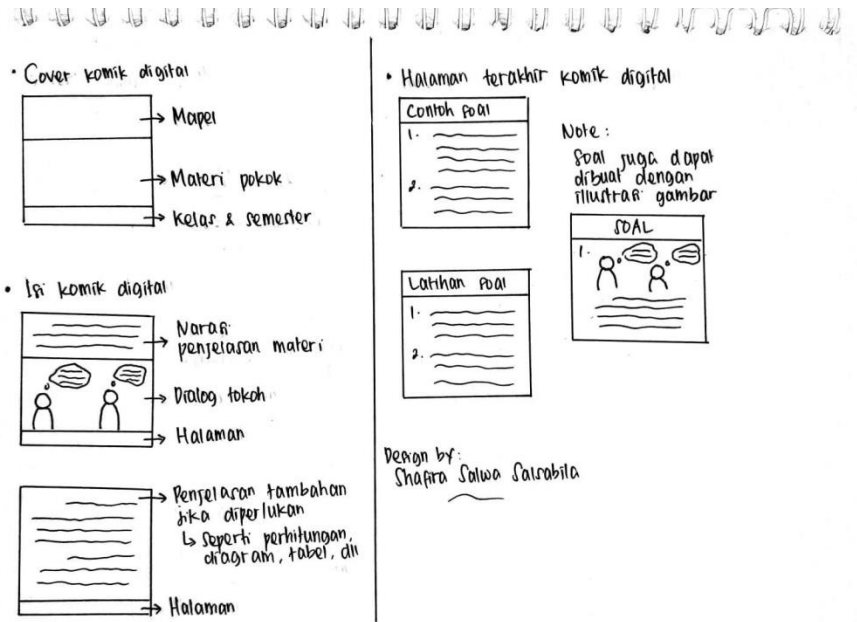
Figure2. Digital Comic Storyboard

2. **Software selection**

   The next step is the selection of editing media or software that will be used to design media. The software that the researcher uses is Canva which is a graphic design platform for creating designs for social media, presentations, posters, documents, and other content. By using Canva, designs can be created in a form of images, videos, and documents so that it is very suitable for development of various digital media. Canva can be accessed either through mobile phones, laptops, computers, or tablets for free or paid so that it can be adapted to user needs.

3. **Selection of learning materials or content**

   The development of this digital comic media is adjusted to the basic competencies of economics subjects for high school. The researcher chose the subject matter of Demand and Supply because the material can be applied in digital comics so that the presentation will be more attractive through the unification of colors, images, and texts. It is expected that through this media, students will be interested in reading and find it easier to read and understand the material.

Development stage

The third stage in the ADDIE model is the development stage which contains realization activities product design that has been made in the first stage. In this stage, the researcher begins to conduct the development of digital comic media through the software used, namely Canva. Below are the steps taken by researchers in developing digital comic media:

1. **Template selection**

   The selection of templates can be adjusted to the subject matter and content to be discussed.
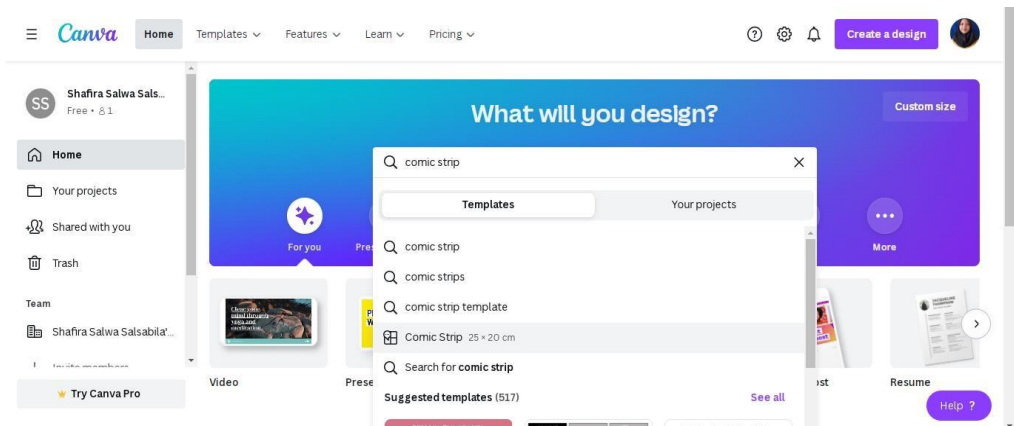

Figure3. Selection of Digital Comic Templates in Canva

2. **Introduction to its features and functions**

   For beginners in designing media through Canva, after choosing a template one can identify the available features and their functions.
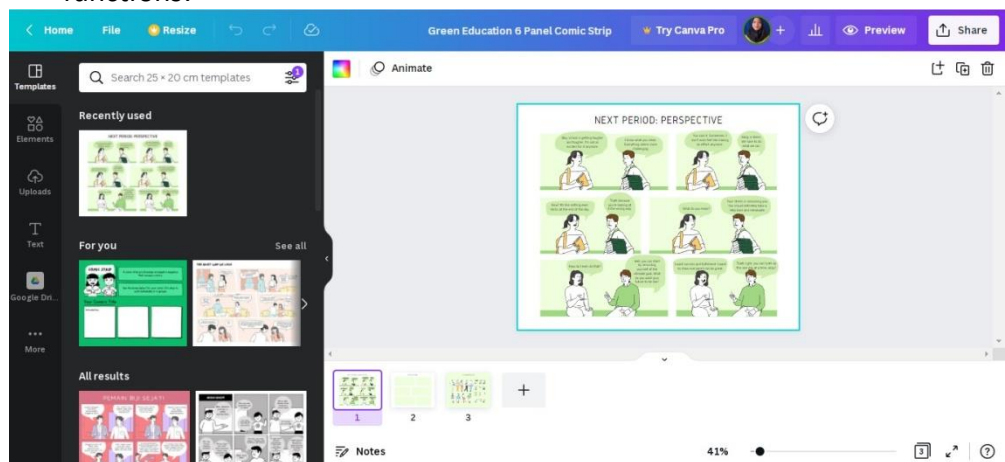

Figure4. Introduction to Canva Features and Their Functions

3. **Design process**

   After understanding Canva's features, the researchers carried out the comic media design process digitally according to the design or storyboard that has been made previously.
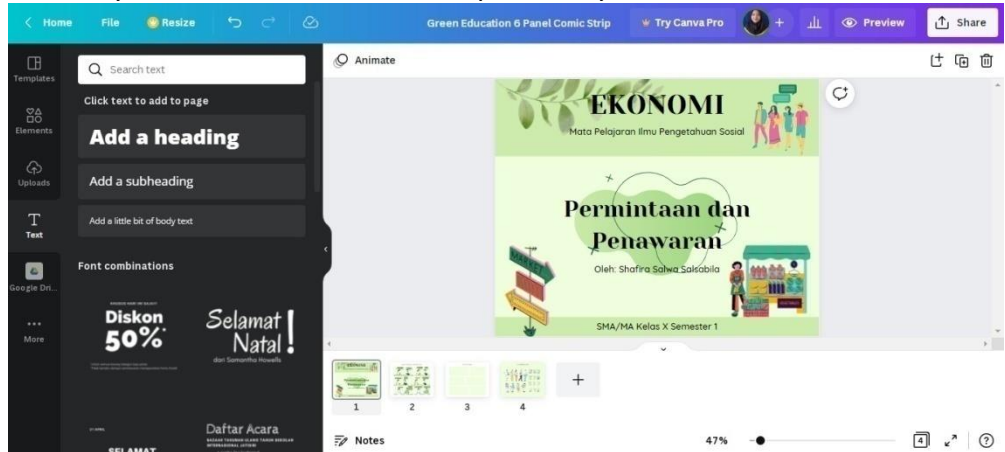

Figure5. Design Process Based Storyboard

4. **The final product or media**

   These digital comics can be accessed with a flipping book website where students can upload files in PDF to the website and later a display will appear like opening a real comic, so it looks more attractive. In addition, students can access digital comic files in the form of PDF and JPG via google drive. Below are the google drive link to access digital comics with the subject matter "Demand and Supply".

   a. PDF format:https://bit.ly/PermintaandanPenawaranPDF
   b. JPG format:https://bit.ly/PermintaandanPenawaranJPG

   The following is the result of the digital comic media that has been made by the researcher which consists of 9 designs:

Figure 6. Layout Comic 1
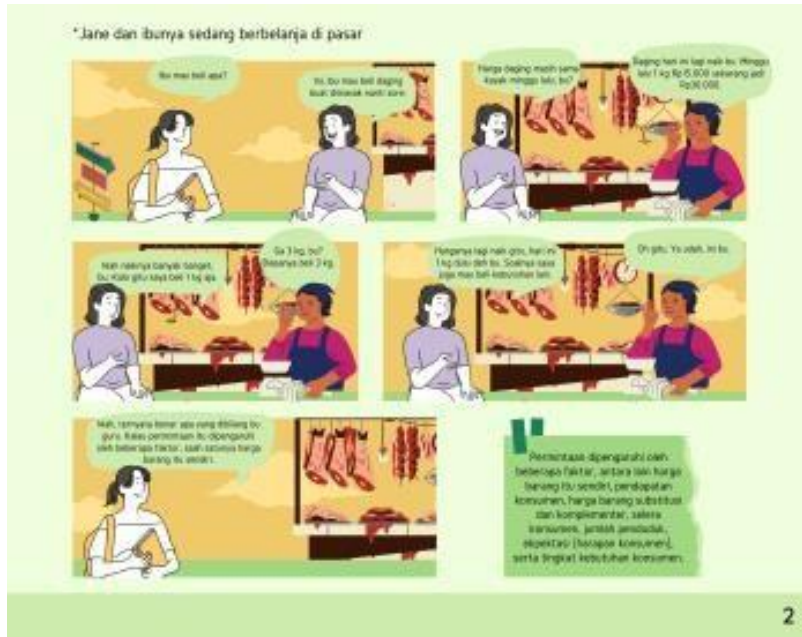

Figure 7. Layout Comic 2

Figure 8. Layout Comic 3

Figure 9. Layout Comic 4

Figure 10. Layout Comic 5
Figure 11. Layout Comic 6
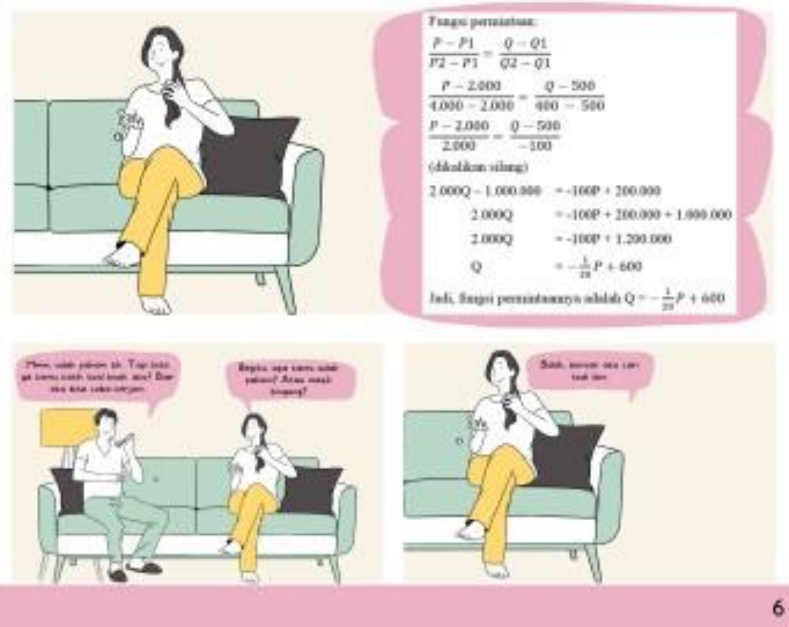

Figure 12. Layout Comic 7

Figure 13. Layout Comic 8

Figure 14. Layout Comic 9

Implementation stage

This digital comic has been validated by two experts. The first is material expert validation. The results of the validation of each expert are based on the following scores (Purwanto, 2013):

NP = $\frac{R}{SM}$ x 100%

Keterangan :

NP   : Nilai persentase yang diharapkan

R   : Skor mentah perolehan

SM   : Skor maksimum

Table 1. Scale and Category

Percentage	Category
86% - 100%	Very Good
76% - 85%	Good
60% - 75%	Passably
55% - 59%	Deficient
≤ 54%	Not Good

Based on this benchmark, the results of material expert validation can be seen in table 2.

Table 2. Material Expert Validation Results

No.	Aspect	Score	Percentage	Category
1	Material Substance	4,5	90%	Very Good
2	Learning Design	4,0	80%	Good
	Rate	**4,25**	**85%**	**Good**

Table 2 shows that the material in digital comics is in the good category. This can be seen in the average value of 4.25 or if it is presented at 85%. The substance aspect of the material is included in the very good category while the learning design aspect is included in the good category. Important notes added by material experts to add more diverse questions so that students can discuss more sample questions.

Table 3. Media Expert Validation Results

No.	Aspect	Score	Percentage	Category
1	Visual Communication Display	4,0	80%	Good
2	Software Utilization	3,5	60%	Passably
	Rate	**3,75**	**75%**	**Passably**

Based on the validation results, digital comics are included in the fairly good category with a score of 3.75 or equivalent to 75%. The validation of this technology expert consists of two aspects. The first aspect is the visual communication display which gets a good category. The second aspect, namely the aspect of software utilization, got a score of 3.5 with a passably category. These results are accompanied by expert input, namely the need to add audio and animation effects in certain parts.

Evaluation stage

This stage is where digital comics have passed the evaluation stage and are ready to be tested on students. This stage is done by applying digital comics in two classes. At the end of the lesson, the students were asked to fill out a questionnaire related to the learning media, starting from the substance of the material, the design of the lesson, the display of visual communication, and the use of software. After conducting trials on 40 students consisting of two classes, the results obtained an average score of 4.0 with a presentation of 80%. This average score consists of four aspects. The highest aspect obtained is the aspect of material substance of 4.5 with a percentage of 90%. And the lowest aspect is in the aspect of software utilization with a score of 3.5 which is equivalent to 70%. These results can be seen in table 4.

Table 4. Student Test Questionnaire Results

No.	Aspect	Score	Percentage	Category
1	Material Substance	4,5	90%	Good
2	Learning Design	4,0	80%	Good
3	Visual Communication Display	4,0	80%	Good
4	Software Utilization	3,5	70%	Passably
	Rate	**4,0**	**80%**	**Good**

When this media was applied to both classes, the students were interested in the appearance of the material in digital comics. The students were enthusiastic about this medium. They become more interested in reading and understanding the material and working on problems. There are

several suggestions expressed by some students, namely the addition of audio and animation effects for each display. These things have become a reference for improvement by researchers.

The presentation of interesting material such as digital comics as a learning medium provides a fun learning experience for students. If students feel happy in learning, it will increase learning motivation. If students are motivated to learn, it will also improve learning outcomes. Learning supported by visuals with various colors and animations makes economics lessons more fun. Presentation with interactive media like this can provide a new atmosphere in the teaching and learning process in the classroom (Darmawan, 2016; Krasna, 2014; Hamzah, 2013). The material presented using digital comics will provide more benefits in the learning process so that the purpose of deepening this material is achieved. This media also provides understanding for students effectively (Luhsasi&Permatasari, 2020).

Conclusions

There is a need for learning media that provide an attractive appearance as a support for learning activities. One of these digital learning media is digital comics that can be accessed anytime and anywhere with the help of today's advanced technology. In its development, it needs to be adjusted to the concepts and contents that will be discussed in a subject matter and pay attention to the basic competencies to be achieved. Based on the results obtained, it can be concluded that economic learning, especially demand and supply materials based on digital comics, is feasible to apply. This is evidenced by the results of the validation test of material experts, technology experts, and trials to students who are in the good and fluent category. The average on the material expert validation test shows a good category with a score of 4.25. Technological experts indicate the appropriate category with a score of 3.75. While the student tests are in the good category with a score of 4.0. On the other hand, this digital comic has limitations, which are the lack of audio and animation effects. Therefore, for further research, it is possible to create similar learning media with other materials equipped with audio and animation effects.

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