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# The Development of Social Learning Model Based on Metacognitive Strategies to Foster Mathematics Self-Efficacy of Senior High School Students 9 Makassar, Indonesia

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**ABSTRACT**

The research aims at finding out how the development of social learning model based on metacognitive strategies *or PS MEDIM model* fosters the mathematics self-efficacy of students which is valid, practical, and effective. In order to obtain the valid, practical, and effective model, instruments and learning tools are well developed. The product of this research is a social learning model based on metacognitive strategies that can foster self-efficacy in mathematics. The development is conducted simultaneously. When developing the model, instruments and tools that support learning model of PS MEDIM are also developed. This research is research development (developmental research) which refers to the modification of the development of Tjeerd Plomp model with 4 phases of development. The first phase is a preliminary investigation. The second phase is designing. The third phase is realization. The fourth phase testing, evaluation, and revision. There is also a trial test of PS MEDIM learning model that is conducted in class XI IPA1 and XI IPA2 of SMAN 9 Makassar. There are some results of the research. First, the model, instruments, and the learning tools of PS MEDIM are valid. Second, the model of PS MEDIM is eligible to apply in the classroom. Third, the model of PS MEDIM does not meet the criteria of practicality. It indicates that the components of the model of PS MEDIM has not been implemented as expected and does not meet the criteria of effectiveness. From 4 criteria of effectiveness, there is only one criterion fulfilled. The students' positive response to the learning model of PS MEDIM, and other three criteria have not been met. The classical completeness is not reached. The student's activity has not been as expected. In addition, the teacher's ability for teaching and learning management is still in "medium" category.

**Keywords:** social learning model, metacognitive strategies, mathematics self-efficacy

## INTRODUCTION

Education is something that is fulfilled in order to improve the quality of life. Education should rest on the empowerment of all components of society through its participation in realizing the goals of education are clearly defined in the constitution No. 20 of 2003.

On the bench of school (elementary to high school), the problem that often occurs to the students is not able to demonstrate academic achievement optimally in accordance with its capabilities. One reason is that they often do not believe that they can finish the tasks assigned to them. For the students, this belief is very necessary.

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**State of the literature**

- Borich, (1922) stated that anxiety in learning mathematics can be overcome with self-efficacy.
- Bandura (1977) found is self-efficacy can overcome easily the completion of learning tasks, especially in learning mathematics. Through high motivation.
- Ulupi (2005) concluded that self-belief can make succesful individuals characterized by cognitive behavior in learning.

**Contribution of this paper to the literature**

- Produce a mathematics textbook that can foster the self-efficacy of mathematics learners.
- Providing high motivation for learners in learning mathematics, thus spurring a sense of high self-efficacy.
- Provide direct experience of learners ability to solve mathematical problem through metacognitive strategies.

According to Prakosa (1996), a belief that is based on limits of the perceived ability will lead students to behave steadily and effectively. Spears and Jordan (Prakosa, 1996) says that students in the school can be anticipated success if they feel able to succeed, and the meaning of success is seen as crucial. The term of this belief is called as self-efficacy (self-efficacy).

Conditions that require students to adjust to the learning environment and new teaching techniques for every individual is different. It can be said that the learning process makes students stressed when the subject judge or try to do something about the adjustment, and when the subject wants to understand adjustment for themselves. Schneider (year) (in Ellias & Loomis, 2000), explains that the environment is considered to create a healthy adjustment to the learner if the individual was raised in a family where there is security, love, respect, tolerance and warmth.

At this time, the teacher is required to provide encouragement to students so that he feels capable (accomplishment). When the encouragement and support he has received insufficient, it will develop an inferiority complex (inferiority) in self-students. The excessive anxiety of the failure (due to embarrassment to friends, afraid of the threat of a parent) will result in students having difficulty in completing their tasks (Borich, 1992: 53). Therefore, teachers are required to set up the challenge of learning standards are quite high but not too difficult to be achieved by students. Teachers demanded to develop self-confidence and self-esteem students by providing a challenging task they can accomplish.

Based on the above facts it can be concluded that self-efficacy is one of the factors that affect various behaviors such as academic adjustment and academic achievement of a person. In general, most students experience a change of other factors, such as intelligence, assertiveness, self-esteem, confidence, and others. Therefore, self-efficacy is crucial for a person, because a strong self-efficacy will encourage someone to try hard and be optimistic to obtain a positive result for the success. Therefore, self-efficacy determines the type of behavior and how the business will be poured in addressing the issues or the completion of the task and how long an individual will survive in the face of obstacles or experience undesirable (Bandura, 1977).

Related to the learning of mathematics that is rich in values, Soedjadi (2000) has presented in a straightforward illustration of how to teach mathematics in the school so mathematics can be used as a vehicle to foster abilities and skills, as well as for shaping the personality of the learner. Teachers as educators should be aware that the advancement of mathematics education is more dependent on the dedication and creativity, after knowing the changes that occur in various places. Teachers are aware that their students will live within a more creative. Therefore, they have to try to make new innovation in learning. That is why teachers should always be able and willing to improve themselves in the field of science, both through formal and informal education.

Many conditions are necessary to achieve the expectations above, whether related to personal conditions of students or the personal conditions of teachers and parents. One of the factors that are considered very closely related to the conditions of it is self-efficacy (SE). Psychologists have recently recognized the SE factors as a

determining element of the success of someone in various aspects of life. In addition, students also feel confident that it can obtain sufficient additional information from other subjects.

In accordance with the purposes and needs in relation to the authors of this research plan, the authors conducted observations of mathematics learning in class XI, SMA Negeri 9 Makassar. This observation is focused on two things, namely, self-efficacy of both students and teachers and learning activities. In addition to observing, the authors also conducted interviews with teachers of mathematics in the classroom after the learning process ends. The interview focused on the things that cannot be captured through observation, such as a general overview of the results achieved in learning mathematics students and constraints experienced by a teacher in the learning process in the classroom.

There are some results of observations that seem negative. First, the teachers are less concerned about the treatment of the majority of students who lack good character. Second, the teachers appear to be more empathetic to the students who sat on rows of front seats only. Third, there is a demonstrated sense of disappointment because the teachers do not give a satisfactory answer to the question of the concerned students. Meanwhile, there are also the things that seem positive. First, in the use of time, the teacher showed discipline. Second, the teachers cope with students. Third, the teachers give advice to the students before school hour end. Fourth, the teachers may behave quite friendly to most students.

Moreover, the students frustrated when trying to solve problems mathematics. The students were out of the classroom without permission. The students were drowsy and very restless in his seat. The students did not pay attention what the teachers did during the learning process. The students always laughed without an obvious cause. However, there were positive things that impressed. Some students cautioned to his colleagues to take seriously the things that are said by teachers. Second, most students asked questions politely.

In the classroom activity, observation results show that there was no an emphasis aspects of self-efficacy in the learning process. It had followed the guidelines of learning activities that were listed in the lesson plan that did not provide explicitly for these aspects. If it was applied in the classroom, it was most likely just because personal factors of the teacher or the habit of concerned teachers.

Based on the results of interview toward math teacher, some of relevant information are obtained. First, the results of learning mathematics students for cognitive domains were still low, meanwhile for the affective and psychomotor domain, they were unknown because there was no measurement. Second, insights of the teachers about learning models still needed, so that the learning of mathematics that the teachers did during this practically never refer to one particular model.

It was realized that there had been much learning models that have been developed by experts and can be applied by mathematics teachers. However, there have not found any learning model (especially in mathematics) that explicitly involve the self-efficacy. Related to the above, Marpaung (1999) stated that mathematics learning difficulties experienced by students due to the mathematical objects are abstract, exists only in the mind so that only the mind that can "see" the objects of it. In addition, the difficulty or lack of understanding of students is also caused by the way mathematics is taught. One way that can be taken by the teacher in the learning of mathematics is to foster self-efficacy of math students.

Based on the above description, it is necessary for the mathematical learning model that fosters self-efficacy of students and teachers. It is quite important because the factor of self-efficacy is now recognized to determine the success of a person in his life, including success in learning. One of the interesting dimensions to be studied more in depth, either theoretically or empirically through research is an aspect of the Mathematics self-efficacy in learning. The consideration is not only aspects of mathematics self-efficacy that is the most complex aspect but also the author's knowledge that has not been much research on these aspects. In addition, if the object is associated with the study of mathematics as described above, the aspect of self-efficacy more contact with the indirect object of study mathematics learning that have received less attention from teachers and students. However, the aspect of self-efficacy also cannot be separated from the learning mathematics.

Formulation of the problem in this research is how to design a social learning model based on metacognitive strategies to foster mathematics self-efficacy of students which is valid, practical and efficient.

## RESEARCH METHODS

This research was a research development. To initiate the development of research, the researchers do exploration to uncover the initial self-efficacy profile of students. The exploration results used as boosters in the development of learning models.

The research was conducted on class XI, SMA Negeri 9 Makassar 2014-2015 school year. Characteristics of all classes XI SMAN 9 Makassar 2014-2015 school year were relatively same because the process of class formation was conducted at random. It was not based on their level of ability. There were two classes from 9 selected as a research subject of class XI, namely class XI IPA 1 and XI IPA 2.

The main variable in this study was the social learning model based on metacognitive strategies. There were some other variables that were considered or involved in the process of developing models of social learning. The first is the ability of students' self-efficacy. The second is the effectiveness of normative models, namely compatibility between learning model theoretically and its implementation in the classroom. The third is the effectiveness of the correlative model that can be observed in the activities of students in the learning process.

Some learning tools have been developed as a complete social learning model based metacognitive to foster self-efficacy of mathematics students, namely: the lesson plan for each meeting (face to face). Components of teaching- learning activities in the lesson plan are designed so that it reflects the involvement of self-efficacy aspects of mathematics students proportionally. The development of lesson plan, in general, will be referred to the school-based curriculum. Student and teacher books contain a description of the mathematics teaching materials that can foster mathematics self-efficacy, as well as the incorporation in an integrated manner. Student Worksheet (LKS), to train students directly apply the knowledge and skills of their self-efficacy in solving mathematical problems. The research instrument used in this study consist of the tests of self-efficacy, Observation sheet of lesson plans implementation, observation sheets of students' activity, mastery test of mathematics teaching material

### The implementation of Research

Learning model that has been developed in this study was the social learning model to foster self-efficacy of math students. The stages of development of this learning model refer to the stages of development of the model proposed by Plomp. The components included in the model refers to the components of the learning model proposed Joice, Weil, and Shower (1992). The components consist of syntax, social systems, the principle of reaction, support systems, and the impact of instructional and accompanist. Stages of development of social learning model to foster self-efficacy mathematics students are as follows:

#### *Initial Assessment Stage*

At this stage, the researchers identify some points. The first is models of learning as a comparison oriented on several elements, such as the syntax, the underlying theory, and the results of research on these models (especially finding, identifying, and reviewing the model related to self-efficacy). The second is theories of self-efficacy and its effects on learning outcomes. The third is the curriculum of senior high school especially for math class XI student and environmental conditions as a support system.

#### *Design Stage*

The main activity at this stage is designing a model of social learning to promote the ability of self-efficacy math students. There some detail activities in this phase. The first is designing the syntax of learning or learning activities to foster self-efficacy abilities of students. The second is designing social systems, namely the role of educators and students in optimizing efficacy and empowering aspects of self-learners along with rules and guidelines that must adhere together in the learning process of mathematics. The third is designing principle of reaction. It is s description needed by teachers in responding every action and behavior of students, particularly

their questions. The fourth is designing systems support or adherence to the conditions required by the model. These conditions consist of conditions of students, the atmosphere of learning, learning media and learning tools.

### *Realization or Construction Phase*

At this stage, the researchers prepared the first prototype for the model of social learning to foster the ability of mathematics self-efficacy, regarding the components of the social learning model as mentioned in section (b) above. Implementation of this phase is planned in XI class second semester of academic year 2014/2015 so that the learning materials that are planned for this first prototype is a circle.

### *Test, Evaluation, and Revision Stage*

This stage consists of some activities. The first is asking for consideration of experts. The second is conducting a trial application of the first prototype. The trial is planned to be implemented at class XI of SMA Negeri 9 Makassar of the odd semester of academic year 2014/2015. The third is holding a revision of the first prototype based on test results and consideration of researchers, experts, and teachers. This revision activity conducted on matters deemed necessary for each component of the model. This activity is also possible to re-notice or review the things that have been conducted or decided in part (a), (b) and (c) above. From the results of this review, the second prototype is redesigned to be tested back. Furthermore, the components that are considered necessary are revised and tested back. This cycle is stopped after obtaining a prototype that truly reflects the expected model of learning mathematics. Learning materials for the second prototype is a circle.

### *The implementation stage*

At this stage, the researchers used the final prototype model of social learning. This prototype model has been implemented at class XI of SMA 9 of academic year 2014/2015. Learning material in the final prototype is a circle. At this stage, it is still possible need to revise and redesign when the final prototype still fails to meet expectations. This implementation phase is expected to get some new information on the application of social learning model that involves aspects of self-efficacy, including side-by-side advantages and disadvantages for the purpose of improvement or refinement of the model, as well as the findings in it.

Data analysis was conducted with reference to the research problems. Based on the formulation of the problems that have been formulated, the data analysis is performed in two ways, namely quantitative and qualitative way. To answer the research problems, the researchers used descriptive statistical analysis. Statistical measures that are necessary consist of measures of central tendency and measures of dispersion. In addition, the frequency distribution and diagrams are also displayed.

For research and development, activity for analyzing data is in the form of qualitative. It has been implied in a whole series of activities carried out at each stage of the development model of learning, especially in the four last stage models of Plomp, namely: the design stage, the realization stage, tests, evaluation, revision, and implementation stage. This analysis is conducted on all components of the model proposed by Joice, Weil, and Showers (syntax, social system, the principles of reaction, support systems, and the impact of instructional and accompanist) by paying attention to some points. They are learning, teaching-learning activities, and the effectiveness of learning.

## RESULTS AND DISCUSSION

The results obtained in each phase of development concerning the development process of the PS MEDIM Model are described below.

### **Phase 1: Initial Assessment**

There are some results of the initial assessment of the current conditions associated with self-efficacy in mathematics learning in school, either obtained through research/pilot survey, or through indirect observation. Before carrying out the study, researchers identified students with a questionnaire based on indicators of self-

efficacy. The purpose of the given questionnaire is to see whether the students have self-efficacy or not. The questionnaires are given simultaneously. Based on the results of the initial assessment that has been conducted, it is implied that a mathematical model of learning that fosters students' mathematics self-efficacy is needed. The model is expected to meet a valid, practical and effective criteria.

## Phase 2: Design

The design result of PS MEDIM model is setting the book format models, namely (1) rational, (2) supporting theories, (3) Model of PS MEDIM and (4) the guidelines of the implementation model. This Rational development of PS MEDIM model include things that become a major consideration or grounding importance of developing models for the study of mathematics to foster students' mathematics self-efficacy. Thus, it is loaded with the results of studies that support the need for such a development. In the section on supporting theories, it puts forward some related theories, namely (1) Self-efficacy of mathematics, and (2) Models of Learning. It is objectively recognized that the design that discusses these supporting theories are still simple, minimum, and inadequate. The model of the PS MEDIM discusses the basic concepts of the PS MEDIM model, characteristics of PS MEDIM model, components of PS MEDIM and evaluation models applied in teaching with PS MEDIM model.

In the section that discusses the guidelines for implementing the models, it is listed two main parts, namely the planning and implementation of learning. In the planning part, it is outlined some points that need to be prepared so that the learning with the model of PS MEDIM takes place in a practical and effective way. They are the lesson plan, students' worksheet, independent exercise or quiz sheet, advanced exercise sheet, and learning tools. Meanwhile, in the section that discusses the implementation of learning, it is listed the implementation of the syntax consisting of four phases. The first phase is affecting and motivating students. The second phase is constructing knowledge about cognitive strategy and problem-solving strategy. The third phase is selecting the role and formatting the group. The fourth phase is reciting and generalizing.

### *The Results of Learning Tool Design*

In the design phase, some learning tools are designed. They are the lesson plan, students' worksheet, quiz sheet, and advanced exercise sheet. In this phase, the lesson plan that is successfully designed is based on the syntax of PS MEDIM model. It also considers the relation with other components of the PS MEDIM Model, namely reaction principle, social systems, and the impact of instructional and accompanist. The design of the lesson plan contains some aspects. They are the general purpose of learning, the specific purpose of learning, the subject matter, the material preconditions, learning activities and completeness of learning. However, the draft has not yet determined the material, because it will be adjusted to the field conditions, time and curriculum when this model is tested.

The result of the design sheets and exercise sheet is still the initial framework because learning materials have not been determined in the design phase. However, the designed teaching materials will be adapted to the number of meetings and lesson plan. Presentation style also did not present the concepts and principles of mathematics in detail, but it is made in such way so that the instructional materials sheets can guide students to construct their concepts and principles that have been learned.

The independent exercise sheet that is designed in this phase contains questions that can also serve as an evaluation tool at the meeting. Aspects contained in its draft is the instruction for doing the exercise in the form of description. The advanced exercise sheet as a learning tool designed in this phase is still the basic framework. The learning tool also includes two aspects, namely the instructions and questions consisting of routine and non-routine problems. This learning tool is intended not only to train the students' skills but also to increase the concepts and principles that have been studied. They are also expected to apply this learning tool in solving their problem.

### *Results of Research Instruments Design*

It is crucial to prepare research instruments to obtain data about the process and results of the development model of the PS MEDIM along with the appropriate learning tools. In other words, to decide that the model of PS MEDIM along with the learning tools are valid, practical and effective, the relevant instruments are required. Three

are kinds of instruments that have been designed namely, the validity, the practicality, and effectiveness of the instrument that lesson plan instruments, achievement test, and test model of learning. The validity of the Instruments that are produced in the planning phase is determining aspects of assessment and indicators. Each aspect consists of some points. The first is the validation format of PS MEDIM model. The second is the eligibility assessment sheet of the application of the PS MEDIM model. The third is the validation format for the feasibility of PS MEDIM model. The fourth is validation format for the students' responses based on the questionnaire. The fifth is validation format for evaluation sheets.

The instruments for the practicality that are successfully designed in this phase cover some observations sheets. The first is the observation sheet for implementation of PS MEDIM model. The second is the observation sheet for the implementation of the lesson plan. The third is the observation sheet for the feasibility of teaching materials. The instruments for the effectiveness that have been designed in this phase include some points. The first is the observation sheet for student activities. The second is the observation sheet for teachers' ability to manage the learning process. The third is the responses of students based on the questionnaire. The fourth is the evaluation of learning outcomes. The design of the instruments above contains the instructions and content aspects. The aspect of the content is based on the theories that support the students that will be revealed through the instrument.

## Phase 3: Realization

The results obtained in the first and the second phase are then reflected, discussed with experts, and re-observed. This phase is directed to arrange and realize PS MEDIM model thoroughly along with appropriate learning and instruments that are needed. There are some products obtained in this phase. The first is a book of PS MEDIM model. The second is learning tools that conform to the model of PS MEDIM. The third is the instruments for validity, practicality, and effectiveness of PS MEDIM model. This product is labeled Prototype-1 (Model of PS MEDIM, tools, and instruments).

## Phase 4: Testing, Evaluation and Revision

### *Instruments for Validity*

There are some instruments for validity. The first is assessment sheet for PS MEDIM Model. The second is feasibility assessment sheet for the application of PS MEDIM Model. The third is validation format. These instruments are modified from similar instruments that have been developed by Ratumanan (2003), and Habibah (2006). All these instruments can be made as necessary modification through discussions with colleagues. Meanwhile, validation format for the advanced exercise and the feasibility assessment for the application of the module of PS MEDIM model are not modified. They are compiled from the discussions with peers, examiners, and validators.

### *Instruments for Practicality*

The instruments for practicality consist of observation sheet for the implementation of PS MEDIM model and feasibility assessment sheet for the application of PS MEDIM model. These instruments have been validated by two experts or practitioners in the field of education. The calculation results of reliability for the instruments of the feasibility assessment sheet for the application of PS MEDIM model are obtained from two validators. The result is PA = 0.78. Meanwhile, the coefficient of reliability (R) is calculated after testing. The value is 0.80 (R = 0.80).

### *Instrument for Effectiveness*

The evaluation sheet for learning outcomes consists of 10 items in the form of description. After this evaluation sheet is tested, the reliability coefficient (R) is 0.80 (very high). The observation sheets for students' activity are made to obtain supporting data about the effectiveness of the PS MEDIM Model. These instruments include three aspects, namely the instructions, the types of student activities, and the tables to record the frequency of student activity every 5 minutes. Based on the results of the assessment from the two validators to this observation sheet, it is obtained reliability coefficient (R) is 0, 80. In observation sheet of teacher capability to

manage the learning of PS MEDIM Model, there are six components that assessed the ability of teachers, and they are distributed to 25 indicators. Based on the evaluation of two observers, it is obtained reliability coefficient (R) is 0.80. Thus, this observation sheet is in compliance with the criteria of reliability. Meanwhile, the students' responses based on questionnaire based on the results of instrument testing, it is acquired reliability coefficient (R) 0.83. Thus, this coefficient is in the category of "very high". All items have a validity coefficient that is "fair". (Borich, 1994)

## Validation Results for PS MEDIM Model

Results of the assessment showed that the average value of validity (V) to aspects of supporting theories are V = 3.7 (included in the category of "valid") (Borich, 1994)

## Validation Results of Learning Tool

There are some learning tools used in the PS MEDIM mode, namely: lesson plan, students' worksheet, independent exercise, and advanced exercise. It can be concluded that the learning tools are included in the category of "valid." Validator assessment results indicate that these aspects have met the criteria of validity. For parts a, the average value is 3 (quite valid). The average value for part b is 3.5 (valid). The average value for part c is 4.5 (very valid). The average value for part d is 3.5 (valid). (Borich, 1994:385)

### *Results of Trial I*

Based on the analysis of the feasibility of PS MEDIM model for each meeting of the trials I, it is obtained an average score (T) of two observers. The score in the first meeting is 2.7. The score in the second meeting is 2.7. The score in the third meeting is 2.8. The score in the fourth meeting is 2.9. The scores show that at every meeting, feasibility criteria are not met. Therefore, the learning tools used at every meeting need to be revised. It means that teachers should be given direction related to aspects that are not implemented. For revision needs, the aspects that are not meet feasibility criteria are explored.

### *Results of Trial II*

Based on the analysis of the feasibility of PS MEDIM model for each meeting of the trials I, it is obtained an average score (T) of two observers. The T score is 3.0. It can be concluded that the T-score does not yet meet the criteria of feasibility that has been determined. Therefore, it is necessary to revise the learning tools used in Trial II. The teachers shod be provided direction related to aspects that do not meet the criteria.

Based on the analysis of feasibility for PS MEDIM model for each meeting on the Trial II it is obtained an average or T-score of the two observers. The T-score of the first meeting is 3.0. In the second meeting, it is 3.0. It the third meeting, it is3.1. It the fourth meeting, it is 3.2. It shows that the feasibility criteria for every meeting are not met although there is an improvement for each meeting. Therefore, the learning tools used at every meeting need to be revised, and the teachers should be provided guidelines related to aspects that are not implemented.

### *Results of Trial III*

Based on the analysis of feasibility for PS MEDIM model for each meeting on the Trial II it is obtained an average or T-score of the two observers. The T score is 3.9. It can be concluded that the T-score meets the feasibility criteria. It means that most aspects have been implemented. Therefore, according to predetermined criteria of practicality, the model of PS MEDIM is practical after doing three times of trials.

## The Effectiveness Results of PS MEDIM Model

Furthermore, the effectiveness results of the PS MEDIM Model that is achieved in the phase-4 will be presented as follows:

### *Results of Trial I*

Based on the criteria of effectiveness, it can be concluded that the trial I of PS MEDIM has not been effective. Thus, it is necessary to explore which aspects should be made improvements because the mastery of learning is the most important component. Therefore, this component demands more consideration to be addressed.

### *Results of Trial II*

Before entering the trial II, the form of the revision that is conducted is giving guidance to teachers for learning about these two issues that should be taken seriously. Based on the criteria of effectiveness, it can be concluded that the Trial II of the PS MEDIM model has not been effective. Thus, it is necessary to explore on which aspects should be made improvements because the mastery of learning is the most important component. Therefore, this component demands more consideration to be addressed. The analysis results show that students obtain a low score on the item number 3 and number 8. Item number 3 is associated with sketching parabola graphs. Then, before entering the trial III, the form of the revision that is conducted is giving guidance to teachers for learning about these two issues that should be taken seriously.

### *Results of Trial III*

Based on the criteria of effectiveness, it can be concluded that the trial III of the model PS MEDIM has been effective. The results show that has met the criteria of validity, practicality, and effectiveness. In other words, a high quality of PS MEDIM model has been obtained.

## CONCLUSION

Based on the research results, it can be summarized as follows.

1. PS MEDIM Model meets valid criteria. All validators declare that this model is based on a strong theoretical basis, and the components of this model have been linked consistently.
2. PS MEDIM Model also meets the criteria of practicality. All validators (experts and practitioners) affirm that this model can be implemented and can be used in a feasibility study with the level in the high category. Almost all aspects of the components of PS MEDIM model are accomplished entirely.
3. PS MEDIM Model is also efficient because the mastery of learning has been reached. The students' activities have been conducted as expected. The ability of the teacher to manage the learning is in the category of "good". The, students' response to learning process has been positive. Moreover, mathematics self-efficacy of students has increased.

Instrument is valid criteria that lesson plan, achievement test, student worksheets, and test models of learning.

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