

Needs Analysis for Designing ESP Course of Mechanical Engineering Study Program at Tridinanti University

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Abstract— The growing demand for the specialized English for mechanical engineering has been increased. The mechanical engineers have been required to perform their professional activities such as presentation, meetings, briefings, participation in the international conferences and business arena. The university institutions offer ESP course to assist the learners to prepare for a future professional career. In response to these needs, the aim of this research is to investigate the perceived needs of mechanical engineering students, the teachers, and stakeholders of institution to provide an guided approach to ESP course design for mechanical engineering students. A descriptive research method is adopted for this evaluation study. The purpose of this study is to explore the needs of ESP course design at mechanical engineering study program of Tridinanti University. The participants involved in the study were students, teacher and stakeholders of institution. The results of this study showed the mechanical engineering students, the teachers and stakeholders of institution perspectives were positive towards by taking into consideration needs analysis for designing ESP course to provide the appropriate materials for academic and professional purposes.

Keywords: *need analysis, course design, ESP, mechanical engineering*

I. INTRODUCTION

Mechanical engineers have been required to perform their professional activities such as presentation, meetings, briefings, communication with the professional trainers or engineering linkers from overseas in written or spoken form. As English might be obtained for supporting their career in an engineering field, it is necessary that mechanical engineering learners must be competent in the use of English for their professional activities.

In response to the great demand from the engineering companies, learners have strong needs and motivation to learn English for increasing their English language competence for numerous occupational activities. The learners need English for meeting academic professions and future needs [1].

Therefore, giving enlightenment such as knowing specific reasons for them to learn a language [2] especially English is the best way to underpin their chance to compete globally. Furthermore, [3] assume that learning specific variety of English more effective due to learners' understanding of structures or meanings that the learners use in academic, workplace, or professional environment.

Presently, there are no English courses which provide the materials of ESP course is accorded to their specific language needs, in academic and in professional activities. Some ESP developer and curriculum writers have neglected what the target needs, especially the learners' needs. However, The curriculum writers and designers have designed an ESP course through needs analysis without neglecting the role of language institute, the faculty's management and instructor's expectation from the course [4] Therefore, designing ESP course by taking into consideration the students' needs, the ESP teachers and stakeholders' expectations are the completion requirements to lead teachers and designers to design ESP course through needs analysis.

Based on the observation, The ESP courses for mechanical engineering learners are without taking into consideration of the students' needs, the teachers and stakeholders' perspectives towards ESP course. In regarding with these problems, it is important to assist learners to adapt to the competitive situation, the educational institutions need to design ESP course that can prepare students for a future career. In this respect, the researchers made an attempt to investigate the language needs of mechanical engineering students, ESP teachers and stakeholders' perspectives towards ESP course in order to provide ESP course with insights into needs analysis support. The research project attempts then to find answers to the following research questions:

- What are the students' perspectives of perceived need on their ESP course?

- What are the teachers' perspectives of perceived need on ESP course?
- What are the stakeholders of institution perspectives of perceived need on ESP course?

By analyzing the perceived of learners, ESP teachers, and stakeholders as a consideration to design the framework of ESP course, it is to help the learners adjust to their academic study and future career.

II. LITERATURE REVIEW

A. *English for specific purposes*

ESP (English for Specific Purposes) involves teaching and learning the specific skills and language needed by particular learners for a particular purpose [5]. Furthermore, English for Specific Purposes (ESP) refers to the teaching and learning of the language to a specific group of individuals that have a purpose. In general, this purpose is professional, that is, learners are taught a set of skills that they currently need in their work or will need in their professional career [6].

[7] conclude that ESP can be seen as applied General English where specific subject matter such as engineering or technology is taught in English to students who have qualifications in these fields, but who feel they need to improve their English before enrolling in further studies or entering the workforce".

[8] on ESP proves that stakeholders, students and teachers believe that ESP is very significant for students' career development. Admittedly, ESP is very crucial to be implemented in specific area of learning due to its specification that covers the students needs.

B. *Needs analysis*

Need analysis is the basic component of ESP and guide to present training and development programs [9]. The aims of need analysis are to identify the necessities in their work field. The necessities at their locations are the function or communicative events, linguistics features identified in these situations and the specialized knowledge regarding to their duties and associate with the learner's prior knowledge [10].

Furthermore, [11] claimed that the results of the needs analysis will aid the ESP instructor to identify valuable information about the students. The teacher will know about their prospective professional needs, their needs in terms of language skills and their deficiencies in language skills. With this information, the instructor can determine the objectives of the language course and select material that meets those requirements.

Needs analysis can help a teacher gather information to find out how much the students already know and what they still need to learn [12] It is proven by [13], the more learner needs are clear, the more objectives are expressed and the ESP course easily becomes more successful.

By determining needs analysis, it is easily to set the goals and objectives of ESP course, to design the syllabus, to select the teaching materials and methodology. Consequently, the students learn better and faster [2].

Needs analysis have been divided into several stages as follows:

- Target situation analysis (TSA): [14] defines TSA simply as needs analysis which focuses on students' needs at of a language course. The outcome will become input for preparing learners and their use of target language which is presented in a form of syllabus [15]. [15] states that the importance aspects of TSA is the fact that this model analyzes all the four-skills (listening, speaking, reading and writing) as an input in course design. Dudley-Evans & St. John [14] define TSA as, "TSA refers to task and activities learners are/will be using English for target situation". Target Situation Analysis (TSA) refers to form of needs analysis, which centers on identifying the learners' language requirements in the occupational or academic setting Therefore, TSA may precise the stage at which 'good enough' competence for the job is reached as Munby suggests [16]
- Present Situation Analysis (PSA): PSA stresses the beginning process of learning in the language course that focuses on investigation learners' general description; the learners strengths and weaknesses [14]
- Deficiency Analysis: The term "lacks" which introduced by [2] can be matched with
- deficiency Analysis. [17] describes the function of deficiency analysis is to assess the
- learning gap between present needs and target needs.
- Strategy Analysis: [17] explains that strategy analysis establishes the learners' wishes to learn rather than what they need to learn. [18] describe the situation when the students learn how to learn, both skills and strategy analysis had arrived in ESP.
- Means Analysis: provides information about educational context [19] Means analysis involves information of the local situation (e.g., the teachers, teaching methods, management, students facilities, etc) to see how a language course may be implemented [20]

III. METHODOLOGY

A qualitative with descriptive research method is adopted for this evaluation study. The purpose of this study is to explore the needs of ESP course design at mechanical engineering study program of Tridinanti University. The population is selected to investigate the perspectives of the needs for ESP course among the students, ESP teachers, and stakeholders of institution. Thus, participants from each of these three groups are selected using purposeful sampling to collect the relevant information. The samples are (1) the students of mechanical engineering study program. They are represented to administer the questionnaire, (2) ESP teachers with 5-10 year experience in teaching ESP course. The teachers are chosen for investigating the perspectives of their needs towards the instruction for ESP course, and (3) the stakeholders of mechanical engineering study program who had responsible to decide the appropriate curriculum used for

supporting the objectives of study program. Data were collected through the questionnaire through closed-ended questions in the form of multiple choices for the students and open-ended questions which consist of 10 items for the teachers and 4 items for stakeholders of institution. The questionnaire designed in English was translated into Indonesian to ensure the students' understanding of all the items of question. The general purpose of this questionnaire is to identify the students' needs to ESP course. The questionnaires of the students' needs, the teachers and stakeholders of institution derived were analysed through a qualitative method in order to describe the results of questionnaires

IV. RESULTS AND DISCUSSION

A. The results of students needs analysis

This part presents students' general intentions in learning English, students' expectation of their English proficiency level and mastery in the target situation and students' English necessity for their future work.

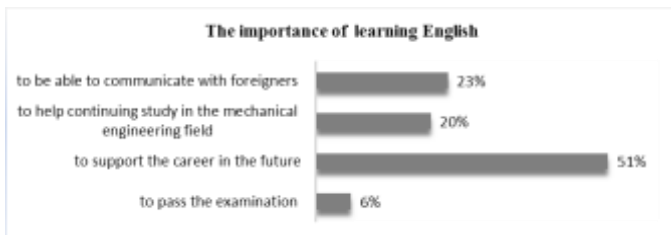


Fig. 1. The importance of learning English

From the figure above, it can be seen that 51% students had reasons to learn English could support their career in the future, the second choice of students (23%) assumed that interact and communicate with foreigners the main reason to study English. Students (20%) was to help continuing study in the mechanical field. Then, the students (6%) agree that English could help them to pass the examination.

The second data obtained were about students' opinion about the English proficiency level which is needed to support their career in mechanical engineering field.

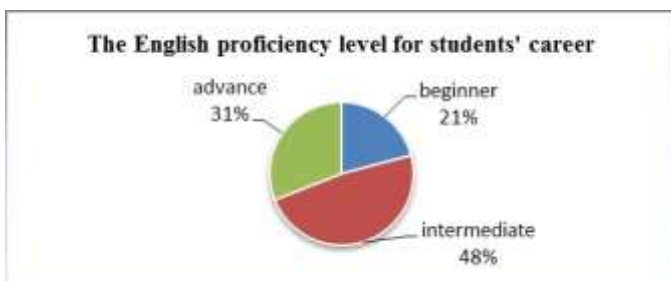


Fig. 2. English proficiency level for students career

There were 48% of students who stated that they should achieve the intermediate proficiency level in order to be dealing with workplace. It can be meant that their English must be relevant and sufficient for professional, academic, and social purposes. Moreover, the students believed that their English proficiency level for their future reach advanced level

(31%). These results reveal that the students also consider the need of English for their future life. In brief, the students expected that after learning English proficiency level would arise into intermediate level.

The third data obtained from the questionnaire was about students' expectation after finishing study. The results can be seen on figure below.

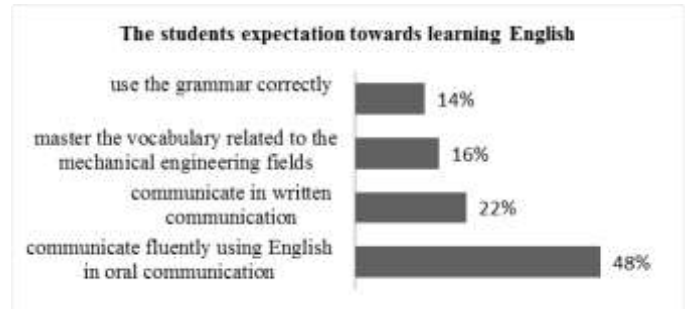


Fig. 3. students expectation towards learning English

Based on the questionnaire results, 48% of students wanted to be able to communicate fluently by using English in oral communication. Meanwhile, 22% students prefer to communicate in written communication. 16% of students would like to master vocabulary related to the mechanical engineering fields and 14% of students prefers to use grammar correctly. In brief, vocabulary and grammar are the subskills that should be mastered by the students to increase their communication in spoken and written form.

The fourth data obtained from the questionnaire was about the language use for students' career.

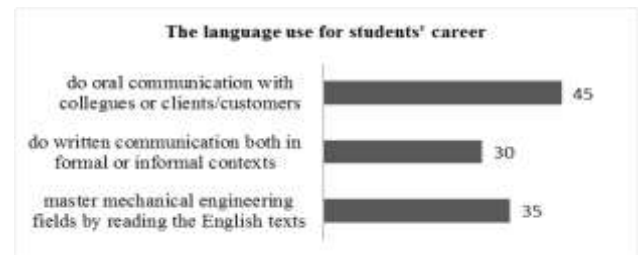


Fig. 4. The language use for students' career

From the figure above, it can be known that 45 of the students were attracted to do oral communication with client or customers. The second tendency was 35 students believed that they would master their English related to their specialist field by reading their English texts. On the other hand, the students choose written communication both in formal and informal contexts.

This part presents students' language skills and aspects difficulties was presented in figure 5.

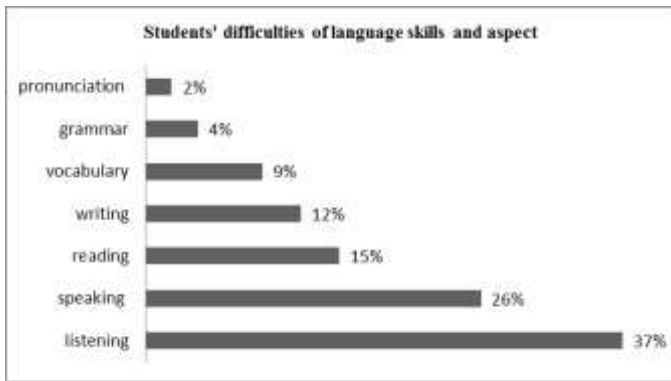


Fig. 5. Students' difficulties of language skills and aspects

From the figure above, it can be seen that almost all of those language skills and aspects chosen by the students and were reputed difficult by the students. The language skills which were categorized by the students as difficult skills to be learned were listening (37%) and speaking (26%). Then reading (15%) and writing (12%). Vocabulary (9%), grammar (4%) and pronunciation (2%) were the sub skills that support their the four language skills.

Based on the results above, it can be summarized that the students considered themselves having difficulties for almost all the language skills and aspects. This fact proves that English lesson is still regarded difficult for the students. Therefore, the teachers of English should make an innovative and effective learning to engage the students in the classroom.

This part presents students' preferred ways of learning and students' point of view towards teachers' role in teaching and learning process was about classroom arrangement to complete the task, individual work, pair work, or group work.

The data obtained was about classroom arrangement to complete the task, individual work, pair work, or group work. It can be described in figure 6.

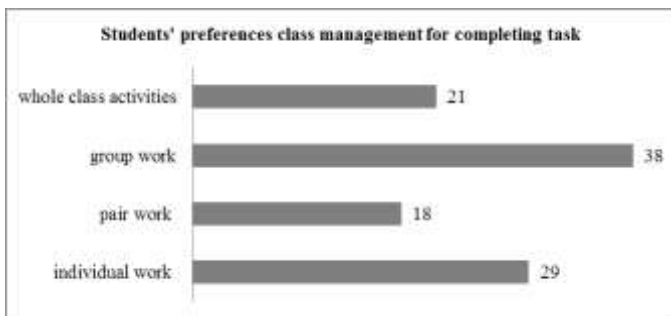


Fig. 6. Students' preferences class management for completing task

In figure 7 shows the preferred class management that is wanted by the students in order to do the task. There were 38 students who wanted group work activities. The second alternative was chosen by 29 students was individual work.

The data obtained was about students' role in the teaching and learning process. What responses that the students should give when their teacher was actually teaching.

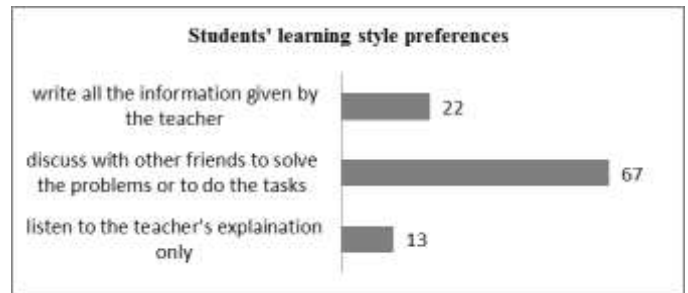


Fig. 7. Students' learning style preferences

As seen from the figure above, the students would like to have discussion with other friends to solve the problems or to do the tasks (67 students). The students were interested in solving problems together and had a role as problems solvers. The second response that the students would give in the teaching and learning process was to write all the information given by the teacher (22 students). It means that the students liked to write and take notes from their teacher's explanation.

The last data obtained from the questionnaire in SA was about teacher's role in the teaching and learning process.

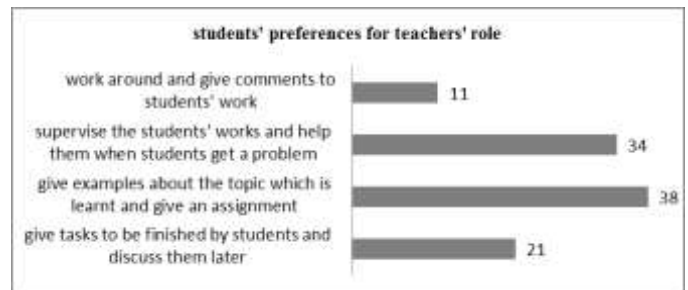


Fig. 8. Students' preferences for teachers' role

B. Results of interview for the stakeholders' institution

There are four stakeholders of institution of Tridinanti University. The dean of Faculty of engineering, the head and secretary of mechanical engineering, the experts of mechanical engineering field. The questions are as follows:

1) Asking about the objective of English class that is related to the mechanical engineering field or General English.

Stakeholder 1	Stakeholder 2	Stakeholder 3	Stakeholder 4
<i>It should be aimed at English mechanical engineering because it will enable students to understand mechanical engineering literature and terminology</i>	<i>For the mechanical engineering unit, the material provided should be English-language mechanical engineering, which is more closely related to the whole and with the right terms.</i>	<i>At least for mechanical engineering, we should use English. It is designed to help students concentrate more on their profession. In contrast, most of the engineering sector literature uses English.</i>	<i>GE has already been discovered when they were junior high school and senior high school. Students would learn English for their particular field of engineering at university.</i>

2) *Asking about English for graduate's job in the future.*

Stakeholder 1	Stakeholder 2	Stakeholder 3	Stakeholder 4
<i>The availability of jobs is essentially very high and almost every company requires graduates of the mechanical engineering competition is very strong so that those who have superior skills will be admitted. Good English language skills are one of the tests and mechanical engineering graduates, therefore, need English to a great extent.</i>	<i>The availability of jobs in the mechanical engineering industry involves factories, hospitals, stores, restaurants, independent businesses, manufacturing industries. English is therefore important for students to support their future career and willing to compete with others.</i>	<i>Essentially, engineering-based job openings are abundant in both companies and entrepreneurship. Graduates in mechanical engineering should have additional skills because they will perform in a number of other companies.</i>	<i>The availability of job opportunities is extremely abundant and has the requisite potential for all manufacturing industries and factory trading.</i>

3) *Asking about English course should be related to academics or their profession in the future.*

Stakeholder 1	Stakeholder 2	Stakeholder 3	Stakeholder 4
<i>English is closely related to the student career and educational field of study.</i>	<i>English courses are very relevant to one's profession, particularly in improving their knowledge and communication.</i>	<i>In the future, English course should be relevant to the academics of the students and their profession.</i>	<i>English would apply to the area of specialization.</i>

4) *Asking about the design of English course for mechanical engineering study program.*

Stakeholder 1	Stakeholder 2	Stakeholder 3	Stakeholder 4
<i>The materials will cover anything relevant to the needs of the students and the update information provided.</i>	<i>I hope the teachers should know the level of skills of the students so that the materials are suitable for the students' level and the toefl prediction test is better to measure the level of the students before and after graduation.</i>	<i>Ideally, when designing English course, the teacher allows the stakeholders to decide the materials are needed and suitable for the purposes. English is more concise in order to focus on English words so that students understand what they are learning and can be active learners.</i>	<i>The material content should be linked to the engineering terms. By using the appropriate material for their profession to help them individually grasp their subject-related textbooks.</i>

C. *Results of interview for the stakeholders' institution*

The teachers of ESP at Tridinanti University are interviewed to determine the teachers' perspectives towards ESP course.

Question items	ESP Teacher (GT)	ESP Teacher (RR)
What is students' difficulty and weaknesses in learning English	They have difficulty in language skills and aspects. Their difficulty is mainly to use English actively and they haven't been able to produce grammatically correct sentences with proper / appropriate diction or word choice / expression choice.	The students' difficulty and weaknesses in learning English is how they understand the materials. Due the lack of vocabulary, the students feel difficult to learn english. Therefore the material should be appropriate with the students' needs and relate to their daily needs. However, the way of teaching should be fun in order to make students enjoy learning English.
Students' attitude toward English subject in the classroom	Low motivation in learning English (some of students are more interested in learning English) Feel bored and confused in involving English activities Some students are shown positive attitude and eagerness in learning process. Some students have a great motivation in learning English even though they have some problems in learning	The students felt enthusiastic and excited to learn English in the classroom, however, there are also several students who still do not really show their eagerness in learning. English, but I still motivate them to keep learning. Some of students are positive and have high motivation, some seem reluctant, so far they can be forced to study well.
What consideration underlies the selection of learning materials?	By considering the theories of language acquisition and learning (integrated skills), contextualisation, the learner's background/ the students' prior knowledge, the size of the students, the students' English ability, the resources and facilities Stimulating interaction between teachers and students Authentic Integrated language skills Flexible	The students' major and their level of English proficiency The selection of learning materials is based on the students' need and ability. Whether there are such a syllabus and textbook for students, the lecturer have to adjust the material and students' ability. It will help both of lecturer and students to create the effective teaching and learning process.

	Opportunities	
What materials are often used in the classroom	We focus more on reading materials but we also give additional materials.	Ready to use materials from textbook including all English aspects and skills.

D. Discussion

After the data had been analyzed, the results of the students needs are the students are more preferences to increase their English competence for supporting their career in the future. It is supported by [5] study, they found that college students considered English is necessary to find a better job. They had positive towards ESP course where the specilized English will be used for their future career.

The English proficiency level for students' career were intermediate as their preferences to prepare their job fields. Even though, the companies demand their employees could have advance level for communication with supervisors, clients, subordinates, suppliers and contractors, and linking the companies from other countries. [21] suggested that English language course for engineering students should be regarded to the real-workplace situations.

Communication is the importance for the students to speak English fluently with colleagues or clients/customers. It is in line with [22], they discovered that the use of English in communicative events was more beneficial for engineers to do the daily tasks than their job promotion. That was communication is taking into consideration for the teacher to design ESP course. Even though, the students had obstacles in listening skills and speaking skills. It means that the students should more practice for increasing these skills because it is crucial for the success of their workplace and individuals. [23] stated that "insufficient of English communication skills was likely to have negative effects on the engineer's job performance in working with international colleagues and clients" (p. 41). [5] suggested speaking skill emerged as the most important are students wished to develop (p.24).

In learning process the students preferred to have a group in completing the task and discussing to solve the problems when they had the tasks or the projects. By giving the authentic materials and providing the examples in delivering the materials, these strategies could help the students more comprehensive in learning ESP.

V. CONCLUSION

This study suggested that the English in University should emphasise more practice and speaking skills and listening to increase their communicative events for academic and professional purposes. Therefore, the teachers determine the students' weaknesses and strengths of their English competence for classifying the students' proficiency level as a results the students could follow the assigned task to assist them learn faster. The teachers also consider the goal or the objective of ESP course in designing ESP course. However, the facilities is taking into consideration to support the students in learning process and implementing the variety strategies and techniques for avoiding the students bored and inactive in the class and stimulating their motivation to

practice their language skill in order to improve their communicative competences.

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