



DESIGNING ENGLISH LANGUAGE TEACHING MATERIAL FOR PHYSICS EDUCATION DEPARTMENT STUDENTS AT UIN ALAUDDIN MAKASSAR: FORCE UNIT

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ABSTRACT

The research intends to design and develop English language teaching material for Physics Education students centered on "Force" as one of unit. The process of designing English teaching material is obtained by Rukmana's research analysis in 2021 which resulted the Physics Education Department was learning not ESP material and has no instructional material as a reference for teaching English. ADDIE model was adapted to this research to design and develop the English teaching material. The data collection was obtained from the prior research analysis as the basis of the research, then the syllabus design become a prototype I and developing the ELT material as prototype II. The second research instrument was evaluation checklists that were evaluated by two validators, lecturers from English Education Department, to evaluate the validity of the appropriateness of the syllabus and the ELT material. Based on this study's aims, the evaluation's result can indicate that the syllabus and module material criteria fulfill the students' needs and are eligible to be used as instructional material for Physics Education students in learning English. Furthermore, this product is recommended for lecturers and students, especially in Physics field for the English learning activity. Moreover, it can be the basis for implementing the product by the next researcher.

Keywords: ELT; English teaching

1. INTRODUCTION

In Indonesia, English for educational purposes considered as important and necessary to be taught (Lauder, 2008). It is not only learned by students of English majors but also by students of non-English departments (Indrasari, 2016). English for non-English major students primarily to help students of English capability based on their actual need in accordance with their major or its specific discipline (Wardani D., Bashtomi Y., & Sunaryo, 2017). For example, they need to find other information related to their field of study like reading international journals, articles, research, and other information sources to understand global issues. So, it is the need for English as a specific purpose (ESP).

Fatmawati (2017) said that teachers should figure out about ESP (English as a Specific Purpose) because the teacher first must understand the students' situation and students' needs such as language skills and language competencies. English as a Specific Purpose (ESP) is goal-oriented learning which is designed and developed based on the concept of need analysis. For that reason, teachers have to analyze to formulate the English material based on the student's needs. (Agustina, 2014).

Nuraeningsih (2019) stated that students in non-English departments must study English with material designed based on their needs and should be more contextual, real-life, and recent, called English Language Teaching Material (ELT). English Language Teaching Material (ELT) included teaching material for non-native speakers who use English as a Foreign or Second language. Brown (1992) stated instructional material is a kind of equipment that can greatly assist teachers in the classroom teaching theory as well as in practical assessment effectively (Zidan, 2021). There are 4 functions of material based on the characteristic. The four functions are, (1) material as an informant, (2) material as an instructor that will guide the learners to do practical activities, (3) material as an experienced provider that gives the learners learning experiences in using the knowledge, and (4) material as a motivator for the learners to apply the knowledge in a real situation (Githa, 2020). It suggested that English material is important in facilitating English language teaching and learning activity (Tomlinson, 2011).

Rukmana (2021) on her research stated that the English Language Teaching Material (ELT) for Physics Education students at UIN Alauddin Makassar does not have a specific learning plan (Goal-oriented learning). The instruction was thought in general (general English) which cause the Physics students to have errors in pronunciation and a lack of vocabulary. As the reason, her research resulted in the specific need for English for Physics Education Department students.

Hence, by using the ADDIE model, the researcher intends to design and develop English material by taking on the result of the previous research. The syllabus design and material development concerned with the topic of "Force". Force is a study of the influence of motion that occurs in an object. The researcher has attempted to provide syllabus design and material development into a coursebook that supports students in learning English. So, the result is expected to help students of Physics Education at UIN Alauddin Makassar complete their study related to the academic tasks and assignments.

2. METHODS

The researcher utilized the R&D method which stands for Research and Development. According to Latif (2012), Research and development method is a method that involves classroom problems, studying recent theories of educational product development, developing the educational products, validating the product to experts, and testing the product (Githa, 2020). In addition, the researcher utilized the ADDIE model as an aspect of the procedural approach to designing the products.

The ADDIE model was the procedural approach of research adopted for designing the syllabus and the English material. It is a common model widely used in instructional development and any design program that provides educators with useful and clear stages for effective instruction implementation (Peterson, 2003), which stands for Analysis, Design, Development, Implementation, and Evaluation. The researcher utilized the ADDIE model in designing the instructional material to achieve the students' learning goals by the reason the ADDIE provides a complete and clear system of each stage to result in the products. It makes it easier for researchers to design materials with a systematic structure.

Document and validator are the main sources for this research. Data of the document is based on the prior research which became the basis for designing this module. Validator evaluates and validates the result of the module.

In addition, an Evaluation checklist was used as an instrument in the evaluation phase when the product has presented as the product. It provides a list of aspects and components of the product which validators assessed, examine, and validate the product's compatibility and the students' needs based on their fields. Then, it was evaluated and validated by two validators, i.e. lecturers of the English education department at UIN Alauddin Makassar. All types of risk and impact assessments involve expert/validator validation assessments (Keeney & Von Winterfeldt, 1991).

3. RESULTS AND DISCUSSION

Result of Analysis

Analysis data of this research is based on the research from Rukmana in 2021 that become a document for the fundamental data sources. Then, the result of the analysis was utilized for designing a syllabus and developing module material. Brown said that there are several things to conduct when designing a syllabus, the overall thing can be seen as follows:

Need Analysis

The syllabus design consisted of several aspects of the need analysis which were involved in the curriculum design. It can be seen as follows:

1) Content

When designing a syllabus, content is the basic part before the researcher starts to create the syllabus. There are about twelve different topics related to Physics, but the researcher took only specific one topic, which is the topic of "Force". It is one of the highest averages for the overall inventory needs in the target needs of the Physics Education students. The average score shows that this topic is needed to be developed on the syllabus and the module to help students' English learning activities.

Table 1. Need Analysis Result: Topic (Rukmana, 2021)

Wants	Topics	Temperature	3.37
		Gravity	3.37
		Thermodynamic	3.36
		Force	3.36
		Kinematic	3.36
		Electricity	3.35
		Equilibrium	3.35
		Relativity	3.35

2) Skills

Based on the result of need analysis from the previous research, there are four main English skills that become the highest average score of the language component in the target needs from the "necessities". Skills are preferred to develop are reading in 3.1, speaking 2.98, writing in 2.86 and listening in 2.80. Then, Speaking and reading

become the most priority in the need of language components. Listening become the fourth after vocabulary. Then, writing is the fifth priority. Writing below, there are pronunciation and grammar.

Table 2. Need analysis result: preferred skill to develop (Rukmana, 2021)

Preferred skill to develop	Reading	3.1
	Speaking	2.98
	Writing	2.86
	Listening	2.80

Table 3. Need analysis result: language component (Rukmana, 2021)

Language Component	Speaking is the first priority	3.56
	Reading is the second priority	3.46
	Vocabulary is the third priority	3.44
	Listening is the fourth priority	3.15
	Writing is the fifth priority	3.13
	Pronunciation is the sixth priority	3.06
	Grammar is the seventh priority	2.82

3) Target and learning needs of need analysis

Table 4. Need analysis result: reading

Target Needs	Average Score
Able to guess the meaning of a word from a reading English text	3.14
Able to understand all types of reading	3.06
Reading Able to find the keywords and main idea through scanning and skimming	3.02
Learning Problem Lack of vocabulary	2.80
Learning Style Learning English through reading while taking notes	3.16

Table 5. Need analysis result: speaking

Target Needs		Average Score
Speaking	Vocabulary	3.17
	Pronunciation	3.16

Learning Needs		Average Score
Learning Problem	Difficulty hearing and capturing meaning of English conversation	2.41
	Difficulty speaking in English	2.4

Table 6. Need analysis result: writing

Target Needs		Average Score
Writing	Able to write cohesive and coherent paragraph	3.17
	Able to organize the paragraph correctly	3.16
Learning Needs		Average Score
Learning Problem	Difficulty writing sentence in English	2.31

Table 7. Need analysis result: listening

Target Needs		Average Score
Listening	Able to identify the main idea from various types of listening material	3.15
	Able to understand listening material	3.09
Learning Needs		Average Score
Learning Style	Learning English through audio	3.11

The design process of the integrated syllabus was done by using Nunan's (1988) syllabus design theory i.e. formulation of goals based on the need analysis, selecting and grading content, and selecting and grading learning tasks.

a. Formulating of Goals Based on the Needs Analysis

Nunan et al., (1988) said that goals come in variety of forms. It can come from the student by knowing when they were learning a language and it can be derived from the teachers themselves about what they want their students to achieve in the classroom. Therefore, the data that was obtained from the previous research must be appropriate to designing the learning objectives, indicators, and learning outcomes of the syllabus.

The indicator is a guideline or gauges to describe the level of achieving the target needs or also discovering a factor that affects the success of the activities. The indicators of this study are based on the necessities of target needs which are also related to the topic.

Learning outcomes are the statement indicating the end result for the student following a learning activity. It stated what a person can observe the student do at the end of a learning activity. In this study, the learning outcomes were designed by using the information from the necessities and the learning problems of the analysis result which specify four English skills.

The researcher was presented by considering the lacks, the learning problems, and learning style, in order to help the students to master their English abilities in their real situation. As well as their purposes in learning needs of English. There are four English skills for every section of the syllabus and the module along with each learning outcome that the students are expected to be able to:

- Students are able to understand the content of the reading text.
- Students are able to deduce into a written text.
- Students can recognize the important information from the listening audio.
- Students can practice their speaking skills by conveying information related to "Force".

b. Selecting and Grading of Content

Selection and grading of content in the syllabus are prepared for the skills that need to be evaluated and criticized (Nunan et al., 1988). This skills-based syllabus must be designed depending on the target needs of students in learning English through learning objectives and learning outcomes.

c. Selection and Grading of Learning Tasks

1) Activity

Syllabus design in this activity stage is part that determines how the syllabus and the module material are properly integrated into the classroom along with the suitable students' learning priorities. In addition, the activities consist of the student's learning needs which are learning problems such as lack of vocabulary, lack of learning strategies, difficulty in understanding the English reading text, etc. as well as the learning style, i.e. learning English through reading while taking notes, learning through audio, learning through speaking while listening.

2) Evaluation

Evaluation is the step to assess the students' understanding to know the result of students learning. Here is the process of students doing alike oral tests. Written tasks and replies ng questions after teaching about the material to students.

Result of Development

After the designing step, there is a development step for module material. This section was the process of development that resulted in the prototype II of ELT material. In development material, three main pedagogical procedures must include, as following below:

a. Providing Language Skills

The ELT module provides the English skills in the set of learning activities to achieve the students' ability in their needs of English and make them understand in practice and the theory. Among them are reading and summarizing text, identifying new vocabularies, listening to English audio, and practice to speak English which is related to the "Force".

b. Giving Opportunities to Use Integrated Skills

The module consisted of several activities that gave the students opportunities to increase their ability. It was categorized into two activities those are functional and social interaction. In functional activity, the researcher provides selective reading, gap-filling tasks, and constructing sentences. Whereas, the skills such as speaking skills that give opportunities for the students to interact with each other is the learning activity of social interaction.

c. Reviewing Learning Outcomes

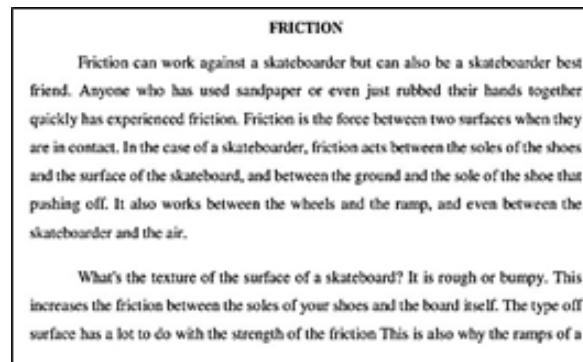
The existence of exercises and the task of the module was for the process of reviewing the student's understanding after conducting the learning activities. It was meant to know the extent of learning acquisition in each student.

As claimed by Hutchinson, T. & Waters (1987) that in development, there are three important phases to constructing the material Choosing from existing material, writing your own material, and then the existing material was upgrading.

a) Choosing from existing material

The first phase of the module development was the process when the researcher selected and sorted out material to be developed, related to the Physics education learning topic, which is "Force". The selected material was obtained from various sources such as physics books, Journals/articles, as well as Youtube videos. Overall, the material had been selected on the appropriateness to the ELT material of the Physics education module, as can be seen below:

1) E-book



Source: Jane Gardner, 2014, *Physics: Investigate the Mechanics of Nature*. Nomadpress.

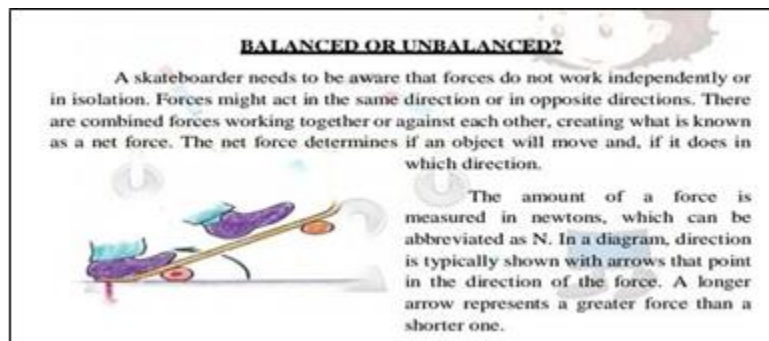


Figure 1. Material: E-book

2) Youtube video converted



Figure 2. Material: YouTube

Source: FuseSchools. (2018). *Forces that cause change | Forces & Motion | Physics | FuseSchool.*
<https://youtu.be/joVOE3sLeGI>

3) Internet

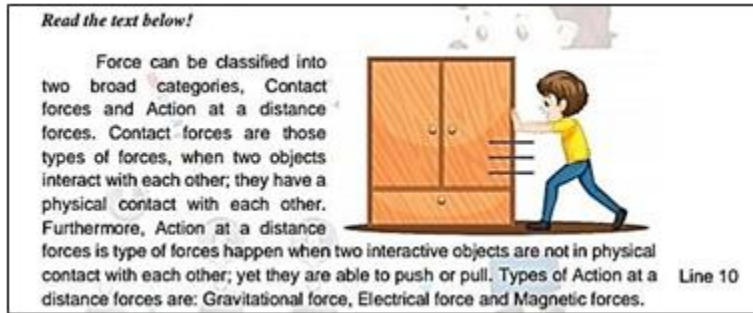


Figure 3. Material: Internet (Source: Mocomi.com, "Types of Forces" (2018)

b) Writing your own material

Based on Hutchinson theory that called develop material by own, in this section, the researcher constructed the content after selecting the material according to the syllabus design.

EXERCISE 1

List vocabularies that are new for you along with the meaning!

Vocabulary	Pronunciation	Parts of Speech	Meaning
Force	/fɔːs/	Noun	Gaya/Tenaga
Frictional	/frɪkʃənəl/	Adjective	Yang bereser

Figure 4. Learning material: exercise vocabulary

EXERCISE 2

After you listed the vocabularies along with the meaning, select the correct answer to the following questions. Circle (O) or cross (X) on the correct answer!

1. Which of the following would be the best title for this passage?

- Force in reality
- What is Force
- Types of Contact Force
- Types of Force




Figure 5. Learning material: exercise reading

4) Upgrading existing material

This section is the process of modifying the material to make it more interesting and fun to study as well as visually along with adding pictures and pigmentation suitable to the topic "Force".

a. Conceptual Maps and Learning Outcome

The conceptual maps and learning outcomes in this section are based on the analysis result of the conducted research by Rukmana (2021).

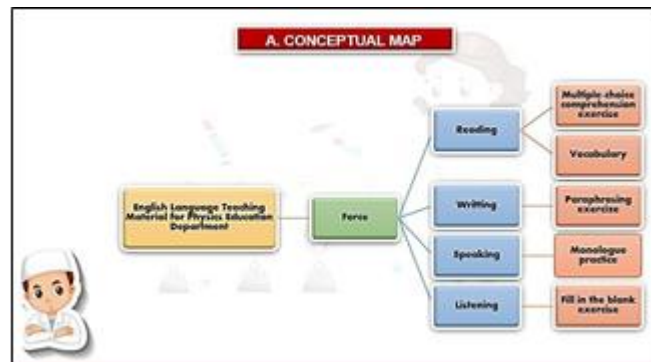


Figure 6. Conceptual maps of themModule

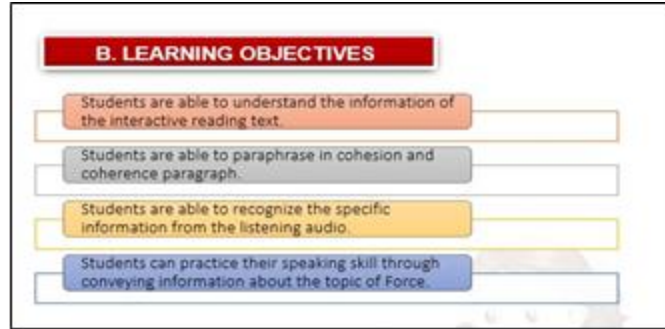


Figure 7. Learning objectives of the module

b. Learning material

Force that caused change

How many people can use a trampoline before it breaks? In this video, we are going to look at the types of change that force can cause. So, what exactly is force?

A Force is just a push or pull in a particular direction. Whenever you push or pull something, you are exerting a force onto it. The forces that you exert cause three things. One, they can change the (2) _____ of an object. Two, they can change the speed of an object and three, a force can change the direction in which something is travelling.

If a force changes both the (3) _____ and the direction of an object. Then we say its velocity has been changed. This is because (4) _____ is a vector quantity that measures both speed and the direction. Changes in shape can mean a variety of things. (5) _____ can be stretched, bent or compressed. When an object changes shape, we say it is deformed. There are two types of deformation. In elastic deformation, the

Figure 8. Learning material: listening

The exercise above is a learning material that focuses on recognizing specific information from the audio listening.

F. VOCABULARIES

Read and memorize the new vocabularies below!

Vocabulary	Pronunciation	Parts of Speech	Meaning
Force	/fɔ:rs/	Noun	Gaya/Tenaga
Frictional	/frɪkʃənəl/	Adjective	Yang berlawanan
Fluid	/flʊɪd/	Noun	Cair
Pull	/pʊl/	Verb	Mendorong/Menarik
Push	/pʊʃ/	Verb	Mendorong
Tension	/tɛnʃən/	Noun	Tegangan

Figure 9. Learning material: vocabulary

c. Task

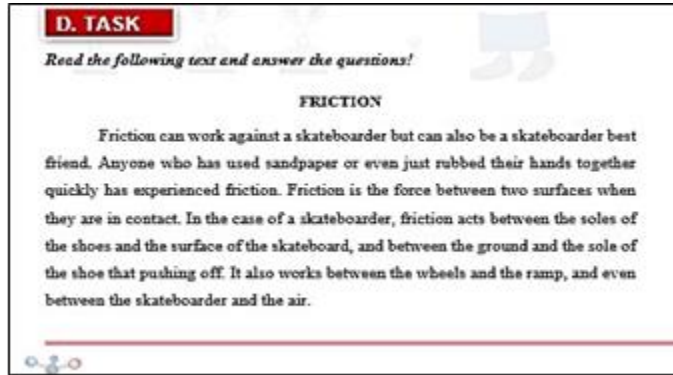


Figure 10. Task of the module: text

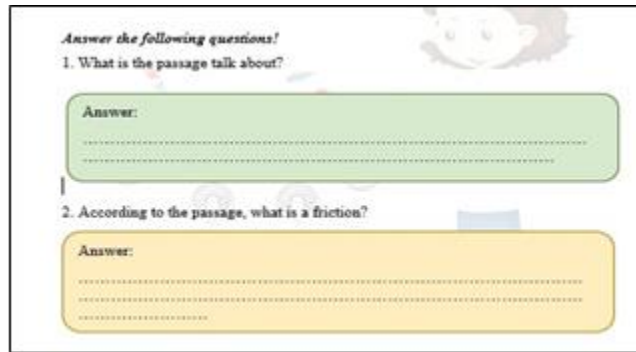


Figure 11. Task of the module: questions

Result of Evaluation

a. Self-evaluation

In this step, the researcher evaluated the product, the designing syllabus and the developed material in the form of prototype 1. It was the process where the researcher selected, adopted, considered and modified the designing syllabus and prototype material I by her own knowledge and experiences to find the appropriate learning objectives that the students need. Thus, it would be the consideration for the consultant of the improvement prototype I.

b. Peer evaluation

The second step of the evaluation was peer evaluation. Peer evaluation conducted after self-evaluation which the products were being evaluated by the consultant of the research in the process for develop the prototype material II.

c. Validators' evaluation

The module and syllabus are evaluated by using an evaluation checklist which consists of seven components, such as course content, learning outcomes, indicator, skills, etc.

No.	Before Revision	After Revision
Validator 1		
1.	Syllabus: -	Syllabus: -
2.	Module: a. Make sure that the learning outcomes of the syllabus are in line with the learning objectives in module b. Use operational verbs of Taxonomy Bloom.	Module: The researcher changed several operational verbs of the learning outcomes that belong to the taxonomy Bloom, and to ascertain both learning outcomes and learning objectives were in line each other.
Validator 2		
1.	Syllabus: -	Syllabus: -
2.	Module: a. Check the spelling of the word "indicators" b. Use white color for the vocabulary list.	Module: a. The researcher fixed the writing "indicators" without "s" b. Researcher change the font color of the vocabulary list to white color.

1. Design of Syllabus

The designing process was the step when the researcher started to create and design the syllabus on the basis of the need analysis related to the study. In designing process, it involves three stages which are stated by Tarihoran (2008).

- a. **Preliminary stage** was the first stage which aims to consider what and how was a good syllabus, then reviewing any syllabus was utilized also to develop a syllabus model framework of the language syllabus.
- b. **Implementation stage** was the second stage of designing the syllabus to conduct the need analysis. The researcher acquired the needed analysis result from the previous research. Therefore, the result of the need analysis was the

process of literature review that the researcher studied and analyzed, including the necessities, lacks, wants, and learning needs of Physics education students' learning problems and learning styles.

- c. **Completion stage** was the process to choose the syllabus type, modifying the syllabus, and creating the final form of syllabus design. Skill-based syllabus became the type of syllabus consisting of four English skills: speaking, reading, writing, and listening. In addition, the process of creating the syllabus was presented based on the skill-based approach as stated by Holmes (1981, as cited in Hutchinson and Water, 1987). Therefore, the syllabus design resulted in several components, those are syllabus content about the topic "Force", and learning outcome. Indicator, skills, activities, and evaluation.

2. Development Process of English Language Teaching Material

Hutchinson and Waters (1987) stated that three aspects of constructing teaching materials can be the foundation of this development process: selecting from existing material, writing your own material, and modifying existing material. Furthermore, the researcher used the third method, which was to modify existing material or adopt material.

During this phase, the researcher select material which available on the internet for various types of text, materials, audio, video, and images and chose the best of the existing material to develop in the module material that can relate between the English teaching material and the topic content. Finally, the researcher was done the process of creating instructional materials with a language focus, content focus, task, and the addition of various interesting things such as pictures and suitable colors related to the material.

3. Evaluation Process of English Language Teaching Material

The evaluation process was conducted gradually into three evaluations step such as self-evaluation, peer and evaluation by validators. Self-evaluation step was conducted by the researcher to evaluate the syllabus and module material's content to create syllabus design and prototype material 1. There were some activities of the designing phase which the researcher conducted such as selecting, designing, modifying, and producing material. During the process, the researcher can learn through reading and comprehending several of the references. So, it is hoped that the product can help students to fulfill their needs.

Peer evaluation was the process the result of the designing phase was evaluated by the consultants of this research who are the English Education Department lecturers

and the researcher's partner who were conducting the same research as this research. Various suggestions, comments, and critiques are all important in the next process of developing materials to be more qualified and suitable to be applied in English teaching and learning activities. Consequently, the syllabus went through a revision process before being developed into product material.

The validator's evaluation includes filling the two types of evaluation checklists: the evaluation checklist for the module material and the syllabus. It aims to know the appropriateness of the syllabus and material through scale measurement provided in the Likert scale adapted from Randi & Sari (2021). Then the checklists of the statements were counted to the form of points ranging from 1 to 5 for every indicator of evaluations. 5 means very good, then the lower point would be categorized to be worse such as 1 means very bad (Gay et al., 2018).

The result of the validators evaluation obtained almost all in the average of 4.2 - 4.6 for all criteria. Based on the Likert scale, it has shown that both the module and the syllabus are good. It also was reinforced by the previous research conducted by Alam (2021)), which stated that the average score between 4,2 – 5,0 is a good product. She was also conducted her research that resulted the development of English Teaching Materials for students in Islamic Economics, which can indicate that a good syllabus and module are deserved and appropriate to use as learning material, especially for the students who intended the module was design, which was Physics Education Students.

CONCLUSION

This research aims to design and develop an English Language Teaching material with the certain topic. Thus, this material is specifically made for the students of Physics Education Department and particularly focused on the topic "Force" unit. ADDIE model was adopted in developing this English Language Teaching Material. It results in a skill-based syllabus comprising four English skills: reading, speaking, writing, and listening. The module material consists of learning outcomes, exercises for each skill, a vocabulary list, grammar focus, as well as a glossary. The module has various exercises such as multiple-choice tasks, open-ended reading comprehension exercises, vocabulary exercises, monologue practice, and writing. There are two types of evaluation checklists both for the module and the syllabus. Then, it was evaluated by two validators, lecturers from English Education Department. After several revisions based on comments and suggestions, the syllabus and the ELT material are appropriate to be used by Physics Education department students to use in their English learning activities.

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