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VALIDITY OF CONTEXTUAL TEACHING AND LEARNING *(CTL)* COMIC LEARNING MEDIA

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Abstract
The lack of student interest in learning mathematics is caused by the teaching materials used not being able to make students active so that student scores have not reached the Minimum Completeness Criteria (KKM). School teaching materials contain many questions with almost the same level of difficulty and solution methods so that students get a little bored of doing them. This research aims to develop mathematics learning media in the form of comics with *Contextual Teaching and Learning (CTL)* nuances to improve the mathematics learning outcomes of class VII students at SMP N 20 Jambi City. In this development it is expected to obtain valid mathematics learning media results. This type of research is development research that produces a product in the form of learning comics. The development of this comic uses the ADDIE model which consists of 5 stages, namely the Analyze, Design, Development, Implementation, Evaluation stages. The research subjects were class VII students of SMP N 20 Jambi City. Learning device validation was carried out by mathematics education experts and Indonesian language education experts. The overall validation results for comic media are very valid with a success rate of 85.52%. With this it can be concluded that the development of comic media with *Contextual Teaching and Learning (CTL)* nuances can be used as teaching material.

Keywords: Contextual Teaching and Learning; Validity; Comic Media.

1. Introduction

Mathematics is the mother of knowledge. Many scientists use mathematics as a tool to develop other sciences. Apart from that, we cannot deny that mathematics is very closely related to the life of human civilization, such as buying and selling transactions. Therefore, mathematics must be studied by students from elementary school (SD) to college. Therefore, students are required to understand mathematical concepts. Factors that influence students' understanding in learning mathematics are learning media that are less varied. Having a variety of media can arouse high enthusiasm for learning and interest in students, apart from that it can also arouse students' learning motivation, and even have a psychological influence on students. The use or utilization of media can also increase students' understanding of lessons at school. Media is used as a tool to help teachers in the teaching process, for example slides, photos, graphics, films, as well as learning using computers which are useful for capturing, processing and reconstructing visual and

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verbal information. As an aid in teaching, media is also expected to provide concrete experiences, motivation to learn, and increase students' learning absorption capacity.

As a result of the researcher's interview with the mathematics teacher at SMP N 20 Jambi City on October 31 2022, information was obtained that the media used in mathematics learning still uses Student Worksheets (LKS). From the researchers' observations, the appearance of the LKS was less attractive and colorless, making students feel bored and difficult to understand the concepts being studied. As a result, students' interest in learning mathematics decreases and this results in low student learning outcomes.

Teachers as educators must be able to utilize innovative learning methods and media, to create student learning motivation so that students are more active in learning activities. Teachers at least have material to use as media, so that students can be interested and understand learning easily. Efforts to increase students' interest in mathematics are by cultivating students to learn to read. Teachers play an important role in this effort, because the teaching materials used so far have not been able to make students active. The following is an example of a worksheet used in schools.

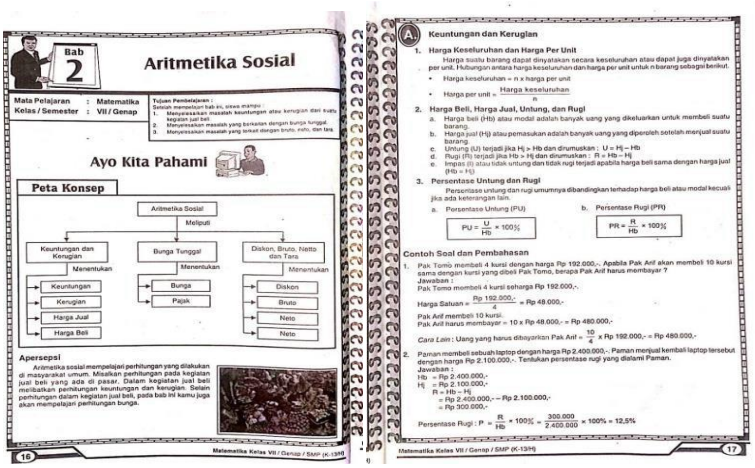

Figure 1. Teaching Materials Used in Schools

In Figure 1, it is necessary to add student activities in constructing their understanding, so that students are directly involved in learning. School teaching materials also contain many questions with almost the same level of difficulty and solution methods so that students get a little bored when working on them. Based on the information on the problems found, the researchers developed comics as a learning medium for mathematics subjects. This is because students need learning media that can stimulate their desire to read. One of the media that is popular with students is comics. The role of mathematics comic media will attract more students' attention, so that this can create motivation to learn.

Comics are a type of cartoon that, to entertain readers, displays characters and tells a story through a series of images that are closely related to each other. (Nugraheni, 2017). Comics are books that contain simple stories accompanied by funny pictures so that the contents are easy to understand and make comics popular with both children and adults. (Daryanto, 2010 : 27).

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Comics are a collection of coherent and continuous illustrated stories, divided into several panels and separated by aisles. In the comic there are word balloons containing the words conveyed by the characters in them and there is a narrative to provide an explanation which is in the form of a box and connected at the edge of the panel. Comic media is made with a Contextual Teaching and Learning (CTL) nuance to help teachers link the material they teach with students' real-world situations and encourage students to make connections between the knowledge they have and its application in everyday life.

2. Methods

This type of research is development research with the ADDIE research development model, which includes stages (1) Analysis; (2) Design*;* (3) *Development*; (4) *Implementation*; (5) *Evaluation*. This research aims to produce comic media for class VII SMP students. The development procedures in this research are based on the ADDIE development model, namely as follows.

a. Analysis
   1) Curriculum Analysis
   2) Analysis of student characteristics
   3) Needs analysis

b. Design

At this stage we start designing media according to the material that has been determined. *The* media design is also adjusted to the basic competencies regarding the material that has been determined. At the design stage, the learning media is designed well so that it is interesting for class VII SMP students.

c. Developmment

The action development stage carried out is creating and modifying teaching materials to achieve predetermined learning objectives (Pribadi: 2011). This stage includes the activities of selecting and determining appropriate methods, media and learning strategies to be used in delivering teaching material. The goal to be achieved at this development stage is to validate the learning media. The aspects to be validated can be seen from Table 1.

Table 1. Validation of Learning Media

No	Aspect	Method of collecting data	Instrument
1.	Planning	Provide validation sheets to mathematics teachers at SMP N 20 Jambi City, mathematics lecturers (material experts), and Indonesian language lecturers (linguist experts)	Validation Sheet
2.	Pedagogy		
3.	Fill		
4.	Ease of use		
5.	Language and readability		

Source: Evi Delviana (*2017:3*)

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The data analysis technique used in this research is quantitative data analysis technique. The instruments used are arranged according to a Likert scale pattern. which consists of five categories and questionnaire statements are positive and negative. Positive statements in the strongly agree category have the highest weight or score and the strongly disagree category have the lowest weight or score. On the other hand, negative statements for the strongly disagree category have the highest weight or score and the strongly agree category have the lowest weight or score (Baso Intang Sappaile, 2007:2). In determining the categories of a Likert scale, it can take the form: Strongly disagree, disagree, unsure, agree, strongly agree; or never, rarely, sometimes, often, always, depending on the concept to be measured (Baso Intang Sappaile, 2007:5).

In analyzing the data from the validation results in this questionnaire, the categories are very valid, valid, quite valid, less valid and invalid. The weighting or scoring for each category can be seen in Table 2 below.

Table 2. Learning Media Validity Questionnaire Scoring Scale

Category	Validator Checklist	Statement Score	
		Positive (+)	Negative (-)
Invalid	1	1	5
Less Valid	2	2	4
Quite Valid	3	3	3
Valid	4	4	2
Very Valid	5	5	1

Learning media validation test data using the Powtoon application were analyzed using the formula proposed by Riduwan in (Raudhatul Jannah 2017:433), namely: After the validation value percentage is obtained, grouping is carried out according to the criteria :

$$\textbf{Validity Value} = \frac{\textbf{Total score obtained}}{\textbf{Total score off all item}} \textbf{x100\%}$$

Tabel 3. Learning Device Validity Category

No	Achievement Level	Category
1	81– 100%	Very Valid
2	61 – 80%	Valid
3	41 – 60%	Quite Valid
4	21 – 40%	Less Valid
5	0 – 20%	invalid

Source: Riduwan (2010:13)

3. Result and Discussion

The results obtained from this development research are: (1) Comic learning media with Contextual Teaching and Learning (CTL) nuances, (2) Assessment of comic media by media experts and language experts by providing media validation questionnaires. In developing comic learning media with Contextual Teaching and Learning (CTL) nuances, researchers are guided by the ADDIE development model with the following stages:

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a. Analysis

1) Curriculum Analysis

To develop mathematics learning media in the form of comics with CTL nuances, researchers must first know the curriculum used at the school where this research will be conducted, namely SMP Negeri 20 Jambi City. The curriculum that applies at SMP Negeri 20 Jambi City is the 2013 curriculum. Mathematics material for class VII SMP according to the 2013 curriculum is material about integers, sets, algebraic forms, linear equations and inequalities with one variable, comparisons, social arithmetic, lines and angles, quadrilaterals and triangles, and data presentation. From several materials studied by students in class VII SMP at SMP Negeri 20 Jambi City, the material that researchers will use for mathematics learning media in the form of comics with a CTL nuance is social arithmetic. This material was chosen because based on initial interviews conducted with the class VII mathematics subject teacher at SMP Negeri 20 Jambi City, it was found that although the social arithmetic material was quite simple material, students still had difficulty learning the social arithmetic material, where students had difficulty learning internal operations. social arithmetic and working on story problems related to social arithmetic operations. Apart from that, another reason why social arithmetic material was chosen to be the material in the mathematics learning media in the form of comics with a CTL nuance is because social arithmetic material is closely related to students' daily lives, so that comic storylines can be created that relate to students' daily lives. .

The title of the paper should appear on the top edge of the first page of the document. Type the title in uppercase and lowercase letters, align left margin and in Times New Roman 16-point, boldface type. Capitalize the first letter of nouns, pronouns, verbs, adjectives, and adverbs; do not capitalize articles, coordinate conjunctions, or prepositions, unless the title begins with such a word. In case the title is two or more lines, single-space between the lines. Insert a blank single-spaced line after the title.

2) Analysis of Student Characteristics

Student analysis is a study of student characteristics. Analysis of student characteristics in this research was carried out on aspects of language development, academic ability background (knowledge), and students' learning methods. The results of the analysis will be used as a frame of reference in preparing learning materials.

Analysis of students' level of language development aims to be considered in compiling language/sentences in learning media. The results of the analysis obtained are, when learning, the language used is the national language (Indonesian), the language that students often use when talking to their friends is Indonesian and sometimes they use regional languages, as well as when talking to teachers and students. uses Indonesian, sometimes also regional languages. In this case, in the learning process it is better to use Indonesian which is easy for students to understand.

Analysis of academic abilities (knowledge) is used as a consideration in determining the level of difficulty of problems in learning media. The analysis of academic ability (knowledge) obtained is that the average student has low-medium ability, only a few people have high ability. Analysis of student characteristics during the preliminary study was carried out on class VII students of

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SMP N 20 Jambi City aged between 12-13 years. , of which 30 students are 15 female students with a percentage of 50%, and 15 students are male with a percentage of 50%.
Student characteristics can be seen in the way students learn during learning. The way students learn is used as a consideration in designing the presentation of learning media in the form of comics to invite students' interest in learning. The observation results obtained were that in the learning process not all students paid attention and listened to the teacher's explanation. Some male students are busy with their own activities. During the lesson, there were several students who were seriously paying attention to the teacher when explaining, several other students were busy writing while the teacher was explaining, there were also several female students busy talking with their friends, but when asked they couldn't answer.
This way of learning is also called learning style, according to De Poter and Hernacki in (Jeanete Ophilia P and Neleke Huliselan, 2016: 58 and 59) learning styles are divided into three groups, namely, visual, auditory and kinesthetic learning styles. From the results of observations of class VII students, it can be concluded that on average class VII students have a visual way/style of learning, so that in learning it is best to use learning media that contains images related to the material being studied.

3) Needs Analysis

This stage is carried out to identify all types of sources needed for development activities. The resources needed in this research include content resources and human resources. The content resource in this research is the mathematics book for class VII students of SMP N 20 Jambi City. At the school that will be researched, namely at SMP N 20 Jambi City, content resources are available, namely mathematics books for class VII middle school students, and all students in class VII as research subjects already have these books.
Human resources include class VII mathematics teachers at SMP N 20 Jambi City, material experts and language experts. To validate the mathematics learning media in the form of comics with Contextual Teaching and Learning nuances that have been developed along with their instruments, the class VII students of SMP N 20 Jambi City were studied.

b. Design

After the analysis stage, the design stage was carried out, namely to start designing mathematics learning media in the form of comics with CTL nuances on social arithmetic material in class VII SMP. This design is still contextual and will underlie the next development process. All the things needed to make a product according to the design are starting to be realized to produce a product that can be used in learning activities.

Following are the steps for creating comic learning media:

1) Cover

On the cover, the title of the comic that will be made is a mathematics comic with a Contextual Teaching and Learning nuance. Then on the comic cover page there are also characters used in the comic. The comic characters were designed by the researchers themselves, namely the characters of 2 boys and 1 girl. Then there is the applicable curriculum logo and props to add to the attractive impression of the comic cover page. Then there is also the name of the creator (creator) of the mathematics learning media in the form of comics with Contextual Teaching and

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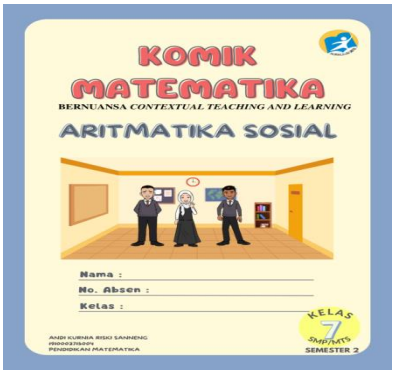
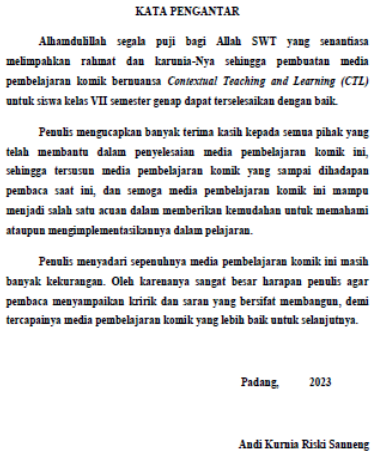
Learning nuances, namely the name of the researcher himself. The following is an image of the comic media cover.



Picture 1. Comic Media Cover

2) Foreword

The title of the foreword uses Times New Roman font size 12 and is in bold. The following is an image from the introductory page to mathematics learning media in the form of comics with a Contextual Teaching and Learning nuance



KATA PENGANTAR

Alhamdulillah segala puji bagi Allah SWT yang senantiasa melimpahkan rahmat dan karunia-Nya sehingga pembuatan media pembelajaran komik bernuansa *Contextual Teaching and Learning (CTL)* untuk siswa kelas VII semester genap dapat terselesaikan dengan baik.

Penulis mengucapkan banyak terima kasih kepada semua pihak yang telah membantu dalam penyelesaian media pembelajaran komik ini, sehingga tersusun media pembelajaran komik yang sampai dihadapan pembaca saat ini, dan semoga media pembelajaran komik ini mampu menjadi salah satu acuan dalam memberikan kemudahan untuk memahami ataupun mengimplementasikannya dalam pelajaran.

Penulis menyadari sepenuhnya media pembelajaran komik ini masih banyak kekurangan. Oleh karenanya sangat besar harapan penulis agar pembaca menyampaikan kritik dan saran yang bersifat membangun, demi tercapainya media pembelajaran komik yang lebih baik untuk selanjutnya.

Padang, 2023

Andi Kurnia Riski Sanneng

Picture 2. Foreword

3) List Of Content

The word table of contents uses Times New Roman font size 12 and is bold. The following is an image from the table of contents page on mathematics learning media in the form of a comic with a Contextual Teaching and Learning nuance.

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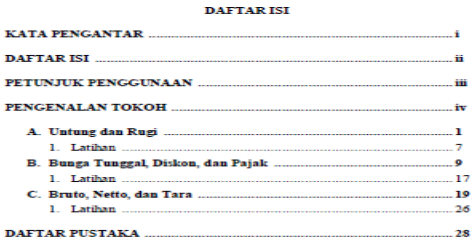

DAFTAR ISI

Picture 3. List Of Content

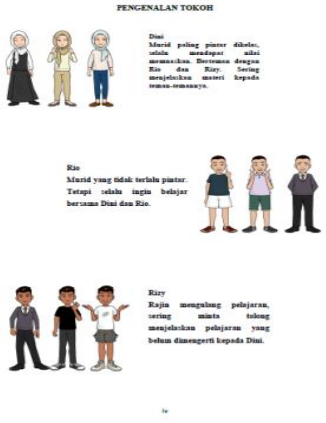
4) Comic Usage Guide

In the instructions for using the comic, two characters are used to explain how to use the comic. The following is an image of the instructions for using the comic.

Picture 4. Comic Usage Guide

5) Character Introduction

The characters in mathematics learning comics are made according to the development of middle school children. There are 3 (three) characters in this comic with different characters. The characters in this comic are characters that were designed by myself. The following is a picture of the character introduction.



Picture 5. Character Introduction

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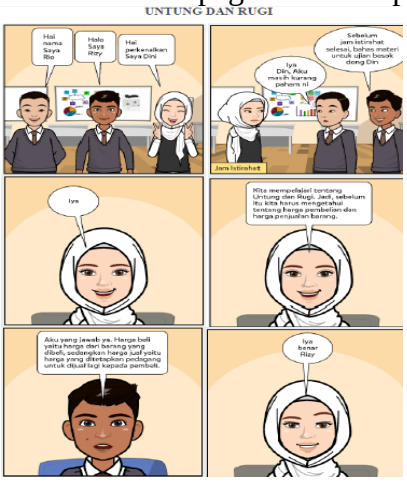
6) Comic Storyline

The activity carried out in this step is to design the content of the comic on social arithmetic material in class VII SMP. After creating a comic storyline related to social mathematics material. The sub-materials used in the comic storyline are: (1) Profit and Loss, (2) Single Interest, Discounts and Taxes, (3) Gross, Net and Tara. The storyline in comics is arranged in a layout. Comics are read from left to right. The storyline contains the daily activities of the characters related to social arithmetic.

In comics, before the comic storyline, a front page is created for each chapter, namely to separate the comic storyline and the comic table of contents page. On the front page of the chapter there is a chapter title that matches the title of the comic storyline, then there is a picture of the comic character. The following is a picture of the front page of the chapter.



Picture 6. Front page *Chapter*

c. Development

The aim of the development stage in the ADDIE model research is to produce and validate the selected learning resources. First, comic validation was carried out with 4 material experts. Namely material expert 1, material expert 2, material expert 3, and material expert 4. Evaluation of comic material pays attention to aspects of content appropriateness, language in the comic, as well as aspects of encouraging student curiosity and activity. The validation results of mathematics learning media in the form of comics by material experts can be seen in the following Table:

Table 4. Learning Media Validation Results from Material Experts

No.	Aspect	Persentage	Kategori
1	Planning	89,92	Very Valid
2	Pedagogy	87,5	Very Valid
3	Fill	88,75	Very Valid
4	Ease of Use	83,2	Very Valid
5	Language	78,33	Valid
	Average	85,52	Very Valid

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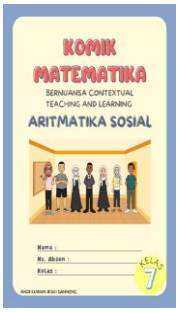
In Table 4, it can be seen that the results of the validation of learning media obtained from the expert assessment results for each aspect were 89.92% with a very valid category for the design aspect, 87.5% with a very valid category for the pedagogical aspect, 88.75% with a very valid category for the content aspect, 83.2% with a very valid category for the ease of use aspect and 78.33% with a valid category for the language aspect. Overall, the validation results for mathematics learning media in the form of comics were 85.52% with a very valid category. This shows that the mathematics learning media in the form of comics with CTL nuances is declared valid, so that the mathematics learning media in the form of comics is suitable for use as a medium in learning.

During the validation stage of this learning media, several revisions were made based on suggestions from the validator. Validator suggestions for this learning media can be seen in table 5 below:

Tabel 5. Validator Suggestions

Validator	Suggestion	Before Revision	After Revision
Material Expert III	1. There are only 3 characters in comics. 2. add curriculum, 3. add name, Student Identification Number and department.		
Linguist	Inaccurate writing		Already repaired

Based on table 5, it can be concluded that the validator provides input about the characters in the comic. In line with research conducted by (Budiarti & Haryanto, 2016) comic books with vivid images have a special attraction for children which helps them get involved and enjoy reading.

4. Conclusion

The research carried out was development research using learning comic media with Contextual Teaching and Learning (CTL) nuances. The material used is Social Arithmetic. Based on the device validation test which was carried out by five validators, it was stated that the learning comic media with Contextual Teaching and Learning (CTL) nuances produced was valid.

Comic media with Contextual Teaching and Learning (CTL) nuances in social arithmetic material can be used as a choice of teaching materials for class VII junior high school students. Comic learning media with Contextual Teaching and Learning (CTL) nuances in social arithmetic material can be used as a variation of independent learning that students can use

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