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The Need Analysis: Teaching Materials for the High-Class Education of Mathematics

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ABSTRACT
The descriptive explorative research aims to scrutinize the need analysis of Primary School Teacher Education students at the University of Dharmas Indonesia in teaching High-Class Education of Mathematics courses. The sample of this study was taken randomly towards 35 Primary School Teacher-Education students at the University of Dharmas Indonesia, who had contracted a High-Class Education of Mathematics courses. Data analysis was obtained from the questionnaire of needs and unstructured interviews. Data were analyzed using descriptive analysis and percentages. The results of the analysis showed that (1) students did not yet have teaching materials that contain learning materials, (2) students stated that the most challenging material is fractions (94,42%), least common multiple and greatest common divisor (85,71%), plane geometry (91,42%), and solid geometry (82,85%), (3) students needed a teaching material that contains problem-solving materials in daily life, interest, and easy to understand. Based on the results of the needs analysis, it is necessary to develop teaching materials in the form of contextual-based modules in the High-Class Education Mathematics courses at the University of Dharmas Indonesia.

***Keywords**: Need Analysis; Teaching Material; High Class Education of Mathematics*

INTRODUCTION
Mathematics learning is one of the compulsory subjects that must be taken and mastered by students majoring in Primary School Teacher Education (PGSD). Jackson (2014) states that mathematics is a basic science for social life, and it is needed to explore the universe. Furthermore, Luzviminda et al. (2015) state that mathematics is a science that teaches us how to understand, appreciate, and accept diversity. Due to the importance of mathematics to the survival of life, it is expected that all students have good mathematical skills, starting at the elementary school levels. Students are stated to have good mathematical abilities if they can solve problems related to mathematics. In order to have good mathematical abilities, a student- teacher who will teach mathematics must also understand and master mathematics before teaching students. Prospective teachers should be able to master mathematics independently, without solely relying on lecturer explanations. The lecturers are not assigned to transfer knowledge which merely asks students to memorize concepts, but they are asked to design learning materials that trigger students being active and independent learners (Khotimah & Satiti, 2019).

Based on observations during the High Class Education of Mathematics Courses lectures, students consider the given materials complicated to understand. There are still many students who have not mastered basic mathematical concepts well. This can be seen from the learning process; students merely memorize mathematical formulas without understanding where the origin of the formulas and concepts are related to these formulas. Students have not been able to connect mathematical problems with everyday life so that the learning process becomes meaningless (Satiti et al, 2021). In addition, teaching materials that guide students to link mathematical concepts with daily life do not yet exist so that students still lean on lecturers as the main information. This problem is also supported by research conducted by Rizki and Linuhung (2013) and Purwanto (2015), which state that the difficulties experienced by students in learning mathematics are caused by students' assumptions that mathematics is

a difficult subject and the absence of teaching material as a teaching tool in the learning process.

Learning resources that can facilitate student are needed so that learning becomes more effective. According to Munadi (2010), the use of media or assistive devices is very helpful in learning activities both inside and outside the classroom, especially in improving student achievement. One of the mediums that students can use in developing knowledge is the teaching material. Teaching materials that are interestingly designed and equipped with contents and illustrations in accordance with daily life, stimulating students to utilize teaching materials as learning resources (Hermawan, 2008). Due to the importance of teaching materials as mathematics learning aids, it is necessary to make efforts to develop teaching materials that are tailored to the needs of students. The teaching material to be developed is expected to help students learn independently in understanding concepts and be able to solve problems in daily life in accordance with the material being studied.

This study aims to determine the students' needs for teaching materials that need to be developed in Higher Education Mathematics courses. The results of this study are expected to provide information about the types of teaching materials that need to be developed to improve student understanding in studying given materials.

METHOD

This research is a descriptive exploratory study. The subjects of this study are the students of the University of Dharmas Indonesia who have contracted High Class Education of Mathematics Courses. The sample used for this study were 35 students. Research data were obtained from filling out questionnaires and unstructured interviews. The needs questionnaire was designed to help researchers examine the needs of students and provide appropriate solutions in accordance with the wishes of the research subjects, while interviews were conducted to strengthen the results of the questionnaire of needs. The data obtained were analyzed descriptively.

RESULT AND DISCUSSION

The analysis of the needs of PGSD students towards learning materials on High Class Education of Mathematics was carried out using instruments in the form of questionnaires and unstructured interviews. The questionnaire of needs was distributed to the 35 PGSD students of the University of Dharmas Indonesia who had contracted a High Class Education of Mathematics course. The results of the distribution of student questionnaires can be seen in Table 1.

Table 1. The Results of Questionnaire of Needs

No.	Questions	Answers
1	Have you contracted a High Class Education of Mathematics course?	• Done (100%) • Not yet (0%)
2	Do you like the given materials in High Class Education of Mathematics courses?	• Yes (57,14%) • No (42,86%)
3	Are High-Class Mathematics courses difficult to understand?	• Yes (94,29%) • No (5,71%)
4	What is the difficult learning material in the High Class Education of Mathematics course? **(Maybe more than one)**	• Integers and its operation (17,14%) • Whole number and its operation (14,29%) • Fractions and its operation (94,29%) • Primes (0%) • Least common multiple and greatest common divisor (85,71%) • Proportion (11,43%) • Plane geometry (91,42%) • solid geometry (82,85%)

		• Presenting data (8,57%)
5	What difficulties did you encounter while studying High Class Education of Mathematics courses? **(Maybe more than one)**	• Linking with daily life (85,71%) • Formulating patterns (97,14%) • Completing practice questions (91,42%)
6	In your opinion, do learning models, methods, approaches, and strategies need to be used in the learning process of High Class Education of Mathematics courses?	• Yes (100%) • No (0%) (Models, methods, and approaches related to daily life to be easily understood and meaningful)
7	What types of teaching materials are used by lecturers to explain lectures on High Class Education of Mathematics courses? **(Maybe more than one)**	• Book (82,86%) • Module (0%) • LKS (0%) • *Handout* (0%) • *E-book* (0%)
8	What references/books are used by lecturers to explain lectures on High Class Education of Mathematics courses?	No Idea
9	Do the existing references and teaching materials already meet your needs in understanding High Class Mathematics Education lectures?	• Already (0%) • Not yet (100%)
10	If Not (Based on question Number 6), what causes the teaching material still does not meet your needs in studying High School Mathematics Education courses? **(Explain briefly)**	• Because I do not have it • Monotonous teaching materials • Language of books that are difficult to understand
11	If there is a development of teaching materials for High Class Education of Mathematics Courses, what kind of teaching criteria do you want? **(Explain briefly)**	• Full of colors • Relating to everyday life as expected in the 2013 curriculum • With picture • Using language that is easy to understand
12	If there is a development of teaching materials in the form of modules for High Class Education of Mathematics Courses, are you interested?	• Yes (100%) • No (0%)
13	Fractions and its operations are one of the subjects studied in the High Class Education of Mathematics course. In the development of a module, the material related to everyday life is presented differently and uniquely. Do you think the material is suitable for the designed modules? (**Give reasons briefly)**	• Yes (100%) • No (0%)

Based on observations during the lecture process of High Class Education of Mathematics, at the beginning of the lecture, students seemed quite enthusiastic in the learning process, but over time the enthusiasm of students to learn declined because they considered the subject difficult to understand. The causal factors that influence students' assumptions are the lack of knowledge of basic mathematics material, the lack of teaching material as a reference during learning, the lack of student involvement in the lecture process, and the students' difficulties in linking material to everyday problems. The Problems faced by students have an impact on the learning process and student learning outcomes. One of the Efforts made by lecturers to overcome problems is to change the learning model and strategy. However, the effort has not shown the desired results.

Based on the data in Table 1, 57.14% of students like high-level mathematics education courses, but they find it difficult to understand the material presented. The most difficult material mastered by students is the fractions (94.42%), least common multiple and greatest common divisors

(85.71%), plane geometry (91.42%), and solid geometry (82.85%). Based on the results of unstructured interviews with students, the process of presenting the material does not use teaching materials so that students do not have it. In addition, students find it difficult to relate the material to daily life so that learning is not meaningful. Consequently, they are not confident to teach mathematics in school. All students from the research subject stated that students need teaching materials that are equipped with pictures and problems in daily life, steps of concept discovery, and practice questions that can help them to understand the material and learn independently so that they have the provision to teach in primary schools. The students also stated that they agreed if there was a development of teaching materials, especially for Fractional Materials, least common multiple and greatest common divisor, Plane Geometry, and Solid Geometry.

Based on the results of the given questionnaire, students need colored teaching materials, related to daily life as expected in the 2013 curriculum, pictorial, and using language that is easy to understand. The development of teaching materials in the form of modules is one way that can help students in meeting their needs so that they can learn independently in understanding mathematical concepts. The developed module should be able to contain daily problems so that students can associate mathematical problems with real problems. Therefore, the contextually based modules should help students learn independently, and be able to overcome mathematical problems in high-class mathematics learning.

Suprijono (2009) states learning with a contextual approach is a concept that helps teachers connect material taught with real-world situations and encourages students to make connections between the knowledge they have and their application in their lives as family and community members. Through contextually based modules, students are not only required to understand the material, but students can study critically and actively in finding solutions and concluding learning materials. After students understand the learning materials, students are expected to apply them in daily life so that learning objectives can be achieved.

Ultimately, based on needs analysis, students need contextually based teaching materials in High Class Education of Mathematics courses, especially on Fractional materials, least common multiple and greatest common divisor, Plane Geometry, and Solid Geometry.

CONCLUSION

The results of the needs analysis show that teaching materials that need to be developed in the High Class Education of Mathematics courses are contextual-based printed modules on Fractional material, least common multiple and greatest common divisor, Plane Geometry, and Solid Geometry. This research is part of a module development study in a High Class Education of Mathematics course, aimed at meeting the needs of students for teaching materials in the PGSD Study Program at the Universitas Dharmas Indonesia. It is hoped that this research can be used as a reference in the development of modules in High Class Education of Mathematics Courses

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