

CHAPTER III

RESEARCH METHODOLOGY

A. The Research Design

The research was conducted for develop interactive digital module to teach active and passive voice with using Research and Development (R&D). Educational Research and Development (R&D) is a process used to develop and validate educational product. The steps of this process are usually referred to as the Research and Development cycle, which consists of studying research findings pertinent to the product to be developed, developing the product based on the finding, field testing it in the setting where it will be used eventually, and revising it to correct the deficiencies found in the field-testing stage. In indicate that product meets its behaviorally defined objectives.¹

Seels and Richey said that, development research is a systematic procedure for designing, developing, and evaluating programs, processes, and products that must meet the criteria of validity, practicality, and effectiveness.²

B. Place and Time

The research will be conducted in class XI SMK Yanisba Boarding School Pontang majoring in pharmacy semester 1 of 2021/2022 academic year as the research sample.

C. Design of Development

The model of development used ADDIE which is a class-oriented development model. The development of ADDIE is identical

¹ Meredith Gall and Walter R. Borg, *Educational Research and Development*, Seventh Edition. (Boston: Pearson Education, 2003), 569.

² Amir Hamzah, "*Metode Pengembangan dan Penelitian (Research and Development)*" (Malang: Literasi Nusantara, 2019) p. 1.

to the development of learning systems. The development process is sequential but interactive, the evaluation results from each stage can be used for development to the next stage. ADDIE is divided into 5 phases, namely: (1) Analysis, defined as an analysis of the needs of learning media programs, related to learning problems, learning goals and objectives. (2) Design, defined as the design and manufacture of instructional media designs. (3) Development, defined as the stage of making a product or learning media. (4) Implementation, defined as the implementation of learning media. (5) Evaluation, defined as the evaluation stage of the developed media.

Because the limitations of the researcher, the number of field test subjects was modified, at this stage the researcher only involves one class with 17 students.

D. Procedure of Development

The procedure of development is divided into five stages as following:

1. Analysis
 - a. literature study and field study

At this stage the aim is to obtain information about how the process of learning English for class XI at SMK Yanisba Boarding School Pontang during online learning, includes what methods and media are used, how are student learning outcomes, what are the obstacles faced during the online learning process.

In addition, at this stage it is also carried out to seek information related to the theme that will be developed into learning media, including reviewing theories obtained through books, journals, and studies of research results that are

relevant to the research to be carried out, in this case research related to the development of digital interactive module.

b. Needs analysis

The analysis carried out includes analysis of curriculum and characteristics of learning English during online learning, analysis of student characteristics, and analysis of the use of devices to use interactive digital modules that will be developed.

2. Design

1. Determination of basic competencies and learning objectives

The determination of basic competencies and learning objectives that will be developed in the interactive digital media module is the result of discussions with the English subject teacher in SMK Yanisba Boarding School Pontang.

2. Designing learning media

This is the stage to create an interactive digital description and design of the module for class XI in the English subject that will be developed. This stage includes the design of the display and the material that will be displayed in interactive digital module media that including the selection of learning material videos, interactive quiz as student exercises that are in accordance with the material and the purpose of making the module.

3. Development

a. Media production

Making products, namely interactive module learning media in accordance with designs or designs that have been made previously. Interactive modules created using the Canva

application by including video links and quizzes to support learning that are presented to make them more interactive. The material displayed is a summary of the material that has been selected, that it is easier for users to understand. This is also done by considering the capacity of the student's smartphone to make it easy to use. On the last page after the material content there is a quiz as student evaluation material.

b. Validation of product

Product validation consists of two stages, material validation and media validation. Material validation is carried out by material experts, the aim is to get an assessment from material experts regarding the material presented. While media validation is carried out by media experts who aim to get an assessment from media experts regarding the developed media. The data was obtained through a questionnaire given to the expert. The data obtained from each expert were collected and then processed into quantitative data. Then find the average of the data. The average result determines the quality of the module to be developed. Suggestions from each expert are then used as a guideline to make revisions or improvements to the developed interactive module learning media.

c. Product trial

The trial was carried out in three stages, namely preliminary field test, main field test, and operational field test. *Preliminary field test* is an initial field test activity carried out on a limited scale. This step includes: 1) Conducting initial field tests on product designs, 2) Limited in nature, from the

substance of the design and the parties involved, 3) Preliminary field tests are carried out repeatedly so that a suitable design is obtained, both in terms of substance and methodology. This test is carried out by giving a limited number of questionnaires to users to find out user responses to the interactive module that has been developed. The data obtained from this trial becomes a reference for making revisions to reduce the weaknesses and shortcomings that exist in the module.

Main field test is a broader product test. This step includes: 1) Testing the effectiveness of the product design, 2) Testing the effectiveness of the design, generally using a repetition model experiment technique, 3) The results of the field test are that an effective design is obtained, both in terms of substance and methodology. This test is carried out by giving a limited number of questionnaires to users to find out user responses to the modules that have been developed.

Operational field test is an operational field test activity or also known as empirical test. This activity is carried out to test the validity of the product hypothesis. This empirical field trial can be carried out using experimental research methods. At this stage, achievement tests are given both before and after treatment, data from research subjects are collected quantitative, the results are evaluated and compared to see the strengths and weaknesses and to assess whether the product or learning model developed is effective. This is done to determine the feasibility of interactive module media before being used on a large scale. The collected data is

then processed to find the average and analyzed using the t-test. This is intended to determine whether the differences in learning outcomes and increase in learning achievement after students use interactive modules in learning.

4. Revision

At this stage it is the final product to refine the final product so that the product developed is more accurate. At this stage obtained the level of effectiveness that can be accounted for. the final product has a reliable generalization value.

5. Implementation

At this stage, the media is implemented in the learning process. The goal is to see the effectiveness of media users in learning. The media is implemented in a class called the experimental class, which is a class that uses interactive modules in learning. While as a comparison or also called a control class is a class that does not use interactive module media in learning (only uses textbooks). The analysis carried out at this stage is item analysis. This step is carried out to determine the quality of the items that will be used in the achievement test. Analysis was performed using Correl.

6. Evaluation

This stage is the stage of evaluating the data obtained from the questionnaires and tests that have been given in the previous stages. The evaluation results are used as a reference whether the media no longer requires revision and is suitable for use on a wide scale and can be said to be the final product.

E. Instruments of Data Collecting

1. Observation

Observation is one of the data collecting instruments in the form of careful and systematic observation or recording of the phenomenon that are being studied.³ Observation is made when learning takes place, observation is made directly to know the effective of the product development.

2. Interview

Interview is data collection by asking and answering questions directly between the researcher and the respondent.⁴ Interviews were conducted by researcher with English teachers. The interview data will be described to answer the formulation of problem related to how to learn English at SMK Yanisba Boarding School Pontang.

3. Questionnaire

Questionnaire is a question that is distributed to respondents to be filled out. Questionnaire is carried out to determine the validity of the product. Questionnaires will be given to media experts and materials experts. The material validity questionnaire contains aspects of the assessment which consist of aspects of content and readability of the material. While the media validity questionnaire contains aspects of the assessment of the display aspect, and media elements. And practicality questionnaires include students' perceptions of the modules that have been made.

All questionnaires are measured using a Likert scale, with a scale of 1-5 (not very good, good, enough, good, and very good)

³ Firdaus Fakhry Zamzam, "*Aplikasi Metodologi Penelitian*" (Yogyakarta:Deepublish, 2018) p. 104.

⁴ Firdaus Fakhry, "*Aplikasi Metodologi*" (Yogyakarta:Deepublish 2018) p. 104.

the data from the questionnaire produces quantitative data, namely by scoring from one to five.

4. Test

Test is a set of question used to measure cognitive aspects in the form of student knowledge and understanding. This test is used to measure a person's achievement after studying the material before using e-module (pre-test) and after (post-test) using development media in the form of interactive digital modules.

Table 1.1. Criteria and Quality of Interactive Digital Module

Aspects	Criteria	Indicator	Instrument Item
1. Material 1	1.1 Content	1. The materials are interesting for target user. 2. The interactive digital module achieves the objective as media to increase student's comprehension in Grammarly. 3. The content of the materials is flexible to be used in any situation and condition. 4. The instruction of the materials is clear.	1-10

		<p>5. The materials support students centered learning.</p> <p>6. The coverage of materials applies the student's comprehension in Grammarly.</p> <p>7. The materials of active and passive voice are appropriate with student's ability.</p> <p>8. The examples are easy to understand.</p> <p>9. The link video and quiz are easy to access.</p> <p>10. Using of words are famous and simple than easy to understand.</p>	
	1.2 Level of difficulty	<p>11. The materials are easy to understand for target learner.</p> <p>12. The materials are appropriate with the material given.</p> <p>13. The product can add new insight to the learning process.</p> <p>14. The product got interest</p>	11-14

		and motivation to learn for target learner.	
2. Media	1.1 Content	<ol style="list-style-type: none"> 1. It is suitable for target user. 2. The materials are interesting for target user. 3. It is relevance to English student levels. 4. It is relevance to the language function targeted. 5. The product's helpful for the teacher. 	1-5
	1.2 Display	<ol style="list-style-type: none"> 6. The size of the book is enough. 7. The component of the book looks uniform. 8. The component of the is book clear. 9. The book able to be understood easily. 	6-9
	1.3 Media purpose	<ol style="list-style-type: none"> 10. The media is easy to use 11. The use of the media able to attract the student more interactive during online learning 12. The use of media able to 	10-14

		<p>help the teacher for teaching during online learning</p> <p>13. The link video and quiz are easy to access.</p> <p>14. The purpose of the media uses able to be achieved</p>	
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F. Data Analysis Technique

This research was used qualitative and quantitative data. Qualitative data is used to measure the validity of the product. Qualitative data were obtained from the opinions and suggestions of experts and students. This aims to determine the shortcoming of the product before the trial and to improve product quality. Validity of product is taken from several aspects by a questionnaire with the rate scale of 1 to 5. The result of validity was calculated and show in percentage with following the formulation:

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

Where: P = Percentage

$\sum x$ = Total score of validation component

$\sum xi$ = maximal score

Table 1.2. Level of Validity Criteria⁵

No.	Percentages	Criteria of Validity
1.	76% - 100%	Valid; no need for revision
2.	66% - 75%	Quite Valid; no need for revision
3.	40% - 65%	Less Valid; revision
4.	0% - 39%	Invalid; revision

For the data statistical analysis, to measure the effectiveness of development interactive digital module on active and passive voice material will calculate using quantitative data. The data was taken from student's pre-test and post-test. The result of pre-test and post-test then analysis to measure student's skill before and after using interactive digital module to developed active and passive voice, with following the formulation:

$$S_D = \sqrt{\frac{\sum(D - \bar{D})^2}{\sqrt{n-1}}} \quad \text{and} \quad S_{\bar{D}} = \sqrt{\frac{SD}{\sqrt{n}}}$$

⁵ Sa'dun Akbar, *Instrument Perangkat Pembelajaran*, (Bandung: PT.Remaja Rosdakarya, 2013),40-41