

CHAPTER III

RESEARCH METHODS

3.1 Research and Development Method

Development generally refers to the process of growth, progress, or improvement in various contexts, such as economic, social, educational, and personal dimensions. In a broad sense, it encompasses changes that lead to enhanced capabilities, quality of life, and well-being. Meanwhile, Research is a systematic process of inquiry aimed at discovering new information, validating existing knowledge, or solving specific problems. It involves the collection, analysis, and interpretation of data to answer questions or test hypotheses. Research can be conducted in various fields, including the sciences, humanities, social sciences, and applied disciplines, and can take many forms, such as qualitative, quantitative, or mixed-methods approaches.

Moris and Pece (2022) argues that research and experimental development (R&D) Activities are described as methodical and creative effort done to expand the body of knowledge, including knowledge about people, culture, and society, and to develop new applications based on the knowledge already in existence. Anon (2023) explain that research and development (R&D) activities are an important part of one's efforts to improve the knowledge base and create innovations. Rustamana *et al* (2024) emphasize that research and development (R&D) in education is a complex process aimed at producing or improving products to enhance effectiveness. With a systematic and iterative approach, development research can lead to innovative and effective products and services.

So, based on the views of the three experts, research and development (R&D) activities are significant and complex processes that contribute to knowledge expansion and innovation. In addition to providing knowledge, R&D prioritizes using appropriate research techniques and having a thorough understanding of student needs. With a methodical and iterative approach, R&D can lead to creative and effective products and services. Therefore, R&D

is essential for the continuous development and adaptation of this research to the needs of students.

Research and development (R&D) is an important approach in creating effective learning solutions, with the ADDIE model as one of the systematic frameworks widely used to design, implement and evaluate innovative learning programs that meet the needs of learners. As Hamzah (2023) stated that ADDIE (Analyze-design-development-implementation-evaluate) is a classroom-oriented development model. ADDIE model development is synonymous with learning system development. In addition, Abuhassna *et al.*, (2024) argued the ADDIE model is a framework for instructional design that can be enhanced by integrating technology.

The conclusion that can be drawn from this paragraph is that the application of the ADDIE model in the development of learning solutions, such as interactive educational Game, is very relevant and effective to meet students' needs. By following the systematic steps in the ADDIE model (analysis, design, development, implementation, and evaluation) the process of developing learning programs can produce innovations that are interesting and in line with learning needs. In addition, the integration of technology in instructional design can enhance students' learning experience, thus creating a more interactive and effective learning environment. This shows that the ADDIE model serves not only as a framework, but also as a tool that can improve the quality of education through a structured and technology-based approach.

3.1.1 Data Collecting Techniques

To collect comprehensive data on students' speaking skills in English language learning, this study will use two main data collection instruments: observation and interview. These two methods will be used to collect rich and contextualized data from teachers and students at SMP Negeri 4 Gunungsitoli Selatan.

a. Observation

Observations were made to gain a better understanding of classroom dynamics, interactions between students, and teaching methods applied by the teacher. Through observation, the researchers used observation sheet as a tool to collect data systematically and purposefully. Through this sheet, the researcher can get a comprehensive picture of the real conditions in the field, the data from this observation becomes the basis for designing learning media that suits students' needs and characteristics.

Table 3.1 Observation sheet during teaching learning process in Analysis

No	Observed Statement	Yes	No
Students Needs			
1	Students need speaking materials related to everyday communication.		
2	Students still have difficulty using certain vocabulary in speaking.		
Learning Style			
3	Students show a preference for kinesthetic learning (learning by doing/movement)		
4	Students feel more comfortable with auditory-based learning (listening/conversation)		
5	Students prefer a combination of learning styles (combination)		
Prior Knowledge			
6	Students understand basic vocabulary related to the topic		

7	Students are able to construct simple sentences based on the topic		
8	Do students have background knowledge about the material being discussed		
Relevant Skills			
9	Students are able to follow simple instructions in English		
10	Students have the skills to use technology or interactive games		
Learning Problems			
11	Students face difficulties in grammar when speaking		
12	Students face problems with pronunciation		
13	Students find it difficult to express ideas or opinions orally		
Potential of Games			
14	Games increase students' motivation to speak		
15	Games help students understand difficult vocabulary/expressions through practice		
16	Games facilitate student interaction to build speaking confidence		
Students Characteristics			
17	Do students seem motivated to speak when activities are made fun		
18	Do students try to improve their pronunciation or information when speaking		

b. Interview

Interviews will be conducted with both teachers and students to gather data. Patton (2020) explains that an interview is a question-and-answer process between the researcher and the informant, aimed at gathering in-depth information about the informant's views, opinions, experiences, and feelings regarding a particular topic. Dursun (2023) underline that interview is the process in which the researcher is asked various questions to the person participating in the interview and is trying to obtain information from the interviewer about a certain subject.

The researcher conducted a question-and-answer session related to teacher experiences in speaking English including, teachers' biggest challenges when talking about learning topic, teacher experiences in learning English so far and several other questions to get information related to their speaking skills. To support the answers from the students' results, the research also conducted an interview with the teacher regarding the challenges faced by the teacher in teaching no littering material to students, how to teach it and also the extent to which students are involved in discussions related to the topic being discussed. Interviews were conducted with students and teachers to dig deeper into their experiences and views on learning to speak. Interviews with students will reveal how they find it difficult to speak English when there are opportunities to practice and feel anxious when they have to speak in front of their peers and the teacher in front of the class. In this era of digitalization, the researcher believes that many students want more interesting and interactive learning methods, such as role playing or group discussions, which can help them feel more comfortable and confident when speaking in English learning.

Table 3.2 Interview Question for the Teacher in Analysis

No	Question	Response
1	Did you study English speaking in classroom?	
2	Did you interest to study speaking?	
3	What were topics did you study in speaking	
4	What the topic did you prefer to study?	
5	What steps do teachers use in the learning process to engage students in speaking?	

6	To what extent do you incorporate this approach into your English teaching?	
7	In your opinion, would students be more interested in learning English if the material was linked to interactive games?	
8	What are your expectations regarding the use of educational games in teaching learning topics?	
9	How often do you evaluate students' speaking skills after discussing learning topics?	
10	Would you be willing to participate in the development of interactive educational games?	

c. Oral Test

In any research, the evaluation stage is one of the most important components to ensure that the desired goals are achieved. This evaluation not only serves to assess the end result, but also to understand the processes that occur during implementation. As Sahir (2022) stated that An evaluation method used to measure a person's understanding, knowledge or skills through questions asked orally. In this test, participants are asked to answer questions directly in front of an examiner or in a group situation. Ummah (2020) asserted that an oral exam is a form of evaluation conducted through question and answer between the examiner and the examinee. This exam aims to measure participants' understanding of the material they have learned, as well as their ability to communicate orally and think critically.

In this study, the oral test served as the main instrument to collect in-depth qualitative data, allowing the researcher to explore the respondents' thoughts and knowledge in more detail and then the respondents were asked

to answer questions orally to measure their understanding and skills in the learning topics studied in class after using Interactive educational Game. By using this technique, researchers can assess not only the respondents' level of speaking, but also their ability to communicate and convey ideas effectively. In addition, oral tests provide an opportunity for researchers to clarify answers and delve into relevant topics, resulting in richer and more contextualized data. The results of these tests can be used to evaluate an individual's ability or achievement in an educational context. Thus, the evaluation stage that includes testing is not only important for assessing the final outcome, but also for providing deep insights into the effectiveness of the process applied, thus enabling continuous improvement in achieving the research objectives.

In the following, the researcher presents a list of questions that have been designed to provide a clearer and more structured picture of the data to be analyzed.

Table 3.3 Pre-test

No	Question	Answer
1	What do you know about the trash?	
2	What do you usually do if you see your friend littering?	
3	Why is it important to keep the school environment clean from litter?	
4	Can you mention three places that we often see full of trash?	
5	Explain one simple thing you can do every day to help reduce litter!	

Table.3.4 Post-test

No	Question	Answer
1	What do you know about the trash?	
2	What do you usually do if you see your friend littering?	
3	Why is it important to keep the school environment clean from litter?	
4	Can you mention three places that we often see full of trash?	
5	Explain one simple thing you can do every day to help reduce litter!	
6	What are the consequences of littering that you know of?	
7	Have you ever seen someone littering? Tell when and where it happened?	
8	What did you do when you saw someone throw trash?	
9	Can you tell me about a cleaning event you joined in your school?	
10	Make one question for your friend about how to keep the environment clean.	

3.1.2 Data Analysis Technique

For this study, data processing will be conducted using two data analysis techniques: qualitative and quantitative analysis, which will complement each other.

a. Quantitative Analysis

Descriptive analytics uses statistical methods and data visualization to analyze historical data and identify patterns and trends. In addition, Bingham (2023) stated that the stages in quantitative analysis are interconnected, enabling researchers to gain a deeper understanding of

emerging data patterns. The information gathered from observations and interviews will be discussed in this study to show trends in the character development of students learning English.

The descriptive data shall offer thorough justifications of the attitudes, behaviors, and personal qualities of the pupils that were seen throughout English classes.

Calculate the average score of each aspect assessed by equality:

Σ

$$X^{-} = \frac{\Sigma x}{N}$$

Information: X^{-} : Average score of assessment by experts

Σx : Number of scores obtained by experts

N : Number of questions

b. Qualitative Analysis

Measurements are used in quantitative tests to assess how adequate the media produced is. As Hamza A (2019) stated qualitative research is Alamia without any manipulation and is grounded in reality at the moment of interaction occurring at the scene through observation, recording, questioning, and the exploration of sources that are intimately related to the events that take place. V. Geetha *et al* (2024) underline that the descriptive analysis will concentrate on thoroughly describing and elucidating the data. Descriptive analytics uses statistical methods and data visualization to analyze historical data and identify patterns and trends.

3.2 Procedure of Development

The ADDIE development model has become one of the most recognized and widely used frameworks for designing and implementing effective learning programs. With five main phases- analysis, design, development, implementation, and evaluation-the

model provides a systematic guide that researchers will use to assist educators and material developers in creating structured, results-oriented learning experiences. In this subtopic, we will explore each phase of the ADDIE model and how its application can improve the quality of the learning process.

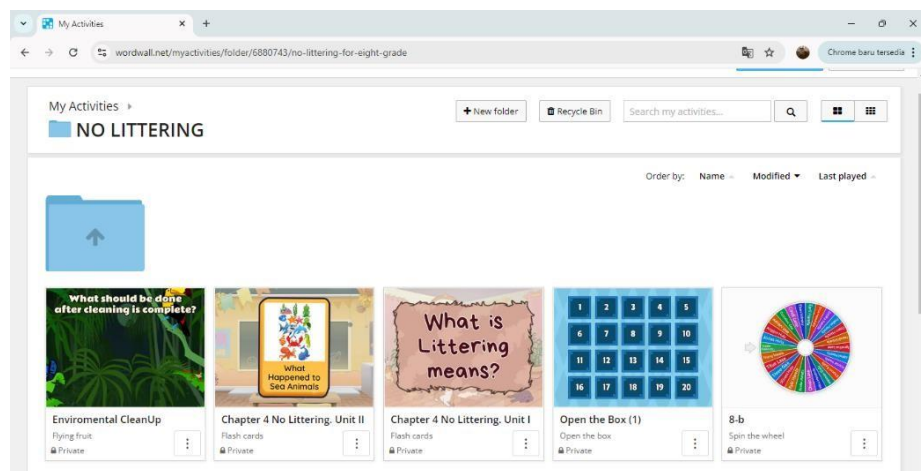
3.2.1 Analysis

Firstly, the researcher would identify the needs of students at SMP Negeri 4 Gunungsitoli Selatan, as stated by Prawiyogi (2021) observation includes the activity of paying attention to an object using all the sensory organs so that, observation is a data collection method that uses the five senses accompanied by detailed recording of the object of research. Kumar (2022) argues that observation is described as a method for observing and describing subject behavior and involves basic techniques for observing phenomena simply until some hunch or insight is gained. Also, Shakeel *et al* (2023) emphasize that observation requires the researcher to analyze and determine student needs, learning styles, student comprehension, relevant skills, student characteristics, learning objectives, learning problems, and game potential. Then, the researcher analyzes the results of the observation and interview and determines that the students need to be provided.

3.2.2 Design

After determining the needs of students based on observations and interviews conducted, in the design stage, researchers began designing interactive and engaging learning products by including elements such as game scenarios that are relevant to students' daily lives, as well as features that encourage active participation and collaboration between students. In this process, researchers utilized the Wordwall platform as a medium for designing interactive games as well as teaching materials to be used in the classroom. Various templates available on Wordwall were adapted to students' learning needs so that the resulting games were relevant to the learning objectives. At this stage, researchers also determined the learning

methods, selected the appropriate media, and formulated learning objectives in line with students' needs which the researcher included in the teaching module. The final product is a website link, so that it can be accessed easily by teachers and students as part of teaching and learning activities. After the initial design was completed, researchers involved several experts in the validation process to ensure the quality and suitability of the products developed.



Picture 3.1 Designing interactive games

3.2.3 Development

After the product was designed, researchers planned a validation process involving several experts, consisting of design experts, linguists, and material experts. This validation aims to ensure that the product is suitable for use in terms of visual, linguistic, and content conformity with the curriculum. Design experts will assess the aspects of design appearance, audience suitability, straightforward aspect, communicative aspect, accuracy of the use of language rules, and aspects of terms and symbols. Meanwhile, material experts will evaluate the appropriateness of the material to learning outcomes, accuracy of content, material support for the

learning process, presentation technique, completeness of presentation aids, and completeness of presentation.

As part of the documentation and analysis process, researchers will also present the validation results in the form of an assessment table from each expert. The table will contain the aspects assessed, the score or category of the assessment given, as well as suggestions and comments from the validators. This information will be used as the basis for revising and improving the product before the product is implemented in the learning process.

1) Design Validation

Table 3.5 validation of design

No	INDICATOR	RATING SCALE				
		1	2	3	4	5
Design Appearance						
1	The layout of elements (menus, buttons, content) is neat and easy to understand.					
2	Colors and images are consistent with the learning theme					
3	Icons, buttons, and symbols are easy to recognize and understand					
Layout and Structure						
4	The placement of elements (titles and instructions) is neat and logical.					
5	The display is neither too full nor too empty; it is proportional and pleasing to the eye.					
6	There are interactive elements (images, quizzes) that enrich the learning experience.					
Audience Suitability						
7	The design is tailored to the characteristics of students (colors, icons, and text)					
8	The text on the design display is clear and easy to understand					
9	Illustrations and image descriptions					

10	The design is able to attract attention and motivate students to use the game					
Total Score						
Percentage						
Category						

2) Linguistic Validation

Table 3.6 validation of language

No	INDICATORS	RATING SCALE				
		1	2	3	4	5
Straightforward Aspects						
1	Effectiveness of sentences					
2	Terminology					
Communicative Aspects						
3	Understanding messages or information					
Language Rules						
4	Grammatical accuracy					
Aspects of Terms and Symbols						
5	Spelling accuracy					
6	Consistent use of terminology					
7	Consistent use of symbols					
Total Score						
Percentage						
Category						

3) Material validation

Table 3.7 validation of material

No	INDICATORS	RATING SCALE				
		1	2	3	4	5
Content Feasibility Aspects						
Appropriateness of material to learning outcomes						
1	Completeness of material					
2	Breadth of material					
3	Depth of material					
Accuracy of material						
4	Accuracy of concepts and definitions					
5	Accuracy of data and facts					
6	Accuracy of examples and cases					
7	Accuracy of images and illustrations					
8	Accuracy of terminology					
Learning material supporters						
9	Availability of teaching materials					
Presentation Feasibility Aspects						
Presentation Techniques						
10	Conceptual coherence					
Support for presentation						
11	Examples of images in everyday life					
12	Images and illustrations for each indicator					
13	Introduction					
14	Summary					
Presentation of learning						
15	Student involvement					
Completeness of presentation						
16	Presentation of material in the form of a website					
Total Score						

Percentage	
Category	

3.2.4 Implementation

During the implementation phase, the interactive educational game will be introduced in class VIII at SMP Negeri 4 Gunungsitoli Selatan. The teachers will be trained on how to use the game effectively to improve students' speaking skills, and the researchers will monitor the use of the game to assess how it can improve students' engagement and speaking skills. Feedback from teachers and students will be collected to evaluate the effectiveness of educational Game in English language learning. In addition to the ADDIE model, this study will use an experimental approach as a methodology to test the impact of interactive educational Game on students' speaking ability. As Setyanto (2013) stated that experimental approach is a research method that aims to examine causal relationships by manipulating one or more independent variables under controlled conditions. Researchers divide subjects into experimental groups that receive treatment and control groups that do not receive treatment, so that the results can be compared. It supported by Akbar *et al* (2023) said that the experimental approach is to determine whether a change in one variable (independent variable) causes a change in another variable (dependent variable) in a controlled context.

The researcher will conduct a pre-test and post-test to see the development of students' speaking skills before and after using learning media in the form of interactive educational games, using rubric assessment as a measuring tool. This approach is very relevant for this study because it will provide strong data on how effective educational games are in improving students' speaking skills. By using an experimental design, researchers can compare the learning outcomes of students who use educational games with those who do not, thus providing a deeper insight into their effect on speaking skills.

3.2.4 Evaluation

After implementation, the researcher will collect feedback from students and teachers to evaluate the effectiveness of the game in improving students' speaking ability. At this stage, data collection will involve several instruments to get comprehensive feedback from various perspectives. The researcher will distribute student response questionnaires to collect students' perceptions regarding the use of educational games in the learning process. In addition, the Observation Sheet for Researchers will be used to record the learning objectives with teaching materials, innovation and design, media and technology, managing the class to encourage students to actively contribute and be active, student responses, the effectiveness of the game, and the researcher's ability to monitor student progress during learning. Researchers will also include the Results of the Validation of the Learning Implementation Plan (RPP), which contains an assessment of the suitability of the curriculum, learning objectives, learning materials, learning methods, learning media, assessment and evaluation, and feasibility of time.

1) Students' response questionnaires

Table 3.8 Students' response questionnaires

No	Aspect of Assessment	Score					Total score	Mean	Percentage
		1	2	3	4	5			
1	Design attractiveness								
2	Good colors and images								
3	Content attractiveness								
4	The letters used are easy to read								
5	Color blend attractiveness								
6	Easy to use								
7	Easy to understand								
8	Simple sentences								
9	Usage guidelines								

10	Ease of learning								
11	Interest in using the game								
12	learning								

2) Observation Sheet for the Research in Teaching Learning Process

Table 3.9 Observation sheet for the research in teaching learning process

No	Aspects assessed	Assessment indicator	Skor (1-5)	Note
Preliminary Stage				
1	Classroom Management Skills	Researchers are able to organize classes, schedules, and student interactions from the beginning of the learning process.		
2	Creating a Conducive Learning Environment	Researchers create a learning environment that is comfortable, safe, and supportive of student participation.		
3	Implementation of Initial Steps Interactive Educational	Researchers explain learning objectives, provide an overview of activities, and motivate students to participate.		
Core Activity Stage				
4	Game Suitability for Learning Objectives	The games used are relevant to the material and support the achievement of learning objectives.		
5	Innovation in Activity Design	Learning activities are designed to be creative,		

		engaging, and relevant to students' lives.		
6	Researchers' Ability to Present Material	The material is explained clearly, coherently, and in accordance with the students' level of understanding.		
7	Student Activity	Students are actively involved in learning activities (asking questions, answering questions, trying things out, discussing).		
8	Student Motivation	Students showed enthusiasm and excitement in participating in the learning process.		
9	Students' Ability to Use Interactive Educational Games	Students can play educational games according to the instructions and objectives of the activity.		
10	Researchers' Ability to Monitor Student Progress	Researchers actively observe, provide feedback, and adjust methods according to student progress.		
Closing Stage				
11	Learning Outcomes in Line with Learning Objectives	Student learning outcomes show that the planned learning objectives have been achieved.		
12	The Impact of Learning on Students	Learning has a positive impact on students' knowledge, skills, or attitudes, and motivates them to learn more.		
Total				

Percentage	
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3) Lesson plan validation

Table 3.10 lesson plan validation

No	Assessment Aspect	Assessment Criterion	Skor				
			1	2	3	4	5
1	Curriculum Alignment	Are the tools in line with the current curriculum?					
2	Learning Objectives	Are the learning objectives clear and measurable?					
3	Learning Materials	Is the material relevant and up-to-date?					
4	Learning Methods	Are the methods used varied and appropriate for the students' characteristics?					
5	Learning Media and Resources	Do the media and learning resources used support the learning process?					
6	Assessment and Evaluation	Is there a clear and objective assessment system?					
7	Student Engagement	Do the tools encourage students to actively engage in learning?					
8	Integration	Does the tool demonstrate integration between learning components?					
9	Creativity and Innovation	Are there elements of creativity and innovation in the tool?					
10	Time Feasibility	Is the time allocated for each activity appropriate?					
Total Score							
Percentage							