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The Development Of E-Comic As A Media For Learning Biology Subject In The Psychotropic Material

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Abstract

The use of smartphones has been widely used by the public. However, in the field of education teachers have not made optimal use of the online learning process. Electronic comic media (e-comics) can be an interesting choice of learning media for problems experienced by students when online such as low motivation and student learning outcomes, one of which is psychotropic mateeial. The purpose of this research was to analyse the characteristics of e-comic biology learning media on psychotropic material for high school students, analyse the feasibility of e-comic biology learning media on psychotropic material for high school students, and analyse the effectiveness of e-comic biology learning media on student learning outcomes on psychotropic material. The research used a Research and Development (R&D) approach which was tested at SMA Negeri 1 Petarukan on a small scale with 24 respondents from class XII MIPA. While the large-scale trial with 100 students from XI MIPA 4, XI MIPA 5, and XI MIPA 6 respondents. The e-comics that were successfully developed were declared valid by media and material experts with obtaining percentages of 93.6% and 88.8 % which showed e-comics in the very feasible criteria. Student learning outcomes after using e-comics obtained a classical completeness percentage of class XI MIPA 4 of 97%, XI MIPA 5 of 91%, and XI MIPA 6 of 91%. The responses of teachers and students showed positive results, seen from the percentages obtained, namely 94% and 98.6%, which indicated that e-comics were in very good criteria. Based on the results of the study, it can be concluded that e-comic learning media on psychotropic material meet the criteria of being appropriate and effective for use as learning media for high school students.

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INTRODUCTION

Smartphone is an information technology that provides many conveniences in its use, one of which is in the field of education. Learning using a smartphone can help students learn content in a more comfortable and easy way, because it can be used anytime and anywhere (Huang et al., 2010). Teachers can optimize technology development by developing learning media, one of which is visual media. According to Smaldino in Risandi (2015) that visuals can increase interest in a subject. Such interest can increase motivation by attracting attention, maintaining attention, and creating involvement in the learning process.

Based on the results of interviews with biology teachers at SMAN 1 Petarukan, it is known that students were bored taking online classes. This affects student motivation in learning, especially when the media used online was still conventional. Judging from the learning outcomes of class XI students of Petarukan 1 Public High School when online in 2021 in a class that meets the KKM is still <85%. Learning outcomes that have not reached classical completeness can be overcome by using attractive visual media. According to (Rosyid et al., 2019) visual-based media, for example e-comic media, plays an important role in the learning process because this type of media is related to the sense of sight which can make students interested and connected between subjects and the real world.

E-comics is a form of digital visual connection that has the ability to channel messages through pictorial stories so that readers can easily understand them, including students. (Putriani & Hudaidah, 2021). The advantages of e-comics compared to other learning media are that they are concrete and more realistic (Nurdiyanti, 2019). The use of e-comic media in online learning activities is more supportive because it is practical and interesting.

One of the biological materials related to real problems in society is psychotropic material. Psychotropic material is one of the important materials in biology lessons in class XI SMA. Psychotropic material has a basic competency (KD) that must be achieved, namely Basic Competence 3.11 Evaluating the dangers of using psychotropic compounds and their impact on personal, environmental and community health and as for the Skills KD that must be achieved, namely Basic Competence 4.11 Conducting anti-drug campaigns in the school environment and local communities. Therefore, e-comic learning media on psychotropic material competence is deemed appropriate. Through e-comic learning media, the implementation of anti-drug campaigns in the school environment and surrounding communities can be achieved.

Based on the description above, it is necessary to develop an e-comic learning media on psychotropic material for high school students. The e-comic developed is in the form of a pdf designed and created by the researcher himself using the Pixton. The pixton comic maker application online that is easily accessible to all people (Mustakim, 2020). The designed e-comic media is equipped with subject matter, animated cartoon images, daily storylines, easy to use, flexible, fast access and lightweight. This e-comic will later be tested on high school students. E-Comic is expected to be feasible and effective to be used as a student learning media.

RESEARCH METHOD

The research was conducted at SMAN 1 Petarukan in the even semester of the 2021/2022 academic year. The research population was all students of class XI SMA Negeri 1 Petarukan and the sample of the research product trial was 24 students of class XII MIPA 1 for small-scale trials and 100 students of classes XI MIPA 4, XI MIPA 5, and XI MIPA 6 for large-scale trials. The following is a series of 7 simple procedures for research on the development of biology learning media on psychotropic materials which are modified from the steps for using the R&D method shown in Figure 1.

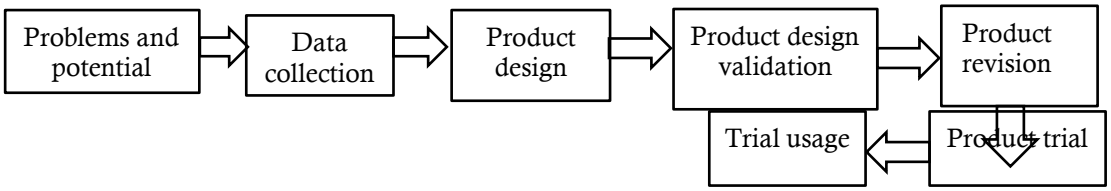

Figure 1. Research step

Sequentially, the following are the stages of data collection and the instruments presented in Table 1.

Table 1. Data Collection Instrument

Data	Instrument	Analysis	Source	Time
E-Comic eligibility data	Question naire	Media feasibility analysis	Media expert and materials expert	At the validation stage
E-Comic Effectiveness Data	Test Sheet	Effectiveness data analysis	Class XI MIPA 4, XI MIPA 5, and XI MIPA 6 SMAN 1 Petarukan	At the trial stage
E-Comic Responses Data	Question naire	Responses in using e-comic	Biology teacher, students of class XII MIPA 4, XI MIPA 4, XI MIPA 5, and XI MIPA 6 SMAN 1 Petarukan	At the trial stage

The data on feasibility and data responsive to the e-comic were analyzed using the Sugiyono (2019) formula as follows:

$P = \frac{f}{N}$ x 100 %

Description:
P = percentage of score obtained
f = total score obtained
N = maximum score

Based on student test scores, the completeness of student learning outcomes based on KKM (Minimum Completeness Criteria) in Petarukan 1 Public High School was 70. Then the percentage of success indicators (IK) obtained was calculated using the following formula.

$$\text{IK} = \frac{\Sigma students\ with\ grades \geq (70)}{\Sigma Total\ student} \text{ x } 100\%$$

The criteria for the effectiveness of e-comic media in the learning process are said to be effective if the completeness of the learning outcomes test meets the criteria as much as 85% of students have achieved KKM as stastsssss stated by (Mulyasa, 2009).

RESULTS AND DISCUSSION

The results of the product development in this study were in the form of e-comic media as a medium for learning biology in psychotropic material for high school students. The developed e-comic was in the form of a pdf file which was easy for students to access using a smartphone. The e-comics developed include covers, table of contents, character introduction, instructions for using e-comics, and main material.

Based on the results of the analysis of e-comic validation instruments by media experts and material experts it is known that the developed e-comic media is very suitable for use as a learning medium. The feasibility results of e-comics by experts are presented in Table 4.

Table 4. E-Comic Eligibility Results by Experts

Validator	Total Score	Score Percentage	Criteria
Media Expert	71	93,6%	Very Valid
Material Expert	71	88,8%	Very Valid

Media experts are of the opinion that in general, e-comic media is good. The appearance of e-comics, especially components such as letters, colors, layout, and illustrations, is correct. According to Arsyad (2017) visual components such as illustrated images and aligned text help convey the information they contain. Visual media such as e-comics can support understanding of the material because of the interesting illustrations that can increase curiosity. In line with what was stated by Usman & Asnawir (2002) that interesting media can make students learn better so that students' understanding can increase. In addition, students were also given convenience in accessing e-comics because those were practical and simple. Sentences are arranged according to the age of the student, namely the high school level.

Material experts are of the opinion that the material presented is in accordance with the ability level of students. In addition, there is interaction (stimulus and response) so that the material is easy to understand. Clarity of language, suitability with good and correct Indonesian language rules, as well as the language in e-comics according to the student's developmental stage. This showed that students had no difficulty in using e-comic media, which means that these students easily understand psychotropic material.

The effectiveness of e-comic learning media was seen from student learning outcomes. The final test is carried out at the end of the learning activity with the aim of measuring knowledge of the material that has been taught (Matondang, 2009). Student learning outcomes after using e-comics can be seen in Table 5.

Table 5. Percentage of classical completeness

	Class XI MIPA 4	Class XI MIPA 5	Class XI MIPA 6
Total Students	35	33	32
Number of students completed studying	34	30	29
The number of students who did not finish studying	1	3	3
Classical completeness	97%	91%	91%

The classical completeness of students in class XI MIPA 4 was 97%, class XI MIPA 5 was 91% and class XI MIPA 6 was 91%. Based on the results of the percentage of students' classical completeness, it shows that the application of e-comics as a learning medium in psychotropic material for the three classes was effective, because it shows positive behavior changes in students at least as much as 85% of students have achieved KKM as stated by (Mulyasa, 2009).

During the learning process, student learning outcomes were influenced by students' ability to understand e-comics and student activity. Differences in student learning outcomes of the three classes were influenced by the activeness of students when discussing. Based on the results of observations of student activities, students in class XI MIPA 4 were the most active class in discussions compared to students in class XI MIPA 5 and XI MIPA 6. In line with Zakiah's opinion (2017) states that students who are active in the learning process will be superior to students who are not active, and also the acquisition of learning outcomes obtained will certainly be different.

Student responses were obtained from 100 respondents in class XI MIPA 4, XI MIPA 5, and XI MIPA 6 SMA Negeri 1 Petarukan. Data on the results of student responses to e-comics are presented in Table 6.

Table 6. Student responses

Persentage (%)	Criteria	Amount
$80 < x \leq 100$	Excellent	98
$60 < x \leq 80$	Good	2
$40 < x \leq 60$	Fair	-
$20 < x \leq 40$	Weak	-
$0 < x \leq 20$	Fail	-

Based on the responses from 100 students in class XI, a total percentage of 98% was obtained, with the lowest percentage being 77% and the highest being 100%. The results obtained indicate that e-comic media was very well used by students in the learning process, because more than 80% of students respond positively to learning using e-comic media.

Based on the results of the analysis of the teacher's response to e-comics, it is known that the developed e-comics are very well used for the learning process. The percentage results from the two teachers were 94% and were in the very good category. The results of the teacher's response can be seen in Table 7.

Table 7. Biology Teacher Responses

No.	Teacher	Persentage	Criteria
1.	Teacher-1	94%	Excellent
2.	Teacher-2	94%	Excellent

The positive response of the teacher in general explains that e-comic media was very good to use as

a learning medium. The results of the teacher's response to the use of e-comics as a learning medium show that the material presented in e-comics had attractive data that could help students achieve learning goals. This is because the combination of images, colors, and writing in e-comic media was interesting. The use of simple sentences and language appropriate to the stage of student development, so that students could be assisted in building understanding of the material. This is in line with the opinion of Sadiman *et al*., (2014) which explains that the benefits of e-comics are good for use as learning media, one of which can overcome the limitations of the senses, space, and time.

CONCLUSION

Based on the results of the research and discussion it can be concluded that e-comics are appropriate for use as learning media on psychotropic material. Student learning outcomes with the application of e-comics from the three classes are effectively used in the learning process.

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