

Designing English Learning Materials for Electrical Engineering Students as Occupational Purposes

Ni Nyoman Yuliantini^{1✉}, I Gusti Ayu Putu Dewi Paramita²

Politeknik Negeri Bali^{1,2}

✉Address correspondence: Politeknik Negeri Bali

E-mail: nyomanyuliantini@pnb.ac.id

Abstract - This research was designed using the ADDIE's model development. The subjects included experts practitioners in the electrical engineering, English language instructors, and students. The objects were focused on needs containing the topics, sub topics, and the language aspects like texts, social functions, lexicon, text structure and grammar, meaning as well. The objective of this research was to assess and analyze a need and develop job related learning material for EOP. O'Donnell's technique were deploying to assessed and analyzed the needs of EOP learning materials. An interview guide and rating scales were used to assess and analyze needs and to validate the draft and final EOP learning materials. The obtained data were analyzed descriptively and qualitatively. The research findings show that the needs learning materials for EOP topics in Electrical engineering, Electrical Circuit Elements and sub topics Active Element, Passive Element, Series and Parallel element, and the language aspects, namely descriptive and procedure text genres; text social function, namely a description and procedure, Electrical lexical items, descriptive and procedure text structures, list of denotative meanings of the words used in the text.

Keywords: *EOP learning materials, English electrical engineering, needs, model development.*

1. INTRODUCTION

According to Law No. 12 of 2012 on Higher Education, clause 59 subsection (5), a Polytechnic is a college that organizes vocational education in various groups of science and/or technology, and if it meets the requirements, polytechnics can hold professional education. The third part of paragraph 2 of clause 16 subsection (1) states that vocational education is a Higher Education diploma program that prepares students for work with specific applied skills to an applied undergraduate program. As an educational institution that prioritizes professionalism and practice, Bali State Polytechnic (hereinafter: BSP) has an emphasis on teaching English which is different from teaching English in other educational institutions. At the Bali State Polytechnic “we are not learning the language but we are learning how to use the language” (Rame, 2000). BSP graduates are prepared to be able to communicate actively both orally and in writing. This means that the ability to speak and write actively is prioritized without compromising other aspects of ability.

English is one of the subjects designed in the BSP curriculum to envisage PNB’s graduate competency. Prior analysis on BSP’s curriculum identified a gap between the existing English learning materials and targeted English learning materials. The existing English syllabus and general course outline had not been designed and developed to integrate the English language skills with the respective vocations in the areas of automatic electrical system in tourism, maintenance of electrical industrial, supervision on building automatic systems, consultancy in planning industrial control, or technopreneurships in automatic control system. English for occupational purposes is so designed that students have sufficient English skills according to the needs of their world of job. EOP learning activities are designed within the framework of professionalism in the world of work. Therefore, the syllabus and teaching material must be in favor of the learner's needs (Kalpana & Shankar, 2017). Moreover, Far (2008) added that EOP learning activities are designed within the framework of professionalism in the world of work. Therefore, the syllabus and teaching materials must refer to the needs of the students.

BSP academic researchers had reviewed the BSP English curriculum on a local level. One study sought to design and develop (D&D) English instruction based on students' learning needs (Mudhina, 2007). This study assumed that students chose which English job-related learning materials to use for ESP at BSP. This study was prompted by the question of English's relevance to industrial demands. The study found that English was still being taught in order to produce professional and competent workers. It was suggested that students learn about language literacy rather than English. Previous studies on EOP have also been conducted. Masadeh and Alahmed (2016) investigated the demand for EOP curricula. The purpose of this research was to look into the EOP needs of students at Najran University during the second semester of 2014/2015. For this

purpose, two questionnaires were used. One questionnaire was distributed to faculty members, while the other was distributed to students. The research findings revealed that faculty members and students agreed on the importance of training ESP students to meet EOP needs such as reading and writing work-related faxes and emails, using information sources, communicating with foreigners about work, writing work-related reports, using tactful language with people, particularly customers, and understanding basic principles in work correspondence. A set of recommendations was proposed to improve ESP teaching at the university level.

The current study is distinct from previous studies. To begin, the English learning materials were designed and developed as job-related EOP learning materials (hereinafter: JRLM) using the ADDIE model (Fadilasari, 2020; Taufiq; 2019; Hamsah, 2018). O'Donnell's five steps of analysis were used to assess and analyze the JRLM's EOP needs (O'Donnell, 2018). The JRLM needs for EOP were documented by defining the objectives of the needs assessment, reviewing resources and capacity, identifying target audiences and data sources, summarizing results, and receiving feedback guidance in implementing the product, and developing the actual JRLM for EOP using a conceptual framework. Second, the draft and final JRLM for EOP were designed and developed using the ADDIE's model development. The process development activities included the following: providing a rational and feasibility of JRLM for EOP novelty, feasibility to solve problems, resources, facilities, and implement ability, designing JRLM for EOP in a systemic and gradual approach including guidance in implementing the product, and developing the actual JRLM for EOP following a conceptual framework.

2. METHOD

This study was created using the ADDIE model development software. The main goal was to create JRLM for EOP based on 'Electrical Circuit Elements' (Askehave & Swales, 2001; Noguchi, et., al, 2001). This study used the ADDIE model, which has a five-step systematic framework. The JRLM's research subjects for EOP needs assessment and analysis included a) electricity informants, b) electricity lecturers, c) English language instructors, and d) first-semester students. Text, text social functions, lexis, text structure & grammar, and a glossary of meaning suitable for JRLM for EOP based on Electrical Circuit Elements were the research objects (Ababio, 2013; O'Donnell, 2006; Kurt, 2018). The informants on electricity were given an interview guide, and rating scales were used to validate the readability, reliability, and validity indices in Units One through Sixteen (Candiasa, 2013; Sudiana,2021).

Data on JRLM for EOP topics and sub-topics, as well as English language aspects such as text, text social function, lexical item, text structure and grammar, and glossary of meaning for first semester students learning English at the tertiary institution levels,

were gathered from informants who are experts in electricity, lecturers on electricity, English language instructors, and first-semester students registering for English. Data on the readability, reliability, and validity of the JRLM for EOP containing topics and sub-topics, as well as the English language aspect such as text, text social function, lexical item, text structure and grammar, and glossary of meaning were also gathered and analyzed descriptively and quantitatively.

3. RESULTS AND DISCUSSION

Result Finding 1: Needs Assessment and Analysis.

Through interviews, the Electrical relevantly used as topics are *Electrical Circuit Elements* the topic-based on JRLM for EOP characterizes a close tie with the students' field practices on basic Electrical subjects (Abduvaliyeva, 2019; Huan, 2019; Kamil, 2021; Sudipa, 2020; Sudiana, 2021). Whereas, the sub topics are *Active Element, Passive Element, Series and Parallel element*. The English language aspects relevantly integrated in the *Electrical Circuit Elements* consisted of text, text social function, lexical item, text structure and grammar, as well as glossary of meaning. Sixteen texts were identified and selected from the basic Electrical subjects *Electrical Circuit Elements*, they are 1) descriptive text of *Active Element*, 2) descriptive text of *Passive Element*, 3) *procedure text of Series and Parallel element*, 4) descriptive text of *Active Element*, 5) descriptive text of *Passive Element*, 6) procedure text of *Series and Parallel Element*, 7) descriptive text of *Active Element*, 8) *descriptive text of Passive Element*, 9) procedure text of *Series and Parallel element*, 10) descriptive text of *Active Element*, 11) descriptive text of *Passive Element*, 12) descriptive text of *Series and Parallel element*, 13) descriptive text of *Active Element*, 14) descriptive text of *Passive element*, 15) procedure text of *Series and Parallel element*, 16) descriptive text of *Active Element*. In terms of the English language aspects like text genres, text social functions, lexical items, text structure and grammar, glossary of word or phrase meanings nested within the Electrical fields topic and sub topics were documented for EOP learning materials. The needs for the EOP learning materials were validated by experts in electricity before they were further designed and developed as draft and final products of EOP learning materials.

Result Finding 2: EOP Learning Materials

Through rating scales, the needs for EOP learning materials were organized and structured into sixteen course outlines structured as 1) topic (*Electrical Circuit Elements*), 2) sub topics (*Active Element, Passive Element, Series and Parallel Element*), 3 learning outcome (ability to read, write, and speak in English on *Electrical Circuit Element*), 4) learning indicators (to understand main idea, specific information, textual reference, and word meaning; to develop and arrange cohesive and grammatical paragraphs, to speak grammatically and fluently), 5) learning materials (descriptive and procedure texts); 6)

social functions of the texts, 7) descriptive, and procedure text structures, and 8) glossary of word or phrase meanings.

DISCUSSION

The newly developed EOP learning materials are discussed in relation to six theoretical issues, there are text-based learning, text's social function, word-based learning, grammar-based learning, meaning-based learning, and theme-based learning. First, EOP learning materials designed and developed with a perspective of topic-based learning involves learners' learning through one central topic (Devira, 2017). The topic could have strong links to one subject. A thematic approach to teaching involves integrating all subject areas together under one topic. It crosses over subject lines and helps children relate basic academic skills to real-world ideas. The benefits of a topic-based learning are (1) interesting topics encourage a love of learning, (2) students make deeper connections to learning, (3) students learn about the electricity deeper (Adnan, 2029; Hee, Ahmad, 2017).

An EOP text-based approach entails linking written texts to spoken skills with the Electrical context. Designing units of lessons that focus on developing language skills in relation to whole texts. Providing students with guided practice as they develop language skills for meaningful communication through whole texts (Li, 2018). An EOP text-based approach will improve and nurture the learners' English by interacting with tasks and then to use the target language to complete the tasks. This framework also involves the learners much more productively and makes them depend on prior world knowledge (Hafner, 2018); Liu, 2021; Widodo, 2015). Also, students tend to be active and participate with great motivation towards tasks and activities in a text-based learning environment. It offers a platform for students to display their skills through their efforts and develops them further (Abdujabbarova, 2020; Sasidharan, 2012).

Social roles provide an example of social influence in general and conformity in particular. Most of us, most of the time, conform to the guidelines provided by the roles we perform (Belcher, 20130). For example, descriptive is the text picturing the person, place and thing with clear detail to help the readers visualize an object which is described (Gerot & Wignel, 1994). Descriptive text also has its structure or stages. The elements or schematic structures of descriptive text are called identification or general statement and description. Furthermore, description activity is used to describe an object and the readers become easily to be understood, so that they can imagine the object which is described clearly like the real one (Knapp & Watkins, 2005). Through description, the learners will describe specifically parts, qualities, and characteristics of an object that is being described. Furthermore, they also explain about the grammatical features (language

features (simple present tense, action verb and adjective), vocabulary, and mechanics) of descriptive text.

An EOP word-based learning is a teaching process where students learn by engaging in personally meaningful and real-world projects and activities. Learners work on their project over a period of time. Word-based learning can be used to achieve a number of different objectives, such as: 1) to develop language skills that contribute to recognized qualifications, 2) to develop knowledge on the Electrical, and (3) to help students to understand what is involved in textual Electrical related job. Also, it provides individuals with the opportunity to strengthen six key soft skill areas (1) communication, (2) enthusiasm and attitude, (3) teamwork, (4) networking, (5) problem solving and critical thinking, and (6) professionalism. These types of skills provide a competitive advantage for achieving career goals (Chooma, 2020).

Grammar-Based Approach is one of the techniques to teaching and studying language, particularly a second or foreign language (Bratanych & Vyshnevskya). It is not literally or directly teaching grammar but scaffold learners to learn the language through and with grammar using different methods. Grammar is important because it is the language that makes it possible for us to talk about language. Grammar names the types of words and word groups that make up sentences not only in English but in any language. As human beings, we can put sentences together even as children - we can all do grammar. Different methods of teaching grammar are (1) diagramming sentences, (2) learning through writing, inductive teaching, (4) deductive teaching, and (5) interactive teaching. Along with an understanding of the nature of language, one of the principal benefits of grammar-based approach is that it helps students gain an understanding of grammar concepts: concepts such as subordination and coordination; concepts of expressing time relationships through the use of verb forms; concepts of nouns and adjectives.

An EOP meaning-based reading instruction involves teaching reading through exposure to text, social function, lexical items, grammar, and meaning of the English language. In other words, students learn how to analyze texts by reading and analyzing texts. The focus of meaning-based instruction is to help children develop literacy skills through having real-life literary experiences (Reyes & Raga, 2020; Varita, 2017; Meurers et., al, 2019). Effective literacy programs for children at risk focus on a meaning-based, functional approach to literacy (Mahar & Richdale, 2008). In meaning-based instruction, children feel motivated to learn early literacy skills because they see how literacy is personally relevant to them.

4. CONCLUSION

Needs assessment is important because it allows a language instructor to identify the gaps that are preventing the program from reaching its objectives. A good needs assessment and analysis imply some advantages for the development of EOP based on fundamental electrical concepts. (1) to improve the effectiveness of EOP learnings (2) It allows us to collect important information and data that we can analyze and use for EOP instructional benefit, and (3) it assists in identifying learning needs that should be addressed for better EOP results at BSP. Furthermore, according to O'Donnell (2006), needs assessment is an important component of learning materials because it helps students learn. Students can determine whether or not they understand EOP course material contextually when they can see how they are doing in class. Assessment of needs can also help motivate students. The needs for EOP learning materials were assessed and categorized into topics and sub-topics that included the Electrical for EOP as well as the language: text, social function, lexical items, grammar, and meaning glossary. The Electrical topic (Concept of Electrical Element) and subtopics were included in the validated draft and final product of EOP learning materials (Active Element, Passive Element, Series and Parallel Element). And the tried-and-true final EOP learning materials organized into sixteen topics to be studied as EOP at BSP for one semester. The teaching materials created during the development stages of this research were created with the help of English instructors in BSP, as well as input from BSP learners who will use this teaching material. This will ensure that the English teaching materials developed based on work competencies can truly meet the needs of English learning in BSP.

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