

# *Training on Making Comicstrip Learning Media with ADDIE Instructional Design*

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**Abstract**—This community service program was carried out at the Mathematics MGMP of Junior High School, Cisarua Commissariat, Bogor Regency, held at SMP Ciawi 1, Jl. Veteran III Banjarwangi Ciawi, Bogor Regency. The aim of community service is to provide knowledge about the development of comic strip learning media with ADDIE instructional designs. The implementation is by giving a comprehensive workshop with the target participants able to understand and make comic strips with ADDIE instructional designs. The first stage is the preparation phase. At this stage the team conducted a preliminary survey to find out the conditions of community service partners by analyzing the conditions of the place to be used, participants and compiling the design of activities with the junior high school mathematics MGMP, Cisarua Commissariat in Bogor Regency. The second stage is the implementation phase. The training activity was started by introducing the mathematics

teacher of MGMP Junior High School Commissariat Cisarua in Bogor Regency about the development of mathematics comics learning media. The team also provided information on how to develop media using ADDIE instructional designs. Then the training in making learning media is carried out using a learning model that is based on the project base learning model. The team and mathematics teacher work together to design learning media using ADDIE learning design. All participant activities are guided by the Abdimas team. The last stage was the evaluation phase of the activities that had been carried out, the enthusiasm of the participants was quite high with the presence of 64 participants and the activeness when participating in the activity.

**Keywords**—*learning media, comic strips, ADDIE*

## I. INTRODUCTION

Teachers as one of the most important components in the learning process have a big part in increasing the ability of students, for that teachers must find appropriate learning methods in order to create a pleasant classroom atmosphere, increase student interest in learning and can eliminate students' perception of lessons learned difficult to understand. The teacher can also motivate students to increase interest in learning at school for all subjects, one of which is mathematics.

Mathematics is taught at every level of education. Mathematics has an important role in the world of education. Learning mathematics aims to train students to think systematically, logically, critically, and creatively in communicating ideas or solving problems. However, mathematics as the main science in learning still provides its own strength for students. As a result, the process of learning mathematics requires extra energy from both teachers and students. Many students think that mathematics is very difficult to understand because it is abstract, and there are many numbers that cause students to start to get bored with studying it.

In the development of increasingly rapid times, mathematics teachers are required to be creative in developing their learning methods, one of which uses learning media to improve student understanding.

According to Arsyad (2017), media is a tool that can physically help in the delivery of learning material consisting of books, tape recorders, films, comics, slides (picture frames) photos, pictures, graphics, television and computers. This concrete learning media can help mathematics teachers to attract students' attention so that they can follow the lesson well.

According to Richey and Kein (2007) "Development is the process of translating the design specifications into physical form related to the systematic study design, development and evaluation process with a view establishing an empirical basis for the creation of non-learning products and learning new or enhanced models of existing development ". From the opinion of Richey and Kein, it can be interpreted as research and development is a type of research that produces a new product or updates an existing product by creating many things so as to create other products that are slightly different from existing products.

According to Santoso (2010), there are several development models in manufacturing products in physical or non-physical forms, one of which is the ADDIE instructional design model. This model, as the name implies, consists of five main phases or stages, namely: (A) analysis, (D) design, (D) development, (I) implementation, and (E) evaluation. This model uses five

stages of development, namely: (1) Analysis, there are three segments that must be analyzed, namely students, learning, and the media to deliver teaching material; (2) Design, this stage is the formulation of the analysis that must be prepared such as syllabus making, learning objectives, basic competencies, core competencies, learning methods, making story boards and storylines; (3) Development, this stage is the stage of production where everything that has been made in the design stage becomes real. (4) Implementation, this learning media is ready to be used by students. (5) Evaluation is done by testing the application in class.

The progress of information technology that is increasingly rapid with the industrial era 4.0, requires teachers to continue to develop their knowledge and experience. One of them is by making and developing learning media. From the results of a survey conducted by the community service team, the problems faced by teachers in the scope of mathematics teacher deliberations (MGMP) of Cisarua Commissariat Junior High School in Bogor Regency lack of information and training in making learning media and have an impact on students' motivation. Middle school students prefer to read comics compared to textbooks, especially math books.

To overcome the problems faced by teachers in the mathematics mathematics MGMP scope, the Commissariat of Cisarua, Bogor Regency. requires briefing about the steps in the process of developing learning media and how to make learning media. The steps taken by the community service team refer to one of ADDIE's instructional approach models and the learning media that will be made are comic strips. This training was held on April 26, 2019. It is hoped that the training provided will increase the understanding and knowledge of teachers in developing instructional media with ADDIE approach models and can design comic strips well..

## II. METHOD

The method of implementation carried out is using classroom training methods, using programmed teaching in order to obtain the level of effectiveness and efficiency of teacher performance in understanding comic strip learning media with ADDIE instructional design approaches, so that teachers can be professional in

training. While the learning model in this training uses Project Base Learning, project-based learning is the right choice.

Using e-portfolio assessments has proven useful in project-based learning (Gülbahar & Tinmaz, 2006: 309). The material provided during the training included introduction, design and development. The implementation of this activity is carried out in three stages, namely 1) The first stage is the preparation stage. In this stage the team conducted a preliminary survey to find out the target conditions of the activity by analyzing the conditions of the place to be used, the conditions of the participants who would be given training, and compiling the design of the activities that would be carried out with the mathematics teacher deliberations (MGMP) of the Cisarua Commissariat Middle School in Bogor Regency. 2) The second stage is the implementation phase. The team conducted a series of training for MGMP mathematics teachers at the Cisarua Commissariat in Bogor Regency, including: a) Types of learning media; b) Development models; c) the results of student workshops using comic learning media. 3) The third stage is evaluation. Evaluation of this activity is carried out on the activity process. Evaluation is related during the activity from the preparation stage to the implementation stage, which includes the condition of the school, the attendance of the trainees, the enthusiasm of the participants when participating in the activity, and suggestions or criticisms of the activity.

## III. RESULTS AND DISCUSSION

In accordance with the scheme that had been planned by the Abdimas team, the implementation of this activity was carried out in three stages, namely the preparation, implementation and evaluation stages. Realization of implementation is in accordance with the planning of the implementing team. In the preparation phase, the implementation team reviewed the partner locations, namely the mathematics MGMP of the Cisarua Commissariat Junior High School, Bogor Regency, which was located at Ciawi Bogor 1 Public Middle School, Jl. Veteran III Banjarwangi Ciawi Kab. Bogor. The organizational structure of the MGMP Mathematics Junior High School, the Commissariat of Cisarua is as follows:

TABLE 1. MGMP MATHEMATICAL ORGANIZATIONAL STRUCTURE.

Position	Name	Work unit
Head	Erin Pangestuti, S.Pd	SMP Negeri 1 Ciawi
Secretary	Agus Mahargiyana, M.Pd	SMP Negeri 1 Caringin
Treasurer	Dra. Hj. Nofrianti Lubis	SMP Negeri 3 Ciawi
Field Planning and Programming	Euis Naryuningsih, S.Pd	SMP Negeri 2 Cisarua

Head of Administration, Facilities and Infrastructure	Ade Sapari, M.Pd.	SMP Negeri Cigombong	2
Head of Public Relations and Cooperation	Yuni Fitria Kurniati, S.Pd	SMP Negeri Megamendung	2

In the survey of the location of the community service object, a discussion was held with the mathematics MGMP leader of the Cisarua Commissariat Junior High School in Bogor Regency, the school principal and several mathematics teachers to find out what partner problems were occurring. From the results of the discussion, it was found that the problems faced by teachers were: 1) Teachers had difficulty in preparing learning media, 2) Lack of understanding of teachers in designing learning designs, 3) demands in the Industrial Age 4.0 where technology was very rapidly becoming a serious challenge for education and affect student character.

Based on these problems, the community service team and the mathematics MGMP junior high school agreed to hold community service activities to improve teacher competency through training, which aims to make teachers as qualified educators and bring a pleasant atmosphere in each learning process. The training provided includes material: a) Types of instructional media; b) Development models; c) the results of student workshops using comics. In accordance with the agreement made between the abdimas team and the mathematics MGMP Ciawi Junior High School Bogor,

the implementation of the abdimas activities was carried out on April 26, 2019.

The training began at 08.00 with discussions on the introduction of instructional media, the development of instructional media and the introduction of mathematics comics learning media and the development of comic strip learning media with ADDIE instruction designs. The training activities ended at 16.00 which was closed by the Head of Mathematics MGMP.

In the first meeting workshop on April 26, 2019 discussed the "Development of Learning Media Comics With ADDIE Instructional Design". This discussion aims to develop mathematics learning media for grade VII junior high schools using mathematical comics. The mathematics comic strips in this workshop were carried out with simulations developed using the ADDIE method (Analysis, Design, Development, Implementation, Evaluation).



Picture 1. Development of Comicstrip with ADDIE Instructional Design

The focus of this workshop is on the definition of comic strips, the purpose of making comic strips, the determination of characters or characters, the scientific method of making comic strips and the ADDIE instructional development design. In the workshop, the comic strip is defined as a short comic in sheet form, which generally consists of 3-5 panels. If more than five panels, usually no more than one page. Komikstrip is generally published in newspapers such as newspapers and magazines, but along with the current technological developments, comic strips can also be published via the internet. The purpose of making comic strips presented in this workshop is as a medium for student learning, increasing interest in learning, can be used as student projects in Project Base Learning, increasing creativity, economic aspects and others.

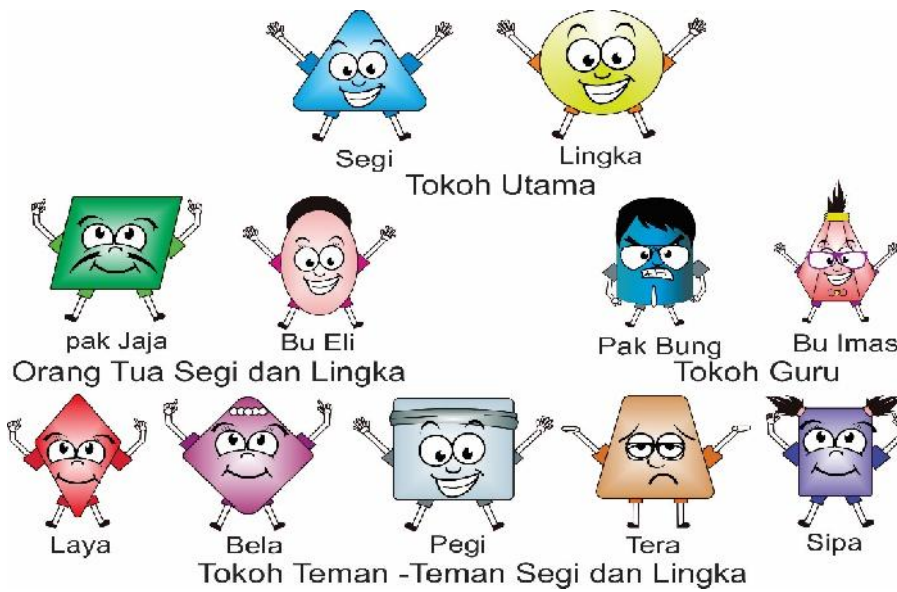
Making a comic strip is inseparable from the arrangement of characters in accordance with the nature and characteristics in the story such as the presence of protagonist characters (Heroes, good main actors), antagonistic characters (opponents of the protagonists, evil actors), and other actors according to four human personalities (dominant, steady, compliance, influence, or combination thereof). The main key in determining character is that the name is easily recognizable, memorized and can become a brand, for example: Ipin and Upin, Sali and Saliha, Nussa and Rarra, Segi and

Linka. In addition, good character must be able to express human faces. The following is an example of a character that reflects mathematics. Picture 2

Making comic strips can be developed using instructional development designs, there are many instructional development methods, one of which is ADDIE. The development of this learning media in the form of visuals made with drawing techniques using drawing tools and computers. From this study produced a learning media that is expected to increase student enthusiasm and high curiosity. So students can learn mathematics more fun and enjoyable.

Needs analysis is carried out in several stages, including validating performance gaps, identifying student characters, formulating instructional needs, identifying resources needed, determining learning strategies and developing program plans.

In the analysis of the performance gap validation is done by using a questionnaire instrument of learning media needs with teacher and junior high school student respondents. In the analysis with teacher respondents, there were 3 junior high school teacher respondents used as a simulation example. Based on the results of the learning media questionnaire is needed to facilitate the understanding of the material presented, facilitate the teaching and learning process, making mathematics more interesting, interactive, creative and fun.



Picture 2. Introduction of Mathematical Character Figures.

In the needs analysis with the stages of identifying the characteristics of students, based on observations and questionnaires, at this age children have characteristics including having high curiosity and learning, like to form groups of games, like playing games, having a high awareness of responsibility and to Certain children like playing and watching on a smartphone.

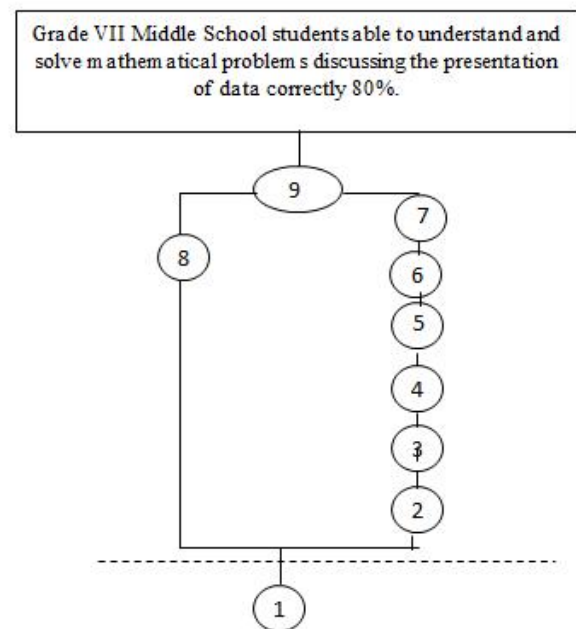
Analysis in formulating instructional objectives from the making of this comic strip is formulated by analyzing performance gaps accompanied by KI / KD analysis. The KI 1 and KI 2 analyzes were actualized by the use of themes in animated stories adapted to the theme in the 2013 education curriculum (Kurtilas), while the KI 3 and KI 4 analyzes were carried out by analyzing BC and making competency maps.

This analysis provides a description of existing basic competencies, formulates Instructional objectives and compiles a description of the competency map, and an explanation of each competency as follows:

1. Students can get to know data in everyday life.
2. Students can understand various kinds of data.
3. Students can understand how to collect data.
4. Students are able to present data in the form of frequency tables.
5. Students can read the frequency table.
6. Students are able to calculate averages simply.
7. Students can present data in the form of line charts, bar charts and pie charts.
8. Students know the use of line charts and bar charts in everyday life.
9. Students are able to solve simple data presentation problems and daily application problems.

The compilation of competencies was made to compile the formulation of instructional objectives, with the formulation of Grade VII Middle School students

able to understand and solve mathematical problems discussing the presentation of data correctly 80%. From this explanation, the competency mapping is made as follows:



**Picture 3. Competency Map of Class VII Data Presentation in Middle School.**

In the needs analysis phase to identify the resources needed, there are four categories of resources needed namely: hardware, software, learning materials and consumables.

The hardware used as a manufacturing medium is a computer that is equipped with a Corel Draw application (software) for making comic strips. The subject matter and the determination of the title and theme of each comic story use teaching materials in 2013 curriculum material (Kurtilas) Junior High School grade VII, while the themes and storylines developed follow the themes in the 2013 curriculum discussion in accordance with those discussed in mathematics. Whereas in the form of non-digital comic strip made on sketchbook.

The learning strategy used is to use a multi-media based learning strategy. In compiling a program / project management plan, it is carried out by scheduling with the aim of keeping the project completed well in an effective time. The program management plan goes through three stages, namely the preparatory stage includes the introduction of making mathematical comics, and looking for literature about mathematical comics. The second step is to arrange teaching material and make a storyboard as a reference for making comic strips. The third stage is producing mathematical comics.

At the design stage of the development of mathematical comic strips, the making of the development of the development of the mathematics comic strips begins with compiling the material scripts in accordance with the basic competencies of the data presentation materials for grade VII junior high schools, making drawings and illustrations, taking pictures using

scan techniques, editing images into visual media. The design of SMP data presentation material uses a chart or basic competency flow from the subject matter of statistics. Material map design is prepared by detailing the subject matter and adjusting the basic competency standards prepared. The design of the preparation of the manuscript is the initial stage before entering the production stage. The manuscript in the development of this media in the form of text for the material, the concept of images and illustrations, this is to facilitate the process of developing media after compiling the material script, then the next is to arrange a storyboard concept of illustrated images.

At this stage of development is to change the text into a media complete with material, and explanations, accompanied by illustrations. The media is created using the Corel Draw application, which includes characters and texts with appropriate backgrounds from the storyboard.

The production process begins by preparing the tools first, including pencils, erasers, sketchboards, laptops, Formative testing is done by validating the product to media experts, design experts, linguists, and material experts. The result is that there are a number of things that need to be revised, namely: 1) Voice dubbing should be further enlarged and clarified, 2) Compiler profile included, 3) Instructions for use, 4) Include reference libraries.

Tests on students are conducted with 10 respondents to test the validation of learning media. The results of the questionnaire from 7 items each as follows:

TABLE 2. VALIDATION RESULTS FOR STUDENTS.

No.	Aspect	Indicator	Average	Category
1.	Content aspect	a. Suitability of the media with learning needs	4,25	High
		b. Independence and facilitate learning	4,03	High
		c. The learning aspects of life	4,08	High
2.	Language and Image Aspects	a. Easy and pleasant language clarity	4,20	High
		b. The suitability of the illustrations with the material	3,85	High
3.	Presentation Aspects			
		a. Interesting, fun and not boring	4,20	High
		b. Interesting figure	4,28	High

Based on the data obtained, it can be concluded in the good category.

From the simulation results it can be seen that the trainees' understanding in understanding comic strips and developing them with ADDIE instructional design is very good.

#### IV. SUGGESTION

This community service activity is one of the strategic implementation to provide services in developing teacher competency, particularly in the design process of developing comicstrip-based learning media development. Demands in the industrial era 4.0 where

technological developments are very rapidly become a serious challenge for the world of education and can affect the character of students. Teachers still find it difficult to prepare learning media and the lack of understanding of teachers in developing development designs. Providing training in making comicstrip learning media with ADDIE instructional designs one of the solutions. The results of this activity are participants 1) understanding the basics and techniques in developing instructional design development, 2) Knowing the types of instructional media that can be used to improve learning motivation including using comic strip based learning media, 3) Development models which can be used, one of which uses the ADDIE instructional design. The participants were very enthusiastic and happy with the training in making instructional media with ADDIE instructional designs. They said this activity was very beneficial for the preparation of learning media, especially mathematics. In general this activity has been going well and has made a positive contribution to the teacher.

#### **Thank-you note**

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4. Thank you to the Abdimas Team for working optimally so that this Community Service Program was implemented.

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