CHAPTER III
RESEARCH METHOD

3.1 Research and Development Method

This research used a type of Research and Development method (R&D). Research and Development method is a research method used to produce certain products, and test the effectiveness of the products. The study's primary goal was to support future researcher in their investigation and to developing the eleventh graders' reading comprehension material utilizing project-based learning model. In accordance with the definition of Research and Development design according to Borg and Gall in Sumarni (2019) stated that "*educational Research and Development (R&D) is a process used to develop and validate educational products*" this means that research and development is a process of creating educational products that have undergone passed field testing and revisions before being declared valid and appropriate for use or implemented. The term of educational products here means that any kinds of material resources such as book, software, videos or audios, learning media, supplementary materials and so on. But the educational products that researcher taken is the eleventh graders' reading comprehension material utilizing project-based learning model.

To ensure the systematic development the eleventh graders' reading comprehension material utilizing project-based learning model this study will adopt the 4D Development Model, a well-established framework for instructional design. The advantage of 4D models is that the steps are relatively uncomplicated, so they do not take a relatively long time. While the weakness of the 4D model is that the -4D model only reaches the sales stage and there is no evaluation. The 4D model will include four stages namely, Define, Design, Develop, and Disseminate (Kusmaryani & Ramli, 2023). The 4D model will be crucial in this research because it systematic approach that accommodates student-centered learning needs. This will ensure that the product will be continuously refined to meet the learning needs of students.

The model supported developing the eleventh graders' reading comprehension material utilizing Project-based learning model.

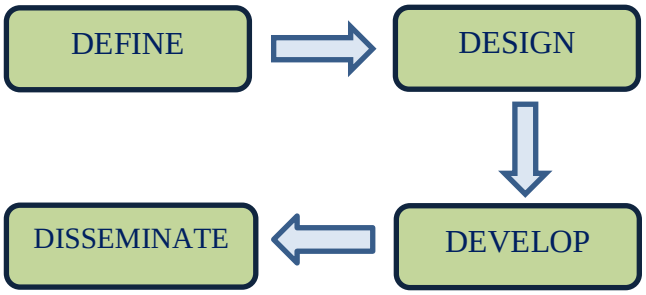

Figure 3.1 4D Model Development Steps

In addition to R&D and the 4D model, this research utilized Classroom Action Research (CAR) as a methodology to test and refine reading comprehension material utilizing project-based learning model in an actual classroom. According to Kemmis and McTaggart in Alek (2016), CAR is an iterative process consisting of four stages: planning, acting, observing, and reflecting. This design was considered appropriate for this research since it enabled continuous improvement of the reading material through direct classroom practice and teacher–student interaction.

In this study, the CAR cycles were applied to evaluate how reading comprehension material utilizing Project-Based Learning model, specifically explanation text could develop students' reading comprehension. Through the cycles of planning the lesson, implementing the materials in classroom action, observing students' participation and learning outcomes, and reflecting on the results, the researcher and the teacher collaboratively refined the product to make it more effective, engaging, and aligned with students' needs.

3.1.1 Data Collecting Technique

To gather comprehensive data on the eleventh graders' reading comprehension material utilizing project-based learning model this study employed three primary data collection techniques: observation, interviews and questionnaire. These methods were used to obtain rich, contextual data from both teacher and students at SMA Negeri 1 Moro'o.

1. Observation

Observation would provide direct insight into classroom interactions and the development of reading comprehension material utilizing project-based model. Specifically, the observation focused on students' reading skills, level of participation, the teaching model, and instructional media used during the learning process.

The primary purpose of the observation was to identify students' learning behaviors and engagement patterns during reading activities, understand how students interact with reading material, and explore the implementation of PjBL in real classroom settings. This helped the researcher determine the difficulty and needs of students, which served as a foundational step in designing appropriate reading material.

As suggested by Johnson & Christensen (2014), observation is considered the most direct means of studying human behavior, especially when aiming to capture individuals' overt actions in authentic settings. Through observation, the researcher could see how students responded to reading activities and project-based tasks, thereby collecting valuable contextual data that complemented findings from interviews and needs analysis questionnaire.

Table 3.1 Observation Sheet

Aspect	Indicators to Observe	Observation Notes
Students' Reading Skills	• Do students able to comprehend English texts containing unfamiliar words? • Do students able to interpret sentence structures in reading passages correctly?	
Teaching Model Used	• Does the teacher provide opportunities for students to engage in exploration and discussion? • Does the teacher use a variety of instructional strategies beyond lecturing (group work or project-based tasks)?	
Students Participation	• Do Students actively engage in group discussions and classroom activities? • Do students voluntarily express their opinions and ask questions?	
	• Is the availability of media and	

Teaching Media and Resources	materials supports the implementation of project-based learning (PjBL)? • Does the teacher utilize visual, audio, printed material or digital media to support learning activities?	

2. Interviews

Interviews were conducted with both teacher and students to complement data from classroom observation and questionnaires in identifying students' needs. As Johnson & Christensen (2014) stated, an interview is a two way method that allows the exchange of ideas and information. In this study, interviews aimed to explore in depth information regarding the difficulties experienced in implementing project-based learning (PjBL) model and its impact on students' reading comprehension.

The interviews with teacher focused on identifying instructional challenges and the effectiveness of current reading material, while the interviews with students were intended to uncover their perceptions of the PjBL model and engagement with reading tasks. The information obtained from interviews served as a valuable basis for improving and contextualizing the development of reading comprehension material utilizing PjBL model.

a. For Students

Table 3.2 Interviews Sheet for Students

Category	No.	Interviews Questions	Responses
Students' Reading Skills	1	What difficulties do you usually face when reading English texts?	
	2	Was it easy or difficult for you to understand the reading material used in the project?	
Teaching Model Used	3	Do you understand the steps in project-based learning?	
	4	What difficulties did you face when participating in project-based activities?	
Students Participation	5	Do your group members actively participate in the project assigned by the teacher?	
	6	What usually makes you excited or discouraged to participate in projects?	
	7	Are the reading texts used in the	

Teaching Media and Resources		lesson easy for you to comprehend?	
	8	Do you need additional learning resources or media to facilitate and improve your comprehending?	

b. For Teacher

Table 3.3 Interviews Sheet for Teacher

Category	No.	Interviews Questions	Responses
Students' Reading Skills	1	How do you assess students' reading comprehension of English texts?	
	2	What challenges do you face when students are required to comprehend reading texts as part of a project?	
Teaching Model Used	3	Do you feel confident and comfortable implementing Project-Based Learning (PjBL) to teach reading skills?	
	4	What are the main obstacles you have faced in implementing this learning model?	
Students Participation	5	How do students participate during the project-based learning process?	
	6	Are there any students who are less active? If so, how do you deal with it?	
Teaching Media and Resources	7	Do the media and reading material you use support the successful implementation of PjBL in teaching reading?	
	8	Do you feel the need for additional learning resources or media to support this process?	

3. Questionnaire

Questionnaire used to take measurements to produce accurate quantitative data. The questionnaire used in this study is a closed questionnaire type whose filling is sufficient using a checklist or tick. The questionnaire is structured used a four point Likert scale. Questionnaire was used as one of the data collection techniques in this study to obtain information about student responses to Reading Material developed utilizing the Project-Based Learning Model. This questionnaire aims to determine the level of readability, attractiveness, and usefulness of reading material from the students' perspective.

Table 3.4 Questionnaire Sheet

No	Aspek Penilaian	Indikator Penilaian	Skor (1-4)			
			4	3	2	1
1	Keterbacaan Materi (**Readability of Content**)	Materi mudah saya pahami dan tidak membuat saya bingung.				
2	**Kemenarikan Materi** *(Engagement of Content)*	Materi menarik dan membuat saya lebih bersemangat belajar.				
3	**Dukungan terhadap Pembelajaran** *(Learning Support)*	Materi dapat membantu saya dalam meningkatkan pemahaman terhadap teks bacaan.				
4	**Kesesuaian dengan Kebutuhan Siswa** *(Relevance to Student Needs)*	Materi sesuai dengan apa yang saya butuhkan dalam memahami bacaan.				
5	Kemudahan Penggunaan Media (**Ease of Use**)	Bahan ajar ini mudah untuk saya gunakan.				
6	Interaktivitas Media (**Interactivity of Media**)	Bahan ajar ini memuat latihan soal dan kegiatan proyek yang berkaitan dengan materi.				
7	**Kepraktisan dalam Penggunaan** *(Practicality in Usage)*	Bahan ajar ini dapat saya gunakan secara mandiri tanpa banyak bantuan dari guru.				
8	**Kelayakan dalam Pembelajaran** *(Feasibility in Learning)*	Bahan ajar ini sesuai untuk saya gunakan dalam pembelajaran di sekolah maupun di rumah.				

Source: Adapted from Minto, T. L. (2024).

3.1.2 Data Analysis Technique

For this study, data processing was conducted using two data analysis techniques: quantitative and qualitative analysis, which complemented each other.

1. Quantitative Analysis

a. Descriptive Analysis

The descriptive analysis focused on detailing and explaining the data comprehensively. According to Creswell

& Creswell (2018), descriptive analysis in qualitative research aims to provide an in-depth understanding of the phenomenon being studied by systematically and structurally presenting findings. In this study, data collected through interviews and observation was described to illustrate students' reading comprehension of the materials developed using the PjBL model. The descriptive results included a detailed explanation of the students' comprehension observed during English language learning.

2. Qualitative Analysis

According to Creswell & Creswell (2018), the stages in qualitative analysis are interconnected, enabling researcher to interpret data systematically and uncover deeper patterns. This study followed their three step approach to analyze the qualitative data collected.

a. Data Reduction

This process involved sorting, simplifying and coding the data. Data collected from interviews or observation will be categorized to describe students' understanding of the material delivered using the PjBL model. For example, taking data that shows students' needs in reading will be categorized and simplified to facilitate further analysis.

b. Data Display

After the data was simplified, it will be presented in a more organized and easily understood form. This can be in the form of tables, diagrams, or narratives that illustrate students' understanding of the material developed using the PjBL model. This display was aim to provide a clear picture of the relationship between reading comprehension material and project-based learning model.

c. Conclusion Drawing

At this stage, the researcher drew conclusions from the data that has been analyzed and displayed. These conclusions will lead to an understanding of how the material taught utilizing project-based learning model is able to develop students' reading comprehension.

3.2 Procedure of Development

The procedure for developing the eleventh graders' reading comprehension material based on project-based learning model was carried out through several systematic stages including define, design, develop and disseminate based on the 4D model in Research and Development (R&D). This procedure aims to produce reading comprehension material based on PjBL model.

a. Define

At this stage, the researcher identified the fundamental problems in students' reading comprehension through observation, interview, and preliminary analysis of the existing materials used by the teacher. The findings showed that the materials were already implemented using the Project-Based Learning model, but they had not yet accommodated students' needs and interests. Therefore, the researcher concluded that there was a need to develop reading material, specifically focusing on Explanation Text, to improve students' engagement and comprehension.

b. Design

This stage focused on designing the initial product in the form of Reading Material Based on Project-Based Learning Model. The researcher developed a product structure consisting of an opening section (cover, preface, table of contents, and learning objectives), a content section (explanation text material, exercises, and projects), and a closing section (bibliography). The design of reading material is made by considering

visual elements, readability, and the connection of content with the context of students' live. Researcher used the Canva application to design the appearance of reading material to make them more attractive and easy for students to understand. This initial design resulted in a prototype of reading material that was ready to be validated at the next stage.

c. Develop

At the develop stage, researcher carried out the validation process of the product that has been designed. This stage focused on developing and validating the product. The initial draft of the reading material was evaluated by experts to ensure content validity, language clarity, and suitability with PjBL principles. The feedback obtained from the experts was then used to revise and improve the product. After validation, the product was tried out in a small group consisting of six students. The try out aimed to measure the practicality of the material and to gather direct feedback from students. The evaluation was conducted through two instruments:

a. Final Evaluation which was administered to measure students' reading comprehension after using the developed material. The results of the test indicated that students were able to achieve better comprehension, as reflected in the mean and median scores obtained during the small try out. The results of the final evaluation served as the basis for revising the product before dissemination.
b. Students' Response Questionnaire which was distributed to assess students' perceptions of the product regarding interest, clarity, attractiveness, and usefulness. The tabulation of the data showed that the majority of students gave positive responses toward the developed material. The results of the questionnaire served as the basis for revising the product before dissemination.

Table 3.5 Students Response Scores on Small Group

Students Initial	Score (0-100)	Status (≥70=KKM)
ADW	70	Achieved
JG	80	Achieved
LSW	90	Achieved
TTBG	80	Achieved
WDG	90	Achieved
YW	100	Achieved

Table 3.6 Distribution of Final Evaluation Score on Small Group

Score Category	Frequency	Percentage
70	1	16.67%
80	2	33.33%
90	2	33.33%
100	1	16.67%
Total	**6**	**100%**

Table 3.7 Summary of Final Evaluation Statistics on Small Group

Indicator	Score
Number of Students (N)	6
Minimum Score	70
Maximum Score	100
Mean	85.0%
Median	85
KKM	70
Number of Students Achieved	6
Percentage	100%

$$\text{Percentage} = \frac{Number\ of\ Students\ Achieved}{Number\ of\ Students} \text{x}100\%$$

$$= \frac{6}{6} \text{ x } 100 = 100\%$$

$$\text{Mean} = \frac{\Sigma X}{N} = \frac{510}{6} = 85.0\%$$

The results of the small tryout showed an average score of 85.0 with a median of 85. All 6 students (100%) achieved or exceeded the predetermined minimum mastery criteria (70). The distribution of scores showed that most students scored between 80 and 90 (33.33% each), and one student scored perfectly (100). These findings indicate that the product (Reading Material Based on PjBL Model) is sufficiently practical at the small scale testing stage and therefore worthy of being continued to large scale testing/dissemination.

Table 3.8 Students Response Scores on Small Group

No	Students Initial	Total Score	Score (%)	Category
1	ADW	23	71,88%	Feasible
2	JG	30	93,75%	Very Feasible
3	LSW	26	81,25%	Very Feasible
4	TTBG	26	81,25%	Very Feasible
5	WDG	29	90,63%	Very Feasible
6	YW	32	100%	Very Feasible
Total Average Score		**166**	**86,5%**	**Very Feasible**

Based on the data tabulation in Table 3.8 regarding student responses to reading material based on project-based learning model during the small tryout phase, it can be seen that most students gave positive assessments of the products developed. The calculation results show that the overall average score reached 86.5%, which falls into the 'Very Feasible' category. This indicates that students found reading material used to be engaging, easy to understand, and relevant to their needs in learning text explanations. Additionally, students also assessed that the project-based activities presented in reading material were able to enhance active engagement, and understanding of the reading material. Therefore, it can be concluded that the products tested on the small group received positive feedback from students, making them suitable for use and continuation to a broader field trial phase.

After conducting the small tryout, the researcher implemented a Classroom Action Research (CAR) in the pilot class. This stage aimed to refine the product further by applying it in real classroom activities and observing the learning process directly. Through CAR, the researcher identified students' engagement, participation, and challenges during the learning process using the developed reading material. The findings from this stage provided valuable insights that supported the improvement of the material before it was disseminated to a broader class.

d. Disseminate

The last stage is the dissemination of Reading Material (explanation text) in classroom learning for the eleventh grade students of SMA Negeri 1 Moro'o. In this stage, the researcher applied Reading Material Based on

Project-Based Learning Model, where students were divided into groups and given project activity that was directly related to the reading material. This dissemination process aims to determine the acceptance of the product by students as well as its practicality in supporting reading comprehension.

The revised product was applied in a larger class (XI MIA 1) to examine its broader applicability. The implementation also included a final evaluation to analyze students' reading comprehension and overall effectiveness of the developed material. The dissemination confirmed that the product could be effectively used in classroom settings and provided meaningful support to students' reading comprehension activities. To evaluate the products that have been used, researcher distributed student response questionnaire covering aspects of readability, ease of use, engagement, and relevance to students' live.