

CHAPTER III

RESEARCH METHODOLOGY

3.1 Research Method

The research method used in this study is developmental research method. This developmental research was chosen because it has been defined as a systematic study of designing, developing, and evaluating instructional programs, processes, and products (Richey, 1994). Therefore, this research method was suitable with this research objective, which was to develop comic as a learning media. The model used to develop comic learning media is ADDIE model, which consists of analysis, design, development, implementation, and evaluation. The researcher employed this research method and the model to develop the comic as learning media with the purpose of testing the feasibility of the comic learning media by getting validity from experts and revised it before implemented to the students.

3.2 Research Design

This ADDIE model is a design model for learning media development. The step in ADDIE involved (1) The analysis phase was carried out by analyzing the needs of the media, material analysis, user analysis, and software requirement analysis. (2) The design stage was carried out by creating the storyline, flowchart, storyboard, and the detailed drawing. (3) The development involved the process of validation by expert and the revision based on some recommendation from the expert before implementing the comic in the learning activity. (4) At the implementation stage, the researcher disseminated the comic learning media to science teachers and students then collected the data from them by using the questionnaire. (5) Evaluation was carried out by analyzing the data result and reporting the data result.

3.3 Population and Sample

The subjects in this research consisted of experts, students, and teachers. The experts involved in this research consisted of three experts. The target population included in this research are those students who have learned about respiratory system topics, so the researcher chooses 8th graders as the population target, while

teachers are those who teach science, so there are 34 students involved in this research. Furthermore, the science teachers involved in this research are four science teachers. The sampling technique used in this research is convenience sampling where the researcher selected participants because they are willing and available to be studied (Creswell, 2008).

3.4 Research Instruments

In this research, there were three types of research instruments which were expert judgement, teacher questionnaire, and student questionnaire. Data was obtained through expert validation sheets in the form of quantitative data based on the results of statement scores about the suitability of comic media and qualitative data obtained based on the developed comic reviews. The detailed explanation will be described as follow:

1) Experts' Judgement

The expert judgement presented in the form of rubric that involved some indicators with 4-criteria judgement. The role of the expert judgement was to assess the comic learning media in terms of its material suitability, user experience, health literacy, visual appeal, and text quality. The Expert judgement rubric can be seen in Table 3.1. The detailed expert judgement rubric can be seen in Appendix 1.

Table 3.1 Table of Material Expert Judgement

| Indicator | Criteria | | | |
|----------------------|---|---|---|--|
| | 1 | 2 | 3 | 4 |
| Material suitability | No evidence of a connection to the learning outcome of the study. | Little evidence of a connection to the learning outcome of the study. | Some evidence of a connection to the learning outcome of the study. | All evidence of a connection to the learning outcome of the study. |
| | No evidence that the content of this comic supports | Little evidence that the content of this comic supports | Some evidence that the content of this comic supports | All evidence that the content of this comic supports |

| Indicator | Criteria | | | |
|-----------------|--|--|--|---|
| | 1 | 2 | 3 | 4 |
| User experience | the stated objectives. No evidence that the depth of the material is presented in accordance with learning objectives. | the stated objectives. Little evidence that the depth of the material is presented in accordance with learning objectives. | the stated objectives. Some evidence that the depth of the material is presented in accordance with learning objectives. | the stated objectives. All evidence that the depth of the material is presented in accordance with learning objectives. |
| | that the presentation of the concept is presented coherently. | that the presentation of the concept is presented coherently. | that the presentation of the concept is presented coherently. | that the presentation of the concept is presented coherently. |
| | that the presentation of the material is interactive. | that the presentation of the material is interactive. | that the presentation of the material is interactive. | that the presentation of the material is interactive. |
| | that QR codes help to enrich the learning experience. | that QR codes help to enrich the learning experience. | that QR codes help to enrich the learning experience. | that QR codes help to enrich the learning experience. |
| | that the placement of content flow fits well and provides an efficient way to grab the reader's attention. | that the placement of content flow fits well and provides an efficient way to grab the reader's attention. | that the placement of content flow fits well and provides an efficient way to grab the reader's attention. | that the placement of content flow fits well and provides an efficient way to grab the reader's attention. |

| Indicator | Criteria | | | |
|-----------------|---|---|---|--|
| | 1 | 2 | 3 | 4 |
| | No evidence that the comic provide access to health information. | Little evidence that the comic provide access to health information. | Some evidence that the comic provide access to health information. | All evidence that the comic provide access to health information. |
| | No evidence that the content is understandable | Little evidence that the content is understandable | Some evidence that the content is understandable | All evidence that the content is understandable |
| Health Literacy | No evidence that the health information that has been delivered is relevant to make decisions and taking action to benefit health | Little evidence that the health information that has been delivered is relevant to make decisions and taking action to benefit health | Some evidence that the health information that has been delivered is relevant to make decisions and taking action to benefit health | All evidence that the health information that has been delivered is relevant to make decisions and taking action to benefit health |
| Visual Appeal | No evidence that the panels are related to the theme. | Little evidence that the panels are related to the theme. | Some evidence that the panels are related to the theme. | All evidence that the panels are related to the theme. |
| | No evidence that the main characters are clearly identified. | Little evidence that the main characters are clearly identified. | Some evidence that the main characters are clearly identified. | All evidence that the main characters are clearly identified. |
| | No evidence that color matching help readers increase their attention. | Little evidence that color matching help readers increase their attention. | Some evidence that color matching help readers increase their attention. | All evidence that color matching help readers increase their attention. |

| Indicator | Criteria | | | |
|-----------|---|---|---|--|
| | 1 | 2 | 3 | 4 |
| Text | No evidence that the visual aesthetics can captivate the reader's attention. | Little evidence that the visual aesthetics can captivate the reader's attention. | Some evidence that the visual aesthetics can captivate the reader's attention. | All evidence that the visual aesthetics can captivate the reader's attention. |
| | No evidence that a balance between artistic creativity and functional readability ensures the readers are drawn into the story. | Little evidence that a balance between artistic creativity and functional readability ensures the readers are drawn into the story. | Some evidence that a balance between artistic creativity and functional readability ensures the readers are drawn into the story. | All evidence that a balance between artistic creativity and functional readability ensures the readers are drawn into the story. |
| | No evidence that the text is clear and good in resolution. | Little evidence that the text is clear and good in resolution. | Some evidence that the text is clear and good in resolution. | All evidence that the text is clear and good in resolution. |
| | No evidence that the selection of font size is readable and enhance reading speed. | Little evidence that the selection of font size is readable and enhance reading speed. | Some evidence that the selection of font size is readable and enhance reading speed. | All evidence that the selection of font size is readable and enhance reading speed. |
| | No evidence that the selection font type is readable and direct the reader's attention. | Little evidence that the selection font type is readable and direct the reader's attention. | Some evidence that the selection font type is readable and direct the reader's attention. | All evidence that the selection font type is readable and direct the reader's attention. |

Based on the Table 3.1, the expert judgment instrument was designed with four criteria, each accompanied by its specific description. Those criteria guided the experts in evaluating the comic learning media. In the comic assessment, experts filled in scores according to the rubric in the provided column.

2) Teacher Questionnaire

In this study, a teacher questionnaire was utilized during the implementation stage following the development stage. The questionnaire was distributed to four teachers from different science fields, including physics, chemistry, and biology. The questionnaire comprised 12 statements, using a dichotomy format to assess various indicators such as material suitability, text quality, visual appeal, content understanding, comprehension, information structure, health literacy, and facility. Each of the indicators assessed in the teacher questionnaire can be seen in Table 3.2. The detailed teacher questionnaire can be seen in Appendix 2.

Table 3.2 Teacher Questionnaire

| Indicator | Statement | Yes | No |
|-----------------------|--|-----|----|
| Material Suitability | The content in the comic aligns with the learning outcome of the respiratory system topic. | | |
| | The content in the comic aligns with the learning objectives. | | |
| Text quality | The presentation of the concept is presented coherently | | |
| | Presenting text with appropriate size and type enhances reading speed. | | |
| Visual appeal | The attractive comic design enhances student motivation to learn. | | |
| Content understanding | The material is understandable | | |
| Comprehension | The presentation of the material enhances understanding of health literacy on the topic of the respiratory system. | | |
| Information structure | I cannot focus on the content flow and understand it easily. | | |
| Health Literacy | The comic provides access to health information from various resources. | | |
| | The content in the comic helps readers understand how health literacy can improve quality of life by avoiding smoking behavior. | | |
| | The delivered health information is relevant for making decisions and taking action to benefit health. | | |
| Facility | The overall content in the comic helps students to access, understand, and make decisions for their health, particularly in avoiding smoking behavior. | | |

The teachers' responses and feedback gathered through this questionnaire will play a crucial role in evaluating and enhancing the effectiveness of the comic learning media.

3) Student Questionnaire

In this study, a student questionnaire was conducted during the implementation stage after the development stage. The questionnaire was distributed to 34 students from 2 different schools in Bandung City. The questionnaire comprised 12 statements, using a dichotomy format to assess various indicators such as creativity, media quality, text quality, visual appeal, content understanding, comprehension, enhancement, information structure, health literacy, and facility. Each of the indicators assessed in the student questionnaire can be seen in Table 3.3. The detailed student's questionnaire can be seen in Appendix 3.

Table 3.3 Student Questionnaire

| Indicator | Statement | Yes | No |
|-----------------------|--|-----|----|
| Creativity | the comic media helps me to focus on the story and allows me to imagine myself in the story | | |
| User Experience | The comic media do not help me to improve the quality of learning and do not become more motivated to learn with the comic media | | |
| Text Quality | I can enhance my reading speed and keep my attention because the text in the comic is good in resolution | | |
| Visual appeal | I am not interested and motivated to learn because the comic designs are not interesting. | | |
| Content understanding | I can understand the content of the comic that is related to the respiratory system I have learned before | | |
| Comprehension | This comic media improves my understanding related to health literacy in the respiratory system topic | | |
| Enhancement | I got a lot of learning experience because the comic is complete with a QR code that links me to the various website | | |

| Indicator | Statement | Yes | No |
|-----------------------|--|-----|----|
| Information structure | I cannot focus on the content flow and understand it easily. | | |
| | I realize that getting reliable access to health information is important | | |
| Health Literacy | Through this comic, I understand how health literacy can improve the quality of life, especially by preventing smoking behavior. | | |
| | I can decide and take action to get benefit health after learning through comic media. | | |
| Facility | I understand the concept of health literacy in the respiratory system after learning through comic media. | | |

3.5 Data Analysis

The data analysis process involved Aiken's variable and Percentage of agreement. The data was obtained from expert judgment and analyzed using Aiken's variable, while data from student and teacher questionnaires were analyzed by counting the percentage of agreement.

1) Expert Judgement Data Analysis

To assess the validity of expert judgement, the Aiken validity index was used to analyze the validity of the comic learning media that has been developed. Aiken formula was used in this research because the possibility of getting a combination of the three validators in assessing strong relevant items is high and it is more stable compared to another formula, such as Gregory formula (Retnawati, 2016). Aiken introduced a validity index, which is expressed as follows:

$$V = \frac{\sum s}{n(c - 1)}$$

(Aiken, 1980)

where V is the item validity index; s are the scores given by each validator minus the lowest score in the used category ($s = r - lo$, where r = rater category selection score, and lo = the lowest scores in the scoring category); n is the number of raters;

and c is the number of categories that raters can choose. The V index value ranges from 0 to 1. The closer an item to 1, the better it is, because it is more relevant to the indicator. According to (Retnawati, 2016), the criteria for content validity can be described below.

1. If the validity index score (V) < 0.4 , then its validity is considered low.
2. If the validity index score is $0.4 < V < 0.8$, it is said to have moderate validity.
3. If the validity index score $V > 0.8$, it can be considered to have high validity.

2) Teacher and Student Data Analysis

The teachers and students' questionnaire went to the same analysis technique by calculating the percentage of agreement. According to Arikunto (2011), the feasibility of comic learning media can be calculated using the following formula:

$$\text{Percentage score} = \frac{\sum \text{gained score}}{\sum \text{maximum score}} \times 100\%$$

The data percentage that had been obtained was then transformed into the table in order to make it easy to read the result. To determine Qualitative criteria are carried out by:

- 1) Determine the percentage of the ideal score (maximum score) = 100%.
- 2) Determine the percentage of the lowest score (minimum score) = 0%.
- 3) Define range = $100 - 0 = 100$.
- 4) Determine the desired interval = 4 (not feasible, feasible enough, feasible, very feasible)
- 5) Specifies the width of the interval ($100/4 = 25$).
- 6) Based on the calculation above, the average of percentage interpreted in the criteria served in Table 3.4.

Table 3.4 Criteria of Percentage

| Percentage | Interpretation |
|-------------------------------------|-----------------|
| $76\% \leq \text{score} \leq 100\%$ | Very feasible |
| $51\% \leq \text{score} \leq 75\%$ | Feasible |
| $26\% \leq \text{score} \leq 50\%$ | Feasible enough |
| $0\% \leq \text{score} \leq 25\%$ | Not feasible |

(Arikunto, 2011)

3.6 Research Procedure

In conducting this research, the author followed some steps were used to collect and analyze the information. Those steps were categorized into three main stages, which were preparation stage, implementation stage, and completion stage.

1) Preparation Stage

The preparation stage was the beginning of this study. This stage was conducted by identifying a research problem, especially an issue or problem in education that must be solved. In identifying the research problem, the author specified the issue in education and suggested the importance of studied it. The next step was reviewing the literature which included finding the journals, books, and indexed publications, then summarizing the literature in the form of written report. From the summarized literature, the author specified the purpose of the research that had been narrowed into specific research questions.

2) Implementation Stage

The implementation stage was focused on developing of the research instruments and collecting the data of the research. The development of research instruments was included developing the comic learning media using ADDIE Model, developing expert judgement rubric, and developing student and teacher questionnaires. In analyzing step of ADDIE Model, the author analyzed the needs of the media, material, user, and software. Continuing with designing comic learning media, began by creating a storyline, flowchart, and storyboard, and finally drawing it within panels. The comic that had been made was reviewed by experts to be revised. After revising the comic, the comic learning media was implemented to collect the data from teachers and students' questionnaires. The data that had been collected was then analyzed and interpreted.

3) Completion Stage

After conducting the research, the author developed a written report and evaluated the research involved in assessing the quality of the study. The report was written in the form of research paper and journal article. The proof of journal submission can be seen in Appendix 13.

The entire research procedure, divided into three main stages, was summarized in Figure 3.1.

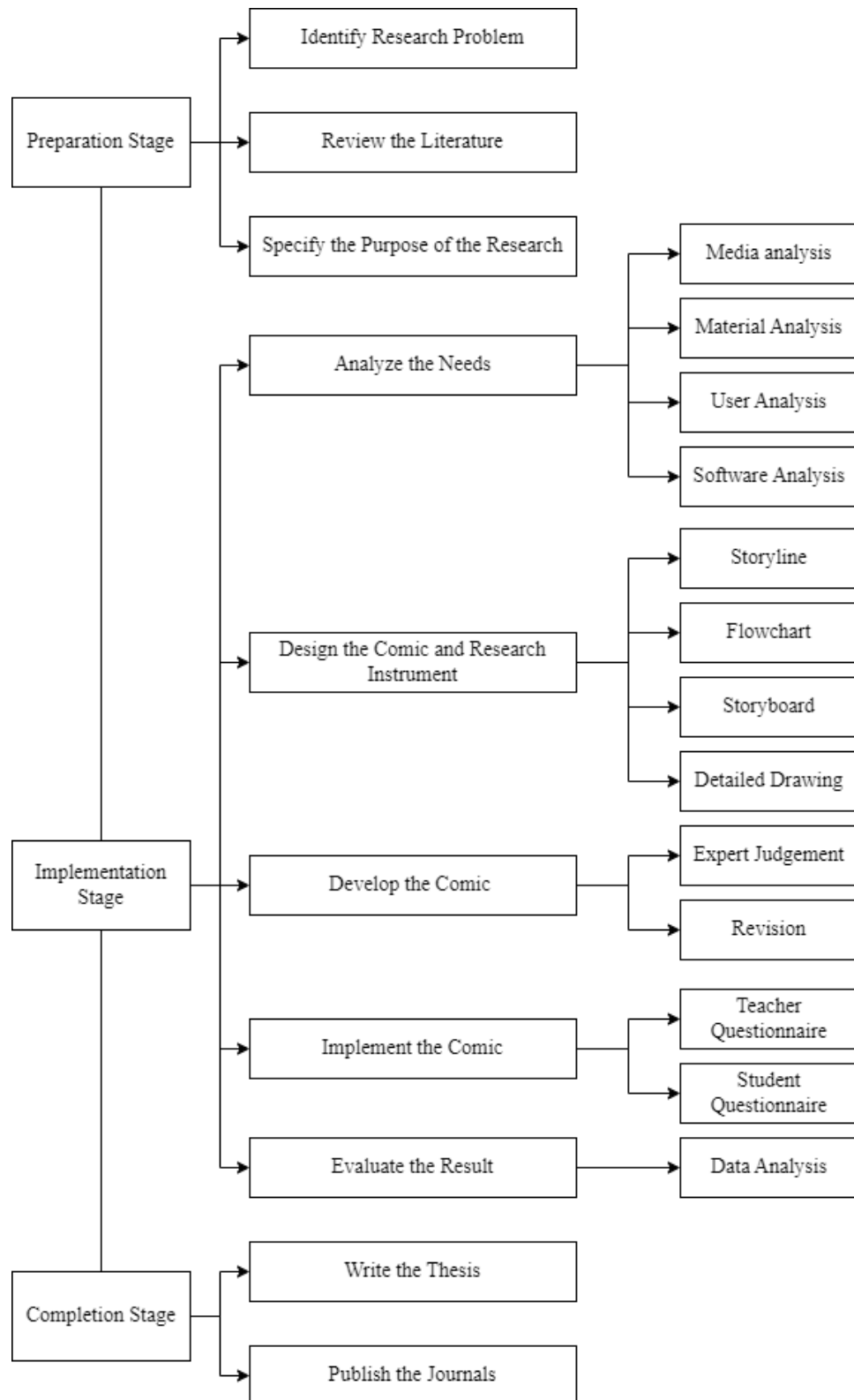


Figure 3.1 Flowchart of Research Design