



MAPLE APPLICATION TRAINING PROGRAM FOR MATHEMATICS EDUCATION AT UNIVERSITAS KATOLIK SANTO AGUSTINUS HIPPO

Bernadeta Ritawati^{1*}, Nasri Tupulu², Konstansia Hermiati³, Pradipta Annurwanda⁴

^{1,2,3,4}Universitas Katolik Santo Agustinus Hippo, Indonesia

Email: b.ritawati@sanagustin.ac.id¹

Abstract

The community service activity entitled “Maple Application Training for Mathematics Education Study Program” at St. Augustine Hippo Catholic University aims to improve students' abilities in mathematics education study programs using existing applications as sources of learning mathematics. The problems found at the Catholic University of St. Augustine Hippo in the mathematics education study program where students still do not know the application, students still use the manual way of counting, students are still not accustomed to using existing learning applications, and rarely use applications in learning. Community service activities that use a participatory approach and through this training method, the result that students at St. Augustine Hippo Catholic University realized that increasing competence is essential for the world of education, both in increasing knowledge and skills, through various applications of learning mathematics, in this case, the application of maple. Educators here can improve their competence to play a direct role in online and offline learning to improve students' mathematical problem-solving abilities.

Keywords: Problem-Solving, Student Training, Maple Application

IMPLEMENTATION BACKGROUND

According to Hutabarat, Y. (2020), many factors must be considered to improve mathematical problem-solving abilities. These factors include 1) the learning process (which is conventional), 2) the accuracy of the learning model that is used, 3) a low interest in learning, 4) a method of delivering learning material that is difficult to understand, and 5) the absorption of learning material delivered, which is low. Developing students' problem-solving skills is one of the goals of mathematics education. Sumarmo (in Ariawan et al.: 2017) emphasized that problem-solving ability is crucial because it allows students to: (1) determine the suitability of data for problem-solving; (2) make a mathematical model of a general situation or problem and solve it; and (3) selecting and implementing strategies to solve problems; (4) explaining and interpreting the results according to the original problem and checking the correctness of the results or answers; (5) applying mathematics meaningfully. The importance of problem-solving abilities by students in mathematics is also emphasized by Branca (Jainuri, 2013), namely: “(1) the ability to solve problems is a general goal of teaching mathematics; (2) problem-solving which includes methods, procedures, and strategies is the core and primary process in the mathematics curriculum; (3) problem-solving is an essential ability in learning mathematics. “(1) the ability to solve problems is a general goal of teaching mathematics; (2) problem-solving, which includes methods, procedures, and strategies, is the core and primary process in the mathematics curriculum; (3) problem-solving is an essential ability in learning mathematics. “(1) the ability to solve problems is a general goal of teaching mathematics; (2) problem-solving, which includes methods, procedures, and strategies, is the core and primary process in the mathematics curriculum; (3) problem-solving is a fundamental ability in learning mathematics.

Applications are software developed by a computer company to carry out specific tasks. Some applications include Ms. World and Ms. Excel, amongst others, by the assertions made by Asropudin in Suhimarita (2020). Applications, also known as application software, are already configured for use, as Irawan (2013) claims in his book “Information and Communication Technology Education” that. Students can complete their assignments with the assistance of applications when necessary. Students can increase their knowledge of technology by becoming proficient with various applications. Students can gain an understanding of technology by using the application, which allows them to be lectured and provides them with that understanding.

During the digitalization period, many students exhibit limited familiarity with utilizing educational applications and must be made aware of the existence of math-solving applications. Therefore, students need to be held training on technology that supports their knowledge because, through training, students can develop themselves in the world of work. The Maple software is a computational tool utilized to resolve mathematical problems encompassing domains such as linear algebra, calculus, and geometry. This application can also perform calculations, manipulate various formulas, and generate graphs. The calculations performed by this maple application yield precise and reliable solutions when solving mathematical problems. A comprehensive comprehension of the application program facilitates its utilization by students during the educational endeavor.

The community service implementation team carried out an activity titled “Maple Application Training for the Mathematics Education Study Program” due to the existence of many factors listed above. Students' proficiency in solving mathematical problems will be enhanced through mathematics learning applications, which is the focus of this activity. The direct role of students in the 21st century is very much needed in achieving meaningful learning objectives and creating high-quality human resources when they are involved in education and society. With the provision of academic and technological knowledge, students can develop themselves wherever they are when they have finished their studies.

IMPLEMENTATION METHOD

Volunteer work in the community with the official title “Maple Application Training for the Mathematics Education Study Program.” The carrying out of actions with students in a one-on-one setting. Community service is carried out in the lecture hall of St. Augustine Hippo Catholic University. The object of this training is students of the mathematics education study program. This community service activity will be held on 19-20 May 2023 from 08:00 WIB to 12:00 WIB. Activities carried out during these activities included delivering material, discussions, and hands-on maple application training, starting from downloading the application to how to apply it. Activities carried out using a participatory approach through training methods, which in general is a picture of a process of institutional and community development in achieving various related objectives. The three stages of implementation carried out in this community service activity include:

1. Preparation

The team responsible for implementing community service activities starts by conducting a survey to gather information regarding the use of an application in the learning process and the circumstances under which students are required to use the application. Next, the team searches for, selects, and determines the approaches and methods used during implementation. Finally, the team arranges the activities that will be carried out and prepares the materials and equipment used, as well as the appropriate material, according to the requirements of mathematics education study program students.

2. Implementation

The group that was responsible for putting together the community service activities presented and provided an understanding of the material, which included skills in the area of problem-solving through the utilization of mathematics learning applications.

3. Evaluation

The team implementing community service activities evaluates by responding to responses, suggestions, and criticisms from students of community service activities regarding the applications used in training.

Training Objectives

The objectives of the Maple Application Training for the Mathematics Education Study Program are as follows:

1. Introducing the Maple Application to students of the mathematics education study program at St. Augustine Hippo Catholic University
2. Train students to be able to integrate knowledge with applications.
3. It can help students in solving math problems.

Training Techniques

Students are given training according to the learning stages of the independent curriculum. The procedure for this training is as follows:

1. The moderator leads the training by allowing the presenters to present their material.
2. The presenter shows the parts in the maple application.
3. The moderator opened a discussion and question and answer session.
4. The speaker invites students to directly use the Maple application, starting by downloading it and using it in detail according to the explanation.

IMPLEMENTATION AND DISCUSSION

Results

Because they referred to student issues and the results of survey analysis carried out by the team implementing community service activities for students, face-to-face community service activities in a room on the St. Augustine Hippo Catholic University campus generally went well and smoothly. Students of the mathematics education study program who attended participated in this community service activity totaled 16 people. The implementation of community service activities is divided into three stages. The team implementing the community service activities in the first stage presented and provided an understanding of the material, including the ability to solve mathematical problems and the application of maple in learning mathematics. The activities carried out in the second stage.

In the final stage, the third stage, the team implementing community service activities raises awareness of those activities among the students. It is done so that the students can continue to improve their level of competence and successfully master their role in accomplishing meaningful learning goals. They can further improve the quality of education. It is hoped that students will continue to hone their knowledge through participation in this activity, ultimately leading to their becoming skilled and competent students.

In this activity, pictures of documentation related to training activities carried out at the Catholic University of St. Augustine Hippo were shown. Figures 1, 2, 3, and 4 are the stages of the maple application training stages, evidencing that community service activities are carried out well.

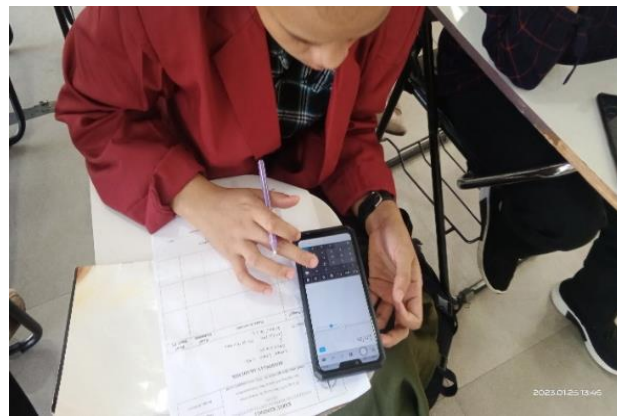




Figure 1. Maple Application Training Implementation Activities

Discussion

The existence of a learning system that requires educators to continue to improve their knowledge and skills so that they can convey learning material in an easy solution through various appropriate learning applications and in accordance is the cause of the participation of sixteen students in the mathematics education study program at the Catholic University of St. Augustine Hippo in community service activities. This participation was caused by the learning system requiring educators to continue improving their knowledge and skills. Based on this, students of mathematics education study programs need to hone and prepare themselves in using maple applications. Of course, this ability must also be adapted to student development needs, curriculum demands, and the times that continue to change. Using technology, information, and communication devices alone is only enough to be supported by abilities, skills, and self-confidence in understanding, mastering, planning, implementing, developing, and assessing the process and results of the integrated curriculum concept as a whole. As prospective educators, students must improve all of these abilities so that they can collaborate and use learning applications appropriately and accordingly to improve their problem-solving abilities.

The aim at the implementation stage of this community service activity is to provide knowledge, understanding, and mastery regarding the background, goals, and indicators of mathematical problem-solving ability, the advantages and disadvantages of using mathematics learning applications, as well as various learning applications that can be used online to participants in community service activities. The second phase aims to develop knowledge and skills in applying various mathematics learning applications, such as maple. Participants in community service activities in this second phase are required to be able to increase their knowledge, skills.

The community service implementation team then raised the participants' awareness in the third stage of community service activities to continue to be enthusiastic about improving their competencies so that they could continue to improve the quality of education. These three stages must be carried out to avoid misconceptions contained in learning. High curiosity raises the enthusiasm of community service participants to participate in each series of community service activities. Many participants in community service activities still need to learn how to improve their math problem-solving skills through various existing math learning applications. Especially in the implementation of community service activities.

Several things that students must pay attention to when using the Maple application, especially in learning mathematics which uses many symbols, are 1) limited student facilities and infrastructure, 2) being able to use the application correctly, 3) the accuracy of selecting effective and efficient learning methods and applications, 4) the amount of student learning load each day, and 5) accuracy in preparing learning plans. The ideal mathematics learning is learning mathematics that pays attention to differences in the speed of thinking, fighting power, learning styles, interests, and motivation of students. Apart from all that, educators must also have and provide solutions that make it easier for students to learn mathematics. It needs to be done because mathematics is an intellectual skill that involves reasoning abilities and thinking systematically, carefully, critically, and creatively. These intellectual skills help students improve their ability to solve mathematical problems in everyday life.

CONCLUSIONS

Students in the mathematics education study program realize at the end of this activity that increasing competence is essential for the world of education, particularly in improving knowledge and skills through various learning applications. It is the conclusion that can draw from this activity. As prospective educators, students need knowledge and skills to directly improve students mathematical problem-solving skills in using Maple applications. Students must master their roles in various learning processes, using applications and books, to achieve meaningful learning goals and produce high-quality successors for the nation. The suggestions from this training activity are that:

1. Reorganizing the training with the same general topic but focusing more intently on maple applications.
2. It is anticipated that students of the mathematics education study program will be able to correctly implement the maple application provided to them after the post-evaluation of community service activities.

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