

Need Analysis of English Learning Materials for International Class Program

(ICP) of Mathematics Department at State University of Makassar

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ABSTRACT

This research was aimed to find out the learning needs, target needs and suggested syllabus of International Class Program of Mathematics students at State University of Makassar. This research employed quantitative and qualitative research method in analyzing learning needs, target needs and suggested syllabus. The subjects of this research were the third semester student which consists of 30 students, lecturer and graduates of International Mathematics Education. The researcher distributed questionnaires and conducted interview by using audio recording. The findings of this research showed that the needs of the students comprise of learning need and target need. Learning needs include; English language skills, learning activities, materials preferences in term of approaches and strategies in learning English for Specific Purposes in classroom setting. In terms of language skills, speaking and writing are more needed in the classroom which is supported by the questionnaire and interview. Furthermore, in learning activities, study in small group and presentation are more prefer than other learning activities. Meanwhile, the materials preferences, terms of Mathematics in English, Ways of talking and writing (e.g. word problem, writing a solution, giving an explanation) and General English, such as vocabulary and grammar are more preferred. Target needs comprise of the necessities, lacks and wants in the workplace. Necessities includes English language skills (speaking and writing skills) and Grammatical structural functions. Lacks include Lack of General English Vocabulary and Terms of Mathematics in English. And Want includes Terms of Mathematics in English, Set phrases and set sentences tasks and Learning through

presentation. The newly syllabus that has been designed and proposed was topical syllabus which include topics, language function and focus, English focus skills, competence and teaching strategies in it an surely based on the students' needs as listed.

Keywords: Need Analysis, Learning Needs, Target Needs, Suggested Syllabus.

INTRODUCTION

Many universities located in the big cities of Indonesia introduced English-Indonesia bilingual program in order to improve the quality of their graduates. In South Sulawesi Province, one of the universities which conducted bilingual program is International Class Program (ICP) in Department of Faculty of Science of the State University of Makassar. Bilingual programs means the use of two different languages, in Indonesian and English as a foreign language which both languages are utilized as mean of instruction.

Since 2007, there are six international study programs in Department of Faculty of Science (FMIPA). They are mathematics education, biology education, chemistry education, physics education, and geography education. This research will focus mainly on the need analysis of English for International Mathematics Education. The most significant difference between ICP and regular program is not only the facilities but also the use of English instructions. The purposes of English for mathematics are to improve the quality of students, to open opportunity for study abroad, to support students' access to English mathematics books, and as an absolutely challenging and promising program, it is one step further at State University of Makassar in general, except for English department students in which the use of English is obligatory.

The findings of the preliminary observation shows that there are some problems faced by students when they learn mathematics through English. These may be: lack of materials related to English for mathematics, some lecturers do not use English in teaching and learning process, mathematics' technical terms which could be problematic including homonyms and synonyms, etc. For example, the word to express "tambah" in Bahasa Indonesia, has similar meaning to add, plus, sum, etc. It needs deep understanding to decide the correct word for a certain context.

The supporting research from Sultan (2018) stated that there were still many challenges in implementing English as a medium of instruction at the International Class Program (ICP) of Department of Mathematics of UNM, such as lecturer's low English proficiency, lack of sufficient of bilingual materials, and lack of English environment at the campus. Based on the statement, the researcher will analyze what the lecturer and student need in teaching and learning process.

The reason why this research is important because lecturers and students of International mathematics education who have been teaching and learning in Indonesia are expected to be able to perform effectively in English. Both lecturers and students mostly used textbooks in which the content or the explanation is in English. It means that they need to learn English first to understand the mathematics subject. On one hand students must learn mathematics in English, and on the other hand, the lecturer must teach mathematics in English. According to Pandian and Ramiah (2004) pointed out, what teachers know and can do, affect all the teaching practice. The reason in choosing International Mathematics Education program is mainly because it is challenging and both the lecturers and the students are required to use English especially during the class activity; and it is promising because at the end of the course the students will have a certain level of English proficiency.

To further our understanding, the research questions driving this research are as follows:

1. What are the learning needs of undergraduate students of ICP Mathematics Departement ?
2. What are the target needs of undergraduate students of ICP Mathematics Departement ?
3. How is the suggested syllabus develop for undergraduate students of ICP Mathematics Departement ?

The result of this analysis is a suggested syllabus for International Mathematics Education program. The suggested syllabus helps the teachers/facilitators in preparing the materials. Preparing a need-based syllabus initiated by need analysis in ESP teaching is an important part of the language teaching itself. Kopiatina (2018) in her research had been trying various combinations of tasks to target general, academic and professional language, trying to prepare her students for the career in geology by designing a specific syllabus for them. Therefore, the present study will involve all these elements in need analysis to construct the suitable syllabus by making adjustments to connect it to the biology field.

LITERATURE REVIEW

Ratnah (2013) in her research at AKPAR (Akademi Pariwisata) Makassar entitled '*Developing English Specific Purposes (ESP) Course for Tour and Travel Students Based on Need Analysis*'. This research showed that language needs cover the use of English in the workplace. The distribution of English in the curriculum is not really relevant to the contents of standartad competency. The ESP course of tour and travel department was designed and developed based on the results of needs analysis by using an integrated or a mixed syllabus, and also learning needs to cover language skills and learning preferences.

Chunling (2014) in his research entitled “ Syllabus Design for Business English based on Need Analysis” at Inner Mongolia University, Tongliao, China. He found that need analysis of the society and the business English learners had been done in order to achieve the optimization of business English course design. The development and implementation of the needs based on Business English and the syllabus design was regarded as highly effective in enhancing the learners’ performance and promoting their achievement in Business English learning.

Novita (2013) on her research at STAKN Toraja with the title ‘*An Analysis of Teaching Material and Students’ Needs in Learning English at STAKN Toraja*. This research aimed to describe the students’ needs in learning English in developing their skill at STAKN Toraja and to describe the students’ perceptions about the syllabus used in relation to their needs. Data from questionnaire, interview and document analysis, the researcher can infer that students at STAKN Toraja need theological English than general English for their future profession and they need speaking than three other skills in line with their academic studies and their future profession.

1. English For Specific Purposes

English for Specific Purposes refers to the way of teaching English for specific learners who study for a certain workplace. It provides teaching English taught is related to learners’ need in their workplace. English for Specific Purposes is an umbrella term that conveys the teaching of English to students who are learning the language for a particular work or study related reason (Tomlinson 2003, p.306). Moreover, English for Specific Purposes is more emphasized to students who learn specific skill in their study and gives significant contribution in learning English for a specific skill. It is also supported by Hutchinson and Waters (2006, p.19) English for specific purposes is an approach which is based on learners’ need or it is not a language product.

English for Specific Purposes is also not a methodology in teaching English. It means that English for Specific Purposes refers to a way to teach English skill closely related with their study field. Hence, English for Specific Purposes is not a result of English teaching learning process, but it reflects to process of English teaching learning for certain learners.

2. Need Analysis

Hutchinson & Waters (1987: 54) divide needs analysis into two types, which are *target needs* and *learning needs*. Target needs is what the student needs to do in the target situation. Target needs is something of an umbrella term, which in practice hides a number of important term such as necessities, lacks and wants.

Necessities is a type of the need, which is determined by the demands of the target situation, that is what the students have to know in order to function effectively in the target situation. One of example is a businessman might need to understand business letters, to communicate effectively at sales conferences, to get necessary information from sales catalogues and so on. He or she will also need to know the

linguistic feature-discourse, functional, structure, lexical- which are commonly used in the situations identified.

Lacks are what the learners already know and what they are deficient in, i.e. what they ignore or cannot perform in English. Furthermore, lacks are the gaps between the initial or actual situation of the learners in terms of language proficiency or aptitudes, and the one which is required after the accomplishment of the language training. Wants mean learners' personal expectations and hopes towards acquiring English, for example is what they would like to gain from the language course itself.

3. Syllabus

A material design model consists of four elements: input, content focus, language focus, tasks (Hutchinson and Waters).

Input: This may be a text, dialogue, video recording, diagram or any place of communication data, depending on the needs you have defined in your analysis. Content focus: Language is not an end in itself, but a means of conveying information and feelings about something. Non linguistic content should be exploited to generate meaningful communication in the classroom. Language focus: our aim is to enable learners to use language, but it is unfair to give learners communicative tasks and activities for which they do not have enough language knowledge. Task: The ultimate purpose of language learning is language use. Materials should be designed to lead towards a communicative task in which learners use the content and language knowledge they have built up through the units. Brown (1995:7) classifies syllabus into seven classifications, they are:

- a. Structural syllabus is a kind of syllabus in which the content of language teaching is grammatical and phonological structure organizing principles sequenced from easy to difficult of frequent to less frequent.
- b. Situational syllabus is a kind of syllabus in which the content of language teaching is based on the situations such as, at the bank, at the supermarket, at the restaurant, at the hotel, and so on. It forms the organizing principle sequenced by the likelihood that students will encounter them (structural sequence may be in background).
- c. Topical syllabus is a kind of a syllabus in which the content of language teaching is based on the topics of themes, such as health, food, clothing, and so on. Form the organizing principle sequence the likelihood that students will encounter them (structural sequence may be in background).
- d. Functional syllabus is a kind of syllabus in which the content of language teaching is based on the functions, such as, identifying, reporting, correcting, describing, and so on. The organizing principle sequence by some sense of chronology or usefulness of each function.
- e. Notional syllabus is a kind of syllabus in which the content of language teaching is conceptual categories called notions (such as, duration, quantity, location and so on). The organizing sequenced by some sense of chronology or usefulness of each notion.

- f. Skills syllabus is a kind of syllabus in which the content of language teaching is skills (such as listening for main ideas, listening for inferences, scanning a reading passage for specific information, and so on) serve as the basic for organization sequenced by some sense of chronology or usefulness of each skill.
- g. Task syllabus is a kind of syllabus in which the content of language teaching is task or activity based on categories (such as drawing, maps, following directions or instructions, and so on) serve as the basic for organization sequenced by some sense of chronology or usefulness of each task.

METHODS

The research would be mix research method, which combine qualitative and quantitative research techniques, methods, approaches, concepts into a single research. This type of research is commonly classified according to how data are collected, that is through questionnaires and interviews (Gay, et al 2006). This research was conducted at International Mathematics Education of State University of Makassar (UNM) on academic year 2018/2019. The populations of this research were the third semester students, lecturers and graduates of International Mathematics Education. So, the subjects were taken from three groups. First, the subjects were taken from 30 students of the third semester who were still studying in International Mathematics Education. Second is the lecturers who teach English for mathematics. Third is International Mathematics Education graduates who were working in variety fields.

This research method, using multiple techniques of data collections, they are questionnaire, interview and document analysis. The use of multiple methods to collect data about a phenomenon can enhanced the validity of a case study finding. The existence of the instruments of data collection was very important to reach the research objective. The procedures of collecting data of this research was described as follows:

Preliminary research, the researcher gathered data from some students, lecturer, and graduates about English for mathematics taught in International Class Program of Mathematics Department of State University of Makassar. Among six study programs in International Class Program, the researcher choose mathematics department. Preliminary research is having interview to some students and observing the class. From those activities, the researcher found that lack of materials related to English for mathematics, some lecturers do not use English in teaching and learning process, etc

Checking Validity, to found out the valid and reliable data, the researcher used valid and reliable instrument. Validity in this research refers to the appropriateness, meaningfulness, and usefulness of the instrument to collect the data. In this research, the instruments will be validated by the experts. For the first research question, the reseacher distributed the questionnaires and interviewed to the ICP of Mathematics

students to find out their learning needs. For the second research question, the researcher distributed the questionnaires and interviewed to the ICP of Mathematics graduates and lecturer to find out the target needs. During the research, the researcher also analyzed existing syllabus, English textbooks or materials to find out suggested syllabus for International Mathematics Education. And for the last question, the researcher will designed a suggested syllabus based on students' language and learning needs of International Mathematics Education students at State University of Makassar.

Since it is a mix method research, there are two kinds of approaches that the researcher employs. They are quantitative and qualitative methods. First, the quantitative method will be used to analyse data from questionnaires by looking at the frequency, percentage and average of each number, while the data from the interview was transcribed. Second, in the qualitative method, data analysis techniques was a process of resolving data into its constituent components, to reveal its characteristic elements and structure. Based on Robert K. Yin (2011), data in qualitative research is analyzed in a five- phased technique: compiling, disassembling, reassembling (and Arraying), interpreting, and concluding. However, in this research the data were analyzed in four phase because disassembling and reassembling phase can be combined.

FINDING AND DISCUSSION

1. The Learning Needs of the Students of ICP of Mathematics

For the first research question about the laerning need, the researcher found that the learning needs was the needs that related with students learning in the situation. Learning needs of this research covers English language skills, learning activities, materials preferences in term of approaches and strategies in learning English for Specific Purposes in classroom setting. As indicated by the result of the questionnaire and interview, the researcher found that all the language skills; speaking, listening, reading and writing are not used specifically in the classroom. But, based on the data, the English language skills regarding to learning needs for the students need mostly are speaking and writing skills, this is also expressed in the interview :

“kalau menurutku semua skill sama pentingnya, tapi dalam pembelajaran yang paling penting menurut saya itu speaking sama writing, karena apa, bagaimana kita bisa menyampaikan pendapat didepan kalau dosen bertanya kalau speaking ta kurang, terus bagaimana kita bisa menyelesaikan soal dalam bahasa inggris kalau writing ta lemah. Belum lagi tugas akhir nanti bikin skripsi pakai bahasa inggris.” (In my opinion, all English skills are very important, however in the learning,the most important matters are speaking and writing, why? when the lecturer asked us a question, How come we can convey our opinion if we are lack in speaking, then how to accomplish any items if we are weak in writing. Moreover, in the final task we have to write our own thesis written in English, that is my point of view.) 1st Student

From the data above, learning activities should also be significant with the students' mastery of English. This research found out that students tend to focus not only to English for mathematics, but also to focus on practicing skill, such as speaking and writing skills. The most important reasons why the students need to master speaking and writing skills are to express opinions and solve mathematics questions in English. Meanwhile, the final task of ICP of mathematics students is to make thesis in English. So in this case, the lecturer should provide more opportunities for speaking and writing related to the mathematics in practice.

In teaching and learning English it is not only about students, teacher, material and all aspects but also the effective method. Effective method can support and facilitate the teaching and learning process. Based on the problem, the research stated one question about method in the last number of her questionnaire. From the questionnaire, it showed that the highest percentage pointed to learning through presentation and small group, this is supported by interview transcription:

“Presentasi kak, tapi kalau saya tergantung mata kuliahnya, adakan mata kuliah yang kalau kita persentasi trus banyak materinya, biasa teman teman tidak perhatikanji dan pasti akan bermasalah pada pengetahuanta nanti. Ada beberapa mata kuliah yang cocok persentasi, trus keunggulannya presentasi di ICP itu na bantuki speak up.”(The presentation, but I perceive that it depends on the subject of the lecture, sometimes we find a lecture consisting of many materials, and usually our friend did not focus on us in which there will be many problems encountered later. Actually, there is also an appropriate lecture for presentation and the advantage of carrying out the presentation in ICP is we will be assisted to speak up. In the final examination, the students have to conduct microteaching by using English in which certainly we have to begin to learn English since now) 1st Student

Extract above indicated that learning preferences in terms of the ways of learning with others, the findings obtained from the students show that learning through presentation in small group is preferred by the students. The statement above also related to the one of the English language skills regarding to learning needs for the students need most is speaking, as Harmer (2007: 284) stated speaking is the important ability to speak fluently and presupposes not only knowledge of language features, but also the ability to process information and language ‘on the spot’.

For materials preferences based on the questionnaire, the materials preferences regarding to learning needs for the students need most are Ways of talking and writing (e.g. word problem, writing a solution, giving an explanation), mathematics terms in English and General English. it is also related to the English language skills regarding to learning needs for the students need most are speaking and writing. It is supporting by interview data, as expressed:

1st Student: *“Kalau saya menurutku toh kak, semua istilah matematika dalam bahasa Inggris dan bagaimana cara penggunaannya dalam bahasa Inggris, bagaimana caranya dikasi hubung, bagaimana caranya supaya bagus kalimat jawabannya dalam bahasa Inggris,. Karena bagaimana carata mau menjawab kalau tidak ditau. Kan masalahnya juga bukuta pake bahasa Inggriski dan haruski mengerti. Banyakji memang versi Indonesianya, tapi lebih kacauki versi Indonesianya itu buku daripada versi bahasa Inggrisnya”*(In my point of view, the main obstacles are all terms of mathematic in English, the way of using it, how to connect it, how to answer appropriately by using English. Because, we could not answer if we did not know it. The other problem also is our textbook written in English and we have to understand it thoroughly. We may find the indonesian version however it has more poor organization than the English version)

2nd Student: *“Harusnya itu dipelajari yang bahasa Inggris yang matematikanya, dipelajari juga caranya menyampaikan pendapat karena ada biasa itu kalau misalnya ditanyaki, tidak tau ki kasi keluar pendapat menggunakan bahasa Inggris, pasti pada ujung-ujungnya menggunakan bahasa Indonesia ki lagi. Kan kita kelas Internasional otomatis harus internasional.”* (The lesson that should be learned is mathematical English as we need to learn how to convey our opinion. Sometimes we are being asked then we could not convey our opinion, as a consequence it will lead us to speak Indonesian at the end. Meanwhile, we are international class which means that we have to be international)

Extract above indicated that the materials needed include Ways of talking and writing (e.g. word problem, writing a solution, giving an explanation), mathematics terms in English (e.g number and basic operation, symbol, terms of calculus, algebra, geometri, etc) and General English (e.g vocabulary and grammatical structural functions).

So, the English skills regarding to learning needs for the students need most are speaking and writing skills. Meanwhile, in case the learning activities preferences in term of learning through presentation and small group. For materials preferences based on the questionnaire, the materials preferences regarding to learning needs for the students need most are terms of Mathematics in English, Ways of talking and writing (e.g. word problem, writing a solution, giving an explanation) and General English, such as vocabulary and grammar. Jordan (1997) who has noted the importance of learning needs:

“if we accept...that a student will learn best if what he wants to learn, less well what he only needs to learn, less well still what he either wants or needs to learn, it is clearly important to leave room in a learning programme for the learner’s own wishes regarding both goals and processes”

2. The Target Needs of Graduates of ICP of Mathematics

For the second research question about target need, the researcher found that the target needs is the language learners to do in the target situation. Hutchinson and Waters (1987) regarded target needs as an umbrella term, which in practices hides a number of important distinctions. A more useful technique is to look at the target situation in terms of necessities, lacks and wants that were used in this research to do need analysis of respondents. Different way to look at needs is to make a major division between present knowledge and required knowledge, and objective needs and subjective needs. Lacks fit into present knowledge, necessities fit into required knowledge, and wants fit into subjective needs. The objective which the language is needed and subjective about learning goals, preferences of methodology, learning strategies about the learner, etc.

a. Necessities:

Necessities are the most important tenure to identify the target needs. The needs are determined by the demands of the target situation. It means what the learners has to know in order to functions effectively in the target situation.

Related to the findings, the data gained from the instruments. Basically, they need to learn English for Mathematics specifically as mention by the lecturer and graduate:

1st Graduate : *“Keterampilan bahasa inggris yang saya gunakan dan perlukan di tempat kerja saya adalah speaking, writing, listening, and reading skill. Karna keempat keterampilan ini sangat membantu kita dalam proses belajar mengajar. Tapi yang paling penting adalah Speaking karena kita perlu menyampaikan materi secara jelas, menuliskan materi menggunakan bahasa inggris, berkomunikasi dengan siswa dan rekan kerja serta membaca literatur sekolah yang menggunakan bahasa inggris.”* (The skills required and used in the workplace are speaking, writing, listening, and reading skill. Because these four skills are indeed assisting us in teaching and learning process. But the most important skill is speaking as we have to deliver our points clearly,

write materials, communicate with students and colleagues and reading the school literature by using English)

2nd Graduate : *“Microteaching dengan full berbahasa inggris, istilah-istilah matematika dalam berbahasa inggris, dan cara membuat soal matematika dalam bahasa inggris.”*(Microteaching in full English, terms of mathematics in English and how to solve the task of mathematics in English)

Then, they need to learn English language skills, especially speaking and writing skills. The result of the language skills needed and high response was reasonable because the graduates especially in their field are demanded to communicate with students and other teachers using English. Besides that they are required to deliver and write material or assignment clearly using English, such as how to solve the task of mathematics in English. Moreover, suggesting these two English language skills actually had been proposed by the lecturer in this interview

Lecturer : *“Tapi kalau saya pribadi sifatnya mengasumsikan mereka sudah belajar grammar, sudah belajar teori-teori bahasa Inggris di sekolah yang umum, jadi saya tidak terlalu tekankan sebenarnya skill bahasa Inggris tersebut dan ya artinya sy asumsikan mereka diharapkan sudah mempunyai pengetahuan bahasa Inggris yang dasar sebagaimana yang mereka dapatkan di sekolah ataupun mungkin mereka pernah kursus ya lebih bagus lagi..artinya saya tidak bertanggungjawab lagi ataupun tidak menjelaskan secara rinci misalnya ini noun clausenya,, grammar bgtu..”* (Personally, I assumed that they have studied grammar, English theories in general school. So I did not emphasize the English skill. In the other word, I assumed that they are expected to have Basic knowledge of English as what they have acquired during studying at school and the one who has taken course is much better. Overall, It means that it is out of my responsibility anymore in explaining whether this is noun classes, grammar or not)

b. Lack

Lack is required to know what the learners know already, so that it can be decided then which of the learners lack. According to Hutchinson and Water (1984), the target proficiency needs to be matched against the existing proficiency of the learners' lack.

Related to the findings, the data gained from the instruments. Basically, the lack of the learning English in ICP of Mathematics as mention by the graduate and lecturer:

1st Graduate : *“Matematika memiliki bahasa inggris tersendiri yang sedikit berbeda dari bahasa inggris sehari-hari. Jadi harus bisa dan terbiasa membedakan”*.(Mathemday English. So we must be able and accustomed to differentiating)

2nd Graduate : *“kurangnya pengetahuan tentang istilah-istilah matematika dalam bahasa inggris”*(lack of mathematics terms in English)

The extract above clearly explain that the graduates difficult to differenciate between terms of mathematics and general English. It is also supported by interview data from lecturer:

Lecturer : *“yang jadi kendala mereka lemah pada kosakata, mereka mungkin tahu apa arti istilah matematika dalam bahasa Indonesia .Cuma itu dia, bukan cuma kosakata matematika yang ada pada teks atau paragraf yang kita pelajari tapi juga terdapat kata kata yang umum”* (Yes, they are lack in the vocabulary or in the incorrect sentences structure. Perhaps they know what is the meaning of the terms of math in Indonesia, however not only the math vocabularies are found on the studied text or paragraph but also the general vocabularies exist)

c. Want

Learners have their own views about what they think is useful for them. At the very least, information about this is useful in working out whether the learners' views and the needs analysis's view are the same or not. If they are not the same, then the curriculum designer may need to rethink the results of the needs analysis. Learners too have a view as to what their needs are. According to Ricterich (1980) the existence of need is associated with the perceptions and desire of a person. Needs do not exist in reality, it is rather than image of personaly feelings that the learner express on the basis of data pertinent to their environment. So, *want* are, in fact, the reflection of learner's own perceptions.

Related to the findings, the data gained from the instruments. Basically, the want of the learning English in ICP of Mathematics as mention by the graduate and lecturer:

1th Graduate : *“diskusi dan persentasi dengan full berbahasa inggris karena juga bisa melatih speaking kita”*.(Using English entirely in discussion and presentation can also train our speaking)

The extract above shows graduates' want to learn English for mathematics through discussion and presentation. It is supporting by interview data from lecturer, as expressed:

Lecturer : *“yang mesti dipelajari.. ya sesuai dengan kontrak perkuliahan yang saya berikan, artinya mereka dulu mesti menguasai kosakata, lalu dari kosakata itu bisa merangkai kalimat dan dari kalimat tersebut mereka bisa menulis atau menerjemahkan suatu paragraf. Artinya dibagian awal itu memang saya tekankan ke mereka harus menghapalkan kosa kata ini, kosakata tentang aljabar, aritmatika dan sebagainya, supaya pada saat mereka masuk pada materi menerjemahkan atau melihat suatu video tidak lagi kesulitan, seperti itu”*(What should be learned is according to the given agreement of my lecture, in which they have to master the vocabularies, then by those vocabularies they can arrange sentences and by the sentences they can write and translate a paragraph. In the beginning of my lecture, I emphasized to memorize vocabularies, whether algebra and arithmetic vocabularies and etc. in order to facilitate them in translating and watching a movie without any obstacles.)

So, the English skills regarding to target needs. Necessities which is includes grammatical structural functions and English language skill (Speaking and Writing skills). Lacks includes lack of general English vocabulary and wants includes terms of mathematics in English, set phrase and set sentences tasks, and learning through presentation.

Based on the analysis above, it was accordance with the students' needs which the needs and the ability of students. Also, it was included target needs and learning needs. John Flowerdew (2013) had suggested needs analysis carried out to establish the “what” and “how” of a course, it first stage in ESP course development, followed by curriculum design materials selection, methodology, assessment, and evaluation. On the other hand, Hutchinson and Waters (1978) had stated two types of needs namely target needs and learning needs which the target needs was the needs of students of language that had used in desirable situation. Learning needs was how learners from the beginning to the intended target.

From the explanations above, it can be concluded that need analysis is the techniques in identifying specific language feature and skills that the language

learners need then it will be the base in designing a course. According to Hyland in Paltridge and Starfield (2013) state his definition of need analysis as follows:

Need analysis refers to the techniques for collecting and assessing information relevant to course design: it is the means of establishing the how and what of a course. It is a continuous process, since we modify our teaching as we come to learn more about our students, and in this way it actually shades into evaluation – the means of establishing the effectiveness of a course. Needs is actually an umbrella terms that embraces many aspects, incorporating learners' goals and backgrounds, their language proficiencies, and the situations they will need to communicate in. Needs can involve what learners know, don't know or want to know, and can be collected and analyzed in a variety of ways.

3. Document Analysis

a. Existing Syllabus

The existing English documents used which is available to be analyzed in ICP of Mathematics study program is a syllabus. It is gained from the lecturer who teaches English for Mathematics. The analysis of the syllabus is divided into some categories, they are: overview identity, course description, standard competence, basic competence, indicators, material, teaching method, learning activity, and reference.

In the overview identity, there are four informations about the course. Those information are: course name, department, credit point value, and course group. Some informations do not state on the syllabus, such as: class meeting location, number of meeting and contact information. However, based on the lecturer, it is not a problem that can influence the learning process. For class meeting location and contact information, the lecture does not put the information in the syllabus, but he has shared in the first meeting when introduction and overview English for mathematics orally. Therefore, the students can know how should contact the instructor when they get problems related to the course. As a conclusion, whether the syllabus does not state some information about the course which is needed by the students, but the lecture covers it in oral explanation and welcoming students to contact him by phone.

b. Suggested Syllabus

In this case, document which is analyzed is syllabus. Analyzing the document is complemented by interviewing section to the lecture of English for mathematics, third semester students, and a graduate student. It is for answering the third question that is, *what are the suggested syllabus for undergraduate ICP of mathematics students?*

Designing a suggested syllabus to teach English for mathematics is not easy. There are some problems when designing the syllabus. The first problem is the lack of reference. The researcher just found one example of the syllabus that can be

adapted or adopted. To solve the problems, the researcher tries to find some references in internet, and shares the problem to the lecturer who also teach English for Mathematics. The next problems is the different opinion between students and lecturer. The students need to learn about general English and English for Mathematics. While, the lecturer thought that slightly necessary to teach general English such as grammar and vocabulary.

There is no general English subject in International Class Program of Mathematics and the lecturer educational background study who teach English for Mathematics is not from English department. So, The lecturer needs to masters not only English for Mathematics , but also some general English vocabularies in order to facilitate students to familiarize in learning English for mathematics. Because the problem is complex, it needs analysis to decide whether the syllabus can be used, or it needs some improvement.

The researcher suggests that a syllabus used by lecturer in teaching ICP of Mathematics students should include topics, language functions and focus, English focus skills, competence and teaching strategies and of course it should be based on the students' needs, so in order to design the syllabus for ICP of Mathematics study program, the researcher applied a topical syllabus in which the content of language teaching is based on the topics, themes or other units of content. Contents are vehicle for practicing language structure, functions, or skills. Its advantages are this syllabus facilitates comprehension, content makes linguistics form more meaningful, they allow for integration of the English language skills.

Meanwhile, the newly designed syllabus that could be modify has to meet typical contents and proficiency based on the needs of the ICP of Mathematics students. Here the newly design syllabus that proposed to be used for students and lecturer of ICP of Mathematics study program.

CONCLUSION

Need analysis is very crucial in English language teaching, especially in ESP. By conducting need analysis, the ESP lecturer or the course designer can get the detail information about students' need in which it plays an important role in designing the materials that will be given to the students. Need analysis helps the lecturers or the course designer to do concept mapping in the ESP course with a clear focus.

In conclusion, there are some important aspects that has been revealed through need analysis which are very beneficial for designing the course such as: The needs of the students comprise of learning need and target need. Learning needs include; English language skills, learning activities, materials preferences in term of approaches and strategies in learning English for Specific Purposes in classroom setting. In terms of language skills, all the four language skills; listening, speaking, reading and writing are sometimes used in the classroom. But, speaking and writing

are used little bit more needed in the classroom which is supported from the questionnaire and interview. Furthermore, in learning activities, study in small group and presentation are more preferred than others learning activities. Meanwhile, the materials preferences, terms of Mathematics in English, Ways of talking and writing (e.g. word problem, writing a solution, giving an explanation) and General English, such as vocabulary and grammar are more preferred. Target needs comprise of the necessities, lacks and wants in the workplace. Necessities includes English language skills (speaking and writing skills) and Grammatical structural functions. Lacks include Lack of General English Vocabulary and Terms of Mathematics in English. And Want includes Terms of Mathematics in English, Set phrases and set sentences tasks and Learning through presentation

The suitable English teaching material with the need of International Class Program of Mathematics students. Some students felt that the materials is not enough, there are some materials they need to learn but the problem is the limited time. Based on current curriculum of education, undergraduate ICP of Mathematics students pass two-credit English course. With reference to the class time, only one session (two hours) a week is allocated to the English classes in the curriculum; therefore, it provides little time for students to be exposed to English. In interviews with lecturer and undergraduate students, they claimed this time is not enough to learn English for Mathematics.

The newly syllabus that has been designed and proposed was functional syllabus which include topics, language function and focus, English focus skills, competence and teaching strategies in it an surely based on the students' needs as listed.

After conducting the research about *Need Analysis of English for International Class Program of Mathematics Department of State University of Makassar*, the researcher suggests some important points: First, for course designers or lecturer can design the ESP course, especially English for Mathematics students at State University of Makassar, by considering those information in this research in order to achieve the most beneficial materials to the students. Second, for the syllabus of English For Mathematics for International Class Program of Mathematics should include language skills especially speaking and writing and two English elements which are vocabulary and grammar in mathematics context. Third, for further researcher who wants to conduct the research in the same field of need analysis (NA) or developing teaching materials, she/he can used this research as references to develop the material based on the newly designed syllabus.

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