

Self-Regulated Learning of Junior High School Students through Blended Learning based on Indonesian Realistic Mathematics Education Approach

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ABSTRACT

This research is a descriptive study with mixed methods that describe students' self-regulated learning through blended learning based on the PMRI approach. In this study, a pretest and posttest were conducted in the form questionnaire to know the category of student self-regulated learning. The research subjects in this study were 35 students of SMP Negeri 40 Palembang in class VII.11. The research phase procedure consists of three stages: the preparation stage, the implementation stage, and the data analysis stage. Data collection techniques in this study were questionnaires, observations, and interviews. Questionnaire data were analyzed using a Likert scale. At the same time, observation and interview data would be analyzed qualitatively by describing the emergence of indicators of self-regulated learning. The study results indicate that blended learning based on the Indonesian Realistic Mathematics Education (PMRI) approach has contributed to students' self-regulated learning, with the average student being categorized as good. The percentage increase when students studied through PMRI-based blended learning. This indicator Showing activeness in learning has increased by 7.69%. Manage mind by themself indicator rose 1.72%. The indicator of managing behavior by themself rose by 3.12%. Indicators that prioritize a responsible attitude rose by 5.81%. Furthermore, the indicator of manages everything by themself by 3.43%. This shows that blended learning based on the PMRI approach has a role in student self-regulated learning.

Keywords: *Self-Regulated Learning, Blended Learning, PMRI*

1. INTRODUCTION

Curriculum 2013 in Permendikbud No.22 of 2016 is centered on students who are required to gain knowledge through self-regulated learning, not depending on educators or others. In the process of learning mathematics, the role of students is not only to receive knowledge from educators but also to seek knowledge independently. Self-regulated learning does not bind students to others at the metacognitive, behavioral, and motivational levels in learning, having responsibility, and controlling themselves, which is carried out consciously with no coercion from others [1]. Self-regulated learning for students aims to have a sense of self-discipline and develop a willingness to learn on their initiative [2]. Students who have high self-regulated learning tend to overcome their obstacles when the teaching and learning process is ongoing [3]. In addition, students' self-regulated learning is a factor that

causes the low learning outcomes of students, the more self-regulated, the higher the learning outcomes [4]. Therefore, self-regulated learning is an effective domain that students must own.

Facts on the ground at SMPN 02 Air Hitam, many students have low self-regulated learning in mathematics. This is indicated by the results of the questionnaire, which states that students still depend on their friends to complete math assignments, that the tasks given are difficult to achieve, and in the end the atmosphere provided in the classroom becomes tense, so they are reluctant to study because of students' wrong prejudices against mathematics. [5]. Another fact at SMPN 15 Yogyakarta is that students prefer to be silent when learning takes place, are not good at working independently, always get encouragement from educators, and are happier if there are empty lessons hours. Several factors cause student self-regulated learning not to develop, namely students who grow up in an environment

that do not train students to learn, students who learn to be apathetic in learning, students who lack focus in learning, and students who experience mood disorders. [7]. Therefore, we need a learning model that can help students learn with an approach that makes them develop self-regulated habits in learning.

At this time, the COVID-19 pandemic has had a significant impact on the world of education. To suppress the spread of the Covid-19 virus, the Minister of Education and Culture of the Republic of Indonesia, through Circular Letter Number 4 of 2020 decided, the teaching and learning process must be carried out from home. Advanced Circular Letter Number 4 of 2020 based on Ministerial Decree Number 4 concerning Guidelines for Implementation of Learning for the 2020/2021 Academic Year during the covid-19 pandemic stated that learning could be carried out face-to-face but with permission from the Principal, local government, permission from students' parents, is an area with a yellow zone and a green zone and will continue to apply health protocols from January 2021. So based on this statement proves the need for a learning model that can combine online learning, offline learning, and face-to-face learning directly.

One of the effective learning models used during this pandemic is blended learning [8]. Blended learning is described as a learning model that combines face-to-face learning and online learning [9]. In blended learning, there are two learning systems, namely asynchronous and synchronous. Synchronous learning activities have two types of learning, namely: 1. Direct synchronous learning is carried out face-to-face directly at the same time and place; and 2. Synchronous virtual learning is carried out with face-to-face virtual directly at the same time, but in different places [10]. While asynchronous learning activities are learning that is carried out indirectly with other places and times. With this learning model, students are expected to meet face-to-face with their friends and educators through applications from electronic media. And can also meet face to face in class without electronic media. So we can say that this learning model can directly combine online learning, online learning, and face-to-face learning.

In the application to the classroom, blended learning has a significant impact in increasing students' self-regulated learning. This statement also applies in the field of mathematics. According to research conducted by Yanto and Retnawati, when blended learning is used in learning mathematics in the classroom, students' self-regulated learning can increase, this is because this learning model allows students to learn independently with online facilities provided by the model [12]. The implementation of blended learning can train students' self-regulated learning [13]. In addition, based on research conducted by Tsaniyah and colleagues compared to conventional learning, blended

learning is considered more capable of improving students with high self-regulated learning [14].

In achieving learning objectives, of course, it will not be separated from the learning approach [15]. Mathematics can be understood by students well using realistic utilization and students' familiar environment [16]. One approach that uses realistic utilization and the familiar environment of students is the Indonesian Realistic Mathematics Education (PMRI) approach. The 2013 PMRI curriculum is the recommended approach to educators because by using this approach, learning will be more meaningful if it uses a realistic context [17]. Based on Rifky's research, to increase self-regulated learning, it is necessary to provide a strategy in learning by providing a realistic context so that students understand it more efficiently and are excited to learn it [18]. In PMRI, the use of context is an essential aspect to use. The use of a familiar context in learning can make students challenged and interested in education, for example the use of context in a problem, students will be challenged and interesting in finding a solution to the problem of the problem, thus ultimately causing students to want to learn. study [19-21]. Based on research that has been done by Aeni and Sugiman, in terms of the effectiveness of achieving and increasing self-regulated learning, PMR can make students increase self-regulated learning, we can see from the high score of the effectiveness of achieving self-regulated learning which is above the average of 87.625 out of 84, and the average score of the effectiveness of increasing self-regulated learning is increasing from the indicators assessed on self-regulated learning [15]. It can be concluded that in addition to helping students understand mathematical concepts, PMR is also an approach that can assist students in increasing self-regulated learning by utilizing realistic conditions and the familiar environment of students.

In previous studies, many studies related to blended learning and self-regulated learning. Such as the research entitled "Building student self-regulated learning through blended learning during the covid-19 pandemic," which in this study resulted in the conclusion that blended learning is effective in increasing self-regulated learning [22]. In addition, there are also studies related to self-regulated learning and PMRI, such as a study entitled "Improving reasoning abilities and self-regulated learning mathematics through Indonesian Realistic Mathematics Education (PMRI) for junior high school students," which assesses students' mathematical learning abilities and self-regulated learning through the PMRI approach which results in the conclusion that PMRI improves the reasoning ability and self-regulated learning of mathematics learning of students who study with the PMRI approach better than those who do not use this approach [23]. However, researchers have not found research related to self-regulated learning through blended learning based on the Indonesian Realistic

Mathematics Education approach. Thus, researchers are interested in researching " Self-Regulated Learning of Junior High School Students Through *Blended Learning* Based on Indonesian Realistic Mathematics Education Approach."

2. METHODS

This research is a descriptive study with mixed methods that aims to describe the self-regulated learning of class VII students in algebraic form through blended learning based on the Indonesian Realistic Mathematics Education approach. The subjects of this study were students of class VII.11 SMP Negeri 40 Palembang in the

academic year 2021/2022, totaling 35 students. This research was conducted from August 2021 to September 2021 with four meetings.

Data collection techniques used in this study were questionnaires, observations, and interviews. The observation sheet is used to make observations on the implementation of blended learning and PMRI. Interviews were conducted to complete the observation data and questionnaire data. Data from observations of classes and interviews will be analyzed by looking at the emergence of indicators from blended learning. As for the indicators and descriptors of the learning independence of students are as follows:

Table 1. The indicators and descriptors of the self-regulated learning of students

No.	Indicators	Descriptors
1.	Showing activeness in learning	Students contribute to activities group
		Students come to class on time
		Students try to express their opinion
		Students are encouraged to move forward on the initiative alone
2.	Manage mind by themself	Students use other learning resources to increase knowledge.
		Students have a schedule for learning mathematics.
		Students have the courage to ask questions.
		Students dare to express opinions.
3.	Manage behavior by themself	Students study the material before learning begins
		Students strengthen the material which he had studied
		Students try to complete tasks that given
		Students try to find information
		Students are disciplined in learning
4.	Prioritizing responsible attitudes	Student interest in learning
		Students learn on their own accord.
		Students work on assignments.
		Students pay full attention to learning.
5.	Manage everything yourself	Students are always serious in carry out a task.
		Students can adapt themselves in any conditions for learning
		Students prepare their own school equipment
		Students add insight by training themselves

The student self-regulated learning questionnaire results were analyzed descriptively quantitatively with the help of a Likert scale with the following five categories.

Table 2. Category of Self-Regulated Learning of Students

Average Score	category
$X > 4,2$	Very good
$3,4 < X \leq 4,2$	Good
$2,6 < X \leq 3,4$	Enough Good
$1,8 < X \leq 2,6$	Not good

$X \leq 1,8$	Very not good
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Based on the table above, the percentage obtained is as follows:

Table 3. Percentage of self-regulated learning of students

Percentage	Category
$X > 84\%$	Very good
$68\% < X \leq 84\%$	Good
$52\% < X \leq 68\%$	Enough Good
$36\% < X \leq 52\%$	Not good
$X \leq 36\%$	Very not good

3. RESULTS AND DISCUSSION

This research was conducted in four meetings. The first meeting was held through one of the face-to-face applications, namely Zoom Meetings. At this meeting, a pretest was conducted in the form of a self-regulated questionnaire to see the level of self-regulated learning before carrying out blended learning based on the PMRI approach.

The second meeting at a previously scheduled asynchronous time is conducted via the Google Classroom app. In this lesson, students learn about the multiplication of algebraic forms through teaching materials and learning videos, and discussions on the Google Classroom discussion forum. Then, students do synchronous learning through face-to-face virtual applications, zoom meetings. Students are directed to student's worksheet related to multiplication operations of algebraic forms to deepen students' knowledge. This meeting, which also carried out post-scheduled asynchronous activities by giving assignments through Google Classroom.

who conducted the third meeting at the pre-scheduled asynchronous time through Google Classroom. This meeting was held to study dividing algebraic forms through teaching materials and learning videos and discussions in the Google Classroom discussion forum. In contrast to the previous two meetings, the third meeting was held directly in class during limited synchronous learning to complete student's worksheet related to the operation of dividing algebraic forms. Then, at this meeting, what also carried out post-scheduled asynchronous learning to continue the work on student's worksheet that had not been completed in synchronous learning and gave assignments collected in Google Classroom.

Finally, at the fourth meeting, a posttest was conducted in the form of a self-regulated learning questionnaire after completing the PMRI-based blended learning through virtual zoom meetings. This questionnaire aims to see the level of student self-regulated learning after carrying out blended learning based on the PMRI approach.

At the second and third meetings, the researcher asked the observer for help to see and observe the implementation of blended learning based on the PMRI approach. This observation was made based on the characteristics of blended learning and the characteristics

of the PMRI approach. At the second meeting, most of the students were active and enthusiastic in participating in asynchronous learning. However, in synchronous learning, students have difficulty in conducting discussions with their groups. This is because students experience signal interference. As a result, the information that students must have is incomplete. In addition, they are also still awkward with their group mates because they have never had a face-to-face or virtual experience, and it is difficult to understand the problems given to the student's worksheet. At the third meeting, students showed that they could do asynchronous learning well. Then, unlike the previous meeting, almost all problems faced by students were resolved at this meeting. Because synchronous learning is done directly, students can more easily understand the issues given. It's just that there are still groups of students who are less active in group activities because they still feel awkward with their group mates.

Based on the data obtained, students' self-regulated learning towards learning through blended learning based on the PMRI approach is good. This is evidenced by the results of student questionnaires during the pretest and posttest obtained from 35 students. At the pretest, students who were categorized as very good were 0 students with a percentage of 0%, while at the posttest, students who were categorized as very good were 2 students with a percentage of 5.71%. At the pretest, students who were categorized as good were 19 students with a presentation of 54.29%, while at the posttest, students who were categorized as good were 23 students with a percentage of 65.71%. At the pretest, the students who were categorized as good enough amounted to 16 students with a presentation of 45.71%, while at the posttest, the students who were categorized as good enough amounted to 10 students with a percentage of 28.57%. From these results, it is stated that, in general, the self-regulated learning of students through blended learning based on the PMRI approach is good. This is in line with the results of research conducted by Izzati that the PMR approach has a more significant effect than ordinary learning for self-regulated learning and the results of research from Diana that blended learning can make students' self-regulated learning in a positive direction [24,25].

Following are the results of the data analysis of the self-regulated learning questionnaire, which shows the average and the percentage of answers from the pretest and posttest for each indicator.

Table 4. Data on Student self-regulated Learning Response Results

No.	Indicators	Time Frame	Average	Percentage (%)	Criteria
1.	Showing activeness in learning	Pretest	3,12	62,41	Good Enough
		Posttest	3,50	70,10	Good
2.	Manage mind by themselves	Pretest	3,45	68,91	Good
		Posttest	3,53	70,63	Good

3.	Manage behavior by themselves	Pretest	3,73	74,51	Good
		Posttest	3,88	77,63	Good
4.	Prioritizing responsible attitude	Pretest	3,15	63,05	Good Enough
		Posttest	3,44	68,86	Good
5.	Manage everything by themself	Pretest	3,57	71,33	Good
		Posttest	3,74	74,76	Good

Each indicator shows that students are still self-regulated learning is not categorized as good through blended learning based on the PMRI approach. However, each indicator in table 3 experienced a percentage increase when students studied through PMRI-based blended learning. This indicator Showing activeness in learning has increased by 7.69%. Manage mind by themself indicator rose 1.72%. The indicator of managing behavior by themself rose by 3.12%. Indicators that prioritize a responsible attitude rose by 5.81%. Furthermore, the indicator of manages everything by themself by 3.43%. This shows that blended learning based on the PMRI approach has a role in student self-regulated learning.

1. Showing activeness in learning

Based on the questionnaire results related to indicators showing activeness in learning through PMRI-based blended learning, it showed that students were categorized as "Good." In this indicator, there are 3 participants included in the very good category with a percentage of 8.57%, 16 participants included in the good category with a percentage of 45.71%, and 16 participants included in the enough good category with a percentage of 45.71%. This shows that learning through PMRI-based blended learning can make students active in learning.

Students show activeness in learning by contributing to the group. Students stated that learning with the discussion method with other students under the teacher's guidance made it easier to exchange ideas. This is supported by the observation data obtained. During the group discussion process, students exchanged views by asking each other and giving opinions, and some volunteered to help their friends understand the problems presented. In line with the statement of Rahmi et al. that students' learning independence can also arise from cooperating with other people [26]. By familiarizing students to exchange ideas, they can also train them to express views or opinions verbally and make students respect the opinions given by others [27]. In addition, learning with discussion can make students understand the contents of the debate in a structured manner. This learning also makes it easier for students to understand the math topic studied because it provides learning videos and teaching materials. According to Tasmalina & Prabowo, given video learning, students tend to improve their learning outcomes [28]. In addition, based on interviews with students, synchronous learning can make it easier for students to understand the

math topics being studied because they are given questions to deepen the knowledge they get in asynchronous learning.

Based on the study results, students showed active learning when they had the urge to answer questions from the educator, voluntarily presenting their answers and discussion results. Based on the observations, they will take the initiative to answer questions when educators ask questions. In line with this, Hanapiati stated, using the PMRI approach, students will be more active to encourage themselves in presenting the results of their work and conclude the results of the joint discussion [29]. Students who have the initiative in answering questions from educators are self-motivated. They know the possibility of being judged by the educator, motivated by students because they are afraid that the teacher will be angry if they are not answered, and understand that this is a learning process.

Furthermore, based on observations, students took the initiative to conclude the results of the discussion. Because concluding the results of the discussion will make students understand the material being studied. Some students have the initiative because they are confident in answers they have. In contrast, some others do not have the initiative to conclude the discussion results because students are afraid of making the wrong conclusions. Based on observations at the second and third meetings, the number of students who took the initiative to present the results of discussions without being appointed by the teacher increased. It is based on students' confidence that their answers are correct because they can reconstruct their knowledge from the discussion. Through learning with blended learning, students can comfortably construct their knowledge [30]. Meanwhile, there are still students who are not sure about the results of their work because the group is not actively discussing.

However, there are inhibiting factors within students in carrying out synchronous learning. For example, students still feel embarrassed to interact with their friends and not focus on other subjects. In addition to inhibiting factors from within students, there are also inhibiting factors from outside students, namely signals. A lousy signal causes students not to connect well with other students. Amalia and Fatonah also revealed that students experienced many problems with signal because the student's house is an area that is less covered by the signal [31].

2. Manage mind by themself

Based on the questionnaire results related to indicators of managing mind by themself through PMRI-based blended learning, it shows that students are categorized as "Good." In this indicator, there are 2 students included in the very good category with a percentage of 5.71%, 23 students had a good class with a ratio of 65.71%, and 10 students included in enough good category with a rate of 28.57 %.

Based on interviews related to other learning resources that students have to increase their knowledge, it is stated that learning resources are not only sufficient from teaching materials and learning videos provided by educators through Google Classroom. Students tend to increase their knowledge by looking for other learning resources outside the learning resources provided by researchers because they feel less satisfied if they only have learning resources from educators. Learning resources that students usually use are textbooks provided by schools, the internet, and students' parents. This is in line with the statement. Kusumaningrum, independent learning of students can emerge with educators and students parents [23].

Based on the results of interviews related to a mathematics learning schedule owned by students, most students have a mathematics study schedule. The reason is that students can learn before class hours take place and repeat what they have learned. Another use is to understand the subject matter and answer the teacher's questions if asked. However, some students do not have a schedule for learning mathematics but flexible learning outside of class hours. This shows that even though students do not have a study schedule, they can manage their thoughts.

Based on the results of observations on the management of students' minds about their courage to ask questions, students tend to have still to be encouraged by educators. This is because so far, students have never met face to face with other students. Therefore, there is an awkwardness in students to ask their friends or educators. However, some students force themselves to ask their friends because they will not solve the problems given if they do not ask.

Based on the results of observations on the management of students' minds regarding the focus of their learning, it can be seen that students have never done other activities outside of mathematics. This is extraordinary because students are aware that they must pay attention to educators in learning. In addition, students are afraid of being left behind in lessons. However, based on observations of students' focus on indirect face-to-face learning, it appears that students are less focused because of the disruption of bad signals. The students confirmed

this statement. This causes students to experience missing information and causes students not to focus on learning. In addition, face-to-face learning does have considerable potential for external interference. This can be seen in students bullied by their younger siblings while studying. Therefore, students should pay attention to a conducive environment to encourage themselves to maximize themselves to do independent learning because if the environment does not change the conducive situation, students will have difficulty completing the tasks they have [32]. The environment contributes quite a lot to the learning atmosphere [33]. This also applies to asynchronous learning. Others claim that they can focus on learning because asynchronous and synchronous learning complement each other. Asynchronous can be likened to the forerunner of knowledge for students. Through Google Classroom, students are facilitated with teaching materials and learning videos and creativity. Meanwhile, synchronous learning with the PMRI approach complements the knowledge gained from asynchronous learning because synchronous learning explains the subject matter studied asynchronously and understanding by giving problems by educators[34]. Students still do have not good self-confidence because students still feel shy when conducting discussions in class.

Based on the results of observations, students are aware that they have learning objectives at each meeting. This is evidenced when students can answer what math topics were learned at the second and third meetings. Based on the results of interviews, students' beliefs in achieving learning goals through online learning and face-to-face learning cannot be said to be good. The first students believe that they can achieve the learning objectives by learning asynchronously, synchronously, and PMRI learning stages. The reason is that students have a high sense of trust in carrying out learning and have full support from parents so that students have a high enthusiasm for learning. He stated that the PMRI-based blended learning model could help him learn mathematics and understand the subject matter. The second student is quite sure that he can achieve the objectives of learning mathematics with the learning that has been carried out because he has an effort to find out answers from discussing with friends and alone. Furthermore, the second student also stated that the PMRI-based blended learning model could help him learn mathematics and understand the subject matter. Because using the PMRI stage can help him understand learning because the stages in the student's worksheet are pretty easy for students to understand. However, according to him, learning that is carried out face-to-face directly has little time, so students think that face-to-face learning is more efficient to do. The third student stated that he was not sure that with asynchronous and synchronous discussion, students could achieve the learning objectives. This happens because students often experience

connection problems when using the Zoom Meeting virtual face-to-face application. As a result, students experience losses in the form of a lack of student understanding of the subject matter. However, from these answers, students said that synchronous learning that was carried out directly could make them able to understand the learning material because they were given material, questions, and examples of questions. Furthermore, students stated that the PMRI-based blended learning model did not help them in learning mathematics and understanding the subject matter because students could only understand contextual forms by dividing algebraic forms through tile contexts and constructing them into abstract mathematical forms. However, he had trouble managing abstract shapes. So that it raises the curiosity of students to understand the math topic being studied by finding out for themselves on the internet and asking parents to teach it. In conclusion, blended learning based on the PMRI approach can provoke students' curiosity. As a result, enthusiastic students satisfy their curiosity independently.

Based on the results of interviews, students are more satisfied with finding answers on their own than asking friends for help. Because, if students do their work, the knowledge gained by students will last a long time.

3. Manage behavior by themselves

Based on the questionnaire results related to indicators of managing behavior by themselves through PMRI-based blended learning, it showed that students were categorized as "Good." In this indicator, there are 4 students included in the very good category with a percentage of 11.43%, 22 students had in the good variety with a rate of 62.86%, and 9 students included in enough good category with a ratio of 25.71 %.

Based on the observations, students read teaching materials provided by educators through online applications before the meeting started because many students tried to answer questions from educators. Based on the interview results, this was done so that students could anticipate the situation when asked by educators or friends. Students also strengthen the material they are learning. According to Amadea & ayuningtyas, watching learning video money can make students repeat or recall the material they have learned [35]. Based on the observations, students collect their summary results during asynchronous learning and ask for time to record explanations from educators or other students when comparing answers. That means students do reinforcement by noting essential things. In addition, based on interviews, students also strengthened by re-reading the important points of mathematics topics before learning began. In addition, after learning is carried out, students also claim to learn flexibly using learning videos, teaching materials,

and discussion results that can be accessed on google classroom on the material studied. The management of student behaviour is also seen when students discipline themselves. This can be seen at the time of the interview, and the students stated that they would not only study mathematics if tomorrow there was a math lesson at school. This is reinforced by a flexible learning schedule for at least learning mathematics 1-2 times per week outside of school hours.

Based on the observations, students will tend to ask if they need information. This can be seen from the active participation of students in asking questions that they do not understand in the Google Classroom discussion forum. In line with this, according to Widia et al. Google Classroom can make learners get feedback faster because Google Classroom is easy to use [36]. Furthermore, when students have difficulty understanding or solving contextual problems on students' worksheets, students ask other students. Moreover, if they are both confused, they will ask the educator for instructions.

This indicator also appears when students have an interest in learning. It can be seen when students are given time to discuss independently. Some students guide their friends to understand the problems and solve the problems given. The reason is because of the feeling of pity and the sense of solidarity between friends. It means that students are interested in learning by being involved in discussions. It is in line with research conducted by Arisinta et al., which states that learning independence can also be seen from group discussions using the Realistic Mathematics Education (RME) approach [40]. This is the PMRI approach. In addition, students' interest in learning can also be seen from students' statements that by working in groups in synchronous learning, students feel very fun because when discussing, students can complement each other, and it is more fun to do virtual face-to-face than ordinary learning (only given learning videos and lectures). teaching materials without further explanation from the educator) because they can see their friends. However, students' shortcomings in virtual face-to-face learning feel are a terrible signal. As for the synchronous learning, the third meeting, which was held face-to-face, had no obstacles at all in the teaching and learning process.

4. Prioritizing responsible attitudes

The questionnaire results related to indicators of prioritizing responsible attitudes through PMRI-based blended learning show that students are categorized as "Good." In this indicator, there are 5 students included in very good category with a percentage of 14.29%, 16 students included in the good variety with a rate of 45.71%, 7 students included in enough good class with a ratio of 20%, and 7 students are included in the bad category with a percentage of 20%.

Based on interviews, it can be seen that students learn mathematics on their own accord without any coercion or orders from their parents. Students stated that they knew on their own accord because they had a strong motivation to learn mathematics. Sugianto et al. argue that one of the benchmarks for students' learning independence is learning motivation [37]. The motivation of students to learn mathematics is to pursue their goals, understand and understand the subject matter, and be motivated by seeing their parents who are good at mathematics. This means that students have a solid motivation to learn mathematics.

Based on the results of observations of students, it appears that most students can give full attention to learning by not doing other activities or discussing outside mathematics learning during the teaching and learning process. It is because students prioritize learning mathematics and focus on working on questions. The selection of an appropriate learning model can make students foster feelings of pleasure towards learning, grow and increase motivation in doing, and provide students with ease in understanding the subject matter [39]. Students feel that if they speak or do things unrelated to the learning topic, they cannot answer the questions given so that they do not feel bored and are excited to learn through the blended learning PMRI based learning approach. However, most students also stated that they could not give full attention when learning occurred because of external factors such as signals and other priority activities.

Based on observations of the seriousness of students in doing assignments, it can be seen that students still have a seriousness that is not yet good. This can be seen from students who collect assignments when the allotted time is almost up. There are even students who submit assignments, not on time. Interviews with students show that signals are very influential in learning through blended learning based on the PMRI approach. After being traced, it turns out that students have difficulty collecting assignments on time due to signal interference. In addition, students do not yet have self-awareness and a high sense of responsibility in collecting assignments because they often forget which tasks have not been done because there are many assignments from other subjects.

5. Manage everything yourself

The questionnaire results related to the indicators of managing everything themselves through PMRI-based blended learning show that students have been categorized as "Good." In this indicator, there are 4 students included in the very good category with a percentage of 11.43%, 22 students included in the good category with a percentage of 62.86%, and 9 students included in the fairly good category with a percentage of 25.71 %.

Students stated that they could adjust the conditions in each lesson. From the results of observations, students can

do asynchronous, face-to-face synchronous, and face-to-face synchronous learning. Although the students stated that Google Classroom and Zoom Meeting were new learning support applications for him. Even students need parental assistance to run applications used in this learning, such as when entering zoom meetings and entering Google Classrooms class codes. This is in line with the findings of Banat & Martiani, google classroom makes it easier to write comments, questions, or responses, have a lot of time in accessing videos uploaded on Google Classroom, and easy interaction [38]. However, students are enthusiastic about carrying out learning that is carried out without face-to-face because the facilities in Google Classroom are already qualified and fun to do learning without face-to-face. Some stated that they were not enthusiastic about learning because if they only did learning through Google Classroom, what was learned would be difficult to understand. Therefore, there must be a further explanation from the teacher regarding the math topic being studied so that students can understand the math topic being studied well. On the other hand, students are enthusiastic about face-to-face and virtual learning.

Furthermore, based on researcher interviews related to learning that combines learning via google classroom (asynchronous) and learning using zoom (synchronous), it is fun because it can help him understand knowledge. Through asynchronous learning, students state that they can understand the operation of multiplication and division of algebraic forms because they have facilitated learning videos, teaching materials, and discussion opportunities. Furthermore, they can deepen their understanding of their knowledge from synchronous learning by giving their problems from everyday life that they can solve through discussion.

From the observations, students have the awareness to prepare books, stationery, and mathematics learning equipment during synchronous learning (through zoom meetings and directly in class) and asynchronous learning. Students realize that stationery is needed when there are essential things that must be noted or done and consider that preparing stationery is something they have to do.

Based on the results of interviews, students add insight by training themselves. The way students train themselves is by doing math exercises. The role of blended learning based on the PMRI approach to adding insight is by rereading asynchronous learning discussions and learning from learning videos and teaching materials provided.

4. CONCLUSION

Based on the study results, it can be concluded that the self-regulated learning of class VII.11 students of SMP Negeri 40 Palembang through blended learning based on the PMRI approach is good and has increased. However,

there are still students who cannot be said to be good. This can be seen from comparing students' self-regulated learning in the pretest and posttest questionnaires, where the percentage of students' self-regulated learning in the very good category increased from 0% to 5.71%. In the good category, students increased 54.29% to 65.71%. Meanwhile, students categorized as good enough also experienced a decrease from 45.71% to 28.57%.

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