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Geogebra Learning Management Strategy in Mathematics

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Abstract

This qualitative study analysed how learning management methods with Geogebra in mathematics are implemented, the roles of instructors and students in learning management strategies with Geogebra in mathematics, and the challenges encountered in learning management strategies with Geogebra in mathematics. The results showed that Mathematics instructors at SMA Negeri Sub Rayon 03 OKU Timur in South Sumatra have begun to experiment with using technology-based learning resources in the classroom. Mathematics instructors at SMA Negeri Sub Rayon 03 OKU Timur South Sumatra have an active part in learning management practices utilizing Geogebra. Students from SMA Negeri Sub Rayon 03 OKU Timur South Sumatra played an important part in the learning management approach using Geogebra, expressing their enthusiasm for learning mathematics with Geogebra.

Keywords: Geogebra, Learning, Management Strategy

A. Introduction

This paper begins with the findings of Soleh (2020), who stated that 1) students' understanding of geometric concepts who receive Geogebra assisted learning is better than students' understanding of geometric concepts who receive conventional learning. 2) There is no interaction between Geogebra media-assisted learning and students' spatial abilities in terms of geometric concept understanding. Then, in Buru, Suweken (2012) stated that the use of the Geogebra application learning media that is applied to students in the mathematics learning process differs significantly from applications that do not use the Geogebra application. This can be seen by comparing the post-test scores obtained by 31.6% to the pretest scores obtained by 11.6% for improving mathematical ability. According to the findings of this study, the use of instructional media in mathematics is extremely effective. According to the findings of Sihwidi's (2016) research, the Geogebra application can increase the activity and competency of geometry transformation material for class XI students enrolled in semester 3 of the Network Computer Engineering Program at SMK Negeri 1 Tulang Bawang Tengah.

Learning is one of the most important needs that necessitates a variety of challenges in human life. Knowledge, skills, and attitudes in learning are functional demands that can face a variety

of challenges and changes. Learning and education, both formal and informal, are inextricably linked. Learning is a determining factor in creating the role of education in order to improve the quality of human resources as a necessity for educational development in formal education. Management-based learning is one of the roles of school administrators in promoting effective learning. The principal is the education unit level manager, and the teacher is the class manager in the school (Syafaruddin, 2019).

Management is the act of organizing an activity so that it can be managed in a neat, detailed, and effective manner. According to (Effendy, 1996), management is an activity that includes insight into the activities to be planned, carrying out these activities properly and effectively, and evaluating all activities carried out so that business goals can be achieved. Ihwan (2017) explains that management is a force in an organization of activities related to the environment. Materials, managers and members, time, money, markets, and procedures are all management elements. Management is the act of a manager carrying out a business process in order to achieve optimal results (Syafaruddin, 2019).

Learning management will be influenced by the role of a teacher and a school principal in implementing the learning process in schools. Teachers who serve as class managers must engage in 4M activities such as planning, organizing, leading, and evaluating. According to Davis (1995), the role of the teacher as a manager in a learning process is 1) Making plans for the purpose of teaching is referred to as planning; 2) Organizing, that is, gathering all teaching and learning resources in order to achieve the goals as efficiently as possible; 3) Leaders, who instill enthusiasm in students so that they can participate in learning activities. 4) Supervision, which entails ensuring that learning objectives are met. As a result, after learning is completed, it is necessary to conduct an evaluation in order to determine the achievement of learning outcomes.

Learning management, specifically assisting students in gaining insight, skills, understanding, and proficiency with their surroundings. Based on the explanation above, it is possible to conclude that learning management is the management of learning, and thus management plays a role in educational management activities (Hadis & B, 2010). Learning management will be more efficient and effective if done correctly. If a learning management system is accompanied by a strategy, it can help students achieve consistent and maximum understanding. A strategy is a method or technique for carrying out a task (Sanjaya, 2006). Then, various types of learning management can be used to implement this strategy. Teachers as managers can use management techniques to make learning management work well, and each teacher's techniques may differ from those of other teachers (Yamin, 2006). Based on these definitions, strategy can be defined as a learning technique owned and used by a teacher and students to achieve learning objectives efficiently and effectively.

Subjects require more attention in math lessons. Many students believe that mathematics is a "less desirable" or "if it can be avoided" subject (Ahmad, 2010). Students at SMA Negeri Sub Rayon 03 OKU Timur in South Sumatra shared the same sentiment. They believe that mathematics is a burdensome and difficult subject, so few students are interested in it. As a result of this assumption, students' desire to learn mathematics is low, and many students have math scores below the KKM (Minimum Completeness Criteria). Despite having more study hours, students' preoccupation with mathematics remains relatively low when compared to other subjects, according to research. One of the factors that contribute to the occurrence of this condition is that the math teacher appears monotonous when teaching. Learning feels

natural and leaves no imprint on students' minds, so they have difficulty understanding the material being taught. Mathematics study is not the same as studying other sciences. Mathematics contains concepts that must be understood rather than simply memorized (Suherman, 2010). Students will struggle to learn mathematics if they only memorize, because memorizing material is not always applicable to problem solving. This situation will jeopardize pupils' development since they must be able to solve difficulties, particularly in everyday life. According to (Sagala, 2008), the notion of mathematics must be comprehended and then exercised, rather than just memorized.

Learning mathematics must proceed in phases and be dependent on prior knowledge. Mathematics must be studied on a continuous basis, and in order to grasp a topic, prior material must be correctly understood (Hudojo, 1990). Mathematics teachers must comprehend the content being taught in order to optimize learning. A teacher who knows the content being taught is not always able to give pupils with a learning and intellectual experience. The solution to this challenge is the establishment of a learning management plan. A teaching must be carried out with multi-way interactions and with the help of the media, infrastructure, and student preparation (Karso, 2013).

Geogebra (Geometry and Algebra) is a dynamic mathematics (software) study aid (Ekawati, 2016). Geogebra software was developed to aid in the teaching and learning of mathematics in schools. This program may be used as a learning medium, a tool for creating content, and a tool for solving arithmetic problems. This program may be used to increase students' knowledge of ideas covered as well as to introduce and develop new concepts.

OKU Timur is a district in South Sumatra that is part of the OKU district. The region is one of South Sumatra Province's rice barns. This scenario is aided by well-maintained technological irrigation networks that span a large region. The OKU district's natural environment includes farmland, woodlands, rubber plantations, rice fields, and other gardens (OKU Timur, 2021). The availability of these circumstances has improved the East OKU community's economy and education. Every year, improvements in public education institutions in OKU East occur, beginning with the comprehensive educational facilities and the rising number of schools at all levels. There are 111 SMK, MA, private and public high schools in East OKU Regency, as well as 5 public high schools in Sub Rayon 03, namely Buay Madang Timur State High School, Belitang 1 State High School, Belitang Jaya 1 State High School, Belitang III State High School, and Belitang Madang Raya State High School (OKU Timur, 2021).

The researcher performed the investigation at SMA Negeri Sub Rayon 03, OKU Timur Regency. Researchers conducted research at the above-mentioned school because: 1) it is located in an area with a good internet signal, so learning mathematics with the Geogebra application will run smoothly; 2) it has Good accreditation; 3) learning with Geogebra for mathematics lessons has been implemented; and 4) research on learning management strategies with Geogebra in mathematics has never been implemented. Based on the discussion above, "Learning Management Strategy with Geogebra in Mathematics," it has the potential to be researched in order to provide a discussion on learning management so that learning objectives can be achieved effectively, and the results can change high school mathematics learning.

B. Methods

The goal of this study is to discover how learning management techniques using Geogebra in mathematics might increase students' knowledge. As a result, researchers employ a qualitative strategy in their hunt for qualitative research. The resource person is a math teacher at SMA Negeri Sub Rayon 03 OKU Timur in South Sumatra. In this study, data was gathered through interviews, documentation, and observations. This study's data analysis was done both during and after the data gathering procedure, using observation, documentation, and interviews. The data is subsequently processed by recording, typing, and editing operations, followed by qualitative analysis using words.

C. Results and Discussion

Geogebra is one of several math learning mediums. The contribution of a media will not be seen if it is exploited for reasons other than learning aims. Because learning objectives are indications of media usage, media use should be tailored to the demands of learning (Komsiah, 2012). According to (Sanjaya, 2012), media is classified into three sorts based on its nature: a) Auditive Media, which includes solely sound elements and can only be heard, such as sound recordings and radio. b) Visual media, that is, media that does not contain sound elements and may therefore be seen, such as pictures, slide films, paintings, transparencies, and some printed materials, such as graphic media and others. c) Audio Visual Media, which includes pictures and sound, such as films, sound slides, video recordings, and so on. This medium is superior to the other two since it combines sound and picture components. According to (Sanjaya, 2011), learning media works to: (a) Capture a specific item or event, specifically capturing it with video, film, pictures, audio, film, or video that may later be stored if something is required when needed. (b) Changing particular occurrences, things, or situations.

Teachers can use learning media to give instructional resources that are easily understood. Learning media can also be used to exhibit items that are too huge to show inside due to their size, or to show an object that is too little to view with the naked eye because to its size. Furthermore, learning media can present a process or movement that is too quick and difficult to follow, such as the movement of airplanes, vehicles, animals, and humans, but it can also enhance the pace of movement, such as the movement of human and animal growth. (c) Increase pupils' enthusiasm to learn. Learning media may increase student motivation, making it simpler for pupils to absorb the content being taught.

Learning in schools must be scientifically developed and tailored to independent learning techniques. The goal of carrying out a lesson plan is to minimize practice and concept mistakes, with the expectation that learning objectives will be met and students will fully comprehend the content. The usage of proper learning media can result in improved mathematics learning since the media acts as an intermediary to boost knowledge of mathematical topics (Soedjadi, 2001).

According to research done with informants, primarily mathematics instructors at SMA Negeri Sub Rayon 03, OKU East Regency, South Sumatra, not all teachers employed Geogebra learning. The use of unvarying and unsuitable media reduces the quality of learning, which has an influence on students' poor activity in grasping mathematical ideas as well as student learning outcomes (Soedjadi, 2001).

The goal of this study is to improve students' understanding of mathematics using Geogebra. It measures teachers' knowledge and skills in compiling and implementing learning using Geogebra, and student activities during learning using Geogebra. The students' understanding of mathematical concepts, and quality learning using Geogebra is measured by the level of student understanding, and identifying obstacles that arise when implementing learning management systems. To improve mathematics knowledge, the researchers explained learning media with Geogebra to mathematics instructors at SMA Negeri Sub Rayon 03, OKU Timur Regency, South Sumatra. Some of the actions that must be taken in this study are as follows:

1. Geogebra is a Learning Management Technique in Mathematics

Several things must be done by the instructor in order for students to be interested in learning mathematics, namely: (1) the information taught must be suited to the world of students, such as offering education about SPL 3 variables utilizing questions in the form of tales. Students can help themselves by purchasing books, pens, and pencils from bookshops. (2) Making learning simple, for example, by explaining how to graph functions, quadratic functions, linear functions, irrational functions, and rational functions. (3) Directly using visual aids throughout the mathematics learning process, such as by carrying out an exercise that students can witness. (4) Learning may be done indirectly by supplying a picture or photo, and you can also utilize Geogebra in learning using a computer to stimulate student involvement.

The plan must be directed by numerous factors, including (1) deepening the substance of the lessons. (2) the learning level, kind, and purpose. (3) Teacher competence and credentials. (4) the pupils' health, motivation, and history. (5) expenses and facilities utilized (6 schedule and duration).

2. The Role of Instructors and Students in Geogebra Learning Management Techniques in Mathematics

If mathematics instructors at SMA Negeri Sub Rayon 03 OKU Timur in South Sumatra wish to carry out teaching and learning activities, they must first prepare learning resources. Mathematics teachers develop learning aids such as yearly and semester programs, syllabus, assessment lists, answer cards and questions, and lesson plans. Learning planning in schools can be seen in the teacher's readiness to give lessons; it is a learning management strategy that must be carried out by the teacher, namely preparing subject matter that is related to the learning process in class, such as lessons to be discussed in class, textbooks, and other learning methods. Learn how to instruct.

The mathematics instructor at SMA Negeri Sub Rayon 03 OKU Timur in South Sumatra planned in compliance with the provisions of Indonesian teaching and learning activities. However, based on the findings of the interviews, the answer was that a plan that had not been carried out was in learning tools that used Geogebra. In response to the question, "Have you ever used Geogebra in your learning tools?" There were four "never" respondents and two "never" respondents. In addition to setting the learning model, Geogebra's use must be connected with learning tools so that it may be utilized as a support for accomplishing learning objectives. This learning gadget informs students and teachers about the time and purpose for which the software will be used in teaching and learning activities. Teachers will carry out their primary responsibility of teaching to the best of their ability. The instructor is entirely

accountable for educating children in order to mold their personalities and accomplish the intended learning results.

Students will be able to apply their newly acquired knowledge in the community or at home in this manner. Learning outcomes are determined by the quality of a teacher and the skills of students in learning activities. As a result, in order to achieve the highest level of learning quality, a teacher must pay close attention to instructions and lesson planning. Teachers must be able to overcome student differences, encourage, educate, and lead students, as well as identify books or educational material that students can study, such as Geogebra while learning mathematics.

3. Obstacles Faced in Applying Learning Management Systems in Mathematics Using Geogebra

On the inquiry, "Are there any challenges in managing the class, sir/madam?" "Yes," all of the informants said. Classroom management and teaching management are two activities that are quite similar but may and should be differentiated since their goals are distinct.

A teacher in the field of study who manages the teaching and learning process must be able to develop, pay attention to, and restore suitable teaching and learning circumstances. If difficulties arise throughout the learning process that interfere with the current learning process, the learning climate is returned. Students have the chance to gain the most advantage from their activities thanks to the efforts of their teachers. The acts or activities performed by the teacher do not beyond the scope of his function as a subject teacher and are distinct from those performed by the homeroom teacher and guidance and counseling teacher. The teacher's activities include arranging student seats, fostering students, giving praise and prizes (goods) to students who complete assignments correctly and on time, reprimanding students who disturb their neighbors, reconciling students who fight during class hours, and reporting violations of the rules by students to the homeroom teacher, school, and students' parents.

D. Conclusion

Mathematics instructors at SMA Negeri Sub Rayon 03 OKU Timur, South Sumatra, use an excellent learning management technique utilizing Geogebra. Mathematics instructors at SMA Negeri Sub Rayon 03 OKU Timur in South Sumatra have begun to experiment with using technology-based learning resources in the classroom. Mathematics instructors at SMA Negeri Sub Rayon 03 OKU Timur South Sumatra have an active part in learning management practices utilizing Geogebra. Students from SMA Negeri Sub Rayon 03 OKU Timur South Sumatra played an important part in the learning management approach using Geogebra, expressing their enthusiasm for learning mathematics with Geogebra. The challenges that mathematics teachers at SMA Negeri 03 OKU East Sumatra, South Sumatra face in implementing learning management with Geogebra include mathematics teachers at SMA Negeri 03 OKU East Sumatra, South Sumatra, who continue to struggle with exploring the use of Geogebra as a learning medium in each learning material. Mathematics instructors at SMA Negeri Sub Rayon 03 OKU Timur, South Sumatra, must study individually to improve their abilities in utilizing Geogebra as a learning medium in mathematics.

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