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Improving Mastery of Concepts by Implementing The MOGE Model

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Abstract:- This research has a purpose to produce a model that can enhance students' mastery of concepts. The model implementation was carried out in Ronas Middle School, Ronas MTs, and Kemlagi 1 Middle School with one group pretest-posttest design. Data collection using observation methods, concept mastery tests, documentation, and questionnaires. The data analysis technique used is descriptive quantitative and qualitative. The results of the study indicate that students have mastery learning outcomes of 100%. Based on the results of the study it can be concluded that there is an effect of the implementation of the MOGE model on the mastery of student concepts.

Keywords:- *MOGE Model, Student Concept Mastery.*

I. INTRODUCTION

Science is one of the subjects in school that prepares students to understand themselves and their environment, through scientific attitudes, thinking skills, and mastery of concepts and use them in solving problems in their environment [4]. The problem solving skills that students must possess require good mastery of concepts.

One way to optimize the learning process that can encourage active students is to change the learning paradigm, from teacher-centered learning to student-centered learning. This can be seen from the process of learning activities where students hold high responsibility for their own learning. The learning is said to have occurred if there are behavioral changes that are the result of an independent learning process experience [3].

Learning activities can run well, if students learn with strategies or ways that can help them optimize their learning activities. Learning model refers to the behavior and processes that students use on the subject, wherein, the model can Provide value for students [1]. Learning models that can provide.

Students include: 1) models that can provide opportunities for students to apply the way of thinking and learning that is most suitable for students, 2) the learning model used must be in accordance with the learning objectives and characteristics of students.

The reality at school shows that teachers often use learning models that cannot activate students. The dominant teaching methods used by teachers in schools are lectures (70%), discussions (10%), and experiments (10%) [9]. Tsaniyah stated that many teachers have not used a learning model that is fun and stimulates students' curiosity [13]. Vygotsky stated that students' intellectual abilities will develop if faced with confusing new experiences, and when students try to overcome problems caused by experiences [14]. Therefore teachers must often use learning models that can activate students.

Science is one of the difficult, boring, and frightening subjects of students [5]. The teacher must be able to develop the potential of students to create a deep understanding of concepts. Teaching science is not enough to only educate but must include the learning process and how the process of obtaining concepts and applying them in everyday life.

An important problem that must be resolved immediately is how to build understanding and empower thinking skills. One of the goals in learning is to understand the concepts in the subject [8]. MOGE learning model is a learning model developed based on games to be able to create a comfortable and pleasant learning atmosphere. The implementation of the MOGE model is expected to be able to bring students into enjoyable learning situations and be able to provide opportunities for students to understand physics material well and learn according to their learning styles.

II. METHOD

This research is a development study using educational research design. Model development refers to the design of research development models according to the Wademan [2]. The stages of design development include 5 steps, namely: 1) 1) problem identification, 2) identification of tentative products and design principles, 3) tentative products and theories, 4) prototyping and assessment of preliminary products and theories, and 5) problem resolution and advancing theory. The MOGE model was implemented in 246 class VIII students of SMP / MTs in Mojokerto Regency, namely SMPN 1 Kemlagi, SMP Ronas, and MTs Ronas. The obtained sata were analyzed using the descriptive quantitative method. The selection of research samples is based on school groups, namely the upper group, middle group, and lower group. Grouping research samples based on student input, school report cards and results of school accreditation.

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III. RESULTS & DISCUSSION

A. *The Results of the MOGE Model Validation*

Validation of the MOGE model developed was carried out by experts in a discussion forum called the Focus Group Discussion (FGD). FGD is a small group discussion where participants respond to a series of questions focused on one topic. Based on the results of the FGD obtained the results of the content validity and construct validity of the MOGE model. The results of the content validity of the MOGE model can be seen in Table 1, while the results of the construct validity of the MOGE model can be seen in Table 2.

No	Aspek Penilaian	Modus Skor Validasi	Kariteria	Koefisien Realibilitas (%)	Reliabilitas
1	Rasional Pengembangam model pembelajaran moge	4	Sangat Valid	86	Reliabel
2	Pengetahuan mutakir	4	Sangat Valid	86	Reliabel
3	Dukungan teoritik dan empiric model pembelajaram Moge	3	Valid	100	Reliabel
4	Deskripsi model pembelajaram Moge	3	Valid	100	Reliabel
5	Lingkugam belajar dan pengelolaan kelas	4	Sangat Valid	100	Reliabel

Table 1:- Validitas Isi Model Moge

No	Aspek Penilaian	Modus Rerata Skor Validasi	Kariteria	Koefisien Realibilitas (%)	Reliabilitas
1	Rasional model pembelajaran moge	4	Sangat Valid	86	Reliabel
2	Dukungan teoritik dan empiric model pembelajaram Moge	4	Sangat Valid	100	Reliabel
3	Sintaks	3	Valid	100	Reliabel
4	Sistem social	4	Sangat Valid	100	Reliabel
5	Prinsip reaksi	3	Valid	100	Reliabel
6	Sistem pendukung	3	Valid	100	Reliabel
7	Dampak instruksional dan dampak pengiring	3	Valid	100	Reliabel

Table 2:- Validitas Konstruk Model Moge

Based on Tables 1 and 2 it can be shown that the results of the content validity and the construct of the model are valid, where the Percentage of agreement shows consistency among experts in expressing the validity of the MOGE model ≥ 75%. This shows that the learning model developed has a strong theoretical foundation and components of the learning model with high consistency, so that it can be implemented to improve students' concept mastery.

B. *The Results of Mastery of Student Concepts*

Concept mastery has indicators of mastery of cognitive domain concepts based on Bloom's taxonomy including: C1 (remembering), C2 (understanding), C3 (applying), C4 (analyzing), C5 (evaluating), and C6 (creating). The effect of the implementation of the MOGE model on the mastery of the concept of pressure is seen using N-gain.

Penguasa an Konsep	SMP Ronas			MTs Ronas			SMPN 1 Kemlagi		
	A	B	C	A	B	C	A	B	C
Pre-test	43	39	42	35	40	38	38	36	39
Post-test	84	84	83	83	82	82	86	86	87
n-gain	0,74	0,74	0,7	0,74	0,7	0,71	0,77	0,79	0,78

Table 3:- N-gain Tes Penguasaan Konsep Model MOGE

Table 3 shows that the average n-gain in each class are: Ronas Middle School class VIIIA (0.74), Class VIIIB (0.74), Class VIIIC (0.7), in Ronas MTs class VIIIA (0.74), class VIIIB (0.7), class VIIIC (0.71), while in SMP 1 Kemlagi class VIIIA (0.77), class VIIIB (0.79), class VIIIC (0.78). Average n- the gain in each class is in the high category, meaning that there is an influence of the application of the MOGE model to the improvement of students' mastery of physics concepts in the material Pressure. Increased mastery of students' physics concepts can be more clearly shown in figure 1.

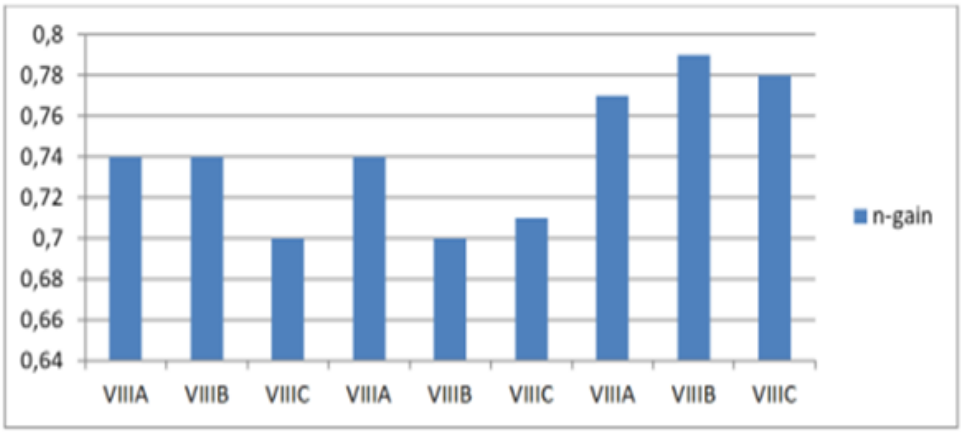

Fig 1:- N-gain Mastery Test MOGE Model Concept

Based on the analysis of the data above shows the mastery of student concepts increases after the learning process with the MOGE model with a high category. This illustrates that the application of the MOGE model has an impact on mastering student concepts.

IV. DISCUSSION OF FINDINGS

A. MOGE Model Validation

The results of the validation of the MOGE model that have been developed have met the validity in content as shown in Table 1. The novelty of the MOGE model was built to correct the weaknesses in the PBL model and the TGT type Cooperative model based on the recommendations of previous researchers. The novelty of the MOGE model compared to the PBL model in practicing creative thinking skills is located in phase 2, namely games. One weakness of the PBL model is that students feel pressured in learning, especially for students whose initial knowledge is not good. The second syntax of the MOGE model is games that reduce the feelings of students who are depressed, because in games all students feel the same and in carrying out learning students will feel comfortable. Feelings of comfort felt by students will increase students' ability to improve their mastery of concepts. Play activities designed in phase 2 encourage students to be directly involved in eliciting creative ideas in solving problems given and relating to the real world. This will encourage students to improve their creative thinking skills and to master their concepts [6]. The stages / syntax of the MOGE model are as follows:

- **Phase 1: Motivation and Orientation Problem**, in this phase students are given a phenomenon in the form of problems related to their daily lives. The activity in phase 1 has been able to arouse their motivation which is marked by an increase in students' curiosity about the material to be studied so as to require students to express their creative ideas and facilitate students in understanding a concept [16]. Increased student curiosity is one of the characteristics of creative students [10].
- **Phase 2: Games Tournament**, which in this phase is divided into three games, namely basic games, intermediate games, and advanced games.

The basic game in phase 2 asks students to compete in providing creative ideas in solving problems related to daily life that have been prepared by the teacher. In this game students get a score from the results of the game that has been done. Students are also asked to evaluate the creative ideas that have been given. Students in groups compete with each other to bring out as many creative ideas as they have. The game can motivate students and make learning comfortable and interesting, so that children become more flexible in thinking and creative performance of students can be improved [11].

The second game from phase 2 is an intermediate game. In this game student will compete with each other in issuing as many ways as possible to prove their creative ideas in the basic game by choosing the right tools that have been provided. Students in groups will get a score from the method presented and also the selection of tools that have been done. Students are also required to evaluate the methods and tools that have been selected in the intermediate game. Intermediate games can encourage cognitive development and affective processes that are needed for students' creative performance. Investigations conducted by students in proving their ideas can improve students understanding of concepts, because students can find concepts that they have learned.

The third game of phase 2 is the advanced game. Students are asked to make a product based on the concepts they have. In this game student get scores based on products that have been made and the suitability of the concepts used in making products. This game has been able to increase students' imagination so that they are able to make original products by elaborating on existing concepts. Creative students are able to solve problems and produce a product that is new and has value.

- **Phase 3: Evaluation and Awarding**, students are required to conduct an evaluation of every challenge that has been done. Evaluations conducted by students are able to improve students' mastery of the concepts of physics material learned so that students are able to make products by elaborating concepts they have mastered. Giving awards to the group with the most scores has a

positive impact on students, so students will tend to repeat the activity.

B. Mastery of Student Concepts

The effectiveness of the MOGE model can be seen from the increase in student learning outcomes towards the mastery of student concepts. The impact of the implementation of the MOGE model in the learning process on the improvement of students' concepts is done by analyzing the n-gain of the pre-test and post-test scores. Data on the learning outcomes of students 'concept mastery based on Table 3 can be shown that the implementation of the MOGE model has an impact on improving student concept mastery learning outcomes as evidenced by the results of the average n-gain analysis of each class at SMP RONAS, SMP 1 Kemlagi, and MTs Roudlotun Nasyi' in is with the high category.

The first syntax of the MOGE model is providing motivation and problem orientation. Motivation to students in the form of giving a problem or phenomenon has an impact on increasing mastery of student concepts. Provision of problems will have an impact on student interest to solve them and arouse students' curiosity. Curiosity is needed to obtain the relationship of concepts that have been held with new concepts to be learned. The existence of motivation and curiosity will facilitate students in developing and understanding a concept, because the provision of motivation is one of the factors that determine the success and failure of a learning [7].

The second syntax of the MOGE model, the games tournament, has also had an impact on increasing student mastery of concepts. This is evidenced by the existence of n-gain as shown in Table 3. The game tournament phases of students conducting experiments to prove the ideas that have been given in the basic game. Experimental activities are able to make students learn on their own and better understand lessons and positive attitudes towards science.

The third syntax in the MOGE model is evaluation where students are asked to evaluate all the results of the game that has been done. Evaluation activities carried out by students can make students understand the truth and mistakes of what has been done, so as to increase student understanding of a topic being studied. Evaluation is an important component carried out by students from a process of inquiry and problem solving [1].

MOGE learning model is one of the effective learning models, because students are active in the learning process and the teacher acts as a facilitator. The application of the MOGE learning model in class based on table 3 has had an impact on increasing students' understanding of concepts. One way to make it easier for students to understand concepts is by applying effective learning models. Students who have creative thinking skills will easily understand the concepts of learning.

Based on the completeness of the minimum criteria (KKM) at Ronas Middle School, MTs Ronas, and SMPN 1 Kenlagi, each of 70, 70, and 75, then the completeness of student teaching bell can be achieved 100%. The mastery of learning outcomes achieved by student shows that the application of the MOGE model has an impact on the mastery of student concepts which ultimately affects the achievement of student learning outcomes. Increasing students' creative thinking skills will facilitate students in understanding a concept [18]. Experimental activities to prove ideas in the games tournament phase (intermediate games) can improve student learning independently and easier to understand a lesson [17].

V. CONCLUSION

Integrating games in the MOGE model is effective in increasing students' mastery of concepts. The implementation of the MOGE model has a significant impact on the difference between the pre-test and post-test scores obtained by students.

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