
Training and Guidance in Use Software Wingeom 2D and 3D in Learning Geometry to Improve the Professionalism of Junior High School Teachers In Tanggetada District, Kolaka District, Southeast Sulawesi Province

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Abstract

This service aims to increase the professionalism of junior high school teachers in learning geometry by using Mathematics Learning Media, namely the use Software Wingeom 2D and 3D. This was done because looking at the problems that are generally faced by teachers in research, namely the lack of utilization and knowledge of teachers in the use of Wingeom-Based Mathematics Learning Media, in schools teachers are known that one of their weaknesses is the lack of work in the field of scientific work and research caused by erroneous one of them is the inadequacy of teachers in using mathematics learning media which can make it easier for them to be able to work. Program Wingeom 2D and 3D is a computer application program designed to support geometry learning, both two-dimensional and three-dimensional. This program can be used as mind tools in learning geometry, where teachers can use it to develop a dimensional geometric framework. With programs Wingeom It is hoped that later the teacher will be able to explore, observe, do shape animation and display dimensional geometry material, in addition to the program Wingeom 2D and 3D are expected to help visualize a geometric concept clearly so that teachers will more easily understand geometric concepts so that it will have an impact on improving the quality of teachers in the learning process, especially learning geometry. The mandatory outputs to be achieved are (1). One scientific article published in a journal with ISSN or proceedings from a national seminar. (2) Publication in print/online/repository mass media PT. (3). Increased competitiveness (increase quality, quantity, and added value of goods, services, product diversification, or other resources depending on the type of activity proposed. (4). Increasing the application of science and technology in society (mechanization, IT, and management). (5) Improvement of community values (art, culture, social, politics, security, peace, education, and health. Meanwhile, Additional Outcomes are in the form of (1). method or system; product (goods or services). (2). HKI, (3). Books with ISSN, (4). TTG Innovation, and, (5). International Publications. Method used in this training and mentoring include: (1) talk and question and answer about steps usage stepssoftware Wingeom 2D and 3D in learning geometry, (2) discussion groups directed on the steps of use software Wingeom 2D and 3D in learning geometry, (3) guidance and each simulation usage stepssoftware Wingeom 2d and 3D in learning geometry, (4) practice direct use of each step usage software Wingeom 2D and 3D dalam learning geometry, (5) giving related assignments usage software Wingeom 2D and 3D dalam geometry learning.

Keywords: *Software Wingeom 2D and 3D, Geometry Learning*

INTRODUCTION

In the current era of scientific and technological reform, efforts must be made to improve teaching and learning activities to the fullest so that the quality of education increases, this is done because the advancement of education has broad implications for human thinking in various fields so that every young generation must learn a lot to become an educated human being, according to the demands of the times. In accordance with the mandate contained in the Teacher and Lecturer Law in the academic field, teacher education qualifications are required to be at the undergraduate level or S1. It is intended that they have qualified professional skills in order to improve the quality of education in Indonesian (Runisah dkk. 2019; Sunardi, 2005; Bagja Nugra dkk 2018). The minimum requirements for teachers at the bachelor's level are expected not only to be able to conduct learning in class, but they are also expected to be able

to conduct research to improve the learning process that they carry out on an ongoing basis. Based on this, in accordance with the limited observations made in teacher schools it is known that one of their weaknesses is the lack of work in the field of scientific work and research which is caused by one of them, namely the teacher's inability to use *Software Wingeom 2D* and 3D in learning geometry (Afrilia, 2018; Hamdunah, Yunita, A., Zulkardi, & Muhafzan, 2016; Rhosyida, 2015). This shows that one of the weak points that teachers have to be addressed. Based on these limited observations, the weaknesses experienced by the teachers were apparently also experienced by teachers, especially junior high school teachers in Tanggetada District, which is in Kolaka Regency. Tanggetada Subdistrict is one of the Subdistricts in Kolaka Regency where the majority of residential areas and educational institutions are more advanced than dozens of subdistricts in Kolaka district, but that does not mean that education is far superior to other subdistricts, this can be seen from research activities, especially in the field community service (PkM), from universities in Kolaka Regency, namely the Nineteen November University of Kolaka and universities outside Kolaka, it can be seen that there is still a lack of researchers who have conducted research in Tanggetada District. Therefore, we, the Mathematics Education Department Service Team, FKIP, Nineteen November Kolaka University intend to do community service for junior high school teachers in Tanggetada District in the form of training and guidance on the use *Software Wingeom 2D* and 3D in Geometry Learning to Increase Junior High School Teacher Professionalism in Tanggetada District, Kolaka Regency, Southeast Sulawesi Province. The aim is to help teachers who have difficulty in conducting training and guidance, especially the use *Software Wingeom 2D* and 3D in learning geometry which hinders the completion of their training and guidance which is one of the professional tasks of teachers as educators, as previously stated (Lestari and Bintari, 2013). It can be said that with the holding of training and guidance on the use of *Software Wingeom* in learning geometry at this service is expected to be able to greatly assist junior high school teachers in Tanggetada District in improving academic professionalism in a sustainable manner.

RESEARCH METHODS

Identification of Partner Priority Issues

- a. There are no SMP/MTs education units that use it yet *software Wingeom 2D* and 3D in learning activities. Learning activities are still dominated by traditional methods. So that learning is more one-way (*teacher centred learning*).
- b. Lack of interest, motivation and confidence of SMP/MTs teachers to improve the quality of learning through use *software Wingeom 2D* and 3D or teachers just carry out their teaching duties and spend learning material.
- c. Even if there are learning innovations only at the level of learning methods and having an internet network, the lack of teacher skills in operating computers, especially in programs *software Wingeom 2D* and 3D so that they can support teaching and learning activities to be more effective and fun.
- d. Lack of skills/*life skill* SMP/MTs teachers as provisions to improve the quality of learning activities, including: 1) skills in interactive media design and, 2) skills in operating computers, especially in programs *software Wingeom 2D* and 3D.

Problem Solving Framework

Operational problem-solving framework is described as follows.

- Determine the number of training participants by inviting math teachers at the SMP/MTs level in Tanggetada District, Kolaka Regency, Southeast Sulawesi Province as participants in the training on the *software Wingeom 2D and 3D* in learning geometry.
- Provides knowledge of how to use *software Wingeom 2D and 3D* in geometry learning so as to increase the professionalism of junior high school/MTs mathematics teachers in Tanggetada District, Kolaka Regency, Southeast Sulawesi Province.
- Provide opportunities for junior high school/MTs mathematics teachers in Tanggetada District, Kolaka Regency, Southeast Sulawesi Province to practice designing geometry lessons using *software Wingeom 2D and 3D*.

Tools and materials

Tools and materials needed in *software Wingeom 2D and 3D* for learning geometry include:

- Laptop/Notebook
- software Wingeom 2D and 3D* and *Tutorials Wingeom 2D and 3D*
- LCD/Projector
- Plug cable.



Figure 1. Laptop/Notebook



Figure 2. *Wingeom Software and Tutorials 2D and 3D*



Figure 3. LCD/Projector



Figure 4. Plug cable

Method Implementation of Activities

The method to be used in training activities and guidance for use *software Wingeom 2D and 3D* in learning geometry are as follows. (1) talk and question and answer about the steps of use *software Wingeom 2D and 3D* in learning geometry, (2) Focused discussion groups regarding the steps for use *software Wingeom 2D and 3D* in geometry learning, (3) guidance and simulation of each step of *software Wingeom 2D and 3D* in learning geometry, (4) direct practice of using each step of use *software Wingeom 2D and 3D* in learning geometry, (5) giving tasks related to use *software Wingeom 2D and 3D* in learning geometry.

RESULTS AND DISCUSSION

Result

The chairman together with the service implementing members made initial observations to determine conditions in the field participants in using learning software. Before carrying out training First, participants were asked to fill out a questionnaire which has been prepared by the activity implementation team. Based on the results of the researcher's initial observations Through a questionnaire that has been filled out by training participants, data was obtained:

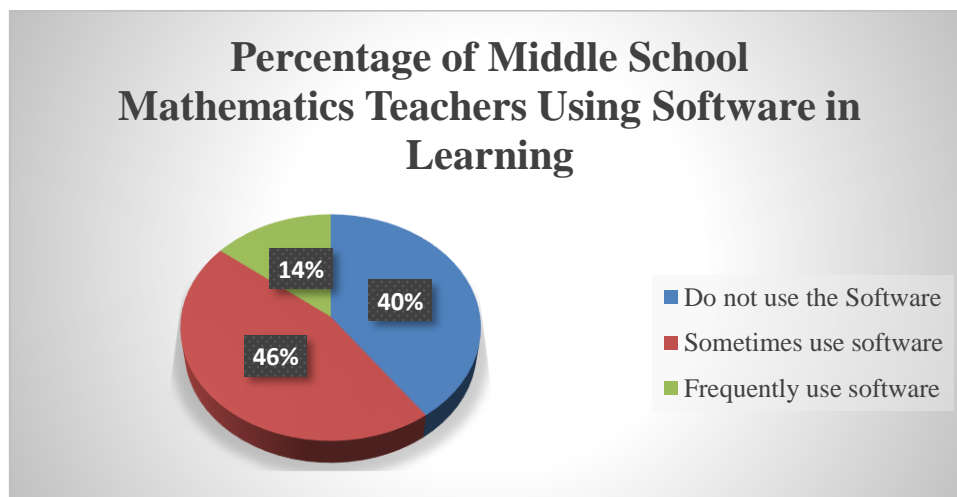


Figure 5. Initial observations of junior high school mathematics teachers in using learning software

The data above strengthens our implementation team to carry out training, because based on data generated from the results of training participants' entries in line with the opinion of the implementation survey results is that the use of mathematics software for teachers is still very lacking, percentage of teachers who said they had never used internal software The percentage of learning is still very high, namely 46% of the 30 who filled in, namely around 14 respondents, meaning there are still many teachers who don't use it software in the teaching and learning process. This is due to the teacher's lack of understanding of the software learning, apart from a lack of knowledge about software learning in Tanggetada District due to lack of training or workshops on software, especially mathematics software.

The stages of training in training and guidance on the use of 2D and 3D winggeom software in learning geometry to increase the professionalism of junior high school teachers in Tanggetada District, Kolaka Regency, Southeast Sulawesi Province include the following activities; (1) get to know the 2D and 3D winggeom software and its facilities, (2) operate the 2D winggeom software, (3) operate the 3D winggeom software, (4) guide in operating the 2D and 3D winggeom software on several flats and build spaces using the 2D winggeom software and 3D. The description of each stage of the exercise is as follows.

a. Get to know wingeom 2D and 3D software and its facilities
1) About Wingeom 2D and 3D

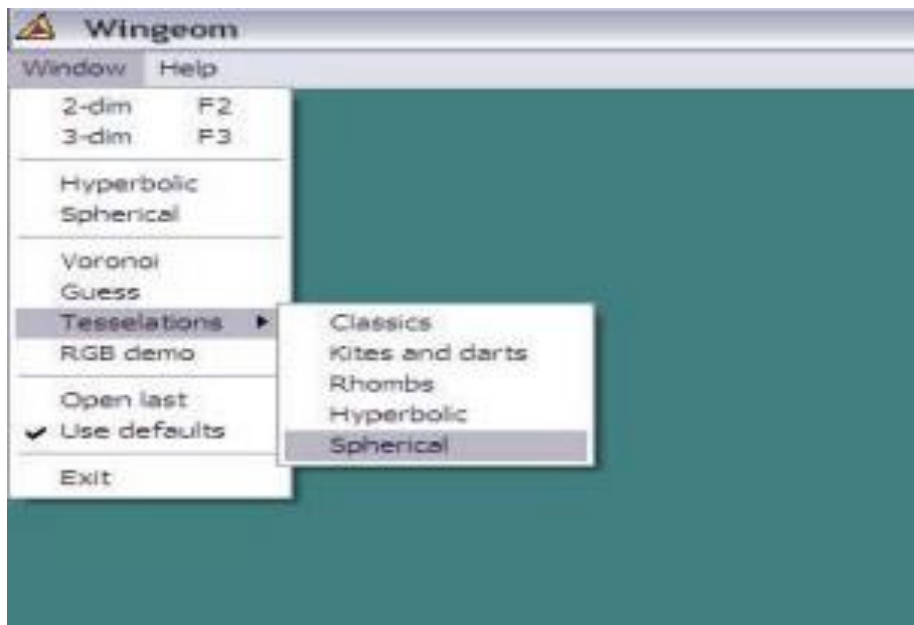


Figure 6. initial view Software Wingeom 2D & 3D

Program *Wingeom* is one of the dynamic mathematics computer software (*dynamic mathematics software*) for the topic of geometry. This program can be used to help learning geometry and solving geometry problems.

2) Wingeom 2D software operation

To draw a point, you must first activate the click function for the segment, by: clicking *Btms > Segments* or by clicking *Btms > Toolbar*, a toolbar window will appear, then select it submenu *segments*. It can also be done by clicking *Btms > clickSegments*. Then do a right click on the image area where you want, then a dot and label (letter) will appear from the point you made. The initial condition of the dot is in the form of a small circle of holes. Do it several times to make several dots. An example of the results of the work can be seen in the following figure.

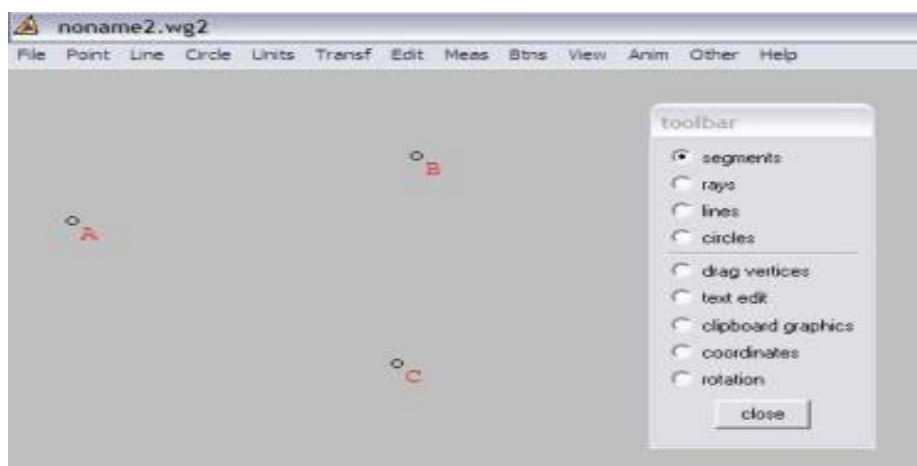


Figure 7. Advanced view Software Wingeom 2D & 3D

3) Guiding in operating the 2D and 3D wingeom software on several flat and spatial shapes using 2D and 3D wingeom software

Guiding in the use of 2D and 3D wingeom software can be presented in the form of the following documentation results



Figure 8. This preparation stage is to check the attendance of participants in the Wingeom 2D & 3D software training



Figure 9. Initial introduction as well as introducing the purpose of this Community Service



Figure 10. Acceptance of material as well as a brief explanation about the 2D and 3D Wingeom Software by the presenter



Figure 11. The presenter explains the steps for using Wingeom 2D and 3D Software and the relationship with flat and spatial material



Figure 12. Practice and guidance on operating 2D software



Figure 13. Practice and guidance on operating 3D software



Figure 14. exercise assignments for junior high school mathematics teachers in Tanggetada

Discussion

An interesting presentation can make it easier for participants to understand the use and function of the Wingeom 2D and 3D software, so that participants can use Wingeom 2D and 3D software in classroom learning for students. Lots of positive input and comments from the participants. Participants really appreciated it this training activity, so they hope that this service can be carried out continuously so that learning can be innovative and enjoyable for students teachers do. At the end of the activity, the implementing team prepared a questionnaire containing a questionnaire to see and see the participants' responses to this training increasing participants' abilities in using Wingeom 2D and 3D software. Here are the results Questionnaires that participants have filled out:

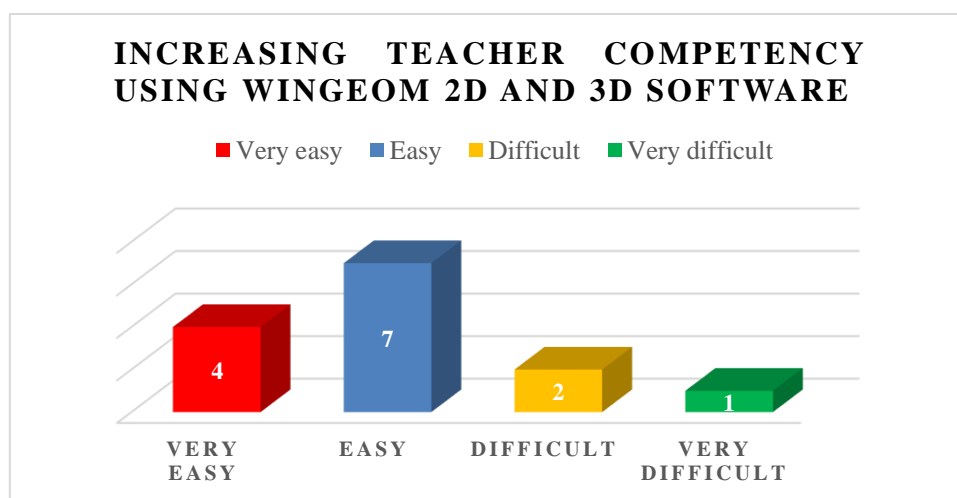


Figure 15. Response results of junior high school mathematics teachers using Wingeom 2D and 3D Software

From the results of the questionnaire, participants' ability to use it can be seen Wingeom 2D and 3D software as many as 14 participants who had never used mathematics applications took part in the training and filled out questionnaires, they state that the use of the application Wingeom's software turned out to be not difficult so they were ready to implement it in depth classroom learning. From the results of the participants' ability to use Wingeom 2D and 3D software, 4 participants also stated that they had used the application Wingeom software is very easy, 7 participants said it was easy, 2 participants said it was still difficult, and 1 participant said it was very difficult. So from the data It can be concluded that the ability of junior high school mathematics teachers in Tanggetada District is in understanding and using it Wingeom 2D and 3D software keeps getting better. Meanwhile, for participants who still find it difficult In implementing the software, participants paid less attention to the layout how to use and operate Wingeom 2D and 3D software during training. Several participants Those who pay less attention and have difficulty participating in training include older teachers, because these teachers cannot operate computers well, making it difficult to take software training. For participants who still need guidance in using Wingeom software, online training will be done so you can do more understand its use and can apply it in the learning process towards students in class. so it can be concluded that this training was successful and can be improved Mathematics teacher competency in using Wingeom 2D and 3D software.

Providing guidance and training using Wingeom 2D and 3D software in Geometry learning for SMP/MTs teachers who are partners is a solution as an effort to increase professionalism. and it is hoped that teachers can go more deeply into observing, animating shapes and displaying dimensional geometric material, and can help visualize geometric concepts clearly so that teachers will more easily understand geometric concepts so that this will have an impact on improving the quality of teachers in the learning process, especially learning geometry. This is in line with research conducted by Fonna, Mutia and Mursalin (2018). that learning using wingeom software can improve students' representation skills so that it is fun to teach.

CONCLUSION

The teacher is able to use Wingeom 2D and 3D software in the Geometry lesson that will be carried out. Through three stages, namely (1) preparation, socialization to junior high school, (2) training and guidance on the use of 2D -3D wingeom software in learning Geometry, (3) direct practice of using every step in Wingeom 2D and 3D software for Geometry learning. Where the preparation stages include; (1) selecting the material to be discussed, and (2) compiling the work instructions for the 2D and 3D wingeom software. The stages of training and guidance include the following: (1) getting to know the 2D and 3D wingeom software, (2) operating the 2D wingeom software, (3) operating the 3D wingeom software, (4) guiding and training to operate Wingeom 2D and 3D software. Based on these stages participants have been able to:

1. Understand several Flat Shapes and build spaces using 2D and 3D wingeom software.
2. Understand the steps in wingeom 2D and 3D software, andc. Using/operating Wingeom 2D and 3D software in learning geometry at junior high school/equivalent level.

Besides that, Training Wingeom 2D and 3D software can improve the competence of teachers in Tanggetada District. Through this mathematics software training, teachers have skills in teaching mathematics that is easy for students to understand, innovative, interesting and fun.

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