



Profile of Self-regulated Learning in Web-Based Learning for Mathematics Education Students of Bengkulu University

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Abstract. This study aimed to describe the profile of self-regulated learning in web-based learning assisted by Geogebra. This research was descriptive qualitative research. The instrument used was a questionnaire. 70 students of mathematics education class 2020 were given 4 sessions of learning, then they filled out a questionnaire consisting of 7 questions about independent study. The results of the study stated almost all students of mathematics education class 2020 already knew the rules of independent learning for each credit. Most of them had been doing self-regulated learning, some have done it on a scheduled basis in the evening a day before the scheduled meeting. Distance learning that involved students' independent learning by designing web-based learning using Geogebra on a plane and space geometry was preferred by the students than distance learning which was done in general. Students carried out independent learning very well due to the encouragement of learning method that had been designed independently, namely web-based learning assisted by the Geogebra application.

Keywords: Profile · self-regulated learning · web-based learning

1 Introduction

It has been more than one academic year that online learning has been conducted in Mathematics Education Department of Bengkulu University. Many media are used by lecturers in conveying their learning. The media used by the synchronous method are zoom, google meet. The media used by the asynchronous method are moodle, telegram, whatsapp, blog. Some courses used mix methods, synchronous and asynchronous. For example, the first week is synchronous with the zoom application, the second week is learning through Moodle. From student reports, there are still difficulties for students in understanding online material [1, 2]. Especially the new students in 2020 who, since starting to enter campus, have never done face-to-face lectures. This statement arises because students are not ready with a higher learning system. Therefore, teachers are

required to have the ability to master learning technology in online learning during the covid-19 period [3].

One of the courses in the Mathematics Education Department is plane and solid geometry course. The competence of this course is that students are able to analyze the characteristics of geometric shapes inductively. Online learning using the web as a learning medium that contains geogebra applications has various advantages in learning [4, 5]. GeoGebra is one of the most widely used media in studying geometry courses [6–8]. In this study, learning was carried out for 4 meetings about the similarity of triangles. Each meeting, materials are uploaded a week before the meeting time, so students can study and answer all questions before the lesson schedule. Teaching materials are included on the web with delivery designs such as student activity sheets. In each material there is a GeoGebra application embedded in the html language. The teaching materials are accompanied by learning instructions and learning steps. The learning steps are presented in detail, and contain short entries and descriptions. Short fields are used to receive answers about the results of geogebra measurements or operational calculations obtained by students. Descriptions are used to receive entries about student conclusions or answers that contain characters that are longer than short entries. All entries are stored in the database and are always displayed when the page is opened by the student. Each student can access teaching materials on the web with their own account at any time, before or after the meeting. All student answers on teaching materials can be changed and remain stored in the database with the last answer stored as the student's final answer.

Several studies on learning independence have found that learning independence has an effect on students' mathematics learning outcomes [9–16]; Geogebra has a significant impact on mathematics learning outcomes [17]; and suitable for learning mathematics [18]. In another study, it was found that learning independence was triggered by learning that required student activity [19]. It has also been investigated the development of learning models of learning independence [20–24] and measuring tools [25, 26]. However, it is not yet known how the profile of learning independence of prospective mathematics teacher students with geogebra-assisted web-based learning is.

The student's self-regulated learning profile is useful as a planning material for the next lesson. The learning outcomes of students in Mathematics Education Department of Bengkulu University are still categorized as not optimal during this pandemic. Maximum learning outcomes can be obtained through careful planning based on the student's self-regulated learning profile. However, at this time the profile of students' self-regulated learning in Mathematics Education Department of Bengkulu University in web-based learning is unknown. For this reason, this research was conducted. This study aims to find out the students' self-regulated learning profile in web-based online learning assisted by Geogebra and designed in such a way as to accommodate all possible student behaviors during independent learning in Mathematics Education.

2 Method

This research is a qualitative descriptive research. The research subjects were 70 semester students of the 2020 batch of Mathematics Education Department, Bengkulu University who took the plane and solid geometry course. The research was conducted

in April 2021 after four geogebra-based web-based learning were done. This study used a questionnaire as a data collection instrument [27]. Questionnaires are made online using a google form and filled out after students complete the evaluation in the fourth meeting. The questionnaire contained seven questions about self-regulated learning done by students on the plane and solid geometry course after four meetings. The results of the questionnaire were processed by making the appropriate categories. After grouping, student answers are described per category for each question.

3 Results and Discussion

From the online questionnaire, the following students' answers were found.

3.1 Do Students Know that There Are 60 min for Independent Study Per Credit?

The first question is whether students know that there is an obligation of 60 min for self-study for each credit of a course. Students' answers are grouped into 2 categories, namely those who do not know and those who know. There are 20 students (27%) who state that they do not know the obligation of self-study for each credit. There are 50 students (73%) who already know that for each credit there is an obligation of 60 min of self-study.

3.2 Do Students Do Self-study Every Week?

The second question is whether students do self-study every week for Geometry of planes and spaces course. Answers are grouped into two categories, namely NO and YES. There are 6 students (9%) who answered NO. Three of them are students who do not know that there is an obligation to study by themselves, while the other three students are students who know that there is an obligation to do self-study. For the YES category, there are 64 students (91%) who do self-study every week.

3.3 How Long Do Students Do Self-study Each Week?

The third question is how long the self-study activities are carried out by students in a week. Answers are grouped into three categories, namely 0 min (None), less than 180 min ($0 < x < 180$ min), and 180 min or more ($x \geq 180$ min). There is 1 student (2%) who answers for the first category. For category 2, there are 54 students (77%) with the data mode is 60 min. For category 3, there are 15 students (21%) with the data mode is 300 min. This answer is the average length of self-study done by students in the last 4 weeks.

3.4 Do Students Have Special Time for Self-study?

The fourth question is whether students have special time to do self-study. Answers are grouped into two categories, namely NO and YES. For the NO category, it is answered by 14 students (20%). Students do self-study when they need and only have free time. For

the YES category, there are 56 students (80%) with the data mode is self-study carried out the day before the lecture. There are also students doing self-study at night because they think it's the quietest time to study. Meanwhile, others answer in the morning because they feel they are still fresh to study currently.

Environmental conditions do not significantly support students studying at home [28]. As a result, many students seek special time to study independently in their environment. Even in the research on the mathematical literacy of Indonesian students in Programme for International Student Assessment (PISA), the environment has a great influence on the ability of these students [29].

3.5 What Are the Reasons Why Students Choose Special Time for Self-study?

The fifth question is the reason for choosing a special time for self-study. Answers are grouped into two categories, namely There is no specific reasons and There are specific reasons. For the first category, there are 12 students (17%). Questionnaire is only answered with the sign “-” or “.”. For the second category, there are 58 students (83%) with the data mode is to prepare for the next lecture schedule. This answer is mostly answered by students who answer that self-study is carried out the day before the lecture on the fourth question. There are also those who give a reason because they want to understand the material well.

Most of the time chosen is at night because of the availability of sufficient time and a calm atmosphere. According to the previous research, learning in the afternoon or evening is easier for teenagers to remember both in terms of vocabulary and skills [30].

3.6 Do Students Like Distance Learning that Has Been Done So Far?

The sixth question is whether students like distance or online learning that has been done so far. Answers are grouped into two categories, namely NO and YES. There are 30 students (43%) who answer NO. 12 of them state that their dislike the distance learning was due to technical problems, primarily unstable signals. The others state that dislike it because they are not used to distance learning. Therefore, it is difficult to understand learning as well as they are not able to meet their friends and lecturers. For the YES category, there are 40 students (57%) like distance learning because it is more practical and effective; saves a lot of time and money; make they can study at home and gather with family; and it is suitable for conditions during this pandemic. Those answers are mostly answered by students who do self-study in accordance with existing rules and have the reason for self-study regularly because of eagerness to understand the material well.

Several previous studies on distance learning found that students liked distance learning more because it was non-academic, while academically, most students did not like it [31–34]. This is due to the lack of distance learning models that increase student interest in learning [35].

3.7 Do Students like the Learning that Was Carried Out During the Last Four Meetings?

The seventh question is whether the students like the learning that has been done during the last four weeks in the Field and Space Geometry course. Answers are grouped into two categories, namely Dislike and Like. There are 3 students (5%) who answer dislike. Three students state that their dislike is due to technical difficulties. Meanwhile, another student explains his dislike because he is not able to meet his friends in person so that it is difficult to carry out learning activities together. For the like category, there are 67 students (95%) who like the course because the learning involves interactive web and GeoGebra application as well as it is challenging and effective and fully involves students.

Learning that activates student self-regulated learning is one of the preferred learning models by students because the learning is carried out very much differently from distance learning. The distance learning generally is not liked by many students due to monotony and does not have a clear learning direction [4]. Furthermore, inquiry learning model can increase student interest in learning [36].

4 Conclusion

Almost all students of the 2020 class of mathematics education already know the rules about independent study for each credit. Most of them have been doing self-regulated learning, some have done it on a scheduled basis in the evening the day before the scheduled meeting. Distance learning that involves students' independent learning by designing web-based learning with the help of geogebra on plane and solid geometry is preferred by students than distance learning which is done in general. Students carry out independent learning very well due to the encouragement of forms of learning that have been designed independently, namely web-based learning assisted by the geogebra application.

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