

## **CHAPTER III**

### **RESEARCH METHOD**

In this chapter, there are discussions about the methodological steps which underlie this study. It covers the research design, research procedure, data collection techniques, data analysis techniques.

#### **3.1 Research Design**

The objective of this research is to develop appropriate model of English learning materials for students of Industrial Engineering Faculty. Research and Development (R&D) is the term commonly used to describe the activities undertaken by firms and other entities such as individual entrepreneurs in order to create new or improved products and processes.

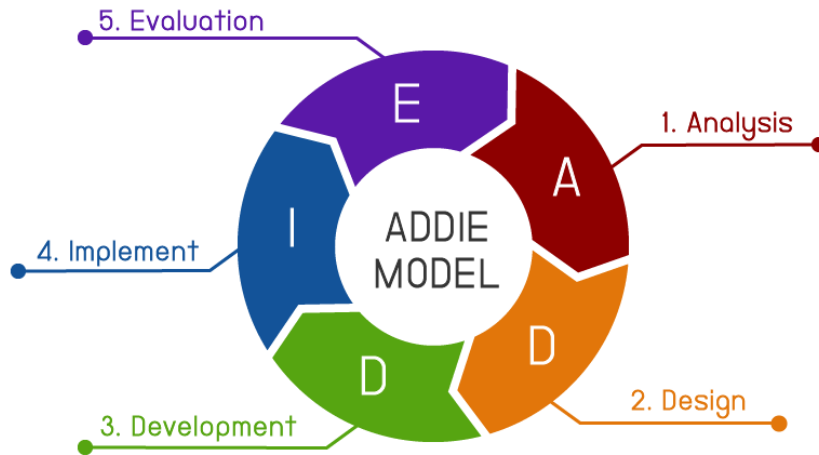
The steps of this study are referred to the R & D cycle which consists of ADDIE models. ADDIE Model Learning Design is an interactive learning process with the basic stages of effective, dynamic and efficient learning. The ADDIE model starts from the concept of Instructional Design Models and Theory for the US Army in 1950. Florida State University was developed again in 1975 for use in all US Armed Forces. Educational practitioners made several revisions and in the mid-1980s came a more interactive and dynamic model than the original. This model can then be used for various forms of product development such as learning strategies and methods, media and teaching materials.

The researcher uses ADDIE models according to Aldoobie (2015) that consist of 5 phases there are Analysis, Design, Development, Implementation and Evaluations. The reason why the researcher uses the ADDIE models is because this model was chosen because the ADDIE model is often used to describe a systematic approach to instructional development. In addition, the ADDIE model is a general learning model that is suitable for development research. This term is almost identical to the development of instructional systems. When used in development, this process is considered sequential but also interactive, where the results of the evaluation of each stage can bring the development of learning to the previous stage. The end result of a stage is the initial product for the next stage (Grafispaten: 2016).

Therefore, this research is classified as Research and Development since it aims to develop a finished product that can be used appropriately in an educational program (Borg: 2002). The end of this study, the product will be in form of teaching and learning material.

### 3.2 Research Procedure

The ADDIE model learning design scheme forms a cycle which consists of 5 stages consisting of: analysis, design, development, implementation and evaluation.



The procedures of the research are described as follows:

#### 3.2.1 Analysis

At this stage researchers do 2 ways to collect the data, the first is to do an interview and the second is to use a questionnaire. Researchers conducted interviews with the head of department in industrial engineering, and gave questionnaires to industrial engineering students in the first semester. The purpose of the researchers to conduct interviews was to obtain information related to the target need and learning need that researchers needed to develop English material books for industrial engineering students from the point of view of the head of department and the purpose of researchers to disseminate questioners was to obtain information related to target need and learning the need that researchers need to develop English material books for industrial engineering students from the point of view of industrial engineering students. Questionnaires that researchers use in need analysis are adaptations of previous research conducted by Yohana (2015) entitled "*Developing English Learning Materials for Grade X students of Beauty Study Programs*". Researchers do this in order to be able to find out the target & learning needs of students.

The design of the analysis phase focuses on the target audience. In the analysis phase there are defining instructional problems, instructional objectives, learning objectives and identifying the learning environment and knowledge possessed by students. The Analysis Stage generally addresses the following instruction:

### **3.2.1.1 Target Needs**

Target needs are general term which has several fields that will determine the need in ESP itself. There are three points Necessity, Lack, and Wants. In necessity points the purpose is to find out the students' needs in terms of the target situation Hutchinson and Waters (1987). What is meant here is researchers must know how students need in the field of English that can support their future as an industrial engineer. Whether they have to master English at beginner level only, intermediate or advanced level, in addition to knowing the level of student needs in this case it can also be categorized to find out what type of reading text can support students' needs in English as an industrial engineer and to know what skills they most need in English as an industrial engineer, and also to find out what kind of approach can help students to improve their knowledge.

In lack points the purpose is to find out the gap between students' existing knowledge and the required knowledge level Hutchinson and Waters (1987). What is meant here is researchers must know at what level the English language proficiency of students is currently available, whether they are at beginner level, intermediate or already at advanced level. This is important to be done by researchers to ensure that the material that the researcher develops in the book is in accordance with the student's situation.

In wants points the purpose is to find the students' wants related to the materials Hutchinson and Waters (1987). What is meant here is, researchers must know what students want to master in English learning itself, for example students want to improve vocabulary in contexts related to industrial engineering also improve critical thinking or to master grammar. To get this information can be done by interviewing and also questionnaires, this information can be used for the material for making syllabus, as well as the divide portion and arrangement of skills in the material book.

### **3.2.1.2 Learning Needs**

To find out what the researcher must include in the material book that the researcher developed, the researcher included several questions in the student's need analysis questionnaire according to Nunan (2004) researcher have to find out the content should be carried out in the designed tasks.. This includes how the desired form of listening text is like a monologue and dialogue or like from songs and films. it also applies to speaking text, researchers must know what students want in the material, whether it should be in the form of a monologue and dialogue or accompanied by a new picture or vocabulary related to industrial engineering. While in reading text the researcher must know what type of text is

read as what the student wants as input for learning, whether it consists of several paragraphs or with pictures and graphs. The length of text used is also one of the things that researchers pay attention to, to avoid boredom in students. Therefore it is important for researchers to know students like medium or short text. The last is writing text, here the researcher must also know the form of text as what students want as good input in the learning book. Whether in the form of sentence structure or in the form of images in this section the researcher emphasizes more on the input of text material in accordance with the wishes and needs of students towards the book that the researcher developed.

Then discussed is about the procedures used in various tasks that researchers provide in English language learning books, according to Nunan (2004) researcher have To find out what students should do with the tasks. During listening activities, for example, researchers must know what kind of tasks students want most, for example, such as completing passages or retelling the text in their own language. Then in speaking activity, the researcher must also know what tasks students want and also need, whether playing roles, conducting debates or creating a dialogue which is then practiced in front of the class. Furthermore, in reading activities, researchers also want to know students' interests about the tasks that must be given in this activity such as reading the text and then answering the questions provided, or discussing a reading provided and expressing their opinions. The last skill we will discuss here is writing activity, in this activity the researcher needs to know how students want whether students want tasks such as correcting sentence structure, or making an essay with a specified topic. In addition to focusing on the four skills in English, researchers also included elements of vocabulary building and language focusing on the book that researchers developed. In this case, the researcher also needs to know what tasks students want in the activity, whether by pronouncing pronunciation correctly, finding the meaning of a word in the dictionary or looking for words that are similar to the vocabulary provided. For language focus it refers more to grammar and tense in English.

Furthermore, the concern of researchers on learning needs is about settings. Researchers want to know whether students only want to study in class or try new experiences outside the classroom such as laboratories or parks in the university. Besides devoting about the place, researchers also want to know how students want to do their work according to Nunan (2004) researcher have to find out how the tasks are carried out (group work, pair work or individually). To get this information can be done by interviewing and also questionnaires, this information can be used for materials for making syllabus, determining topics and types of activities for material books to be developed.

### **3.2.2 Design**

The researcher has six steps to design industrial engineering book material. The first step is to make a syllabus, the basis of making the syllabus itself comes from the results of interviews and questionnaires in the process analysis, there are several elements to the syllabus, for example, topics, general instructional objective, competence etc.

After that the second step is to determine the approach that is deemed appropriate for industrial engineering students, the choice of the approach itself is based on interviews that researchers conducted with industry engineering lecturers who refer to the existing curriculum, the approach used is opinion gap activities.

The third step is to determine the topics that will be used in the material book for industrial engineering majors. The selection of this topic is based on the results of interviews that researchers conducted with industrial engineering referring to the curriculum at Muhammadiyah Gresik University. These topics include project engineers, IT engineers, engineer consultants, Industrial Designer, Plant Engineer and the last is safety & health engineers.

For the fourth step is to determine the types of activities in the material development book for industrial engineering students, the type of activity is obtained based on the results of the questionnaire in the need analysis stage.

English consists of 4 very important skills, namely listening, reading, speaking and writing. For the fifth and sixth steps related to the four skills, namely regarding the division of the portion of each skill in each chapter and how to regulate each skill, of course this division is based on the needs of industrial engineering students, this is based on the results of interviews and questionnaires.

After the syllabus has been developed, the next step is to validate the syllabus for expert validation. At this stage, the feasibility of the syllabus that the researcher has developed will be assessed by the expert and if there is a discrepancy, the researcher will make a revision according to the advice given by expert validation.

### **3.2.3 Development**

Developing is the third step of the ADDIE procedure, at this stage it refers to the previous stage, which is design which means that in the developing stage there are also 6 steps to develop a learning material book for industrial engineering students.

### **1) Syllabus**

Syllabus is a set of plans and arrangements for implementing learning and assessment that are systematically arranged which contain interrelated components. Syllabus is a learning plan for a particular subject and / or group or theme that includes Topics, General Instructional Objectives, and Specific Instructional Objectives, Competence, Teaching learning strategies, Procedure of assessment and meeting.

### **2) Approach**

The approach that researchers used in developing English language books for industrial engineering students was to use an activity opinion gap. Using this approach is expected to help students to improve their communication effectively especially in speaking in an industrial area.

### **3) Topic**

Topic selection is very important in development books based on ESP. Because the topic used must be in accordance with the direction taken by students and must be able to meet their needs. Engineering faculty, industrial engineering department itself has its own reference to graduate profile. It is also included in the curriculum that applies at Muhammadiyah Gresik University. Some of the profiles of these graduates include, project engineer, IT engineer, consultant engineer, safety & health engineer industrial designer and plant engineer. So the topic selection for the book that the researcher developed refers to the six graduate profiles.

### **4) Activity**

Because this development book uses opinion gap activity as approach, then every activity there are many elements that require students to express their opinions, examples of these activities include discussion activities, debate activities, and story completion activity. In addition to these 3 activities, the researcher also provides an opinion gap activity element on some text readings and questions in the textbook material.

### **5) Portion and Arrangement of Skills**

There are four skills in the English language development book for industrial engineering majors, namely listening, reading, speaking and writing. for portion sharing in English skills will depend more on focusing on speaking skills because that is the goal to be achieved by students in industrial engineering, then proceed with writing skills which also serve as communication tools in writing. Then for listening and reading will have more or less the same portion because the functions is as an input. For the arrangement will start from

the receptive skill first, namely listening followed by reading and then enter the productive skill, namely writing, and then speaking skills.

### **3.2.4 Implementing**

Implementation is a concrete step to implement a developed learning system. That is, at this stage all that has been developed in such a way as to suit its role or function so that it can be implemented. The implementation phase of this research was carried out by testing the textbook directly. The textbook was carried out in two stages: the first stage of validity testing by subject matter experts. The second is the validation carried out by industrial engineering students as a form of response because they have used books that researchers developed. The results of this step are used as a basis for carrying out the evaluation phase.

### **3.2.5 Evaluation**

The evaluation phase in this study was carried out until formative evaluation aimed at revision needs. Based on the results of expert review and students response that have been carried out in the implementation phase will determine what the researcher will revise in the book. There are four tables that researchers will use in the evaluation phase the four tables include the feasibility of content, the feasibility of presentation, the feasibility of language and graphics. The tables that researchers use in need analysis are adaptations of previous research conducted by Yohana (2015) entitled "*Developing English Learning Materials for Grade X students of Beauty Study Programs*".

In the table that discusses content eligibility, there are several points, for example, discussing the suitability of material with industrial engineering majors, relevance between the material in books and daily life, compatibility between topics with industrial engineering majors etc. while in the table that discusses the feasibility of presentation related to the suitability of vocabulary with the material or topic, the suitability of technical terms with the material or topic in the book. And in the table related to the feasibility of language related to the suitability of the language used with students' language skills, students' understanding of the instructions and contents contained in the learning material books. In the last table is about graphics, this table deals with the use of fonts, the choice of colors and how to present images or tables of existing learning material books. All stages of this evaluation are aimed at the feasibility of the final product.

