

CHAPTER II LITERATURE REVIEW

2.1 Theoretical Framework

2.1.1 Developing

a. Definition of Developing

Developing in general means a pattern of growth or gradual change. The term developing contains diverse and varied elements. Senn in Gustiani (2019) says that "Development as a tool enabling people to reach the highest level of their abilities, through granting freedom of action, i.e., freedom of economic, social and family actions, etc."

Development is defined by Law of the Republic of Indonesia Number 18 of 2019 as an activity of science and technology that seeks to produce new technology or improve the function, benefits, and application of existing science and technology by applying scientific theories and principles that have been shown to be true (Peraturan Pemerintah RI, 2019).

Based on the above definitions, it can be concluded that developing is a process involving the activation of resources, expansion of opportunities, and application of scientific principles to achieve progress and practical benefits.

b. Purpose of Development in Education

The Millennium Development Goals (MDGs) and Sustainable Development Goals (SDGs) place a high priority on educational development as a means of raising the quality of education in the contemporary world. (Anam et al., 2020). Development as a research methodology refers to "a systematic use of scientific knowledge for the production of useful materials, devices, systems, methods, or processes, exclusive of design and production engineering" (Good, 1972:10) in Kusumarasdyati, 2019.

Therefore, there are three reasons to conduct development in education: (1) to address a pedagogical issue, (2) to increase the

teachers' understanding of the intervention, and (3) to create or validate the theory underlying the intervention (Plomp, 2013) in Kusumarasdyati, 2019.

Based on theory above, it can be concluded that development in education, is a systematic effort aimed at improving materials, programs, and teaching methods in order to meet learning objectives effectively.

2.1.2 Research and Development

a. Definition Research and Development

All investigative activities conducted by educational institutions with the aim of discovering something that could lead to the development of new educational products or procedures, like curricula or learning materials, or the improvement of already existing ones, are referred to as "research and development" (R&D). (Kusmaryani & Ramli, 2023:129). Besides that, Borg and Gall (1983:772) in Okpatrioka (2023) define that The process of creating and evaluating educational products is known as educational research and development, or R&D. The steps in this process are commonly referred to as the R&D cycle. They include reviewing research findings relevant to the product under development, creating products based on these findings, field testing the final product in the intended environment, and making necessary revisions to address any shortcomings discovered during the field-testing phase.

Research used to create a product and evaluate its efficacy is known as research and development, or R&D. The product can be software, such as applications for data processing, classroom learning, libraries or labs, training learning models, guidance, assessment, management, etc., rather than always being hardware, such as books, modules, or classroom learning aids (Hamzah, 2019:1). To overcome the challenges, education must advance, and research is the best method to achieve this.

According to the views of the aforementioned experts, research and development (R&D) in education is a process of innovation and improvement grounded in research that enables the development or enhancement of instruments, techniques, and strategies to satisfy the constantly expanding demands of education.

b. Principles Research and Development

The objective of research and development is to guide the decision-making process throughout the development of a product as it changes and the developer's ability to build these types of things in future situations (Fayrus & Slamet, 2022) the use of research and development is to validate educational products, provide added value to products, increase the effectiveness and efficiency of learning, formulate methodological suggestions for educational products and review previously developed products (Hamzah, 2019:7)

During the implementation of R&D activities, there are requirements that must be met or answered, including: (1) whether all the required materials are available; (2) who will be involved, whether they are ready and according to their abilities; (3) conducting discussions and followed up with activities to build the product to be compiled; (4) before ending, a review of the product (formative evaluation) is carried out; (5) whether various instruments that are needed are available (Winaryati et al., 2021:6).

In general, research and development is characterized by designing and developing products, testing products, and validating products. Research and Development should be practice, feasible, and effective (Kusumarasdyati, 2019). Research is required to test the effectiveness of the product so that it can function in the larger community (CAR or experimental methods are used). The product can be used once it has undergone testing.

In conclusion, Research and Development (R&D) is characterized by its structured, need-based, evaluation-driven

methodology, and the product developed should be practice, feasible, and effective.

c. Research and Development Models

A framework for performing research and development (R&D) in education is provided by a number of well-known models. R&D is a systematic process used to develop, test, and improve educational goods or methods. Kusmaryani & Ramli (2023) explain the various models used in research and development, such as the ADDIE Model, the 4D Development Model, and the Research and Development Borg and Gall Model. And also Winaryati et al. (2021:13) explain that the R&D models include the Model by Borg & Gall, the 5D Cennamo Spiral Model, the ADDIE model, the Model by Havelock, the 4D Thiagarajan Model.

Meanwhile Hamzah (2020:26) focuses on explaining the the models of learning resource development, of which there are at least seven: the Borg and Gall model, the Hannafin and Peck model, the Gagne and Briggs model, the ASSURE model, the ADDIE model, the Kemp model, and the Dick and Carey model.

It can be said that there are many R&D models, but they share the same core processes of design, testing, evaluation, and revision, but their focus and complexity vary. The choice of model depends on the project objectives, product type, and context. Each framework ensures a systematic and iterative approach to quality and relevance in the final product.

2.1.3 Students

a. Definition of Students

Students are also known as learners. Students are individuals who are actively involved in the learning process, acquiring knowledge, skills, values, and attitudes in an educational context, such as a school, university, or other learning environment. This is supported by Martin & Bolliger (2020) describe students as learners actively engaged in the

educational process, interacting with content, instructors, and peers, particularly in online learning environments. A student is a person who comes to an institution to obtain or study some type of education (Mardiana et al., 2022).

Based on explanation above, it can be concluded that Students (learners) are individuals who participate in learning actively acquiring knowledge, skills, and competencies.

b. Students' Need Analysis

Richterich and Chancerel contend that the students are the center of the universe and that everything starts and end with them. To put it another way, everything is only relevant to them (in Modi & Patel, 2020). Students as individuals that needed to identify their learning objectives, choose the methods for tracking how long they have taken to complete them, and make a program available to them. (Surfaifel & Wirza, 2021).

Destianingsih & Satria (2021) define that needs analysis (NA) as a specific foundation for a given student group's future academic activity development. The developer will assess the needs of the pupils and determine the type of teaching and learning resources that will be used. Finding and evaluating the target demands as well as the learning needs is crucial.

Needs analysis, also called as a needs assessment (Brown, 1995, p. 35) in Kakerissa & Lengkanawati (2022) is the first phase in program design and tries to ascertain students' needs so that the assessment can determine the objectives and contents of a program or a subject.

So, it can be understood that need analysis in this case is students' need. Students' needs Analysis (SNA) is a systematic process used in research and development (R&D) to identify and understand the unique needs, goals, and challenges of students in a given educational context. The process involves assessing the needs of the target; what students need to achieve and their learning needs; and how they can

achieve those goals. This process is essential to designing effective and relevant instructional programs, materials, and activities.

2.1.4 Concept Mapping Strategy

a. Definition of Concept Mapping

Joseph Novak first proposed idea mapping in 1972 as a way to expand concept learning in science classes (Salehi et al., 2023). Concept mapping, which are frequently displayed in a node link-node style, are visual organizers or representations of knowledge (Kripa, 2022). The foundation of concept mapping is Ausubel's meaningful learning theory, which suggests a process of identifying one's knowledge framework and how concepts inside it relate to one another and to new information (Novak, 2019).

Concept mapping are visual aids for knowledge organization and representation. They consist of concepts, which are typically encased in boxes or circles of some kind, and the connections between concepts, which are shown by a line connecting two concepts. The relationship between the two concepts is specified by the words on the line, also known as connecting words or linking phrases (Novak & Cañas, 2006) in (Daboer et al., 2022). Concept mapping is a process that provides information for creating connections between concepts and their relationships (Obaid Ullah, 2021).

Based on the opinion of several experts at above, Concept Mapping can be concluded as a graphical tool to organize and represent knowledge visually through a node-link-node format. Nodes are elements that represent concepts or ideas. Usually nodes are depicted in the form of circles, ovals, or boxes, which are filled with the name or a brief description of the concept. Links are lines or arrows that connect two nodes, indicating a relationship or association between the concepts. Along the link, there are often connecting words or phrases that explain how the two nodes are related.

b. Concept Mapping as a Pedagogical Tool

Kripa (2022) claims that idea mapping is an effective teaching method. In order to give students a framework for organizing new material, some academics also support the presentation of concept mapping. In particular, helping students create mental schemas for the larger topic by offering mapping that employ spatial placement (e.g., grouping related concepts together on the mapping) and labeled directional arrows may benefit students who struggle with reading or who have little prior knowledge of the subject.

It is also supported by Yadav & Chaurasia (2023) concept mapping is a cognitive technique that is used to organize knowledge, information, and understanding; make connections between various pieces of information; and comprehend, explain, and present information in a meaningful way. This method allows students to visualize a subject or issue to the best of their ability on a page or piece of paper, after which they can discuss and assess it.

For the long-term benefit of students, Concept mapping is used to measure the attainment of learning objectives, students' academic exams, and planning. It also helps to clear up misconceptions regarding specific academic material (Obaid Ullah, 2021).

So, it can be concluded that Concept mapping as a pedagogical tool is an effective learning strategy to help students organize, understand, and present information in a visual and meaningful way. As a teaching tool, concept mapping helps teachers or facilitators present material in depth, provides guidance to students in organizing new information, and identifies and clarifies conceptual misunderstandings.

c. Advantages of Concept Mapping

Modi & Patel (2020) describe the benefits of concepts mapping as follows:

1. Gain knowledge of a body of information.
2. Investigate fresh data and connections.
3. Make use of past knowledge.

4. Acquire fresh information and knowledge.
5. Disseminate information and knowledge produced.
6. Create procedures or frameworks, such written
7. Multimedia presentations, papers, buildings, websites, and web searches.
8. Options for problem solving.

Ismono et al. (2021) also explain that there are benefit of concept mapping, as follows:

1. Establishes links between pupils' existing knowledge and new information
2. Promotes a deeper comprehension of the matter
3. Makes it easier for children to apply higher order thinking to solve difficulties
4. Will be able to enhance communication skills, higher order thinking abilities, and learning outcomes
5. The concept mapping are useful instruments for evaluating the efficacy of the conceptual shifts prompted by student engagement activities and research into instructional materials in the classroom.
6. One method for helping pupils develop conceptual knowledge is the inquiry strategy.
7. Students' skills in information analysis, evaluation, synthesis, inference, and integration can be enhanced through the usage of concept mapping
8. Students may also interpret information, create views, and make conclusions thanks to concept mapping.

Based on the description above, it can be seen that there are many benefits in education, including helping students integrate new knowledge with previous understanding, fostering deeper understanding, and encouraging high-level thinking skills such as disseminating, disseminating, and synthesizing information.

d. Types of Concept Mapping

According to Ariya (2020) in (Daboer et al., 2022), there are seven kinds of concept mapping, namely:

1. A Spider concept mapping is a type of mapping used to explore and list different facets of a particular theme or subject.
2. The hierarchy concept mapping, which arranges data in decreasing order of significance.
3. Information is arranged in a way using the systems concept mapping displays numerous relationships between the data and includes all of the data on the mapping importance in descending order.
4. Multi-dimensional (3D): idea mapping depict the flow or condition of resources or information that are too complex for a basic two-dimensional mapping
5. Picture Landscape Concept mapping: These mapping use a landscape format to display information.
6. Picture Landscape Concept mapping: These mapping use a landscape format to display information.

Wang (2019) says that concept mapping general can be divided into three categories:

1. Linking similar concepts.
2. Presenting causal links.
3. Evaluating ideas using concept mapping

They come in five primary varieties: mind mapping, chain mapping, spider mapping, fishbone diagrams, and hierarchy mapping. Every one of these five categories has a specific use and can contribute in a different way to learning.

So, based explanation above, it can concluded that the types of concept mapping as follows:

- 1) Spider Concept Mapping
- 2) Hierarchy Concept Mapping
- 3) Systems Concept mapping
- 4) Multi-dimensional (3D) Concept Mapping
- 5) Picture Landscape Concept Mapping
- 6) Fishbone Diagram
- 7) Chain Mapping
- 8) Mind Mapping

e. Concept Mapping in English Background Knowledge

Wang et al., (2008) (in Salehi et al., 2023) presents concept mapping as a teaching tool that promotes conceptual understanding through the meaningful display of concepts and connects new material to existing knowledge structures. Teachers can help students remember, review, communicate, and solve problems by using the useful technique of concept mapping. Concept mapping can then help students gain confidence and expand their knowledge base. (Chen & Hwang, 2020).

The process of connecting previously created concept mapping with additional knowledge structures is known as extension concept mapping. It has benefits at every level of the knowledge-integrating process, motivating students to perform better. (Prasetya et al., 2022).

Thus, it can be said that concept mapping is an important method to support the development of background knowledge of English, encouraging understanding and application in educational contexts.

f. Characteristics of Effective Concept Mapping

According to Kripa (2022), Three essential components are necessary for effective mapping:

1. Concept spacing conveys meaning; two closely related concepts are positioned in close proximity to one another. Consider the example of a family tree.
2. The notions' hierarchy or cycle, for example, is evident. Many concept mapping, for instance, read from top to bottom,

beginning with the most general or expansive subject and working down to the specifics.

3. Concepts are connected in an intentional and clear manner. These are shown as directed arrows with linked labels in idea mapping.

Tabel 2.1 Concept Mapping for Meaningful Learning

Step	Meaningful Learning element	Activity
1	Getting information back	Students compile a list of all the important ideas related to a particular subject or guiding issue.
2	Adding details by deliberately using cognitive processes to combine knowledge that is both relatively fresh and old	Using directed arrows, students arrange the ideas in a framework, usually in a hierarchical manner with the most general idea at the top and more specifics below.
3	Providing more details with clear linkages	Students use one to three words that explain the connections between topics to designate directional arrows that connect them.
4	Reviewing	Students go back to the concept mapping to add new material, which may cause the linkages shown and/or the mapping's structure to alter.

To create a good concept mapping of a subject or topic, it is necessary to have knowledge of the main parts of a concept mapping, including nodes, linking verbs, proportions, and hierarchy. Nodes: Concept mapping is a knowledge graph in which the network between concepts is shown graphically. These concepts are written within many types of geometric shapes such as rectangle, square, circle. These are called nodes. Linking Verbs: to show the relationship between

concepts, we use linking phrases such as gives, rise to, result in, links to, involves etc. Links between concepts can be unidirectional, bidirectional, or unidirectional. Proposition: work to make the meaning of linking verbs more clear. Hierarchy: in a concept mapping, information is arranged in descending order of importance. This sequence of organizing information can be organized in any order, horizontal or vertical (Yadav & Chaurasia, 2023).

In conclusion, an effective concept mapping requires thoughtful arrangement, clear connections, and the use of appropriate symbols and structures to visually represent relationships and organize knowledge in a meaningful way.

g. Concept Mapping as Teaching Strategy

Concept mapping is a teaching strategy that utilizes visual diagrams to represent relationships between concepts. The instruction design philosophy of concept mapping includes teaching objectives, steps and strategies, which is also the guiding principle of teaching design (Wang, 2020). It provides a structured way for learners to organize and integrate knowledge, making abstract information more accessible and meaningful. As a pedagogical tool, concept mapping encourages active learning, critical thinking, and collaboration—key components in learner-centered education.

Originally developed by Novak and Gowin (1984) based on Ausubel's theory of meaningful learning, concept mapping is rooted in the belief that new information is best understood when linked to existing knowledge. Through visual representations, students can connect prior experiences to new material, fostering deeper understanding and long-term retention.

In the classroom, concept mapping serve multiple instructional purposes. Teachers can use them as tools for introducing new topics, reviewing material, assessing comprehension, and supporting student presentations. When integrated into lesson plans, concept mapping

promotes clarity in instruction and allows both teachers and students to identify misconceptions or gaps in understanding.

Recent studies continue to affirm the effectiveness of this strategy. Liu and Bu (2021) emphasize that *concept mapping provide scaffolding that enhances students' ability to organize language input meaningfully, leading to improved reading comprehension and vocabulary acquisition*, particularly in English as a Foreign Language (EFL) contexts. Likewise, Rofiah et al. (2022) found that students using concept mapping demonstrated *better academic performance and greater engagement* compared to those taught with traditional methods. They also highlight its role in developing students' metacognitive skills. Furthermore, Zhou and Lin (2023) argue that *concept mapping facilitates retention and serves as a valuable formative assessment tool* for evaluating students' conceptual understanding.

For English language learning in particular, concept mapping supports the development of vocabulary, reading comprehension, and writing skills. By organizing words and ideas around a central theme, students can explore connections among concepts, reinforce contextual understanding, and construct coherent expressions. It also provides a foundation for students to visualize language patterns, grammar structures, and thematic progressions in texts.

Furthermore, collaborative concept mapping activities enhance peer learning, allowing students to exchange ideas, question each other's reasoning, and co-construct knowledge. This aligns well with the principles of the *Kurikulum Merdeka*, which emphasizes active participation, critical thinking, and the relevance of learning to real-life experiences.

In summary, concept mapping as a teaching strategy offers a dynamic and adaptable approach to classroom instruction. It helps students visualize their thinking, encourages meaningful learning, and supports differentiated instruction to accommodate diverse learning needs.

h. Steps of Implementing Concept Mapping Strategy

The implementation of the concept mapping strategy involves six structured steps as outlined by Kripa Sundar (2019), which can be integrated effectively with Wang's (2019) instructional design framework to support meaningful learning.

1. The first step is Identify the Focus Question, where the teacher sets a central theme or problem that guides the entire mapping process. This aligns with Wang's recommendation to define clear instructional goals and determine essential concepts at the beginning of instruction.
2. The second step is Identify Key Concepts, in which teachers and students collaboratively extract important terms or ideas from instructional content. This step corresponds with the preparation phase suggested by Wang (2019), where teachers analyze the textbook and select key terms that students must learn.
3. The third step, Organize Concepts, requires students to arrange the identified concepts from general to specific. This organization is often scaffolded through visual aids and teacher guidance, ensuring students understand the relationships among concepts—an approach also emphasized by Wang through the use of hierarchy mapping spider mapping, and mind mapping.
4. The fourth step is Create a Preliminary Concept Map, where students begin constructing their maps, initially in groups. Wang (2019) recommends cooperative learning in this stage, as group collaboration fosters creativity and peer learning.
5. The fifth step is Revise the Concept mapping, where students engage in reflection, receive feedback, and refine their work. Wang (2019) suggests peer review and iterative redrawing of concept mapping to improve conceptual clarity and understanding.
6. Finally, the sixth step is Finalize and Share the Concept Mapping, where students present their work to peers or the class, facilitating discussion and reinforcing learning through articulation. This

corresponds to Wang's emphasis on feedback, sharing, and metacognitive reflection. Both models advocate a student-centered approach that not only builds conceptual understanding but also promotes collaboration, critical thinking, and self-regulated learning.

2.1.5 Background Knowledge

a. Definition of Background Knowledge

In general, the terms prior knowledge and background knowledge are interchangeable. Background knowledge, sometimes referred to as earlier or prior knowledge, is far more complex than simple academic facts that are required to develop knowledge. Background knowledge is based on cultural and environmental elements, including the physical and social settings, socioeconomic level, and physical or cognitive abilities (Hinckley & Kevin, 2024).

The term "background knowledge" describes the knowledge that kids pick up and retain in their minds about things, other people, themselves, and their surroundings. As kids start talking and participating in literacy activities, it becomes easier for them to understand new ideas and information the more they already know (Green, 2023).

According to McNamara (2019), background knowledge includes both factual knowledge, such as information about the world, and conceptual knowledge, such as understanding how concepts are interrelated. In the context of learning, it helps learners make sense of new information by connecting it to what they already know, thus facilitating deeper understanding and retention.

Based on definition above, it can be concluded that Background knowledge refers to the information, experiences, and understanding that individuals already possess prior to learning new content. It serves as the foundation upon which new knowledge is built.

b. Function of Background Knowledge

Anderson and Pearson (1984) (in Crab & Arts, 2023) explained that three ways exist for background or prior information to influence comprehension:

- 1) It facilitates students' ability to draw conclusions about what they have read.
- 2) It highlights information that is crucial in a field of knowledge.
- 3) It offers a recall strategy.

Without prior information, students will struggle throughout their academic careers. High prior knowledge students will be able to recollect information more coherently, draw more conclusions based on their prior knowledge, and recognize the significant and irrelevant concepts in a text.

Additionally, Background knowledge is important for critical thinking, problem-solving, and the growth of higher-order cognitive abilities. As Brown et al. (2020) assert, learners with a strong foundation of relevant background knowledge are more likely to succeed in complex cognitive tasks because they can relate new concepts to familiar ideas. Teachers can therefore improve students' learning outcomes by activating and expanding their background knowledge, making it a critical component of educational strategies and curriculum design.

In conclusion, background knowledge is a critical factor in supporting comprehension, cognitive development, and academic success. It helps learners make inferences, focus on essential information, and recall content effectively.

c. Kinds of English Background Knowledge

Recent research has identified several key types of background knowledge that are essential for English language learners:

- 1) Linguistic Knowledge: This encompasses understanding the structural aspects of the English language, including phonology, morphology, syntax, semantics, and pragmatics. A solid grasp of

these elements enables learners to comprehend and produce language accurately (Crawford & Gross, 2019).

- 2) Content Knowledge; familiarity with the subject matter or topics discussed in English texts is crucial. This type of knowledge allows learners to make sense of new information by connecting it to what they already know, thereby enhancing comprehension (Hinckley & Kevin, 2024)(Matthew B. Miles et al., 2019).
- 3) Vocabulary Knowledge; familiarity with English words and their meanings is a fundamental aspect of English background knowledge. It includes basic, vocabulary and academic vocabulary; high-frequency words essential for everyday communication, such as "eat," "run," "house," and "family." These words form the foundation for general language use and interaction. Academic Vocabulary; words commonly used in academic contexts that support understanding and communication in educational settings. Examples include terms like "analyze," "summarize," "evaluate," "interpret," and "compare." These words are critical for engaging with academic texts and assignments.

These types of background knowledge are interrelated and collectively contribute to a learner's ability to understand and use English proficiently. Educators can enhance language acquisition by assessing and building upon these areas of knowledge in their instructional practices.

2.1.6 ADDIE Model

a. Definition of ADDIE Model

Many researchers use the ADDIE model, one of the instructional design frameworks, to create educational software or applications. Analysis, Design, Development, Implementation, and Evaluation are the steps that make up the ADDIE framework for application development design (Stapa & Mohammad, 2019). And then, Deng et al. (2024) explain that the ADDIE model is a traditional

curriculum design approach that is extensively utilized in the fields of education and training both domestically and internationally. Analysis, Design, Development, Implementation, and Evaluation are its five phases. These steps are seen to be essential for creating a curriculum that works.

Boucher (2022) also highlights that Training developers and instructional designers have long employed the ADDIE approach. A dynamic, adaptable framework for creating efficient training and performance support tools is represented by the five phases of analysis, design, development, implementation, and evaluation. Every stage in the ADDIE paradigm has an effect that influences the one after it.

The ADDIE model is a flexible, structured framework that facilitates the systematic design and development of educational programs, software, and training tools. Its five iterative stages, yaitu Analysis, Design, Development, Implementation, and Evaluation—are essential for achieving effective and impactful instructional outcomes. This model's adaptability and focus on continuous improvement make it a cornerstone of instructional design across diverse fields.

b. Stages of ADDIE Model

The development model known as the ADDIE model has five related stages as follows:

1. Analysis

The analysis phase is the foundational step in the ADDIE model. It involves identifying and understanding the problem, the learners' needs, and the learning environment. Experts agree that thorough analysis is critical for developing a targeted instructional solution. Branch (2019) explains that the analysis phase involves a careful review of the existing situation, focusing on learner characteristics, the specific educational needs, and the context in which the learning will take place.

2. Design

The design phase focuses on planning and structuring the learning experience. Here, instructional strategies, assessment methods,

and the overall structure of the content are decided. Boucher (2022) adds that the design phase also considers learner interaction, whether in a face-to-face setting, online, or in a blended environment. The goal is to ensure that the content is learner-centered, focusing on active learning techniques.

3. Development

The development stage is where the instructional materials and content are created. It's a practical phase that brings the design plan into reality, producing all necessary materials and resources for the learning experience. (Deng et al., 2024) Highlight that this phase involves iterative creation and refinement. After creating initial materials, they are tested and reviewed, ensuring they align with the design blueprint and are suitable for the learners.

4. Implementation

The implementation phase focuses on the actual delivery of the instructional materials to the learners. It involves making the content accessible and ensuring that the learners are ready to engage with the material. Boucher (2022) adds that during implementation, it is essential to ensure that the instructional environment, whether in-person or online, is fully equipped for delivery, and that learners have the necessary resources to engage with the content.

5. Evaluation

Evaluation is an ongoing process throughout the ADDIE model, occurring both during (formative evaluation) and after (summative evaluation) the program's implementation. It helps assess the effectiveness of the instructional design and identify areas for improvement. Deng et al. (2024) emphasize that the evaluation phase also focuses on continuous improvement, using feedback to refine the materials and processes for future iterations.

In conclusion, the stages of the ADDIE model include analysis, design, development, implementation, and evaluation, working cohesively to create effective and adaptive teaching solutions. Each

stage has specific tasks and outcomes, which contribute to a comprehensive and iterative approach to education and training development.

2.1.7 Classroom Action Research

a. Definition and Key Concepts of Classroom Action Research

Classroom Action Research (CAR) is a method that involves teachers in systematically investigating their own practices to improve teaching and learning within their classrooms. This is supported by Rani (2024) The process of action research involves teachers working together to evaluate their practice, share their personal theories, develop a shared theory, try out new approaches to make the values they express in their practice more consistent with the educational values they espouse, document their work in a way that other teachers can easily access and understand, and more. Classroom action research is an activity carried out to observe events in the classroom that are framed in several periods or cycles using contextual methods, meaning that the variables to be understood are always related to the conditions of the classroom itself (Asroacri & Rusman, 2020).

The primary goal of CAR is to improve educational practices through a reflective, iterative process, often focusing on a specific classroom issue or challenge. According to Messikh (2020) engaging in CAR allows teachers to become "teacher-researchers," fostering a deeper understanding of their educational practices and contributing to their professional development. And then, a study by Nasrudin et al. (2024) emphasized that CAR can help address specific classroom challenges by involving both teachers and students in the research process. It has been shown to increase collaboration among educators, leading to improved teaching strategies. The process is cyclical, involving planning, action, observation, and reflection, followed by further action based on findings from previous cycles.

In summary Classroom Action Research is a systematic reflective process used by educators or researchers to improve teaching practices and student learning outcomes. This process includes planning, acting, observing, and reflecting in a continuous cycle. As a researcher, collect and analyze data to make informed decisions and improve the learning environment.

b. The Process of Classroom Action Research

Teachers participate in an ongoing cycle of planning, acting, observing, and reflecting as part of Classroom Action Research (CAR), which is commonly described as a cyclical, reflective process. Teaching methods can be continuously improved through this iterative process. Below is a detailed breakdown of the process supported by expert opinions:

1. Planning

According to Rani (2024), the planning phase involves teachers collaboratively evaluating their current teaching practices and identifying specific problems or areas for improvement. Teachers also clarify the values and goals they aim to uphold in their teaching. The planning stage includes developing a plan to address these challenges by introducing new strategies, teaching methods, or adjustments to existing approaches.

2. Action

In the action phase, teachers implement the strategies or changes designed in the planning stage. As Asroacri & Rusman (2020) mention, CAR is deeply contextual, meaning that the actions taken are rooted in the unique environment and conditions of the classroom. Teachers experiment with the changes to observe their effectiveness and adjust as needed.

3. Observation

During this phase, teachers collect data on the outcomes of the implemented actions. This involves observing how students respond to the new strategies and recording relevant information, such as

engagement levels, performance, and behavior. Messikh (2020) suggests that during this phase, teachers begin to gain insights into their own educational practices, which contributes to their growth as "teacher-researchers."

4. Reflection

A crucial part of CAR is reflection, which enables educators to evaluate the success of their efforts. Teachers examine the information gathered during the observation phase and consider how the tactics affect both their own teaching practices and the learning of their students (Nasrudin et al, 2024) emphasize that this reflection helps teachers identify strengths and weaknesses in their practice, guiding the next cycle of improvement.

In conclusion, the process of Classroom Action Research is a cyclical, collaborative, and reflective practice that empowers teachers to make data-driven decisions and enhance their professional development. By regularly engaging in planning, action, observation, and reflection, educators improve their teaching methods and better address the needs of their students. The involvement of teachers as "researchers" in this process fosters continuous professional growth and a deeper understanding of their practices.

2.1.8 Testing

a. Definition of Testing

According to Rusli Lutan in Asroacri & Rusman (2020) An test for gathering data on a person or thing is a test. To assess the knowledge, skills, talents, and abilities of research subjects, tests might take the shape of questions or instrument sheets. Meanwhile according to (Brown, 2019) A test is a tool used to assess someone's performance, knowledge, or talents in a particular field. It functions as an evaluation tool that aids in determining how well a person completes assignments or comprehends material in a specific field. Tests are frequently used to

assess students' comprehension of the subject matter, the efficacy of teaching methods, and to direct additional learning activities.

In conclusion, a test is an essential assessment tool used to gather information about an individual's knowledge, skills, talents, and abilities within a specific domain. It can take various forms, such as questions or instrument sheets, and serves to evaluate performance, measure mastery of content, and assess the effectiveness of instructional strategies.

b. Types of Product Testing

According to Lee and Lee (2022), product testing entails assessing the instructional product's performance under real-world circumstances. To determine a product's effectiveness, a variety of testing and evaluation techniques are employed. During the development stage, formative testing uses surveys, focus groups, and pilot tests to get input on early iterations of the materials. Prior to complete deployment, it seeks to discover problems and make the required changes to guarantee that the resources are efficient, interesting, and in line with learning goals (George & Thomas, 2021). Contrarily, summative testing evaluates the items' overall efficacy in accomplishing learning objectives after they have been used. Usually, it consists of final evaluations to gauge how well the materials have affected students' learning and assessments of their performance (Peterson, 2022).

Usability testing, which focuses on how simple and intuitive the materials are for students to use, is particularly crucial for digital products. To make sure that students can interact with the materials without running into technological difficulties, this kind of testing assesses features including navigation, accessibility, and interaction (Saito & Hanada, 2021). Comparing two iterations of instructional materials to see which one works better is known as A/B testing. Designers can determine which version improves engagement and learning results by testing several designs or techniques with different

groups (Zhang & Xu, 2023). In order to make sure that the materials are useful and applicable to the actual world, contextual assessment assesses how well they work in the particular learning environment while accounting for variables like classroom resources, time restrictions, and learner characteristics (Lee & Kim, 2020).

Performance-based testing evaluates students' ability to use their acquired knowledge and abilities in real-world situations. This approach is helpful for assessing how well students apply what they have learned to practical situations, including projects, presentations, or problem-solving exercises (McLeod & Adams, 2022). Peer evaluation is the process by which other educators or specialists evaluate the teaching resources to offer an outside viewpoint on their efficacy and quality. Any biases, gaps, or opportunities for improvement that might not be apparent from student comments alone are found through this method (Brown & Mitchell, 2021).

Thus, it is clear that product testing is an essential procedure for assessing the usefulness and efficacy of product development under actual circumstances. A/B testing, contextual testing, formative testing, summative testing, usability testing, performance-based testing, and peer review are some of its varieties.

2.1.9 Description of Product Development

According to Kripa (2022), effective mapping involves three essential components: concepts are spaced to convey meaning, and the concepts' structure, such as a hierarchy or cycle is evident. Additionally, there are intentional and clear linkages between ideas. The concept mapping model, which was developed by earlier academics, is used in this study. Product development is described as follows.

a) Focus questions to identify background knowledge

Focus questions are used to guide the development of a concept mapping by helping learners identify their existing background knowledge on a topic. These questions serve as a

starting point for organizing thoughts and connecting new information with what they already know. Effective focus questions help clarify the purpose of the concept mapping and ensure that key ideas are addressed systematically.

b) Meaning is conveyed by the spacing of concepts

The physical placement of concepts on a concept mapping is intentional and helps to convey meaning. Closely related concepts are positioned near each other to visually represent their connection and interdependence. For example, in a family tree, immediate family members are placed close together, while distant relatives are spaced further apart. This spatial arrangement helps users quickly understand relationships and dependencies among concepts.

c) The structure of the concepts, such as a hierarchy or cycle, is clear

Concept mapping follow a specific structure to make the flow of information clear and logical. Hierarchical structures typically start with the most general or broad concept at the top and break down into more specific details below. Cycles, on the other hand, represent processes that repeat over time. Organizing concepts in a clear structure makes it easier for learners to follow and understand the relationships between ideas.

d) Connections between concepts are explicit and purposeful

Concept mapping use linking lines and arrows to explicitly show how different ideas relate to one another. These connections are not random; they are carefully chosen to demonstrate meaningful relationships, dependencies, or causal links. Labels on the arrows provide additional context to clarify the nature of the relationship, ensuring that the concept mapping effectively communicates the intended message.

2.2 Relevant Research

There are several studies are pertinent to this one. First, Prasetya et al. (2022) emphasize how well structured idea mapping methods work to raise

student participation in learning activities and improve educational outcomes. According to the results, the experimental group's proposition quality and structure mapping scores were noticeably better than those of the control group. The use of concept mapping in EFL contexts has the potential to be a potent instructional tool that improves reading comprehension, cultivates good attitudes toward learning, and cultivates critical thinking abilities, according to research by Trang (2023). Students can use concept mapping as a technique to combine new material with prior knowledge to create a comprehensive visual mapping.

Third, a Walden University (2019) study looked at how well idea mapping worked in STEM learning environments that were self-paced and digitally enhanced. The study filled a gap in the literature by emphasizing the potential of concept mapping to increase student engagement and comprehension in online learning. Fourth, research has indicated that concept mapping can ease the cognitive burden associated with learning, enhance comprehension, material retention, and knowledge transfer, and help learners connect new information with what they already know (Zheng & Dahl, 2020). In the most recent, earlier research, Obaid Ullah (2021) shown that idea mapping was beneficial in raising the academic achievement of overseas students and that it could be utilized as a teaching tool for active learning.

Overall, these studies confirm that concept mapping is a powerful pedagogical tool that improves students' understanding, engagement, and critical thinking, while also helping integrate background knowledge with new learning.

2.3 Conceptual Framework

This research focuses on developing and implementing concept mapping as a tool to enhance students' English background knowledge, specifically for eighth-grade students at SMP Negeri 7 Gunungsitoli. It addresses challenges such as low vocabulary mastery, limited engagement, and poor comprehension skills. Drawing on constructivist theories and previous studies, the research highlights the value of concept mapping in linking prior knowledge to new information, fostering critical thinking, and improving comprehension. The study employs the ADDIE model to systematically analyze, design, develop, implement, and evaluate the concept mapping tool, ensuring its practicality and alignment with the

Merdeka Curriculum. Data collection methods include observation, interviews, questionnaires, and documentation, while analysis combines qualitative and quantitative approaches to assess the tool's effectiveness.

This research also incorporates a Classroom Action Research (CAR) framework, involving iterative cycles of planning, action, observation, and reflection to refine the tool. The concept mapping product includes structured templates, activities, and assessments tailored to English learning goals, focusing on vocabulary development, grammar comprehension, and interactive exercises. By integrating concept mapping with curriculum standards and addressing specific learner needs. This research contributes to developing scalable educational strategies suitable for rural and resource-constrained settings. The framework of this research can be seen in the following diagram.

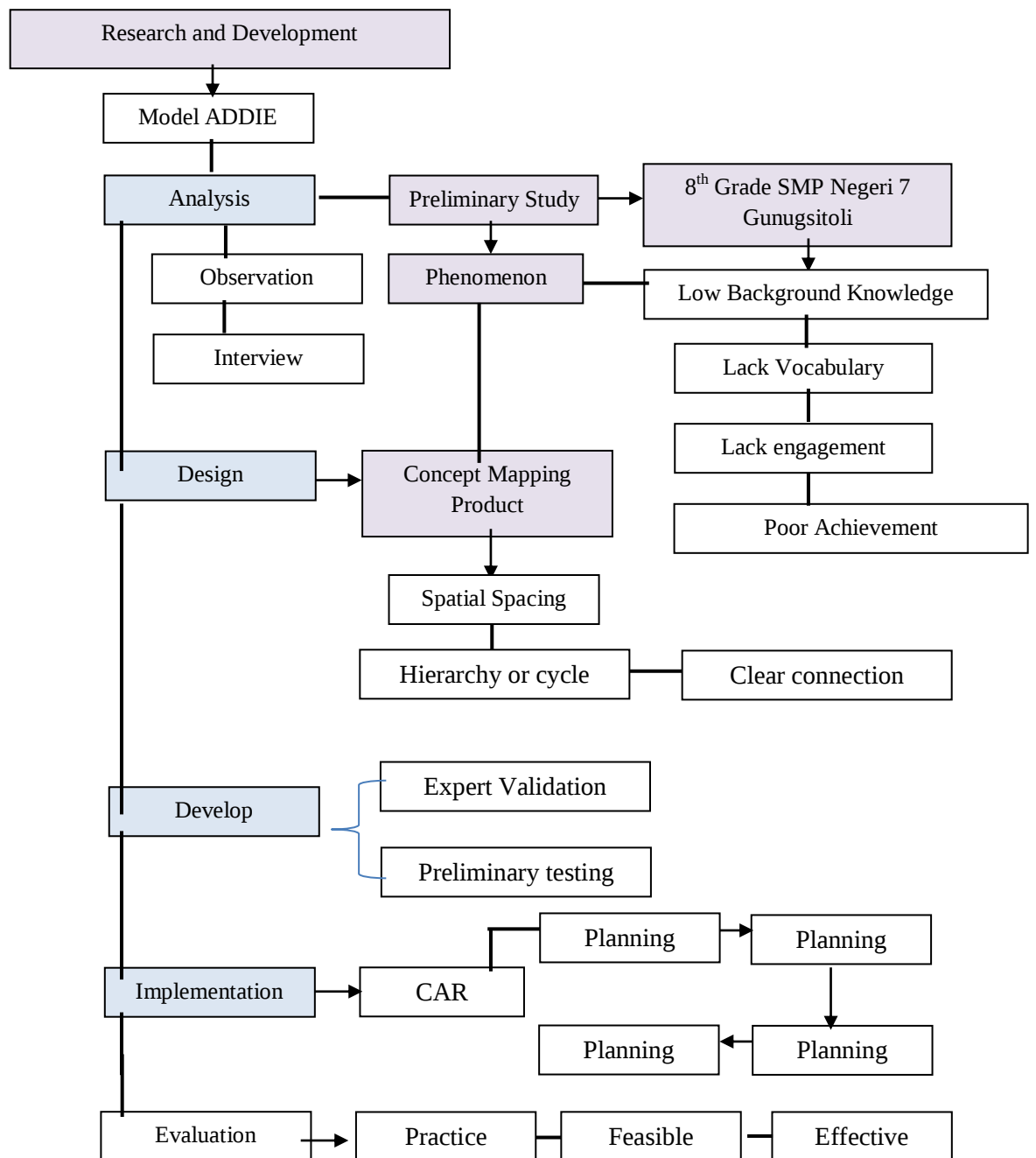


Figure 2.1 Conceptual Framework