



Development of Static Fluid Multimedia Based on Comics Adobe Photoshop and Comic Life Deluxe

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Abstract

Physics textbooks used in learning present more descriptions than pictures, making them less attractive to students. This disinterest causes students to be less interested in reading physics books. Using comics as a learning medium is an alternative to attract students' interest in reading physics books. However, from the field and literature studies conducted, only a very few comics contain learning materials, especially physics materials. This type of research is research and development research using the Borg and Gall model which has been modified according to needs in the field. For this reason, physics comics need to be redeveloped with more colorful pictures, dialogue that is easier to understand and more in-depth material. The results of the perception questionnaire analysis conducted on 24 students of class and the percentage of aspects of using comics in student learning activities is 86% (very good).

Keywords: Comics; Learning media; Static fluid

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INTRODUCTION

Education is a process for someone to hone and develop their talents by providing freedom and fulfilling everything that students need in the process. Education involves learning activities and learning processes. Apart from that, education requires efforts to help students develop all their potential (heart, mind, taste, and will, as well as body) to face the future (Yamin & Antasari, 2008). Meanwhile, according to Syah (2013), education is basically a conscious effort to develop the potential of students' human resources by encouraging and facilitating their learning activities. One of the levels of education that students pass is studying physics. Physics subjects at the senior secondary education level are subjects that tend to be considered as subjects that are difficult for students to understand and understand, so that learning takes place less than optimally. According to Mustikan (2013), in order for the learning process to take place optimally, teacher creativity is needed, especially in selecting and using teaching materials that suit students' development and needs. One of the important needs for students in the learning process is textbooks. Textbooks help students learn both individually and in groups, during class hours and in students' independent activities.

Physics textbooks used in learning present more descriptions than pictures, so they are less interesting for students. As is known, the aim of learning Physics according to Kulsum & Nugroho (2014) is to enable students to develop experience to be able to formulate problems. Students can master physics concepts and their relationships and are able to use scientific methods based on a

scientific attitude to solve related problems in everyday life. However, students' lack of interest in reading books hinders the achievement of the objectives of physics learning. Students' disinterest in Physics textbooks causes students to be lazy about reading them. According to Doman (1986) that all teaching and learning processes are actually based on reading activities. This causes students' low interest in reading Physics books, even though reading is a very important activity.

Low interest in reading causes student learning outcomes to be less than optimal, learning activities are low, and mastery of concepts is also low. Thus it can be concluded that children's high interest in learning will ultimately achieve satisfactory learning outcomes (Pangestu, 2015). Interest is a feeling of preference and interest in something or activity without anyone telling you to. Interest is basically acceptance of a relationship between oneself and something outside oneself. The stronger or closer the relationship, the greater the interest (Mahyudi, 2012). Students' lack of interest in reading or interest in learning is shown by students' lack of enthusiasm for learning, submitting assignments not on time, asking and answering questions is low and students' grades are still far from expectations. According to Larson (2009) Students sharing those perceptions will feel more comfortable and liked in this setting, will express more positive attitudes towards teachers and the school. In response to this, it is necessary to have quality and attractive learning media to support teachers' tasks and motivate students to learn, for example comics.

Using comics as a learning medium is an alternative to attract students' interest in reading physics books and can help students understand physics concepts independently. Darmawan (2012) stated that "comics are telling stories or expressing ideas with pictures. Meanwhile, Sudjana and Riva'i (2002) define comics as "a form of cartoon that reveals characters and acts out a story in a sequence that is closely connected with images and is designed to provide entertainment to readers". The use of comics in the Physics learning process is to stimulate students' motivation and interest in a Physics subject which is considered difficult for the students to understand.

There has not been much development of Physics comics as a learning medium. From the results of observations of the physics comics that have been made, there are several important things to note, namely the lack of use of color, dialogue between characters that is less interesting, and physics material that is not discussed in depth. Therefore, it is necessary to re-develop Physics comics as a learning medium to correct the shortcomings of previous comics in Static Fluid material.

The static fluid material was chosen because the physics concepts presented in this material are closely related to students' daily lives, so that students as comic readers can easily understand the content of the comic which is conveyed through pictures and dialogue between the characters in it. Apart from that, as far as observations have been made there has been no development of comics on static fluid material but only on material that is still related, namely on Pascal's law material.

RESEARCH METHODS

This research is a research and development study, where in its implementation it will adapt the Borg and Gall development model. According to Sukmadinata (2011), research and development is a process or steps to develop a new product or to perfect an existing product and can be accounted for. Meanwhile, the development of the Borg and Gall (1983) research and information collection model (preliminary research and information gathering) is the basis for carrying out development so that it is assumed that the development product is more appropriate for answering service needs and solving service problems. Puslitjaknov (2008) stated that the development model used by Borg and Gall consists of ten steps, but can be modified according to needs in the field.

The test subjects (respondents) selected in this research were students of SMA Negeri Titian Teras H. Abdurrahman Sayoeti class XI MIA 5. This is because SMA Negeri Titian Teras H. Abdurrahman Sayoeti is one of the schools implementing the 2013 curriculum in Jambi province. In this research, the types of data taken are qualitative data and quantitative data. Qualitative data was obtained from validators, namely material experts and media experts, sourced from suggestions and input for improvements in the previously completed questionnaire. Meanwhile, quantitative data was

obtained from filling in scores on questionnaires by students as test subjects (respondents).

In this research, a questionnaire will be used as a data collection instrument. "A questionnaire is a list of questions given to respondents to explore data according to research problems" (Damayanti, 2013). The questionnaires used in this research were structured questionnaires and closed questionnaires. According to Sukmadinata (2007), structured questionnaires are arranged in a structured manner where, apart from the main questions, there are also questions and sub-questions in the questionnaire. Meanwhile, closed questionnaires are questions or statements that have alternative answers (options) that the respondent just has to choose.

The development stages of this Physics comic will be carried out in seven development steps which are an adaptation of Borg and Gall's ten development steps. The first stage is Preliminary Research and Preliminary Data Collection (Prasurvey) which is included in the initial stage.

The second stage is planning, based on the analysis of student needs above, a comic is created based on the static fluid syllabus and learning objectives which refer to the 2013 curriculum. The comic must be in accordance with the core competencies, basic competencies and indicators of Physics learning achievement. Next, the third stage is Initial Product Design with the process of (1) Creating a comic script. (2) Install Adobe Photoshop and Comic Life Deluxe programs. (3) Edit suitable and appropriate images using Adobe Photoshop. (4) Arrange panels according to the storyline and add text and other effects to the comic using Comic Life Deluxe. (5) Change the format of the comic created to .jpg then transfer it to Microsoft Word, and (6) Print the comic that has been created. After that an evaluation is carried out, according to Aunurrahman (2009), "Evaluation is a data collection activity to measure the extent to which the objectives have been achieved".

The fourth stage is the initial trial. The initial trial is carried out by testing the validity of the product that has been made. Next, the fifth stage is media revision. According to Puslitjaknov (2008), the basis for making a decision whether a product needs to be revised or not comes from the conclusions drawn from the results of product data analysis that has been tested. The sixth stage is Field Trial. According to Asyhar (2010) field trials are needed to see the suitability and effectiveness of media products that have been made to the conditions and realities in the field. The data analysis technique used in this development is the triangulation technique. According to Sugiyono (2014), "Triangulation in credibility testing is defined as checking data from various sources in various ways and at various times.

RESULTS AND DISCUSSION

The Physics Comic that has been created is then validated by the validator. Validators will provide suggestions, criticism, assessments, opinions and input on the Physics comics that have been created. The validation results by the validator are as follows:

a. Media Aspect

Table 1. Results of Tringulation of Media Aspects in Validation

Assessment Aspects	Indicator	Results Tringulation Stage I	Results Tringulation Stage II	Results Tringulation Stage III
Appearance Cover	The combination of text color and <i>background</i> is suitable	Add comic image references to the back cover. Change the color to match the image.	No There is revision	No There is revision
Appearance	The variety of images is good	Improve dam image page 10	Improve comic	No There is

picture			images on pages 24, 25 and p 28	revision
Channel Story	The storyline is easy to understand.	Fix the Storyline	No There is revision	No There is revision
	The storyline makes the reader curious	Correct the storyline on page 2 Correct the name of the person the comic character is talking about	Repair channel story on page 23	No There is revision
	The storyline is logical and related	Improve the page's Storyline 1, 6, 7 and page 33	Improve the storyline on page 21	No There is revision
Language and Writing	The language used is easy to understand and comprehend	Correct the sentence in the page dialog box 1, 4, 5 and page 33	Fix pages 1,7 and 10 On page 5, replace the sentence "general equation of pressure" to "pressure on generally".	No There is revision
	Appearance <i>Lay out</i> and dialog box	The dialog box used is suitable and appropriate	Correct the shape dialog box on page 3 and page 5	No There is revision

In table 1, validation of media aspects from stage I to stage III shows that for the cover display, image display, story line, language and writing as well as Layout and dialog box displays only in phase I and phase II must be revised in accordance with suggestions from validator. Meanwhile, in stage III, no revisions are needed, this shows that for the media aspect there are no more revisions and the product is ready to be used.

b. Material Aspects

Table 2. Results of triangulation of material aspects in validation

Aspect Evaluation	Indicator	Results of Phase I Tringulation	Results of Phase II Tringulation
Contents	The content of the material has a clear and precise concept	Correct the word "the same" to the word "big".	No revisions
		Correct the equations and units created in the comic.	

	The order of the material is correct	Adjust the order of explanation of the material on page 7.	No revisions
	Flexible storyline towards users	Page 6 no Need	No revisions
Language	The language used is easy to understand student.	Correct the sentence in the dialog box page 7.	No revisions
	Sentences used to explain the material precisely and correctly	Repair explanation material about fluids on the page 4.	No revisions

In table 2, validation of material aspects in comics from stage I shows that for content validation there are several words that must be corrected and for language validation there are several sentences that must be corrected. Meanwhile, in stage II, nothing needs to be revised, either validating content or language.

c. Student Perceptions

Table 3. Percentage of media effectiveness, learning motivation, and student learning activities

No	Aspect	Percentage	Category
1	Aspect Effectiveness Use Comic As a Learning Media	79.7%	Good
2	Aspects of Using Comic Media on Student Learning Motivation	81.5%	Good
3	aspect use comic to activity Study student	86%	Very good

In table 3, the percentage of media effectiveness, learning motivation and student learning activities is known to be in the categories of good, good and very good. The appearance of the comic is as follows:



Figure 1. Revision of the front and back cover views

Testing the feasibility of comics that will be tested in the field uses media validation tests and material validation tests. The validator will provide suggestions, criticism, assessments, opinions and input on the physics comics that have been created, then the comics will be revised after being analyzed first so that the Physics comics are suitable for use by students when learning Physics, especially on Static Fluid material.

Corrections and validation from the validator team received a good response from the validator team. However, there are several inputs and suggestions in developing the Physics series comic media, both in the form of media appearance and material presentation which includes the appearance of the front and back covers, story line, arrangement of dialogue boxes, image form, explanation of material, sentence structure, sentence writing, formula writing, and questions. So revisions and improvements are made according to these suggestions and input before field trials.

Physics Comic Media has been revised according to suggestions from a team of experts. The Physics Comics were revised in terms of image appearance, story line, dialogue box form, dialogue box arrangement, order of material explanation, sentence writing, word and character name writing, picture form, equation writing and problem solving writing. In the opinion of the expert team, the physics comic media that has been created is declared suitable for production. This is in accordance with the opinion of the 2 validation teams who have validated the physics comic media. Meanwhile, according to the respondents' opinion from the questionnaire that was distributed to class XI MIA 5 students at SMA Negeri Titian Teras H. Abdurrahman Sayoeti.

CONCLUSION

From these results it can be concluded that there is a positive response from students with the physics comic media that has been created. Apart from that, there is an increase in the percentage of perceptions from the same previous research. This is because the comics being developed are made with full color content and a wider range of material than previous developments. Thus, this physics comic media is effective and suitable for use as a physics learning media on static fluid material for class X high school.

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REFERENCES

- Asyhar, Rayandra. (2010). *Kreatif Mengembangkan Media Pembelajaran*. Jambi: Universitas Jambi.
- Aunurrahman. (2009). *Belajar dan Pembelajaran*. Bandung: CV Alfabeta.
- Borg, W.R. & Gall, M.D. Gall. (1983). *Educational Research: An Introduction, Fifth Edition*. New York: Longman.
- Darmawan, Hikmat. (2012). *How to make Comics Menurut Para Master komik Dunia*. Jakarta: PT. Bentang Pustaka.
- Doman, Glenn. (1986) *.Mengajar Bayi Anda Membaca. Terjemahan Ismail Marahimin*. Jakarta : Gaya Favorit Press.
- Kulsum U & Nugroho. (2014). Penerapan model pembelajaran cooperative problem solving untuk meningkatkan kemampuan pemahaman konsep dan komunikasi ilmiah siswa pada mata pelajaran fisika. *Unnes Physics Education Journal. UPEJ*. 3 (2). Hal 73-78.
- Larson, E. Jonathon . (2009) *Educational psychology: cognition and learning, individual differences and motivation*. New York: Nova Science Publishers, Inc.
- Mahyudi, Surya. (2012). Peranan gaya mengajar guru fisika terhadap minat belajar fisika Siswa kelas IX MTs Istiqlal delitua. *Jurnal pendidikan fisika..* Vol 1.No 1.
- Mustikan. (2013). Penggunaan Bahan Ajar Komik untuk Meningkatkan Belajar IPA dalam *Seminar Nasional Lontar Physic Forum*. Jepara. 2013.
- Pangestu. (2015). Pengaruh minat terhadap hasil belajar Matematika siswa SMA Negeri 1 Uluiwoi Kabupaten Kolaka Timur. *Jurnal penelitian pendidikan Matematika*. 2015. Vol 3. No 2.
- Puslitjaknov. (2008). *Metode Penelitian Pengembangan*. Jakarta: Departemen Pendidikan Nasional.
- Sudjana, N. dan Riva'i, Ahmad. (2005). *Media Pengajaran*. Bandung: Sinar Baru Algesindo.

- Sukmadinata, N. S. (2011). *Metode Penelitian Pendidikan*. Bandung : Pt Remaja Rosdakarya.
- Syah, Muhibbin. (2013). *Psikologi Pendidikan*. Bandung: PT Remaja Rosdakarya
- Yamin & Antasari. (2008). *Teknik Mengembangkan Kemampuan Individu Siswa*. Jakarta: GP Press