

THE DIFFICULTIES DURING TEACHING PRACTICE OF PROSPECTIVE MATHEMATICS TEACHER

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Abstract

This study aims to reveal the phenomenon of difficulties experienced by prospective mathematics teachers in carrying out teaching practice, which are focused on difficulties in using mathematics learning media. The method used in this research is descriptive qualitative. Through questionnaires to collect data on the difficulties of prospective teachers during teaching practice, it was found that the difficulty in using the right media was the highest difficulty than others. Data collection techniques to dig deeper into the reasons for the difficulties experienced by students in determining the right learning media were carried out using interviews. The reasons for the difficulties of prospective teacher in using learning media are 1). The habit of teachers teaching mathematics at the school who do not use learning media causes students to have difficulty making decisions in choosing the appropriate media used and hesitate, 2). Limited school infrastructure facilities. 3). Lack of information sources to help prospective teachers choose the right media, in this case, the lack of role of teaching practice supervisors and mentor teachers.

Keywords: Teaching Practice, Mathematics Prospective teacher, Learning media.

Introduction

The curriculums should be adjusted to the development and demands of today's era. The spirit to organize education in accordance with the needs of the world of work is incorporated into the college curriculum which we know as the Indonesian National Qualifications Framework (Kerangka Kualifikasi Nasional Indonesia or KKNl) based curriculum (Natalia et al, 2023). Concerning KKNl, the mathematics education undergraduate program at the Faculty of Teacher Training and Education is a study program that produces prospective teachers. Teachers as one of the professions in the field of education are also inseparable from their role in schools that must be able to answer the needs of professional demands. Along with the times, there are many needs for schools as a marketplace for the teaching profession. Starting from the ability to use information technology in learning, the ability to speak English and other foreign languages, and other more specific abilities.

In addition, the effects of the global pandemic have caused the government to take steps to provide direction and learning solutions during the pandemic, which can be done through a remote system or online education, especially during emergencies and restrictions on public movement. The point is that the government wants

students, teachers, and parents at home to continue to adapt to rather difficult conditions where technological application solutions can provide a little enlightenment so that education is not so disrupted (Prahmana et al., 2021; Dahlan et al., 2022).

The quality of teaching and learning activities that occur in the classroom determines how the quality of a prospective teacher is formed, therefore we need to look at the activities carried out in order to improve the quality of its graduates. One of the mandatory activities given by a teaching faculty to its students is to carry out field experience practice or teaching practice activities. Teaching practice is one of the important parts that must be taken by education students to be able to obtain a bachelor of education degree. Participating in teaching practice activities is a holistic learning exercise in playing the role of a teacher (Mukhibad & Susilowati, 2010; Dasmu & Sumaryati, 2014). Students' readiness to go through this process is also an important concern for universities, so research to analyze the difficulties experienced by students needs to be anticipated and become input for learning development and even become a reference for the curriculum, Teaching practice is a period where students practice applying all the competencies they have to the real conditions of the school. During teaching practice students become prospective teachers. Prospective teachers are faced with real students and schools as if they were real teachers. The importance of field practice activities is in line with the principles that are widely echoed through Minister of Education and Culture Regulation No. 3 of 2020 concerning the right to study 3 semesters for students to open up space for field skills so that students are not unfamiliar with their scope of work and can produce superior human resources. According to Hamalik (2003), the target of prospective teachers to be achieved is a prospective educator who has a set of knowledge, skills, values and attitudes, as well as patterns of behavior needed for his profession and is capable and appropriate to use them in the implementation of education and teaching, both at school and outside school.

Teaching practice is expected to be able to prepare prospective teachers while still receiving facilitator assistance through supervisors. But of course, these difficulties need to be studied in depth to become a reflection for the teacher-producing study program and seek improvements that reduce difficulties. Concerns about the difficulties experienced by prospective teachers in carrying out teaching practice are stated from the results of research conducted by Fadilah (2012) who found several difficulties experienced by prospective teachers including lack of mastery of the material, selection of inappropriate methods, lack of student creativity in managing the class, lack of teaching preparation by prospective teachers, lack of prospective teachers expertise in using learning media, and lack of student communication with prospective teachers Teaching practice is one of the mandatory pre-service programs designed to prepare prospective teachers to enter the field conditions. According to

Heruwono (2013), teaching practice is one of the pre-service teachers designed to train prospective teachers to master complete and integrated teaching skills so that after completing their education they are ready to independently carry out their duties as teachers.

According to Astuti, et al. (2013), the vision of teaching practice implementation is to prepare professional and reliable teachers while the mission of the teaching practice program is to prepare and produce prospective teachers who have the skills, knowledge, high reasoning, attitudes and behavior patterns of an educator so that based on the explanation above, teaching practice activities include various forms of practical activities such as teaching, administration, guidance and counseling as well as academic and non-academic activities that occur at the practice location.

Difficulties experienced by prospective teachers when doing teaching practice can be anticipated and equipped immediately before the student becomes a teacher. The difficulties of teaching practice prospective teachers are narrowed down to the context of prospective math teachers. Mathematics is a subject that is often considered difficult and most avoided by students this is because mathematics is still taught far from the context of everyday life. The content of mathematics itself is also abstract as stated by Sriyanto (2017) mathematics is an abstract subject, the substance of mathematics is abstract thinking objects.

Siswono (2004) classifies some problems which are faced by mathematics teachers, namely: 1. How to design a learning process, such that the students can be guided to reconstruct or reinvent a concept. 2. How to implement the authentic or alternative assessment in the teaching and learning process. 3. How to manage and share attention with students of various abilities. 4. How to organize a teaching process, because teachers suspect that applying the new curriculum is a waste of time. 5. How to manage the students and the majority of them have difficulties in prior knowledge. 6. To implement the new curriculum needs special and expensive devices or equipment, e.g. computers, manipulative or educational tools.

In the sixth point, with the development of technology and information, mathematics educators need to master various manual and computer media (multimedia). Educators need to continue to be learners seeking the ability to develop or use these various media, including the use of the internet. This shows the need for prospective teachers' ability to choose and use the right media to help students have concrete knowledge.

METHODS

This research uses a qualitative research approach in the form of a descriptive qualitative. The purpose of descriptive qualitative research is to reveal facts or, phenomena, a situation that really happened during the research. In addition, it also describes the discrepancies between several events, the relationship between

variables that arise, the differences between existing facts and their influence on a condition, and so on.

The subjects in this study are prospective teachers who have done teaching practice, then confirmation is carried out to maintain the validity of the data, namely to mentor teachers, and teaching practice supervisors which was conducted at a private mathematics education study program in Jakarta. The sampling was done by purposive sampling technique, prospective teachers came from 3 different classes of year who had participated in teaching practice. The research subjects for the interview were selected based on the answers from the questionnaire results that had been carried out previously.

The data in this study were obtained in two ways, namely by questionnaires and interviews. Questionnaires were conducted to record any difficulties experienced by prospective teachers while interviews were conducted to dig deeper into what problems experienced by prospective teachers in teaching practice and the factors that cause these problems.

The form of interviews conducted is semi-structured interviews where questions are more open-ended and answers can be recorded in more detail, and where space is left for unexpected issues that arise in conversation. With these semi-structured interviews, it is hoped that it can dig deeper into the difficulties experienced by teaching practice prospective teachers that escape the observation of the mentor teacher and teaching practice supervisor.

To facilitate researchers in disseminating and recapitulating data, the validated questionnaire was then made into an online version using google forms. Then the link to the questionnaire was distributed to the class leaders to be distributed to each of their classmates. The total number of respondents to the questionnaire was 35 people. With details, 8 people from class A prospective teachers, namely prospective teachers who have participated in teaching practice for 2 years, 10 people from class B prospective teachers, namely prospective teachers who have participated in teaching practice for 1 year, and 17 people from class C prospective teachers, namely prospective teachers who have just participated in teaching practice in the same year.

The process of filling out this questionnaire took about 5 months. Then followed by an interview to dig deeper than the questionnaire data and also see the consistency of the answers from the research subjects, this was also done to fulfill the validity of the data using method triangulation. After obtaining the questionnaire and interview data, a source triangulation step was taken with lecturers that supervise teaching practice and mentor teachers, then a theory triangulation step was taken. So this research conducted three forms of triangulation, namely triangulation of methods, sources and theories.

Data analysis was carried out by following the Miles and Huberman (1994) model, where the data was analyzed continuously and stopped when it found a saturation point of the answers to the phenomena being explored. The stages carried out in analyzing data are data reduction, namely sorting data from the entire data obtained, data is reduced by selecting data that is in accordance with the needs of the research topic, presenting data, namely the researcher's efforts to show the truth of the data obtained and the last is drawing conclusions.

RESULTS AND DISCUSSION

Based on the questionnaire data collection, the results of the recapitulation of difficulties experienced during teaching practice by prospective teachers lie in various difficulties, there are 5 difficulties that are above 50%, that is, more than 50% of prospective teachers agree to experience difficulties in that category. These difficulties are presented in the top 5 difficulties as shown below in Fig.1:

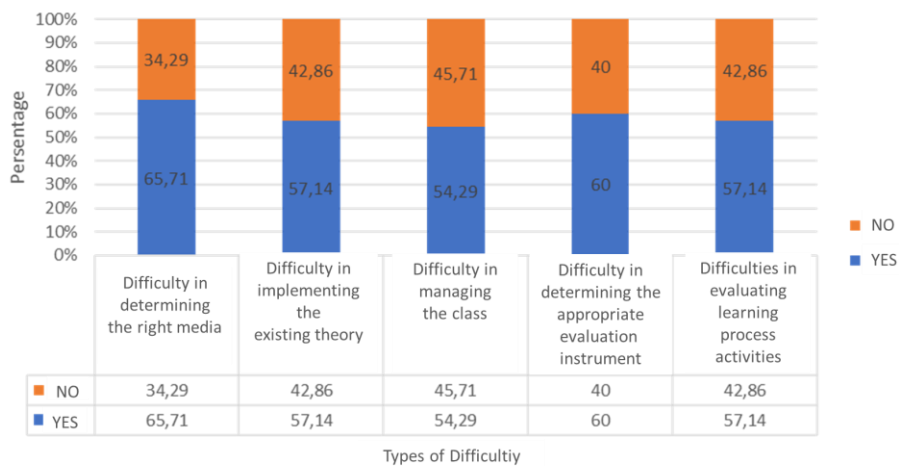


Figure 1. Percentage of the Greatest Difficulties Experienced by Prospective Teachers

Based on Figure 1, it is obtained that prospective teachers experience the most difficulties in the category of determining the right media. Determining the right media is the most difficult thing for teaching practice prospective teachers, as many as 65.71% of prospective teachers experience difficulties in this category. Determining the right media in this study includes the ability to select, create, and use learning media related to the material that will be taught by prospective teachers in teaching practice.

In learning mathematics, the role of learning media is very large in helping prospective teachers' understanding. Mathematics is a subject that has abstract concepts. The function of learning media in this case is to present these abstract concepts to be more concrete. Various studies show the important role of mathematics learning media to improve student understanding. For example, research conducted by Sapta (2007) showed a positive effect of the use of learning media on the mathematics

learning outcomes of high school students. This means that learning can improve the math learning outcomes of high school students.

To dig deeper into the difficulties of prospective teachers in determining the right media for learning, researchers conducted in-depth interviews with several prospective teachers. From the results of the interviews, several reasons were obtained that made it difficult for prospective teachers to determine the media. The first reason is that for some schools where prospective teachers practice, mentor teachers (supervisors in school) teach without using learning media, only directly teaching formulas and then example problems. This is the choice taken by the teacher considering the limited hours of math lessons while the material that must be taught is quite a lot. Teachers do not want to take the risk of missing out on subject matter if teaching must use media (Rozie, 2018; Tafonao, et.al., 2019). This condition indirectly forces prospective teachers to also teach without using learning media. This is in line with the opinion of Anas (2016) who explains some of the shortcomings of teaching aids, namely: teaching using teaching aids is more demanding on the teacher and a lot of time is needed for preparation.

Another cause is that prospective teachers find it difficult to make learning media for certain materials such as trigonometry, geometric transformations, line equations and gradients. Prospective teachers have tried to borrow from the school where they doing teaching practice but the media at school is also limited. Mahmood & Iqbal (2018) found that the classroom lack even minimum essential teaching resources and in schools where such materials are available, school administration is reluctant to provide access to such material because of administrative complications. Prospective teachers also find it difficult to find suitable media even though they have searched for it on the internet. Some prospective teachers conveyed these difficulties to the teaching practice supervisor, but the supervisor advised prospective teachers to be independent. In other words, prospective teachers are advised to find their own solutions to their problems.

Media selection needs to pay attention to several things such as learning objectives and student characteristics. Media is the biggest difficulties than other. Jalinus & Ambiyar (2016) argues that in choosing media, it needs to be adjusted to the needs, situations, and conditions of each. The selection of learning media in the teaching and learning process must be arranged based on the achievement of instructional objectives, the content of the subject matter, the teaching methods to be used and the characteristics of the students (Aras, 2019; Lestari et al., 2018, Sumiharsono, 2017). The media chosen should be truly effective and efficient (Puspita et al., 2017). The use of media must be adapted to learning objectives, materials, interests, needs, and conditions of students by paying attention to these things, learning media can foster motivation and increase learning activities (Setiawan, 2019).

Both statements show that learning media are unique. In the same material, the same learning media cannot necessarily be used for learning conducted in two different

classes. This means prospective teachers must have the ability to choose, find, design and make their own learning media following the characteristics of students and the learning objectives to be achieved.

It takes foresight from prospective teachers in observing the characteristics of students to be able to create appropriate media in learning. Observations can be made by prospective teachers at the observation stage in teaching practice schools. The observation stage is a stage carried out in the first week of prospective teachers doing teaching practice at school. During the observation period, prospective teachers who will practice teaching make observations about the school situation and classroom conditions when the teaching teacher teaches.

It takes sufficient skills for prospective teachers to be able to create learning media for materials that are considered difficult such as trigonometry, geometric transformations, line equations and gradients. These skills can be honed when prospective teachers take the courses in question. Lecturers need to provide examples of learning media through their teaching in class, then continue by giving assignments to prospective teachers to find other media that can also be used.

Interview data conducted with teaching practice prospective teachers are also in line with interview data from mentor teachers and teaching practice supervisors. Teachers admit that they rarely use learning media due to the unavailability of adequate learning media at school. The findings conform with Saricoban (2010) and Annan-brew & Arhin (2022) who found that most of the problems take place due to the lack of mainly audio-visual materials, other supplementary materials needed. This causes teachers to teach with the lecture method without using media or innovative ways of learning due to the large amount of material that must be pursued in a short time. Teaching practice supervisors confirmed that 90% of prospective teachers did not use learning media when conducting the learning process during teaching practice. Teaching practice supervisors added that prospective teachers tend to choose the usual way of teaching that teachers use when they make observations before teaching practice.

The questionnaire and interview data are in line with the opinion of Prastika et al. (2019) that many teachers still experience obstacles in using learning media. Apart from being due to limited funds, the difficulty of media maintenance, teachers already have many difficulties in using let alone maximizing learning through the use of learning media. In addition, according to Elas et al (2019), teachers' (in this case prospective teachers) incompetency in the use of technology and inadequacy of facilities in schools to support the content of lessons have created obstruction for teachers to be able to manipulate technology tools in order to deliver competent teaching. It is good for lecturers who teach mathematics learning courses (such as computer-assisted mathematics learning media courses, or allied) to give project assignments to prospective teachers to develop mathematics teaching tools or materials by utilizing

technology (Nasution, 2018). Also, teachers' incompetency in the use of technology and the inadequacy of facilities in schools to support the content of lessons have created obstruction for teachers to be able to manipulate technology tools in order to deliver competent teaching.

The difficulty in choosing the right media is not only the biggest difficulty for PPL students, this difficulty has also increased from 3 classes of PPL participants from different class years. The increase in difficulty is shown in Figure 2 below.

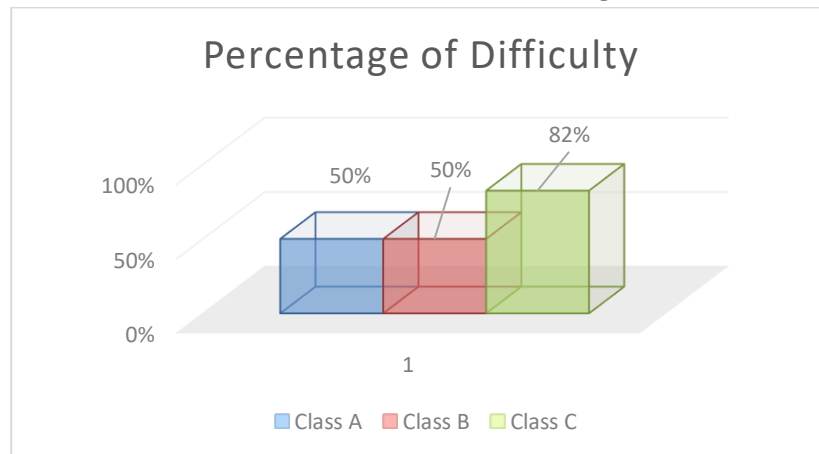


Figure 2. Percentage of Difficulties in determining the right media from third year

The figure above explains that there is an increase in the difficulties experienced by prospective mathematics teachers who are doing PPL. The class A student teachers show the student teachers who have done PPL 2 years earlier, along with the mathematics student teachers who have done PPL 1 year earlier. These two classes both experienced a percentage of difficulty level of 50%. This means that the student teachers have not changed from the last two years. However, the increase in difficulty in determining the right media was higher in the last year of PPL. There were 82% of prospective mathematics teachers who experienced problems in determining the right learning media. When explored further about the difficulties in determining the right media, prospective mathematics teachers provided a description of the situation they experienced in the following interview excerpt:

S₁ : It is difficult to find props or media in certain materials such as media for trigonometry material. I have tried to search the internet but it is difficult to find the use of media in certain materials specifically.

P : How about the teacher, did you not try to ask the teacher?

S₁ : No because during the observation, the teacher usually does not use media, only directly teaches the formula and then the example problem.

P : Why do you have difficulty in determining the right media in teaching math?

S₃ : The media at school is limited.

P : Can't you make your own media or utilize current technology?

- S₃ : I once wanted to try but did not know how to make right media, at that time for the lesson of line equation and gradient.
- P : Did you not try to consult the teacher?
- S₃ : The teacher usually uses the expository method only.

Based on the description of the data obtained, it can be concluded that the obstacles to using the media are due to 1). Limited infrastructure facilities, 2). The ability of prospective teachers to determine media that are suitable for the topic of mathematics material, 3). Knowledge of the various media available, 4). The creativity of prospective teachers in utilizing surrounding objects. Researchers try to observe the patterns of tendencies that exist. The patterns of tendency then lead to assumptions.

The trend of increasing percentage of prospective teachers having difficulties every year can be caused by two factors. The first factor can be caused by the decline in the quality of teaching carried out by lecturers in the mathematics education study program. This assumption is raised from the data on the decline in services carried out by teaching practice supervisors in each class of year.

The second factor can be caused by the increasing demands of the marketplace. The changing times have a big influence on the world of education (Natalia, 2023). The increasing standards of expertise that must be possessed by teachers increase the difficulty of prospective teachers in carrying out teaching practices. This assumption is shown in Figure 2, the difficulties experienced by prospective teachers tend to increase every year, at the same time the implementation of teaching practice increasingly does not meet school expectations. This is certainly an obstacle for a prospective mathematics teacher because teaching mathematics is a teaching that continues to develop so that it requires special abilities from a prospective mathematics teacher to utilize various sources in making mathematics teaching effective in the classroom (Fitriati et al, 2023; Boye, 2020; Chen & Zhang, 2019).

This research has not included English language skills, the use of information and communication technology and some of the skills needed in the era of the industrial revolution 5.0 as factors that have the potential to become prospective teachers' difficulties. This research only refers to the basic teaching skills that a teacher must have. If those skills are included in this research aspect, it is likely to increase the percentage of prospective teachers' difficulties during teaching practice. This deserves the attention of the study program that produces undergraduate educators.

CONCLUSION

The increase in the number of prospective teachers who experience difficulties in determining the right learning media is one of the statements that supports that often the world of education is a field that is left behind and difficult to keep up with the fast-paced development of the times.

The difficulties experienced by prospective teachers seem to come from school, but when reviewed further, the difficulty of prospective teachers in determining the right learning media is due to a lack of understanding of concepts and unpolished creativity, this is also due to the lack of qualified training attended by prospective teachers.

The results of this study are expected to be a consideration for the policymakers in determining the curriculum used in the study program. In addition, the results of this research are also expected to be the attention of lecturers as the highest authority in the implementation of the teaching and learning process in the classroom of prospective teachers in order to support and train prospective teachers to think creatively as one of the skills needed today.

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