

Developing English Reading Learning Materials for International Mathematics Education Study Program of Yogyakarta State University

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Abstract: This research was aimed: (1) to find out the target needs of International Mathematics Education Study Program; (2) to find out the learning needs of the student of International Mathematics Education Study Program; and (3) to develop appropriate reading learning materials for students of International Mathematics Education Study Program. This research was categorized as Research and Development (R&D) study. The subjects of this research were the students of International Mathematics Education study program in the academic year of 2014/ 2015 at Yogyakarta State University. The steps of this research were conducting needs analysis, analyzing the result of needs analysis, developing the course grid, writing the first draft of the materials, evaluating the first draft of the materials, and revising it based on the feedback from the expert. The data in this research were collected by employing the needs analysis questionnaire and the materials evaluation questionnaire. The data obtained from needs analysis were analyzed quantitatively using frequency and percentage and the result of materials evaluation were analyzed using descriptive statistics. The result of needs analysis shows that the target needs of the students of International Mathematics Education study program are: (1) they learn English to help them in understanding English literatures for supporting the teaching and learning process; (2) they are at intermediate level for reading skills; (3) they need to be able to conduct a quick survey of the text to identify the topic, the main idea, and the organization of the text (previewing); (4) they need to understand implicit meaning; (5) they have problems in doing skimming technique and summarizing a text. Related to the learning needs, the inputs use topics related to mathematics and pictures. In terms of activities, the students prefer to carry out the learning process by reading a text and answering questions. In terms of setting, the students choose doing the learning process inside the class and work in a group of 3. This research developed three units of the materials. Each unit has three main parts: introduction, main lesson, and reinforcement. Based on the expert judgment result, the developed English reading learning materials were appropriate in terms of the content, language, presentation, and layout. The mean score of all aspects was 3.4 which was categorized as "very good" that is in the range of $3.25 \leq x \leq 4$.

Introduction

Yogyakarta State University is a university which aims to produce educators that will be able to compete in national and international levels. In line with that, the university has a vision to be a world-class university. Altbach (2004 & 2011) in Wang, *et al* (2013:2) states that "scholars have identified key attributes which world-class universities have and which regular universities do not possess,

including highly qualified faculty, talented students, excellence in research, quality teaching with international standards, high levels of government and non-government funding, academic freedom, autonomous governance structures and well-equipped facilities for teaching, research, administration and students life.”

Students of an international class are expected to have a good ability in English. It is known that the teaching and learning processes are carried out using English in the forms of spoken and written. In spoken forms, during the teaching and learning processes the lecturers give English instructions and explanations. Meanwhile in written forms, the students have to read the English references and literature to support their study. In this case, it can be said that the ability of English seems very crucial. The students should be provided with adequate materials or media to support their English learning processes.

English reading skills are very important for students of International Mathematics Education. The students will frequently find English mathematics texts. The mathematics texts differ from texts in other subjects. Furthermore, they should read the references such as mathematics textbooks, journals, and articles written in English. In terms of the learning needs, the students of International Mathematics Education should be provided with texts which are appropriate with their current study. The students should be given texts which have close relation with a context of mathematics. Barton and Heidema (2002) cited in Metsisto (2005) state that mathematics texts contain more concepts per sentence and paragraph than any other type of texts. They are written in a very compact style. It means that each sentence contains a lot of information with little redundancy.

In order to support this goal, the appropriate English learning materials are needed for the students. The developed materials should represent students' needs, in this case students of International Mathematics Education study program. In addition, the final product of this research might be very useful for students in order to support their study. The materials are expected to help students in learning English reading skills effectively.

Research Methods

This study is categorized as Research and Development. The purpose of research and development study is to develop effective products to be used in educational programs. The subject of the study is the students of International Mathematics Education study program. These students are in the 4th and 6th semesters which consist of 37 students. There are some types of instruments that can be used in gathering the data. It is based on the type of the study. In this research, the instruments used in gathering the data were the needs analysis questionnaire and the expert judgment questionnaire. The first questionnaire was needs analysis questionnaire. The purpose of this questionnaire was to find out the data about the target needs and learning needs. The second questionnaire was the expert judgment questionnaire. The purpose of this questionnaire was to know opinions and suggestions about the materials from the expert of reading and materials. The result of this questionnaire was to revise the first draft of the materials.

Findings and Discussion

The materials were developed based on the results of needs analysis. Gaining the needs analysis was the first step that was done by the researcher. Basturkmen (2010) proposes that needs analysis was a stage in which the course developers identify what specific language and skills the group of language learners would need. This identification could be used in determining and refining the content for the ESP course books.

The first aspect of the questionnaire was target needs. In terms of necessities, most of students of International Mathematics Education wanted to learn English to help them in understanding English literatures. It was because almost the references they used were written in English. Then, most of students of International Mathematics Education had difficulties in identifying main idea and topic, reading to present, and understanding the meaning of abbreviations related to mathematics terms. They wanted to learn more about them. In addition, they wanted to learn more about mathematics vocabulary terms. Nonetheless, this course book could not cover all of students' intentions in learning English reading skills. The researcher decided to pick only some of them. The skills were applied in unit 1 were skimming, scanning, and finding implicit meaning. Meanwhile in second unit, the skills were identifying topic, main idea, and supporting details of the text. The last unit provided the skills of paraphrasing, summarizing, reading to present, and inferring unknown vocabulary. Furthermore, there were also some grammatical and vocabulary aspect in every unit of the book.

The second aspect of the questionnaire was learning needs. For the input, the students prefer texts containing some pictures and no less than 4 paragraphs. Meanwhile, the topic was related to mathematics in general. That is why the titles of the unit were very general. The title of unit 1 was *Why Do You Love Math?* This unit delivered some texts related to the reasons why some people love mathematics. In addition, the title of unit 2 was *Math and Our Real Life*. In this unit, the students were provided with texts related to the application of mathematics in a real life. For the last unit, the title was *Math is Fun*. The provided texts were related to mathematics and music. The texts from each unit consisted of 4-5 paragraphs.

Then, the materials were evaluated by the expert. The material evaluation was done by distributing a questionnaire. It was developed based on the aspects proposed by *BSNP*. They were the appropriateness of content, the appropriateness of presentation, the appropriateness of language, and the appropriateness of layout. The result of the expert judgment shows that the developed speaking materials were appropriate for the needs of intermediate level students of International Mathematics Education at Yogyakarta State University. Then, the second draft of the materials was developed based on the result of evaluation from the first draft of the materials.

Conclusion

This research aims to to find out the students' target needs and learning needs and to develop the suitable materials for International Mathematics Education Study Program of Yogyakarta State University. The results of the needs anlaysis show that the students of International Mathematics Education were in need to have English reading learning materials to to understand English specific terms

related to mathematics study. Based on the findings and discussions of the research, the English reading learning materials that suit the needs of the students of International Mathematics Education Study Program should meet the following characteristics:

1. In terms of the input of the materials, the texts should relate to mathematics study in general. The texts can be adopted and adapted from any resources such as a book, internet, articles, and so on.
2. The input texts should provide a lot of pictures. The pictures have a strong impact for students in carrying out English learning processes.
3. In terms of learning procedure, the activities should engage students to work in pairs or in a group of three.
4. Lastly, in terms of teacher's and learner's role, the activities should be discussions and ask questions to a friend. Meanwhile the teachers are asked to give direct practice, provide a lot of exercises, and carry out the discussion during the learning processes.

References

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