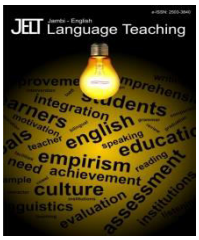

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The Teaching Of English In Superior Science Classes: The Congruence Of Students' Needs And Program Goals

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Abstract

English is mandatory for students of Superior Science Program of teacher education (PGMIPA-U) in the Faculty of Teacher Training and Education of Jambi University because science courses are expected to be taught bilingually through English and Bahasa Indonesia. Therefore, English is a must-to-achieve for students enrolled in this program. This paper focuses on identifying what the students need to achieve in the courses of Englishas EFL and EAP as well as what the program really wants the students to gain through the courses. Moreover, the paper pinpoints whether the students' needs are congruent with the program goals. Data were taken through a questionnaire, interview with thechief of the program, Group interview with 10 students from Physics Teacher education, and program documents. The findings of this study reveal that students' needs and program goals are aligned for developing general and discipline-related communicative practices. The Teaching of EFL course is centered on general communicative skills supported with proper linguistic knowledge. Meanwhile EAP courses are structured hierarchal which begins with constructing reading comprehension on subject-related texts to build students' competence of writing academic compositions related to their discipline and ends in students' pedagogic competence of teaching science in English.

Keywords: English courses, Science Teacher Education, Congruence, Students' Needs, Program Goals

Introduction

In the 21st century, education promotes learning that empowers internet-connected community, justifies civic responsibilities, and values cultural diversity through tolerance and compassion (Trilling &Fadel, 2009: 15). Thus, the learning should be focused more on real-world problems (Mergendoller et. al., 2000) in order to equip students with skills of abstract thinking, problem–solving, self-regulated learning, and group dynamics (Ward & Lee, 2004). Since educationin this century is exposed to digital lifestyle, students are expected to achieve skill of collaborative problem-solving, immerse in blended community principles and traditions as information throughout the world is spread in the internet (Trilling &Fadel, 2009: 18) which is dominantly presented in English.

In the light of this tendency, the Ministry of National Education (MONE) of Indonesia pioneered the national reform in educational sectors. It began with a rationale on National Education System that "a national education system should ensure equal opportunity, improvement of quality and relevance and efficiency in management to meet various challenges of local, national, and global lives; therefore it requires well-planned, well-directed, and sustainable education reform." (Act of the Republic of Indonesia No. 20,year 2003). This Act embraces a new vision that education is implemented to sustain democracy, autonomy, decentralization, and public accountability as the national foundation of education (Act of the Republic of Indonesia No. 20, year 2003)

This educational reform initiated a project called *SekolahBertaraf International* (International Standard School) which was implemented in public/state primary and secondary schools as an introduction to internationalism in education. These schools were expected to meet international standards(Kustulasari, 2009; 2).

In supporting the project to run successfully, the Ministry of Education and Cultures granted some higher educational institutions to initiate a program of International Standard Science Teacher Education which is known as *Pendidikan Guru MatematikadanIlmuPengetahuanAlamBertaraf International (PGMIPABI)*. This program commenced in 2010 academic year as stipulated in the Letter of DIKTI human resources director No. 2345/D4.2/2009 on October 5, 2009. This program aimed to provide science teachers who satisfy international standards of pedagogy and are able to teach science bilingually in International Standard Schools in Indonesia (Kemendikbud, 2012: 4).

This International Standard School project has been problematic concerns due to the possibility of misinterpreting the term 'international" and misconception on how the project would run successfully in school-based management framework (Kustulasari, 2009: 4). Moreover, attaching 'international' in a school's official title is of little value to refine (Walker, 2015). These concerns led to legal action which aborted the project nationally. This affected on the continuity of PGMIPABI Program. As announced in the letter of Higher Education General Directorate of Indonesia No. 0406/E.3.2/2013 on February 15, 2013 that this program was exchanged into a regular program called *Pendidikan Guru Matematikadan IPA Unggulan/ PGMIPA-U*(Superior Science Teacher Education) in 2013 Academic Year.

In Jambi University, this Superior Science Teacher Education Program is embarked to provide science teachers who are able to make use of digital teaching media in their teachings. The students of this program are trained to integrate technology-enhanced learning media and instruction in which English and *Bahasa*

Indonesia are the media of instruction. Students are taught courses of science with those languages. Since the lecturers and the students might face constraints to explain scientific concepts and argue about principles of the concepts clearly through English (Hue & Lei, 2014), the students might encounter difficulties to comprehend the courses when English is dominantly used.

In addition, using English as medium of instruction in non-English speaking countries entails two discreteinstitutional roles; English as Foreign Language (EFL) and English as Academic Purposes (EAP). In EFL contexts, English is taught to provide learners with linguistic knowledge of the language. In EAP contexts, English is taught to enhance their mastery of the language for completing academic tasks of their specific disciplines (Yürekli, 2012).

In promoting the use of English as the medium of instruction, this program offers four courses related to the learning of English language. Those courses are classified into a general compulsory course named '*BahasaInggris*(English)' and three mandatory EAP courses which are labeled as 'English for Physics/Biology/ Chemistry/Mathematics', 'English for Specific Purposes', and 'Peer Teaching in English' (2013 Curriculum of Science Teacher Education, Jambi University)

In addition, Hasmiati*et. al.* (2015) point out that learners' motivation to learn effectively are affected by their distinctive needs and interest.This implies that the teaching should be in accordance with students' needs for the effectiveness of the students' learning.However, the students' needs of English in PGMIPA-U program in Jambi University have never been researched and reported. Therefore, this study is considered worthwhile to be conducted for identifying the congruence among students' needs and program goals. The research questions are addressed as follows:

1. What are the program goals of determining those four taught courses?
2. What do students need to learn in those courses?
3. Are the students' needs congruent with the program goals of those four courses?

Profile of Superior Science Teacher Education Program

Superior Science Teacher Education Program (PGMIPA Unggulan) is formerly known as International standard Science Teacher Education (PGMIPABI). PGMIPABI was a grant project which aimed to yield graduates who are capable not only to teach science bilingually in English and Bahasa Indonesia but also integrate technology in their teachings. They were trained to teach in some international-standardpublic schools after completing their study in the program (the Ministry of Education and Cultures, 2012). This program commenced in 2010 after the letter of DIKTI human resources director No. 2345/D4.2/2009 was issued and enacted. In Jambi University, this program began after the rector decreed the commencement of this program under the Rector's decree No. 08A/H21/DT/2010. However, this program could not be continued in 2013 after legal action of aborting this program.

Directorate of Higher Education in Indonesia started to begin a new scheme of the program and named it "Superior Science Teacher Education" (*PGMIPA Unggulan*) in 2013 (the letter of Higher Education General Directorate of Indonesia No. 0406/E.3.2/2013). This program isembarked to prepare its graduates who are competent in teaching science integrated with advanced technology. This program includes four study programs of teacher education, i.e. Mathematics, Chemistry, Physics, and Biology.Students of this program are expected to be able to teach their

subject through the application of technology- enhanced teaching media and use English and *Bahasa Indonesia* as media of instruction.

Methods

Participants

A qualitative research which lies on participants' viewpoints and holistic analysis on what are described in the viewpoints (Fraenkel&Wallen, 2008: 422) become the design of this study. The participants of this study were the chief of PGMIPA-U in Jambi University and students of PGMIPA-U Physics Education who delivered their views about students' needs of English courses. There were 25 students participated in this study in which 10 out of them were involved in Group Interview. The students who filled in the questionnaire comprised 4 males and 21 females, meanwhile 1 male and 9 females of them participated in group interview. They were in the third semester in the program.

Instrumentation

This research used a questionnaire, (group) interviews, and program documents to dig up information about needs and goals of EFL and EAP courses. Data of the study were taken through a close-ended questionnaire which was filled by 25 students, an interview with the chief of this program, a group interview with 10 students, andProgram documents. The questionnaire, constructed by the author, consisted of 6 questions in which students could respond more than one options.Data gained from questionnaire were reported in percentage and confirmed with data from interview.

The data from the interview and group interview were transcribed, codified, and elaborated. The document data were reviewed to support data taken from questionnaire and interview. Member checking and self-reflection were applied to assess data trustworthiness.

Findings

The teaching of English in the higher institutions with non-English environments is classified into English as Foreign Language and English as Academic Purposes (Yürekli, 2012). Thus, data taken in this study are presented and discussed in two subheadings: (a) Needs Analysis and Goals of English as Foreign Language, and (b) Needs Analysis and Goals of English as Academic Purposes

a) Needs Analysis and Goals of English as Foreign Language

In Superior Science Teacher Education (PGMIPA-U) of Jambi University, '*BahasaInggris'* (English) is a general compulsory course which is categorized as EFL.This course focuses on equipping learners with linguistic knowledge of English as general communication which includes skills of listening, speaking, and reading as well as vocabulary and grammar. As stated in the curriculum that the objective of the course are "at the end of the course, students are expected to be able to communicate in English for general communication supported with proper grammar and vocabulary" (2013 Curriculum of Science Teacher Education, Jambi University).

This objective is aligned with participants' responses on the questionnaire (see Table 1). It is clear that students want to enhance their speaking and reading skills for general communication which are sustained with proper vocabulary, grammar, and pronunciation.

Table 1.
Students' Needs in '*BahasaInggris*' course

No	Needs	Responses
1	Language Skills	
	a. Listening	40 %
	b. Speaking	100 %
	c. Reading	80 %
	d. Writing	40 %
2	Linguistic knowledge	
	a. Vocabulary	72 %
	b. Grammar	72 %
	c. Pronunciation	76 %
3	Topics	
	a. General conversation	80 %
	b. General vocabulary	80 %
	c. Texts of general topic	68 %
	d. Discussion in English	64 %
	e. English Grammar	56 %
	f. Classroom utterances in English	84 %

These needs are also reflected in participants' responses in the interview. They prefer to learn more on classroom communication, daily conversation which are enriched with vocabulary and pronunciation. Theseare depicted in the following excerpts among interviewer (SH) and students (S).

SH : *"What language skills and topics do you like to learn in 'BahasaInggris' course?"*
S #1 : "*We'll be teachers at school, so I want to learn English utterances for classroom. It is useful [when explaining] in the classroom".*
S#5 : *"[I want to learn] Classroom communication. Introducing in teaching" [utterances that are common to use when teaching students in the classroom]*
S#2 : *"[I want to learn] Pronounce words [in English correctly] like native speaker. In English, words are pronounced differently. I have to know that. "*
S#8 : *"I want listening for pronouncing words correctly. General topics in the class."[listening materials for modeling correct pronunciation so that they learn to communicate in the class fluently]*

Besides, Yürekli (2012) identifies that in EFL classroom, accurate use of basic grammar is helpful in learning. This is in line with a student's response that core structure is beneficial for enhancing communication in the classroom. Another responded that reading strategy must be included in the teaching of EFL and learning essential grammar can aid them to make reports in EAP courses.

"I want to learn grammar in 'BahasaInggris' [course]. To tell routines [learn simple present tense], yesterday [learn simple past tense], and

what to do later [future tense]. Easy to speak in the class [when having discussion in the class]with [sufficient] vocabulary" (S #4)

"[For BahasaInggris course] reading to answer the questions correctly [learn reading strategy for finding information related to text]. Certain tenses in the texts for writing texts later." [learning particular tenses that are useful to understand the text and writing report in EAP courses] (S #9)

What the students need to learn in EFL course is aligned with the goals of the course that the chief of PGMIPA-U explained in the interview. He points out that in EFL context, students are presumed to learn how to communicate in English for general purposes, apply reading strategies for comprehending general texts, enrich frequently-used vocabulary, understand particular tenses used in scientific information, and use useful utterances in the classroom settings.

"[the students must learn] Reading strategies? Yeah, for comprehending the texts.General ones. Then, it helps for subject-related texts they learn in EAP courses"

"They must know common vocabulary, [especially] words used in classroom context. Good for their bilingual teaching" [of scientific concepts at schools in the future]"

"Tenses? Those [simple present tense, simple past tense, and future tense] are sufficient. Good for reading" [comprehension]

All excerpts indicate that students' needs of learning 'BahasaInggris' are congruent with PGMIPA-U program goals of equipping students with linguistic knowledge of English for general oral/verbal communication. Strategies in reading a foreign language are primarily necessary for students. Reading strategies enhanced with vocabulary and basic structures of English which are connected in real-life usage are emphasized when learning to read in EFL context (Anderson, 2003)

b) Needs Analysis and Goals of English for Academic Purposes

In English for Academic Purpose context, students' engagement to the language is interwoven with their academic tasks for constructing communicative practices related to their discipline (Yürekli, 2012). At this context, students are expected to perform written and oral communication related to their particular subject-related objectives.

In Superior Science Teacher Education program in Jambi University, three courses offered are categorized as English for Academic Purposes. First, 'English for Mathematics/Physics/Biology/Chemistry' is a specific compulsory subject only for this program that emphasizes on students' comprehension on the discipline-related texts. Second, 'English for Special Purpose' is another one that focuses on students' written production on discipline-related texts. Last, 'Peer-teaching in English' is the other that puts emphasis on students' pedagogical practices. The goals of those

courses involve (a) the students are able to extract the information presented in the scientific texts;(b) write compositions and/or reports of their discipline, and (c) teach science bilingually with English and *Bahasa Indonesia* serve as the media of instruction." ((2013 Curriculum of Science Teacher Education, Jambi University)

These goals are compatible with participants' responses on the questionnaire(see Table 2). It is indicated that in 'English for Physics' course, the students need to familiarize vocabulary of physic concepts sustained with accurate pronunciation which ease them to comprehend physic-related texts. In 'English for Special Purposes', the studentsalso want to describe the concepts of Physics in English compositions. In'Peer Teaching in English', the students expect to practice teaching Physics in classroom setting.

Table 2
Students' Needs of English for Academic Purpose Courses

No	Needs	Percentage of responses		
		English for Physics	**English for Special Purposes**	**Peer Teaching in English**
1	Language skills			
	a. Listening	40	52	40
	b. Speaking	100	40	92
	c. Reading	100	76	52
	d. Writing	40	80	52
	Linguistic knowledge			
	a. Vocabulary	80	100	92
	b. Grammar	40	88	40
	c. Pronunciation	76	40	92
	Topics			
	a. Explaining concepts in English	52	84	88
	b. Vocabulary related to area of study	84	88	88
	c. Scientific text	76	84	64
	d. Discussion in English	64	84	84
	e. Writing scientific report	40	80	-
	f. TOEFL	0	76	-

These needs are in accordance with the participants' responses to the interview. They put emphasis on comprehending scientific texts and specific vocabulary, communicating the concepts in classrooms, and producing compositions or reports about scientific information. Besides, they think that TOEFL must be introduced to actualize their dreams pursuing study abroad. Those are reflected in the excerpt between the interviewer (SH) and the studennts (S #) as follow:

SH : "What do you think is important to learn in English for Physics?"
S #3 : "Yeah, I want them [difficult words related to Physics are taught] in English for Physics [course]. It helps to understand the lecturer [what the lecturer is talking] and texts."

S #10: "I want to learn difficult words [related to Physics] so that I can do tasks [given by lecturer] easily.

S #7 : "Knowing difficult words [related to Physics] helps me to understand the texts [about Physics] and tell them in Bahasa Indonesia."

SH : "What about English for Special Purpose?"

S #1 : "[I want to learn how to] Write reports in English [about concepts in physics]

S #6 : "Learn TOEFL. Above 500 [TOEFL score]. We hope to pursue study abroad later" [studying master degree outside Indonesia after accomplishing this present study]

S #5 : "Discuss in the class [about concepts in Physics] and write it. TOEFL is okay for me. I need it [for studying abroad] later."

SH : "Peer Teaching in English. What do you need to learn?"

S #10: "Teach [Physics] using English. [it is] not easy to tell [Physics] in simple sentences."

S #7 : "Explain [Physics] simply for high school students."

These needs are aligned with the program goals that the chief of PGMIPA-U described in the interview. The program emphasizes on students' mastery to Physics terms in English for discussing Physics concepts in the textsand composing essays or reports about them. The students are also taught how to compose simple, compound, and complex sentences for aiding themto write report ideas well. It is expected that students of this program possess much better academic quality due to English as medium of instruction so that they have more opportunities to pursue further study abroad. However, he asserted that TOEFL is excluded in the courses because it is given in an extra training at the end of particular semester.

"They must understand the [Physics] texts through [learning] specific terms for Physics. They can answer questions [in the text] more easily if [the students] understand [the text]."

"[They need to learn how to] Write practicum reports [about Physics] in English for Special Purposes. [They must] understand simple sentences. Compound and complex ones too"

"They teach or present about Physics in the class using English [in Peer Teaching in English]. Combined with Bahasa [Indonesia] is okay but English must be dominant."

> *"They [the students] are expected to gain wider chances to continue further study abroad because [they are] accustomed to English in academic life."*
>
> *"There is TOEFL training scheduled at the end of certain semester. No need to learn in those courses."*

The teaching of EAP courses in PGMIPA-U are aligned with students' needs and interests due to academic demands it entails. In EAP context, the teaching of English aims to develop skills of reading linked to writing for targeted discipline (Farahzad&Emam, 2010) and construct communicative practices which are centered aroundaccomplishing subject-related tasks given(Yürekli, 2012).

Conclusion

The teaching of English at higher education is challenging enterprise because it needs to adjust with diverse needs and interest the learners possess. The congruence between institutional goals and learners' distinctive needs may deliver successful experience of learning the language. This study identifies that the needs of PGMIPA-U Physics education students are in accordance with the goals of EFL and EAP courses offered. Both students and the program want a hierarchical structure in teaching the language skills and linguistic knowledge that are connected among those courses. The teaching begins with general communication and instruction which are useful for developing discipline-related communicative practices.

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