

**THE DEVELOPMENT OF EDU COMIC TEACHING MATERIALS
ABOUT HUMAN DIGESTIVE SYSTEM MATERIALS ON 5TH-GRADE
ELEMENTARY SCHOOL**

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Article Info	Abstract
<p>History: Submitted July 12th, 2019</p> <p>Revised July 23th, 2020</p> <p>Accepted August 8th, 2020</p>	<p>This research is motivated by the needs for teaching materials that can explain human digestive system material concretely in the form of comics because with the combination of verbal and nonverbal language in comics can expedite students to understand the contents of the material. The purpose of this research is to describe how the process of developing teaching materials in the form of comics on the concept of the human digestive system for 5th-grade students of elementary schools. The research method used in this research is the research and development method. The data collection techniques used are literature studies and questionnaires, while the data were analyzed using descriptive analysis techniques by analyzing quantitative data and then interpreted in a qualitative. The results of research and development show that the process of comic teaching materials development on the material of the human digestive system goes through six stages namely data analysis, data collection, product design, product design validation, product improvement, and product trials. Moreover, the validity test of comic teaching materials on the concept of the human digestive system has a category of "very feasible" with design test results of 85%, material test results of 90%, and educational test results of 89.3%. While the trial results of 5th-grade students' responses were 88% and included in the criteria of "very good".</p> <p>Keywords: Teaching Material, Comic, Human Digestive System</p>

A. Introduction

Teaching material in the learning process is used as an intermediary to deliver messages to students. According to Jamaludin and Rachmatullah (2017) teaching material is a collection of subject matter arranged and packaged systematically in the form of both print and non-print that can be used in learning. based on the functional aspects, teaching materials can be divided into two types, namely as a learning resource that can be used directly and indirectly, the examples of learning resources that are used directly are textbooks, modules, handouts, and other key guidance materials. While the learning resources examples that are used indirectly are reading books, magazines, video programs, leaflets, posters, and comics of learning.

One of the teaching materials that can be used as the teaching materials in science learning is comics of learning (Edu Comics). The term of comics according to Badudu, JS (2009) is a story is a story depicted with pictures and written its story below the picture according to what appears in the picture. Comics can be used as teaching materials if the contents of the comics

have a close relationship with the learning objectives conducted (Edu Comics). Empirically students tend to prefer colorful and visualized picture books in both realistic and cartoon forms (Daryanto, 2016). Then from a journal written by Sari, Y (2017) express that the comics can be used as teaching material in high-level elementary school classes because of its shape can attract students' attention. Thus, this has become one of the stimulating factors to conduct the development of teaching materials in the form of comics. Other than that, based on research conducted by Thorndike (in Daryanto, 2016) known that the children who read more comics for example in a month at least one comic book, then it the same as reading textbooks in every year, this has an impact on students' reading ability and the mastery of vocabulary are far more than students who do not like comics. Then Lubis, A opinion in the journal he wrote, stated that comics are seen to able to increase students' reading interest to stimulate their understanding of learning (Lubis A, 2018)

Supporting teaching materials in the form of comics can be developed and adjusted to the needs of the applied curriculum. The use of comics as the teaching material can be applied on the material of the human digestive system. The human digestive system is one of the materials in science subject of grade 5 elementary school. The basic competencies of the material are to explain the digestive organs and their functions in animals and humans, and how to maintain the health of the human digestive organs. Moreover, the goals of the material are the students can mention the human digestive organs and explain the human digestive system. The materials must be arranged coherently and have a clear plot. Comics as the teaching materials are possible to be arranged coherently and have a clear plot. Besides that, comics are interesting and fun so it will generate students' interest and motivation to learn. This is supported by a journal written by Hidayah, N dkk (2017) based on the results of the research found that learning using comics are more fun for students compared to the teacher explanations. Then the research results' journal of Sukmanasa, E. dkk (2017) JPSD Vol. 6 No. 2, September 2020 ISSN 2540-9093 E-ISSN 2503-0558

and research of Fazriah, L. dkk (2016) found that learning using comics can increase students' interest in following the learning process and facilitate Moreover, the use of comics as a media and teaching material can increase students' motivation, as found on the research results' journal of Budiarti,NW. dkk (2016) which states that comics media significantly influence students' motivation. Therefore, comics are very appropriate to be used as teaching material, especially on the abstract and difficult concepts.

Based on the description above, the researchers are interested to develop teaching materials in the form of edu comics because comics use verbal and nonverbal language, so with the combination of verbal and nonverbal language in comics can expedite the reader to understand the intended content (Munadi, 2010). Moreover, according to Utariyanti, Z dkk (2015) the images in comics can help to encourage students to generate their interest in the lesson. Then the research journal of Al Adiyah, T dkk (2018) and Suciani, F dkk (2018) stated that the use of comics in the form of images can

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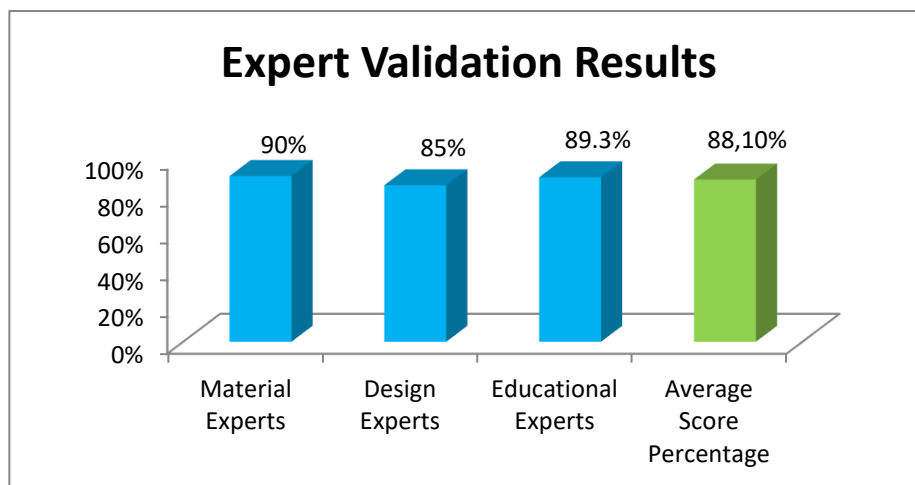
attract students' attention to learn so it will help students to understand the material presented. Agree with the statement above, Wahyuningsih (2011) argues that students tend to be interested to read the picture storybooks like comics compared to textbooks because comics have a coherent and systematic storyline that easy to be recall. Thus, comics as the teaching materials need to be developed in the form of edu comic teaching materials on the Human Digestive System material.

B. Research Methodology

The method used is a *research and development*, according to Syaodiah, S.N (2015), *Research and Development* is a process or steps to develop a new product or to improve an existing product that can be accounted for. Therefore, at the end of this Research and Development research will produce certain products after going through various validation tests. According to Emzir (2014) Developed products are used to find out certain needs with detailed specifications. The research development that will be taken refers to Borg and Gall development design with 10 steps. However, in this study using a research design that has been modified into 6 steps namely, (1) analysis of the problem; (2) data collection; (3) product design; (4) product design validation; (5) product improvement; (6) product trials (limited trials).

C. Research Result and Discussion

Based on the validation test results of teaching materials in the form of comics from material experts, design experts and education experts included in the “very feasible” category. The following is the scores acquisition explanation from each expert in diagram form.



Based on the diagram above, can be seen that the results of each experts' validation are averagely above 81% and get into "very feasible" category, however, in each validation results found some deficiencies that must be corrected so the developed comic edu teaching materials become better and in accordance with the teaching material eligibility standard.

The results of the material test validation obtained a score of 90% which is included in the "very feasible" category. The percentage score result of the feasibility test result by material experts which get into the "very feasible" category is due to the material presentation compiled in the form of comics are in accordance with the material presentation indicator namely the material on the comic teaching

materials is in accordance with the demands of basic competencies, the presentation of the materials is coherently arranged and equipped with the examples, facts, and clear picture illustrations, then the use of language based on the validation result has fulfilled communicative language elements. The language in edu comic should be communicative because this edu comic is a bridge between the author's idea with the reader. This is in accordance with Muslich's opinion (2010) who states that one of the feasibility indicators of comic teaching materials is the language that must be communicative, means that the language in edu comic teaching materials prioritizes communication between the writer and the reader.

Improvements in teaching materials based on validation by material experts are also found in the material contents, that is because there is no scientific explanation on how the works of the colon in digesting food. Before doing the revision on the colon, the researchers only used fictitious stories that told how to arrives at the colon horizontally without being accompanied by a scientific explanation of how food arrived at the colon horizontally.. Based on criticisms and suggestions by material experts, it should also be explained scientifically about how food arrives in the colon horizontally, not just focusing on fictional storylines. This is done to support the accuracy of the presentation of material on the teaching material developed. According to Muslich (2010) to achieve material accuracy, then a concept, principle, procedure, or formula must be made clear with examples, facts, and illustrations that are presented accurately..

Furthermore, the percentage score result from the results of the design experts validation is not much different from the results of the material test validation that is 85%, that number is

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already included in the “very feasible” category. The achievement of that score is due to the design of teaching materials in the form of comics that are in accordance with the feasibility indicators in the design aspects, namely the size of the book that is adjusted to the contents of the material and needs so it is easy to carry, then the covers and parts in the edu comics are designed with the appropriate color selection, color selection in the development of edu comics is very important, because according to Amelia J.D (2018) colors is the non-verbal communication that has meaning. Furthermore Arsyad (2010) states that color is an important element but should be used carefully so it has a good impact. Based on the validation results that the compiled edu comic teaching materials have complied with the appropriate color contrast selection elements. Then the layout of the text or pictures in this compiled edu comic, based on validation has fulfilled the good and attractive text layout or image layout, moreover on the depiction of the character's scene illustrations is in accordance with the story and the material so it arouses students' attraction to read. Even though this edu comic

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teaching material has been categorized as "very feasible" from the design aspect, but there are still some parts of the design in teaching materials that must be improved so the illustration images design contained in the teaching material can help in clarifying the material and not causing misinterpretation for the reader. As for the criticisms and suggestions were given by design experts is the additional pages that are the pages containing preface or introductory pages from the author on each type of book is not always have the same style and shape. Then the respondent validation of the design test also suggested that the accessories/background decoration on the character recognition page, basic competencies and indicators, objectives, and table of contents were deleted because the combination of the text arrangement and the background decoration design was less appropriate so it could disturb the reader's center point and hamper reader's understanding. This is in accordance with Muslich's opinion (2010) who states that in the activities of designing teaching materials the things that must be considered are the placement of

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decorations/illustrations on the page as a background should not interfere the clarity and delivery of information in the text so it can hamper students' understanding.

Besides the validation results of the material tests and design tests that have been explained above, the teaching materials development also requires the educational test validation. Based on the results of the educational test validation obtained a percentage score of 89.3% which get into the "very feasible" category. But, although of being included in the "very feasible" category there are still some deficiency that needs to be fixed. Improvements in teaching materials that need to be done by researchers based on criticism and suggestions from the validation of educational tests about the comic suitability as the educational elements are still less appropriate, especially in the storyline should always be based on educational elements. Besides the use of language according to the validation results is still not in accordance with the development level of 5th-grade elementary school students. According to Lubis, A (2018) stated that the language characteristics that suit to the

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development level of 5th-grade elementary school students will facilitate to understand the learning objectives. In comics does not merely display the storyline but should contain educational elements, in this case, contains the learning objectives elements. Learning objectives will be easy to understand if the language characteristics match the development level.

Opinions from other experts who tested the elements on comic books (edu comics) state that comic books (edu comics) that are arranged on several parts are still not coherent and do not yet have an orderly plot, so it should be corrected. In the opinion of Maryani and friends (2018) the coherence and regularity of the plot is very important to the storyline is easier to be remembered so students are interested to read. If students are interested to read then this comic book (edu comic) will be a teaching material that is interested by the readers.

Based on the results' explanation on the above validation, it can be seen that the overall percentage score has included in the "very feasible" category, with the Furthermore, based on the JPSD Vol. 6 No. 2, September 2020
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product trial results on grade 5 elementary school students obtained a perception score of 88% which included in the "very good" category. The results were obtained from a variety of students response questionnaires with the lowest perception score of students' responses was 78% with "good" category and the highest perception score of students' responses was 100% with "very good" category.

Berdasarkan hasil tersebut respon siswa bervariasi terhadap produk, Based on these results, can be seen that students' responses vary towards the product, differences in the students' responses result because students are unique individuals and have different individual traits between students with one another. In one class there are no students who have the exact same characteristics, both intelligence, emotions, study habits, learning speed, and etc (Siddiq, dkk., 2008). However, overall the average perception scores obtained from the student responses results to teaching materials in the form of comics is 88% with the "very good" category. The obtain perception scores get into "very good" category because of every aspect of teaching materials

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feasibility test in the form of comics that were developed in accordance with feasibility indicators of teaching materials that refer to the content

appropriateness, the appropriateness of presentation, language appropriateness, and graphics appropriateness.

D. Conclusion

Based on the results of research and development can be concluded as follows:

1. Research and development of teaching materials in the form of comics is conducted in six stages, namely problem analysis, data collection, product design development, product design validation (expert testing), product improvement, and trial of the limited scale of products. The product produced in the form of comics' teaching materials on the material of the human digestive system for 5th-grade students of elementary schools.
2. The material test validation results get a score of 90% with a "very feasible" category, while the design test validation results get a score of 85% with a "very feasible" category, and the education test validation scores 89.3% with "very feasible" category. The average validation results obtained 88.1% with a "very feasible" category.
3. Based on the product trial results gets a perception score of 88% which included in the "very good" category.

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