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Implementation of MATLAB GUIDE Training in the Development of Interactive Mathematics Learning Media for Junior High School and Vocational Teachers

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Abstract

The purpose of this science and technology application activity is to provide training to junior and vocational school mathematics teachers in Ajibarang District, Banyumas in improving practical skills in this case the use of Matlab Guide as a learning medium. The subjects in this service are junior and vocational mathematics teachers in Ajibarang District, Banyumas. The location of the implementation of IbM is at SMK Muhammadiyah 2 Ajibarang, Banyumas. The implementation of the activity was carried out through presentations of materials on mathematics learning media, introduction of the Guide Matlab program, and the use of Guide Matlab as a mathematics learning medium in geometry materials. The results of this service activity are the increasing interest of teachers in improving the quality of learning, increasing the understanding of the Guide Matlab program, increasing the practical ability of teachers, in this case the use of the Guide Matlab program as a mathematics learning medium in Geometry materials.

Keywords: Geometry; *Matlab Guide*; Teacher Competence.

1. INTRODUCTION

The 2013 curriculum requires teachers to innovate learning. One of the pressure points for this innovation is the use of computer technology in the implementation of learning. The development of computer technology provides various conveniences for teachers, especially for mathematics teachers. Mathematics teachers can use computers as a learning medium. This use is to make it easier for teachers to construct students' understanding of the material being studied. By using computer media, teachers can easily do a variety of media forms that are tailored to the material and the student's condition.

The use of computers in classroom learning is so important, but this is not supported by teachers' mastery of various computer applications. Most teachers who use computers during learning only use *Microsoft Office applications*, both *word*, *power point*, and *excel* (Hernawati, 2010). This application can also be used to facilitate the implementation of

learning. However, when faced with mathematical material, especially related to geometric shapes, this application often encounters obstacles (Andayani, 2009). Some examples of obstacles faced are teachers having difficulty drawing geometric shapes correctly. Even though the element of image accuracy in mathematics is very necessary, because if there is a slight shift, it can affect the size so that this has an impact on students' mastery of concepts. The solution given by the teacher to overcome this is usually to say, "just think the picture is right".

To overcome these problems, teachers need to be introduced to computer application programs that facilitate the drawing process. The program should be easy to use, have good drawing accuracy, and do not require a lot of capacity. One of the computer programs that has these advantages is *the Matlab* program.

Matlab stands for *matrix laboratory*. *Matlab* is an interactive system with database elements in the form of *arrays* that do not require dimensions (Laksono & Afrianita, 2021). Therefore, *Matlab* is able to solve many technical computing problems, in particular problems that can be formulated in the form of matrix and vectors such as drawing a graph of a function. The use *of Matlab* today is very wide, not only in the field of higher education but has been widely used in the industrial field. A number of toolboxes have been created in Matlab on certain topics that are widely used in the field of science and technology , such as *signal processing, control systems, neural networks, fuzzy logic, wavelets, simulation, finance,* and many others (Kharab & Guenther, 2018).

GUIDE or GUI builder is a *graphical user interface* (GUI) that is built with graphical objects such as buttons, text boxes, sliders, menus and others (Team Labcomputer, 2011; Widiarsono, 2005). Apps that use a GUI are generally easier to learn and use because the person running it doesn't need to know what commands are and how they work. Matlab pioneered programming using GUI starting with version 5, which continues to be refined to this day (*Matlab* 7).

GUIDE *Matlab* has its own advantages compared to other programming languages, including 1) GUIDE *Matlab* is widely used and suitable for science-oriented applications, so many researchers and students use GUIDE *Matlab* to complete research or final projects, 2) GUIDE *Matlab* has built-in functions that are ready to use and users do not need to bother creating their own, 3) The file size, both FIG-file and M-file, produced is relatively small, 5) The graphics capabilities are quite reliable and not inferior to other programming languages (Zahnur, 2013; Trianiza et al., 2024).

2. METHOD

The subjects in this science and technology application activity are MGMP Mathematics teachers of junior high and vocational schools in the Ajibarang area, Banyumas.

The activities/solution steps carried out are 1) Study of Mathematics materials for junior high and vocational schools that require geometric presentation. The material is focused on the material of drawing function graphs, 2) Preparation of a guide module for the use of the GUIDE *Matlab* program which is adjusted to the results of the material study, 3)

Provision of GUIDE *Matlab program materials* for learning in each junior high school and vocational school that require geometric presentation, 4) Assistance in the introduction and mastery of the GUIDE *Matlab* program, and 5) Assistance in making mathematics learning media using the GUIDE *Matlab program.*

The instruments used in this training activity are activity observation sheets and questionnaires. This activity also involves two observers to observe the course of the activity and the final results of the activity.

3. RESULTS AND DISCUSSION

The result of this activity is an increase in teachers' interest in the Guide Matlab program. This is shown by the level of enthusiasm of the teachers in participating in the training. Another indication is that in the implementation of the training, some teachers asked questions and there was a good discussion process. Besides the fact that teachers in this case have excellent theoretical skills, this can be seen from the indicators of understanding the Guide Matlab program, in this case teachers are able to draw graphs. In line with the research conducted by Yanie et al. (2019) explained that the use of Matlab can help teachers' knowledge in understanding geometry materials. Matlab is an interactive application that is able to be present as a teacher's solution in providing explanations about geometry to students. In addition, the Dikdasmen hopes that there will be further activities from this service. According to them, activities like this are very useful to improve teachers' competence in the field of IT in accordance with the times. The participants, in this case, were able to simulate the Guide Matlab program as a learning medium, especially in drawing function graphs, so that they could improve the quality of learning. This is in line with the research of Rohmah et al. (2024) who provided an explanation of the findings of conditions in the field after being given matlab guide training. Matlab guide training is in line with the era of technological development. In addition, the matlab guide provides an interesting visualization display to students or participants so that it becomes a separate attraction and is able to provide a basic understanding of the understanding of geometry concepts.

4. CONCLUSION

Based on the results of observations on the implementation of service, it can be concluded that through the service to Muhammadiyah Junior High School/Vocational Mathematics teachers in Ajibarang, Banyumas District, the results were obtained that (1) teachers' interest in the Guide Matlab program increased, (2) teachers' understanding of the Guide Matlab program increased, (3) teachers' ability to simulate the practice of the Guide Matlab program to draw graphs increased. These results provide advice to teachers, especially Mathematics teachers in the learning process. Mathematics teachers in particular and other subjects in general should make more use of computer media, electronic media or the internet as one of the learning resources, because with many learning resources it can help increase knowledge and add insight in an effort to improve learning outcomes.

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REFERENCES

Andayani, S. (2009). *Handout of Computer Application.*

Hernawati, K. (2010). *Computer Applications*.

Kharab, A., & Guenther, R. (2018). *An introduction to numerical methods: a MATLAB® approach*. CRC press.

Laksono, H. D., & Afrianita, R. (2021). *Application of Matlab to Numerical Methods: Numerical Interpolation*. LPPM–Andalas University.

Rohmah, N. M., Izaati, I. N., & Supriadi, S. (2024). Empowerment of Public and Private High School/MA Mathematics in Banyuwangi Regency through the GUI-MATLAB Program Design Ability to Support Mathematics Learning. *Journal of Community Service*, *9*(2), 380-387. https://doi.org/10.30653/jppm.v9i2.721

Computer Lab, U. M. M. (2011). *MATLAB Practicum Module.*

Trianiza, I., Sidiq, A., & Lisdawati, A. N. (2024). Basic training and assistance in Matlab programming (Matrix Laboratory) at Smk Pgri Banjarbaru. *Semanggi: Journal of Community Service*, *3*(1), 45-52. https://doi.org/10.38156/sjpm.v3i1.251

Widiarsono, T. (2005). Practical tutorial on learning matlab. *Department of Electrical Engineering.* Bandung: ITB.

Yanie, A., Srg, L. A., & Junaidi, J. (2019). Application training on the use of Matlab to improve teacher knowledge. *TUNAS Journal*, *1*(1), 31-34. https://doi.org/10.30645/jtunas.v1i1.9

Zahnur. 2013. *Mathematics Computing Practicum Module.* Aceh: Syiah Kuala University.