



Development of E-Comics as a Learning Media To Improve Students' Understanding of Payment Systems and Tools

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Abstract

Learning using E-Comics media is still rarely done in Senior High Schools. The lack of variation carried out by educators makes the classroom atmosphere less pleasant, so with the presence of E-Comics learning media, learning becomes more varied and interesting, and students do not get bored easily. The purpose of this development research is to determine the feasibility of Comic media on the material of payment systems and instruments, as well as to improve student understanding and to determine the effectiveness of the learning media. The development of E-Comics learning media uses the development procedure by Borg and Gall but is limited to the seventh research stage, namely product revision. The results of this study are in the form of E-Comics, which are formed in Flipbooks and then taught to class X students of SMAN 5 Malang. The results of the E-Comic validation in this study obtained a percentage of 92.5% by media experts, 90% by material experts, and in the response of small group trial students obtained a result of 86.5%, and in the response of large group test students 91%. Thus, it can be concluded that E-Comics media is very feasible to use and gets a positive response from students.

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INTRODUCTION

Current technological developments have had a positive impact on the world of education. An educator is required to be able to transform knowledge optimally for students through an adaptive approach to technological advances. Educators are not only responsible for delivering lesson materials but also encouraging the development of critical thinking in students so that they are able to solve problems independently and in-depth. According to Fitriani & Sukidjo (2018), critical thinking is defined as the process of thinking and concept skills in applying analysis, synthesis, and evaluation of information and generalization. Critical thinking is a skill that includes the ability to analyze, evaluate, and synthesize information, as well as make decisions rationally and responsibly.

The influence of current technological advances can make it easier for students to access learning resources that will be delivered by teachers independently, thus creating student learning independence. In addition to student independence, students should be able to think critically and innovatively in learning. In economics subjects in high school, there is material on payment systems and instruments. This material is very important because it is directly related to everyday life, especially in terms of transactions and the use of payment instruments such as cash, credit cards, e-wallets, and other digital payment systems. However, some students find it difficult to understand the abstract concepts in the material on payment systems and instruments. Therefore, innovative learning media such as e-comics are needed that are able to present material more interestingly and easily understood by students. In addition, teachers are advised to improve the quality of student learning outcomes by developing technology-based teaching materials.

Teaching materials using E-comic media are an innovation that suits today's student interests. Based on observations at SMA Negeri 5 Malang, many students prefer reading comics through digital applications to reading printed books. Meanwhile, in the process of learning economics, teachers still rely on available media, such as textbooks and student worksheets. Due to the limited learning media that support the delivery of material, this condition forces teachers to use makeshift media. On the other hand, the availability of facilities such as LCD projectors has not been utilized optimally—the selection of media in the teaching and learning process should be adjusted to the characteristics and needs of students to increase the effectiveness of learning. However, most students show a tendency to be passive and lack motivation to learn independently, which has an impact on low learning outcomes.

Internal and external factors cause low student learning motivation. External factors that influence learning are the teaching methods applied by teachers. Based on observations in the school environment, the lecture method is still the most dominant approach used in learning activities. This can be seen from the lack of student focus and their tendency to feel bored during the learning process. The use of appropriate media in learning is expected to be able to encourage student motivation, thereby increasing their interest in the subject. In this study, the learning media developed by the researcher is E-Comics. The material is delivered through a short storyline, easy-to-understand language, and is relevant to students' daily lives. This development research is expected to provide positive benefits for various parties with the aim of describing the

feasibility of the media, student responses, and increasing student understanding after the implementation of E-Comics in class X of SMAN 5 Malang.

METHODS

This research is included in the type of Research and Development (R&D) research developed based on the R&D model by Borg and Gall. This research limits the development stages to the seventh stage and does not continue to the mass production stage. The development procedure identifies potential problems, data collection, product design, design validation, design revision, product trials (through small group tests and large group tests), and product revisions. These stages are carried out by adjusting the research needs.

The subjects in this study consisted of students and product validators. The trial targets were determined through random sampling techniques so that the subjects obtained in the small group trial involved 10 students of class X SMAN 5 Malang who were randomly selected from class X J with heterogeneous ability characteristics, while in the large group ability test, 21 students of class X SMAN 5 Malang. The material and media validators consisted of two experts, namely a teacher at SMAN 5 Malang and a lecturer from the State University of Malang.

In this study, data analysis included all opinions and responses from the evaluators. Next, data was collected through an open assessment questionnaire that allowed respondents to provide criticism and suggestions. The results of the validation test from experts and audiences were analyzed using a rating scale. In this scale, the numbers given are converted into qualitative data. This development research uses a rating scale with five answer options, namely numbers 1 to 5, as follows:

Score	Answer
1	VeryBad
2	Not good
3	Pretty good
4	Good
5	Very good

Table1.ValidationAssessmentScoreCriteria

Source: (Bertiliya, 2021)

RESULTS AND DISCUSSION

Based on the results of interviews conducted by researchers with the Economics subject teacher of class X SMAN 5 Malang, Mrs. Neivisatuz Zihan. C, S.Pd in February 2025, potential was found that could be the basis for consideration for carrying out this research and development. One of these potentials is the difference in the level of student ability in each class, consisting of low, medium, and high levels of learning ability. In learning activities, some students have a visual learning style. Therefore, teachers often use visual-based learning media, such as PowerPoint, which is equipped with supporting images to clarify the delivery of the material. In addition, the learning process still relies on conventional learning resources such as textbooks, LKS, and teaching

modules. The process of collecting data for this research and development began with an interview with the Economics subject teacher as an initial step to obtain a general picture of the learning conditions in the classroom. This interview aims to explore information about learning needs, student characteristics, and obstacles faced during the teaching and learning process.

The learning media developed in this study is in the form of E-Comics containing class X Economics material on Payment Systems and Instruments. These E-Comics are designed interactively and attractively, with the aim of increasing students' interest and understanding of the material. The presentation structure in these E-Comics consists of several important components, namely:



Figure1. Front cover view

This section displays the title, developer identity, and illustrations that reflect the general content of the material. The cover is designed attractively to foster students' curiosity and enthusiasm for learning. The opening view of the sub-chapter is as follows:

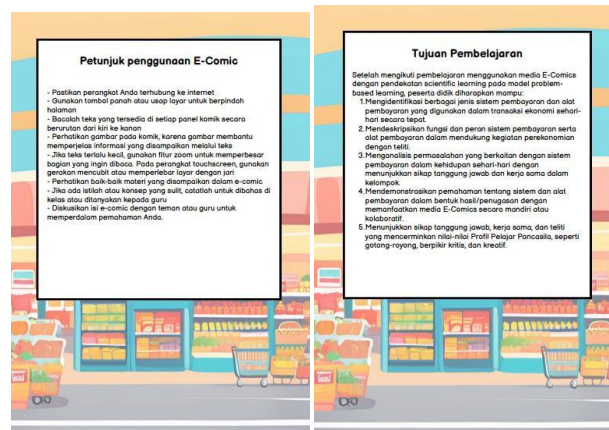


Figure2. Display of user manual and learning objectives

It contains a brief guide on how to use E-Comics, both technically and in terms of reading flow so that students can easily understand and maximize the use of this media. Also, it is presented clearly so that students know the expected learning outcomes after reading and understanding the contents of E-Comics. An example of the presentation of the material is as follows:



Figure3. Display of material description

The core part of this media contains a story delivered in the form of a dialogue between characters, equipped with visual illustrations that support the understanding of the concept of the Payment System and Instruments material. With these visual images, students are more interested in reading and learning.

Next, at the product validation stage, there is a process for developing E-Comics learning media. This stage involves several parties, namely experts and education practitioners. The main goal is to assess the feasibility of the material before it is Applied in classroom learning activities. The validation process is carried out directly (offline) by submitting assessment sheets to each validator. Based on the validation results, the score obtained from the content/material validator reached 90%. This percentage shows that digital comic-based learning media is included in the very valid category, although several revisions are still needed for improvement. In addition, the validation results for the E-Comics media design obtained a score of 92.5%, which indicates that the media is suitable for use in learning activities. However, there are still several revisions to improve the quality of the media optimally after going through the design revision stage based on input, suggestions, and criticism from experts and education practitioners. The next step in the learning media development process is to conduct a trial on students. The following are the results of the product trial implementation on students:

1) Results of small group trials

The implementation of small group trials was carried out on 10 grade X students at SMAN 5 Malang as part of the initial evaluation stage of the E-comics learning media that had been developed. The following are the results of the student response questionnaire in the small group:

No.	Aspect	Total Score	MaximumScore
1.	MaterialSuitability	257	300
2.	MediaSuitability	219	250
3.	Implementation	173	200

4.	Engagement and Motivation	216	250
Total		865	1000

Source: Data processed by researchers

$$V_{au} = \frac{F_x}{N} \times 100\%$$

$$V_{au} = \frac{865}{1000} \times 100\%$$

$$= 86,5\%$$

The results of student responses at the small group trial stage obtained from the level of validation from the audience side of the E-Comics media reached a percentage of 86.5%. The percentage of media is included in the very valid category. In the small group test, the average N-Gain score was 0.58, or equivalent to 58%. These results indicate that the use of developed learning media is classified as quite effective. In other words, there is a significant increase in student learning outcomes in following the learning process using E-Comics media.

2) Results of the main field trial

The trial at the main field stage was carried out by involving 21 research subjects of class X students at SMAN 5 Malang. At this stage, the E-Comics learning media that had gone through the previous revision process was implemented directly in teaching and learning activities. The following is the data obtained from the main field test that has been carried out:

Table3. Results of the main FieldTest Student Response Questionnaire

No.	Aspect	Total Score	MaximumScore
1.	MaterialSuitability	574	630
2.	MediaSuitability	483	525
3.	Implementation	386	420
4.	Engagement and Motivation	467	525
Total		1910	2100

Source: Data processed by researchers $V_{au} = \frac{F_x}{N} \times 100\%$

$$V_{au} = \frac{1910}{2100} \times 100\%$$

$$= 91\%$$

Based on the results of the questionnaire responses of class X students of SMAN 5 Malang to the digital media based on E-Comics that was developed, an audience validation score of 91% was obtained. This percentage shows that this learning media is included in the "very valid" category. An average N- Gain

score of 0.71% was obtained; this score indicates that the increase in student learning outcomes is in the category of quite effective in supporting the learning process.

The results of the trial were developed in the form of E-Comics so that it could attract students' interest. Furthermore, no further revisions are needed to the product. From the two trial results, there was an increase in student learning outcomes after using E-Comics media. In the results of the small group trial, students showed an increase in understanding the material after reading and discussing the contents of E-Comics. This is reflected in a significant increase in the average pretest and posttest scores. In the main field trial, student scores after using E-Comics media were higher than before the media was implemented, which indicates a positive impact on their learning outcomes.

This increase in learning outcomes indicates that E-Comics media is effective in helping students understand abstract economic concepts. The digital comics Developed not only presents the material visually and attractively but also inserts narrative elements that allow students to be emotionally and cognitively involved in the learning process. This is in accordance with the opinion of Widyawati (2024) in multimedia learning theory, which states that the combination of text and images can improve the understanding and retention of information.

In addition, the effectiveness of this media is also reinforced by the responses of students who find it easier to understand the material through E-Comics media. The results of the questionnaire showed that most students felt more focused, motivated, and enjoyed learning when the material was presented through illustrated stories. This is in line with previous findings by Rahayu & Mustadi (2020), which stated that digital comic media is effective in improving learning outcomes because it is able to present material contextually and interestingly.

CONCLUSION

This E-Comics learning media is quite effective to be applied because it reduces students' boredom with economic material. Moreover, if the image design in E-Comics is very good, it will make it easier for students to understand the material that has been delivered. This media not only makes learning more fun but also helps students understand abstract concepts through simple storylines communicative language, and is relevant in everyday life. Thus, based on research data, it can be interpreted that E-Comics learning media is effective in improving students' understanding of the material on payment systems and instruments.

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