CHAPTER III

RESEARCH METHOD

A. Model of Research and Development

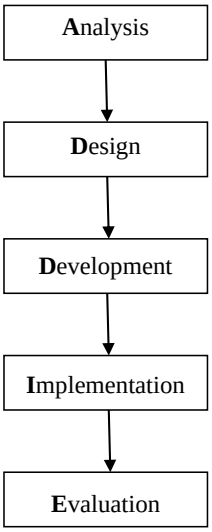
In this study, the researcher used research and development method. Research and development is a research method that is used to produce a new product, develop, and test the effectiveness of a product. Sukmadinata (2010: 164-165) says that research and development is a process or steps to develop a new product or improve an existing product that can be accounted for, the process of research and development shows a cycle that begins with the needs, problems that need solving by using a certain product. The purpose of this study is to produce a certain product to fulfill the learners' needs in learning English by designing media.

Experts have introduced a wide variety of models in developing materials using the research and development method. The models were principally same in goal, but different in procedures, depending on such factors as the educational system, condition of students and teachers, learning situation, etc. The development model carried out in this study used the ADDIE model which stands for Analysis, Design, Development, Implementation, and Evaluation. Development using this model has the advantage that work procedures were used systematically where each step in the development was guided by the previous step which goes through

improvement to obtain an effective product to used. The purpose of choosing the development of the ADDIE model was to produce products and carry out systematic try-out procedures, evaluations, and improvements so that they could met the criteria for effective teaching materials that have quality in line with expectations.

The following were steps of the development model used in this study:

Figure 3. 1 Steps of ADDIE Development Model



The figure above was a modification of the steps ADDIE development model. Research with these steps has been carried out by Anisa Fitri, a student of mathematics education at the State Islamic University of Raden Intan Lampung, with the title *"Pengembangan E-Modul Berbantuan Sigil Software Pada Materi Relasi dan Fungsi"*.

B. Procedures of Research and Development

1. Analysis

In the ADDIE development model, the first stage was to analyze the need for new product development (models, methods, media, teaching materials) and analyze the feasibility and requirements of product development. The development of a product could be initiated by a problem in an existing or applied product. Problems could arise and occur because existing or available products were no longer relevant to the needs of the target, learning environment, technology, student characteristics, and so on. In this study, the researcher conducted a preliminary study, namely collecting data about the problems encountered in teaching and learning activities by conducted interviews, questionnaires of need analysis, literature studies, and so on according to the needs of media development. The results of the research at SMP Negeri 1 Ngantru were:

a. Learning media only used textbooks and worksheets, so the delivery of the material was less than optimal, especially during a pandemic where the learning process is from home or online.
b. At SMP Negeri 1 Ngantru, no one has ever conducted research on learning media based on stop motion animation for teaching English vocabulary.

c. The school, especially the English teachers, were very happy to receive the latest educational innovations that support the development of the teaching process.

Then the problems above were identified to describe the causes of the emergence of problems by carried out several procedures, namely:

a. Need Analysis

This procedure has a purpose, to find out the cause of the problem so that development is needed. According to Nurhayati et al (2019: 180) to produce a particular product, a need analysis and effectiveness test of the product is necessary to ensure that the product is decent and applicable. A need analysis was obtained from learning observations, student questionnaires, and teacher interviews. The results of the analysis found that the cause of the lack of student interest in learning English was due to the lack of student interest in the use of learning media in the teaching and learning process. In addition, students' interest in learning decreases, causing learning outcomes to also decrease. Therefore, creative, innovative, and fun learning media were needed for students.

b. Analysis of Learning Material

At this stage, the analysis of learning materials includes determining the discussion of the material that was taking place at the time of the research and was equated with the curriculum that has been

implemented in schools and has been adapted to the needs of students.

c. Analysis of the Environment

At this stage, an analysis of the environment was carried out to determine the condition of the learning environment and the learning model used. Seventh-grade students' of SMP Negeri 1 Ngantru were divided into 10 classes, each class consisted of 40 students. Each student certainly has different characteristics and not all students could understand the explanation of abstract material.

2. Design

Design in the ADDIE development model is a systematic process that started with designing the concept and content of the product. At this stage, the product design was still conceptual and could underlie the development process at the next stage. After analyzed the problem above, the researcher then designed the teaching materials that would be designed based on the research subject and the learning materials that would be presented in making learning media based on stop motion animation. According to Suryani, et al (2012), the procedures carried out during the design stage were:

a. Determining Core Competencies, Basic Competencies, and Indicators

The design of learning media based on stop motion animation was adjusted to the core competencies, basic competencies, and

indicators that were guided by the curriculum, syllabus, and lesson plans that apply in the school where the research was conducted.

b. Creating Storyboard

At this stage, the researcher conducted a material design, the form of videos and images used, as well as how the position of the animation, which must be systematically designed so that the results of the presentation of learning media in the form of stop motion animation were good and interesting. Storyboard is a sketch of an image that is arranged according to the script. With storyboard, we could convey our story ideas to others more easily. Because, we could accompany someone's imagination to follow the images presented, thus producing the same perception of our story ideas.

c. Creating a Test Strategy

At this stage, what is done was to choose a testing strategy and created an instrument to see the results of student achievement in English subjects. The assessment instrument was formative test questions in the form of multiple choice.

3. Development

The development procedure was carried out to create media and validate the level of effectiveness or feasibility of a learning media to be used. In the previous stage, a conceptual framework for implementing a new product has been developed. The conceptual framework was then realized into a product that is ready to be implemented. The procedures

carried out at the stage of developing learning media based on stop motion animation were:

a. Making a Product of Learning Video Based on Stop Motion Animation

   At this stage, the researcher made a stop motion animation according to a previously planned design using the PixelLab application, KineMaster Pro application, canva, and other supporting media such as google, and pngtree.

b. Expert Validation

   Expert validation refers to the stage where experts were asked to assist in evaluating the initial product based on predetermined standards. Experts on validation by expert judgment include material experts, media experts, and English teachers. The target of the first validity test was to get suggestions, comments, and opinions to modify the stop motion animation video before being tested on students.

c. Revision

   In this step, what was done is to revise the first product according to the suggestions, comments, and opinions of material experts, media experts, and English teachers.

4. Implementation

Product implementation in the ADDIE development research model was intended to obtain feedback on the developed product. This

stage was carried out if the expert validation results have good criteria. At this stage, the small and large groups try out were also carried out. This try out was conducted to test the effectiveness, attractiveness, and feasibility of the product. The researcher asked students to fill out a questionnaire to provide criticism and suggestions and to get an assessment of the attractiveness and ease of use of the learning media. The resulting data were qualitative and quantitative data. Qualitative data were obtained from the results of observations and interviews, while quantitative data was obtained from the results of the pre-test and post-test to determine the effect before and after using the learning media that had been developed.

5. Evaluation

The final stage in the ADDIE development method was evaluation. The evaluation was conducted to determine the effectiveness of learning media based on stop motion animation compared to print media in the form of textbooks and worksheets in teaching vocabulary to increase student achievement in English subjects, especially about students' mastery of English vocabulary.

C. Try Out of the Product

Try-out of the product was done to collect data that useful to evaluate the effectiveness, efficiency, and attractiveness of the product of the research and development. In the first stage of the try-out, the product

would be tested by material experts, media experts, and English teachers to assess the products developed by researchers. While the second stage of the try out, the product would be tested on students' class VII-I SMP Negeri 1 Ngantru to determine the effectiveness of the product.

In this section, it would also be explained about the try-out design, try-out subjects, types of data, data collection, and data analysis techniques used.

1. Design of the Try Out

   Design of the try-out in this research meant that the product would be tried out on the target subjects in real learning and teaching situations to evaluate the quality of the learning media development. This try-out design was carried out using a descriptive try-out design because the design allowed the researcher to obtained two data at once, namely quantitative and qualitative data, which of course were very useful for perfecting the product. The scoring system in this design was based on the rubric of scores from validators, observations, and tests.

2. Subject of the Try Out

   The subject of the try out in the development of learning media based on stop motion animation was material experts, media experts, English teachers, and students of VII I SMP Negeri 1 Ngantru.

3. Types of Data

   a. Data from media experts, materials experts, and English teachers

      The data obtained from media experts, material experts, and English teachers were data in the form of quantitative and qualitative data.

Validation questionnaires were used to obtain quantitative data, suggestions, and criticisms from validators were used to obtain qualitative data. The two of data later would be used as material to be processed in the SPSS application, for that data in the form of qualitative would be transformed into numerical data.

b. Data from students

The data obtained from students were quantitative and qualitative data. Quantitative data was obtained from the acquisition of students learning outcomes on the 'things around us' material, while qualitative data was obtained from the results of observing activities during the learning process.

4. Data Collection

Data collection was the way to collected data that used in this study. In this study, there are some steps that were used to conducted in gaining the data. The researcher conducted the observation, interview, questionnaire, and test. The steps were as follows:

a. Observation

Observation as the first method in this research is commonly used in education as a tool to support understanding and development (Nunan, 1992: 17-20). The purpose of observation was to explain the situation that was examined, the activities that take place, the individuals who were involved in an activity, and the relationship between the situation, events, and individuals. In this study, the

researcher observed some aspects that dealt with the process of vocabulary teaching at SMP Negeri 1 Ngantru.

b. Interview

The second method was interview as the most common data-gathering technique. Interview was a meeting of two persons to exchange information or idea through questions and responses, resulting in communication and joint construction of meaning about a particular topic. Interviewing provided the researcher meant to gain a deeper understanding of how the students interpret a situation or phenomenon that could be gained through observation. The reason of applying interviews in this research such a way was to obtain data to support the description or the theory and help the researcher to strengthen the study. The interview was used in collecting data is from the English subject teacher. The teacher was asked about their opinions of the activity process including problems faced in vocabulary teaching.

c. Questionnaire

Questionnaire as the next method in this research. Questionnaire was a research instrument that consists of a set of questions or other types of prompts that aimed to collected information from a respondent. In this research, the researcher gives a questionnaire to the students. Questionnaire was printed from the data including questions or statements to which the subject is expected to respond. The

researcher gave the questionnaire to the students to know the further opinions and to know the aspect that may influence the process of teaching English vocabulary.

The instrument of product validation questionnaire was used to determine the feasibility of the developed product, where validation was carried out by material experts, media experts, and English subject teachers. To get data on the feasibility of learning media from expert judgment including material experts, media experts, English teachers, and student responses was by used a media feasibility questionnaire instrument. The evaluation in this questionnaire was measured by a Likert scale with five criteria. The reason for choosing Likert scale with five criteria was because has a more completed and good response variability. According to Widoyoko (2014: 106), if compared with the Likert scale with three criteria and four criteria, the Likert scale with five criteria could provide a maximum difference for respondents. Each scale has an assessment meaning:

Table 3. 1 Likert Scale

Score	Explanation
5	Very Good
4	Good
3	Fair
2	Poor
1	Very Poor

The following were grids for assessing the feasibility of learning media based on stop motion animation.

1) Grids of Questionnaire Media Expert Validation Instrument

   Grids of questionnaire media expert validation instruments were seen from the perspective of graphics, learning, and ease of used with a total of 15 questions. The grids of questionnaire media expert validation instruments were presented in the following table.

Table 3. 2 Grids of Questionnaire Media Expert Validation Instrument

Indicators	Number of Items
A. Aspect of language eligibility	
1. The language used is clear.	1
2. The language used encourages students' curiosity.	1
3. Use polite language and not reduce educational values.	1
4. The effectiveness of sentences.	1
5. The spelling precision.	1
6. The precision of text with the picture in the video.	1
B. Aspect of presentation	
1. The presentation of the video is carried out systematically and coherently.	1
2. Video presentation supports students to participate in learning.	1
3. The video presentation is very interesting.	1
C. Aspect of the overall display	
1. The design of learning media can give an interesting impression to students.	1
2. The text is easy to read.	1
3. The ease of using media in learning.	1
4. The selected effects are appropriate and attractive.	1
5. There is a suitability of the picture in the video and the flow of the material discussed.	1

2) Grids of Questionnaire Material Expert Validation Instrument

Table 3. 3 Grids of Questionnaire Material Expert Validation Instrument

Indicators	Number of Items
A. Aspect of material feasibility	
1. The suitability of the content of the material in the video with the purpose of the research.	1
2. The clarity of the material presented.	1
3. The development and ideas in the video can help students understand the material being studied.	1
4. The material can be understood independently by students through learning media that has been developed (stop motion animation video).	1
5. The use of pictures in the video is in accordance with the material being studied.	1
6. The material covered in the stop motion animation video is good and appropriate.	1
7. The use of appropriate materials in accordance with the objectives of the study.	1
8. Encourage students' curiosity about the learning material.	1
9. The material presented in the video is able to increase students' knowledge of English vocabulary.	1
10. The accuracy of the pictures and videos presented.	1
11. The level of accuracy of the content with the material discussed.	1
12. Media supports students to learn the material easily and fun.	1
B. Aspect of language eligibility	
1. The language used is clear.	1
2. The language used encourages students' curiosity.	1
3. Use polite language and not reduce educational values.	1
4. The effectiveness of sentences.	1
5. The spelling precision.	1
6. The precision of text with the picture in the video.	1
C. Aspect of overall display	
1. The text is easy to read.	1
2. There is a suitability of the picture in the video and the flow of the material discussed.	1

These tables showed the grids of questionnaire material expert validation instruments were seen from the perspective of presentation, the content of the material, and language with a total of 20 questions.

3) Grids of Questionnaire Student's Response Instrument

In the grids of Questionnaire student's response instrument, there are 10 questions. These grids were presented in the table below.

Table 3. 4 Grids of Questionnaire Students Response Instrument

Indicators	Number of Items
1. The display of learning videos based on stop motion animation is interesting.	1
2. The presentation of material and pictures in this learning video based on stop motion animation is very good.	1
3. The material presented in this learning video based on stop motion animation is very clear and easy to understand.	1
4. This learning video based on stop motion animation is able to encourage students' curiosity about the learning material.	1
5. This learning video based on stop motion animation is able to motivate students to learn.	1
6. This learning video based on stop motion animation makes the learning process not boring.	1
7. The ease of use the learning video based on stop motion animation in learning English vocabulary.	1
8. With the learning video based on stop motion animation, it makes easier for students to learn independently.	
9. This learning video based on stop motion animation is supported students to learn easily and fun.	1
10. This learning video based on stop motion animation is able to increase students' knowledge of English vocabulary.	1

4) Grids of Questionnaire Pre-Test and Post-Test Question Instrument

Grids of questionnaire pre-test and post-test question instrument with a total of 5 questions. These grids were presented in the following table.

Table 3. 5 Grids of Questionnaire Pre-Test and Post-Test Question Instrument

Indicators	Number of Items
1. The suitability of the questions with the research objectives.	1
2. The clarity of instruction for question work.	1
3. The clarity meaning of the question.	1
4. The possibility of questions can be solved.	1
5. The sentence of question does not have a double meaning.	1

d. Test

Test was the data collection that is used to conduct an assessment in which there was a set of questions or a series of tasks that must be completed by students to measure various aspects of students' behavior (Arifin, 2011: 118). In this research, the researcher used pre-test and post-test. The pre-test was used to measuring the students' abilities before the implementation of learning media based on stop motion animation, while the post-test was used to measuring the students' abilities after the implementation of learning media based on stop motion animation.

5. Techniques of Data Analysis

The data obtained would be analyzed to determined opinions and assessments of the products developed.

a. Validity Analysis Techniques

Validity analysis was used to determine the accuracy of the product or the results of development in the form of learning media. To prove the level of validity of the resulting product, the researchers used the following formula (Arikunto, 2012: 313):

$$P = \frac{\sum x}{\sum xi} \times 100\%$$

Explanation:

P = Eligibility Percentage

$\sum x$ = Total score of the evaluator's answers (real score)

$\sum xi$ = The highest number of answer scores (expected score)

Guidelines in determining the effectiveness and decision of learning media revisions were in accordance with the following criteria:

Table 3. 6 Criteria of Product Validity Level

Percentage (%)	Criteria of Validity
76 – 100	Valid (No Revision Needed)
56 – 75	Sufficiently Valid (No Revision Needed)
40 – 55	Less Valid (Revision)
0 – 39	Not Valid (Revision)

Source: Arikunto,2010.

Based on the criteria in table 3.6 above, a learning media was said to be valid if it met the criteria for a score of 75 of all the elements contained in the questionnaire.

b. Practical Analysis Techniques

To find out whether the developed learning media has met the practicality criteria, it was necessary to conducted an analysis based on student assessments. The results of the assessment were analyzed to determine whether the developed media could be applied well in learning with no or little revision of the learning media. For data processing, researchers used the following formula.

$$\text{ASn} = \frac{\text{The number of students asking questions}}{\text{Total number of students}} \times 100\%$$

Explanation:

ASn = Percentage of students who asked

n = Question

The results of the analysis of each question were calculated on average, then analyzed using the following formula:

$$\text{RAS} = \frac{\text{ASn}}{\text{N(n)}} \times 100\%$$

Explanation:

RAS = The average of the percentage students who asked

N(n) = Number of questions

The percentage of data obtained was converted into descriptive qualitative data using the practicality criteria in the table below.

Table 3. 7 Criteria of Practicality for Learning Media

Percentage (%)	Criteria of Validity
75% ≤ RAS ≤ 100%	Cannot be used
50% ≤ RAS < 75%	Can be used with many revisions
25% ≤ RAS < 50%	Can be used with a little revision
0% ≤ RAS < 25%	Can be used without revision

Source: Siti Khabibah, 2006.

c. Effectiveness Analysis Techniques

The effectiveness test was conducted to prove whether learning media based on stop motion animation video could be used in teaching vocabulary and improve student learning outcomes or not. The effectiveness measurement was done by comparing the students' pre-test and post-test scores. However, the normality test and homogeneity test must be carried out first.

1) Normality Testing

Normality testing was conducted to know whether the research data is normally distributed or not. According to Rohmah (2016), the normality of the data was important

because if the data were in a normal distribution, the data were considered to be representative of the population. Moreover, normality testing was also important to calculate the t-test because t-test was a parametric test that needs the normality assumption.

Normality testing could be done using the Lilliefors (Kolmogorov-Smirnov) test formula with the help of the IBM SPSS Statistics 26 for the windows application program. The significance value for this test is (α) = 0,05. Normality testing was conducted by the rules as follows:

a) H_0: If the value of significance > 0,05, the distribution data is normal.
b) H_1: If the value of significance < 0,05, the distribution data is not normal.

2) Hypothesis Testing

The hypothesis testing aimed to determine whether the hypothesis that has been made was proven or not. Hypothesis testing used in this study was the Independent Sample T-test with the help of the IBM SPSS Statistics 26 for the windows application program.

The hypotheses in this study were as follows:

a) Hypothesis in the Form of Sentences

H_0 : There is no difference in students' vocabulary learning outcomes before and after using learning media based on stop motion animation.

H_1 : There is difference in students' vocabulary learning outcomes before and after using learning media based on stop motion animation.

b) Instruction of the Test

If the probability (sig) > 0,05, H_1 is rejected.

If the probability (sig) < 0,05, H_1 is not rejected (accepted).

The expectation from this research and development was that there is a significant difference in student learning outcomes between before and after using learning media based on stop motion animation.