



THE USE OF COMIC AS A LEARNING MEDIUM FOR ECOLOGY

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Abstract

This research aimed to determine the feasibility of comics as media of learning on ecology materials in class X SMA. The research method was descriptive research and the descriptive research which used was survey method, while the research instrument was validation sheet. Assessment of validity was done by 5 validators. The media validation sheet consists of seven aspects: physical, design and color, drawing and writing, material content, conformity with learning objectives, simplicity, also messaging design elements. The results showed that the average validation of each aspect was 0.99 and CVI value (content validity index) also 0.99. It can be concluded that the comics is valid to use as a media in learning on ecology materials.

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INTRODUCTION

Technology is a medium which supports the improvement of quality education. The development and innovation of education can develop through the development of science and technology. In this case, teachers can implement some approaches, model, method, and learning media to make the learning process effective and efficient.

Actually, learning media is a helping tool used by teacher in the learning process (Afriana *et al.*, 2013; Nurbaiti *et al.*, 2017). Furthermore, Sanjaya (2013) states that learning media allows students to obtain knowledge. Hence, the use of media in education is essential to advance the quality of learning process (Sudjana & Rivai, 2013).

Learning media has a lot of advantages. Media can attract students to learn, ease them in understanding the materials, make the learning process more efficient, and activate students to be more active in learning. In the learning process, teacher can include observation, action, and demonstration (Sudjana and Rivai, 2013).

Comic is an example of a learning media. Comic is an animated product with character and chronological storyboard to entertain the reader (Sudjana and Rivai, 2013). Besides, Sutrisna and Mansoor (2015) states that educational comic is currently developing. Educational comic is unique. The medium has story which contains educational information for students to learn.

Akbar and Raharjo, (2015); Zain *et al.* (2013); Yulianti *et al.* (2016); Purwanto and Yuliani (2013) prove that students like to learn using comic. In Zain *et al.* (2013), comic has a lot of advantages, which are using daily languages and communicative for the students. The story inside of comic is also relevant to students' daily life.

In relation to learning ecology, initial interview to biology teacher shows that teachers' learning medium is not variative. The used media are commonly in power point presentation and learning video. The scope of ecology include ecosystem, flows of energy, cycle of biogeochemistry, and the interaction in the ecosystem. In line with the objective of the education, it is important to propose comic as a learning medium for ecology. It is expected that the medium can accelerate the learning process.

METHODS

As in Dantes (2012), this research is a descriptive research. The research follows the sequences of preparation, execution, and final steps.

Preparation

The steps of the preparation are: (1) school observation, (2) analyzing the syllabus for Senior High School students for ecology and designing the comic, (3) producing the initial design for the storyboard.

Execution

The steps for the execution are: (1) the arrangement of media. The creation of the media includes the modification of the comics according to Hamida *et al.* (2012). The steps in the creation of the media includes analysis of learning objective, the decision of the theme, the content of the comics, the formulation of the materials, the characters, the text and pictures, validation, revision, and the printing of the medium. This comic is made using online application called *toondoo*; (2) the validation of comic by five validators. The measured aspects of the validation are based on Saputro (2015) and Sanjaya (2013), which are the physical, design and color, fonts and picture, contents, the relevance to the learning objectives, the effectiveness of the media, and the message delivery; (3) revision of the comics based on the validation.

Final Steps

The final steps describes the validation of the comics. The analysis uses the content validity ratio (CVR) in accordance with Lawshe (1975). After measured using CVR, the researcher counts CVI (content validity index). The criteria of validity according to both criteria are: if the medium is "valid", the medium is proper to use; if the medium is "valid enough" the media needs revision; if the media is "not valid", the media is not proper to use.

RESULTS AND DISCUSSION

An important component in the learning process is learning medium. The use of medium is desired to advance the quality of the learning process (Sudjana & Rivai, 2013). Comic is a media which can improve the quality of teaching and learning process (Purwanto & Yuliani, 2013);

Novitasary *et al.*, 2014; Akbar & Rahardjo, 2015; Nurlatipah *et al.*, 2015; Utariyanti *et al.*, 2015; Panjaitan *et al.*, 2016; Survia *et al.*, 2016; Nurbaiti *et al.*, 2017). Moreover, Nurlatipah *et al.* (2015) reports that students' learning outcome improves in more significant way than using the orthodox lecturing process.

In accordance to media development, a learning medium needs fit and proper test before the use of it in the fields. The validation of the learning medium shows that a medium is proper to use for the students and teachers in education (Panjaitan *et al.*, 2016; Nurbaiti *et al.*, 2017). Table 1 shows the result of validation to the medium in this research.

From Table 1, the CVR and CVI of the medium are 0.99, which is "valid". The result means that the medium is proper enough to use for the material of ecology.

Physical Aspect

There are three physical aspects of the medium, the attraction, the shape, and the cover. The validation of the aspects obtains the average CVR score of 0.99 (valid).

In terms of attraction, the comic obtains the score of 3.6. The score shows that the medium is interesting for the students. The printed medium is also easy to access. The result supports Utariyanti *et al.* (2015), that comic is accessible for students to use whether online or offline.

For the shape of the comic, the average score is 3.6, which is the standard score of a learning medium. According to Sutrisna and Mansoor (2015), the common formats of the educational comic are 22 cm x 15 cm and 24 cm x 18 cm. In this research, the used comic is in the size of 14 cm x 21 cm.

Table 1. The validation of comic as a learning medium

Aspects	Criteria	Validator					CVR	Note
		1	2	3	4	5		
Physical	1. Type of the comic	3	3	4	4	4	0.99	
	2. Shapes of the comic	3	4	4	3	4	0.99	
	3. Quality of the cover	3	4	4	4	3	0.99	
Design and Colour	1. The colour of the cover	4	3	4	3	3	0.99	
	2. Overall colour	4	3	4	3	4	0.99	
	3. Design and cover of the comic	4	3	4	3	4	0.99	
	4. Paper of the comic	3	3	3	3	4	0.99	
Picture and Text	1. Pictures	3	3	4	4	4	0.99	
	2. Pictures, in relevance to the materials	4	4	4	4	3	0.99	
	3. Clarity of the text	4	3	4	4	4	0.99	
	4. Size of the text	3	3	4	4	4	0.99	
	5. Font of the text	4	3	4	4	4	0.99	
	6. Language of the text	4	3	4	4	4	0.99	
Content	Systematic and relevant to the materials	4	3	4	3	4	0.99	
The relevance to the learning material	1. Correlation with Basic Competence	4	4	4	4	4	0.99	
	2. Correlation with the indicators	4	4	4	4	4	0.99	
	3. Correlation with the learning objective	3	3	3	3	4	0.99	
Effectiveness	1. Easy to understand	3	3	3	4	4	0.99	
	2. Simplicity in the design	3	4	3	4	4	0.99	
Message delivery	Easy to understand	3	4	4	4	4	0.99	
CVI							0.99	Valid

Note:

CVR = Content Validity Ratio

CVI = Content Validity Index

For the cover, the comic obtains the score of 3.6. The researchers use glossy paper, the standard paper for comic or pictures according to Novitasary *et al.* (2014). The result of the printing using this paper is brighter and lighter on a white paper.

Design and Color

The design and color of the aspects has four criteria of validation, which are the cover of the comic, the overall colour, the design and cover of the comic, and the type of the paper. The aspect got the score of 0.99 for CVR, which is valid, and the score of 0.99 to each sub-aspect.

The cover and the color of the comic get the score of 3.6 or can be categorized as interesting and colorful. The result is similar to Utariyanti *et al.* (2015) that a colorful and matterful comic can make students motivated and interested to learn.

The design and cover of the comic obtained the score of 3.6. The type of the paper is in the level of 3.2.

Pictures and Texts

There are six criteria of the aspect, which are the picture, the picture (in relevance to the materials), and clarity of the text, size of the text, fonts, and the language. The validation of the learning medium shows that the picture and text obtain the average score of 0.99, or valid, and each criteria obtained the CVR of 0.99.

The overall impression to the picture gets the score of 3.6 for the display and 3.8 for the materials. In Utariyanti *et al.* (2015), the picture in a comic is proven helpful for students to learn.

The overall score to the text show the score of 3.8 for the clarity, 3.6 for the size, 3.8 for the fonts, and 3.8 for the language. The result shows that the text and its language is easy for students to read. The language is simple that students can comprehend the materials well. The result supports Purwanto and Yuliani (2013), that sentences or words in comic is made very simple that it helps the students to learn in simple, packaged, clear, and solid way.

Content

The content of the materials consists of the systematicity and clarity of the materials. The validation of the media in the comic obtains the score of 0.99 for the CVR. The systematicity of the text helps the students to master the materials of ecology. The result is similar to Purwanto and Yuliani (2013) that an ordered material in a comic is easily understood by the students. Further, Panjaitan *et al.*

(2016) states that comic is systematic and easy for students to learn its content.

The Relevance to the Learning Materials

The aspect has three criteria, which are basic competence, indicator relevance, and the objective of learning process. The validation of the comic obtains the score of 0.99 for CVR and the score of 0.99 for each criterion.

The suitability of the content with the materials are explained as: the basic competence got the score of 4, the indicator got the score of 4, and the objective of the learning process got the score of 3.2. Sanjaya (2013) mentions that there should be a correlation between the learning material and the learning medium to obtain optimum outcome in the learning process.

Effectiveness

There are 2 sub-aspect for the effectiveness, the ease of the materials and the simplicity of the design. The validation of the media shows the average CVR score of 0.99 and the score of 0.99 for each sub-aspect.

The delivery of the materials is simple that obtain the score of 3.4. Meanwhile, the average score for the simplicity is 3.6.

Delivery of the Message

The information of the comic is easy to understand. The aspect obtains the score of 0.99, which is valid. The result shows that the materials is communicated well, accurate, and effective for students to learn. The result is in accordance with Sanjaya (2013) that the criterion for the packaging of medium is whether the material is understandable or not. In order to ease the students, the information should contain picture and caption.

CONCLUSION

The proposed comic is valid and proper to use for the teaching of ecology.

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