

Received: 22 July 2020

Revision received: 2 October 2020

Accepted: 21 December 2020

Copyright © 2021 JESTP

www.jestp.com

DOI 10.12738/jestp.2021.1.001 ♦ January 2021 ♦ 21(1) ♦ 155-166

Article

## Beliefs of mathematics teachers on motivation and action learning models in classroom learning process: Indonesian perspective

Ahmad

Universitas Muhammadiyah Purwokerto,  
Indonesia

[ahmad@ump.ac.id](mailto:ahmad@ump.ac.id)

ORCID: 0000-0003-3805-6678

Marah Doly Nasution

Universitas Muhammadiyah Sumatera Utara,  
Indonesia

[marahdoly@umsu.ac.id](mailto:marahdoly@umsu.ac.id)

ORCID: 0000-0002-0303-6485

### Abstract

Motivation has played an important role in the Indonesian curriculum of mathematics. Mathematics Teachers used action learning models as innovative measures to motivate students and improve mathematics teaching and learning processes. One of the methods included giving positive feedback and developing respectful relationships with their students. The primary objective of this study was to explore how mathematics teachers believed and implemented the concept of motivation and action learning. The sample population consisted of 350 teachers from 50 public and private high schools in Indonesia. An online survey and interview were used to gather data needed to answer the formulated research questions. An interactive analysis method was used to evaluate the data provided by the respondents and determine the teacher's belief of the concepts of motivation and action learning. The results of the study showed 75% respondents believed that students had high motivation in learning Mathematics. Teachers also believe that students can master complex mathematics concepts when they feel motivated. The participants noted that action learning helped motivate students and enabled them to engage in collaborative tasks. This approach is recommended to improve the mathematical skills of students. Future quantitative studies can be carried out to determine the extent to which the use of the two concepts affected academic performance in mathematics classes.

### Keywords

Action Learning • Learning Process • Mathematics • Motivation • Teachers

**Correspondence to** Ahmad, Universitas Muhammadiyah Purwokerto, [ahmad@ump.ac.id](mailto:ahmad@ump.ac.id), ORCID: 0000-0003-3805-6678

**Citation:** Ahmad, Nasution, M. D.. (2021). Beliefs Of Mathematics Teachers On Motivation And Action Learning Models In Classroom Learning Process: Indonesian Perspective. *Educational Sciences: Theory and Practice*, 21(1), 155-166 <http://dx.doi.org/10.12738/jestp.2021.1.012>

## 1. Introduction

Skemp (1971) has observed that mathematics is a valuable and general-purpose technique for satisfying various needs. It has been widely accepted as an essential tool for science, technology, and commerce; and required to enter into many professions. Indonesian Mathematics curriculum pay much attention to critical aspects of mathematics education for high school students, such as developing students' reasoning and skills to deal with real-life problems (Hadi, 2005). It helps the Indonesian students to acquire practical and cognitive experience throughout mathematics and become productive citizens (Hannula, 2007). However, scholars observe that teachers need a wide range of educational activities to improve students' performance (Stringer, 2008) (Greenwood and Levin, 2007; Abramovich and Grinshpan, 2008). The argument is based on realizing that learning achievement is typically affected by various intrinsic and extrinsic factors. One of the main inherent factors explored within the context of mathematics education is motivation (Kriegbaum, Jansen, and Spinath (2015).

Motivation influences the way students acquire and apply information acquired in schools (Kember, 2000). Motivation also determines how students gain experience in a particular subject (Kriegbaum, Jansen, and Spinath, 2015). Fuqoha, Budiyo, and Indriati (2018) report that "motivation has a function as stimulant effort and achievement" (p. 203). Motivated students tend to perform better than those who are not interested in what is being taught in class. Data from previous research show that student motivation influences performance in a wide range of subjects, including Mathematics, Physics, Biology, Chemistry, and Languages (Abramovich, and Grinshpan, 2008). Student performance in mathematics has been a subject of research over the years (Abramovich et al., 2019). Attempts have also been made to identify and explore factors that may influence how students perform mathematics. Some students perform poorly in mathematics because they perceive the subject to be complicated and tedious. Although these researchers have identified several strategies that can help improve mathematics achievement, the number of learners who perform poorly remains high. In spite of that, educators are still expected to motivate their students and support them to record improved performance in mathematics.

Motivation has been described as a psychological element that affects how individuals behave and act in different situations. Motivation is characterized by the desire to work in a given way or achieve specific results (Bloomfield and Nguyen, 2015; Engeström, 2015; Baranik, Barron, and Finney, 2010). It drives students to actively learn and acquire knowledge that will make them competent in specific subjects. Students become interested in mathematics when they understand the subject and are motivated to participate in in-class activities. In some cases, however, the negative perceptions about the subject may affect how it is learned in the school setting. Therefore, teachers should strive to identify strategies and methods that they can use to keep their students motivated (Huang, 2011; Phillips, 2011; Holmqvist, 2010).

Curiosity is considered to be the basis of motivation to learn various subjects, including mathematics. Abramovich et al. (2019) states that educators need to motivate students to learn by developing fascinating teaching methods and strategies. In some cases, educators should introduce new concepts using justified and innovative tools in the classroom. Moreover, learners develop curiosity and motivation when they know that the concepts being taught in class apply to their everyday life (Schwinger, Steinmayr, and Spinath, 2016; Skaalvik and Skaalvik, 2002). Therefore, teachers may need to focus on a specific area, such as using additional operations to determine the quantity of an object, measuring sizes of lattice plans and polygonal enclosures, and analysis of curvilinear plane figures (Kember, 2000). The primary objective is to enlighten students on how they can use various subjects related to mathematics in diverse life areas. Students may develop the curiosity to explore other areas where they can use the subject to address complex and real-world problems. The students will thus get motivated to participate in in-class activities to master the subject and learn how to use the concepts in the real-world context (Hadi, 2005).

Another aspect of motivation explored by Abramovich, Grinshpan, and Milligan (2019) was the subject of concreteness. Concreteness is a crucial element of the learning process because it affects how diverse concepts are grouped and synthesized. The main objective of studying Mathematics is to concretize both applied and theoretical notions (Abramovich, Grinshpan, and Milligan, 2019; Engeström, 1987; Kuutti, 1999). Therefore, the teachers need to help the students develop a precise understanding of mathematics concepts by offering concrete and valid insights. Human beings strive to establish a full understanding and knowledge about different topics in the world. Hilbert (2008) stated that Mathematics lessons normally start with posing problems related to world phenomena. When people know details and concretize ideals, they can minimize the

anxiety linked mainly to describing the concepts. Research shows that concreteness is a vital element determining how all parties involved in mathematics education understand the subject (Plante, I., O’Keefe, P. A., and Théorêt, 2013).

At the implementation level, it is essential to know that the foundation of knowledge and learning curriculum offers an excellent opportunity for people to explore a variety of areas of the subject (Huang, 2011; Kriegbaum, Jansen, and Spinath, 2015; Muenks, Wigfield, Yang, and O’Neal, 2017). Furthermore, it makes people aware of applying the concepts and promotes the understanding of global realities that could be solved through Mathematics models. For the teachers, the Foundation of Knowledge and Learning model provides a basis for enlightening students about the significance of mathematics and how to apply concepts learned in their everyday lives.

## **2. Review Of Literature**

### **2.1. Motivation**

In Mathematics, motivation concepts can be implemented through the development of appropriate hands-on activities and the use of manipulative materials (Abramovich, Grinshpan, and Milligan, 2019). The activities are meant to enable students to understand and integrate mathematics ideas and apply the information gained during the lessons in solving real-world problems. The hands-on activities are also meant to make the students think outside the box and develop new knowledge about the subject. Teachers must always support their students to master complex mathematics concepts (Ben-Eliyahu, 2019; Brunstein and Heckhausen, 2008). The lack of support will have an adverse effect on the student’s level of motivation and influence their academic performance. In some cases, educators need to use digital technology to improve motivation levels among students and keep them engaged during classroom activities (Baharuddin et al., 2018; Dalle and Mutalib, 2018; Derlina et al., 2018; Dalle et al., 2017). Therefore, understanding the concept of motivation in mathematics is critical for teachers and other practitioners in the education sector.

### **2.2. Action Learning**

Educators have been using the subject of action learning as a way of improving the performance of students and supporting them to learn how to apply concepts to real-world situations (Brown and Principles, 2011; Woodley, 2004). Action learning is a problem-solving approach that teachers have used to encourage students to act and reflect on results. The objective of action learning is to improve the professional performance of the teacher and support students to master concepts (Ladel and Kortenkamp, 2013; Cheng, 2014; Even, 2008; Holmqvist, 2011). In mathematics education, action learning, as a teaching method, has been adopted as pedagogy oriented on self-solving real problems followed up by reflection (Abramovich & Grinshpan, 2008). In this case, the learning process starts with creating an environment where the students can ask questions related to the subject taught in class. Besides, the students are accorded the chance to work on real problems and reflect on the work that they have done (Hadi, 2005). In such cases, the students feel motivated to gain more information regarding the subject and solve other related problems. In mathematics education, when students encounter problems during lessons, they should ask questions that will enable them to come up with the right solutions to the issue being addressed. Thus, action learning, just like motivation, can significantly affect the performance of students in mathematics.

### **2.3. Problem Statement and Rationale of the Study**

In the last decade, there have been significant attempts among developing nations to improve the educational sector and performance of students. Educational attainment is considered to be one of the major factors that can enhance the living standards of citizens in developing countries. Since such nations invest a significant amount of resources in the education sector, there is a need to understand the factors that affect the performance of students (Brown and Principles, 2011; Woodley, 2004). It is also critical to examine methods that teachers can use to enhance learning processes at various levels of education (Greenwood and Levin, 2007; Norton, 2007; Phillips, 2010). The current paper takes the first step towards such goals by offering vital information about mathematics education in Indonesia.

One of the most popular topics that have been discussed regarding the education sector is the poor performance of some Indonesian students in mathematics (Conley, 2012; Eccles, J. S., and Wigfield, 2012; Hattie, 2009). The rising number of students who struggle to master mathematics concepts is a major concern

for parents, teachers, and policymakers in the education sector. Studies have been done to examine the possible reasons for the poor performance and to design strategies that teachers can use to ensure that their students perform at optimal levels. These studies have provided vital insights into the subject of mathematics education. However, minimal attention has been directed towards understanding how students can be motivated to learn mathematics and succeed in the subject.

The Indonesian government has made significant changes to the curriculum to improve the way students learn mathematics. For instance, in 1994, the curriculum required that 1-3 grade students must have a ten-hour per week lessons. Those in the 4-5 grades, on the other hand, needed 8 hours of mathematics instructions per week. In 2004, the curriculum was changed to ensure students in Grade 1-6 get five hours per week of mathematics instruction. In 2006, another change was made to promote thematic teaching of mathematics. The primary goal was to ensure that the teachers covered all the concepts and topics in mathematics. The adjustments are usually difficult to implement, especially among teachers who have received minimal training on how to use new strategies.

The impact of such curriculum changes on the performance of students has been a major topic of research over last few years. Studies have revealed that poor performance in mathematics is still a major problem even with the curriculum changes that have been made by the government to improve the way teachers give instructions in the classroom. Contemporary research has shown that one of the possible factors contributing to such situations is the lack of motivation among students (Zaslavsky and Leiken, 2004; Graven, 2004; Bohl and Van Zoest, 2003). Most of the existing studies act as a link between motivation and academic performance in mathematics. However, minimal attention has been directed towards understanding the concepts within the context of the Indonesian education system. The current study seeks to bridge the gap by offering vital information that can be used to improve mathematics performance among students and ensure that they acquire knowledge that they can apply in real-life situations.

In mathematics education, the key to improved performance is the ability to solve problems. Therefore, students need to strive to learn new concepts and master them to be able to integrate them into their everyday life. Teachers, on the other hand, can use action learning as the basis for assisting their students in understanding complex tasks and determining how they are applied to real-life situations. In Indonesia, action learning is an important educational pedagogy that may help enhance performance in a wide range of subjects, including mathematics.

There is a dearth of information regarding how educators perceive the subject of action learning within the context of mathematics education. Therefore, this study framed following objectives:

1. To explore Indonesian teachers' belief in the concept of motivation in the mathematics learning process;
2. To determine how Indonesian teachers understand action learning within the context of mathematics education;
3. To determine how the teachers use motivation and action learning to improve the understanding of mathematics concepts.

### **3. Materials And Methods**

#### **3.1. Data Collecting Instruments**

This study was done in Surabaya and Jakarta, Indonesia. The study population consisted of 350 teachers from 80 different high schools in the region (Table 1). All respondents were high school Mathematics teachers in Jakarta and Surabaya who taught the tenth grade until twelve grade students in the range of age between 14-17 years old. Data were collected in this study through online questionnaire method and interview. The process entailed sending a list of questions to the participants via email. The respondents were requested to provide answers to questions related to motivation and action learning in mathematics teaching in Indonesia high schools.

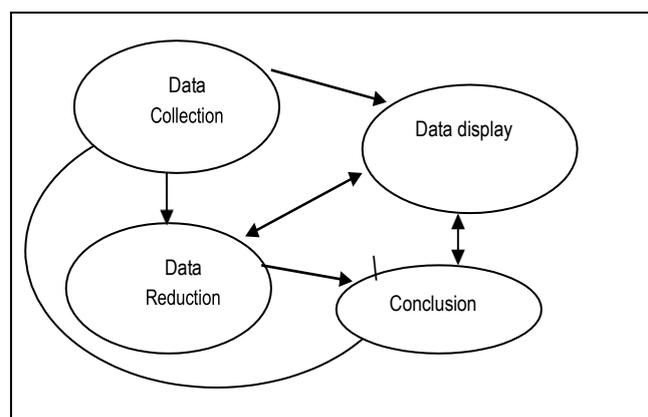
**Table 1.** Distribution of the respondents

Type of school	Number of schools	Number of Respondents	Distribution of teachers	
			Male	Female
Public school	30	100	40	60
Private school	50	250	82	168
Total Number	80	350	122	228

The questionnaire of this study was adapted from Susanti (2015) (See Appendix) which dealt with concept motivation. The questionnaire utilized the Likert scale; each variable provided five alternative answers- Always, Often, Sometimes, Seldom, Never, having the score of 5, 4, 3, 2, and 0 respectively. The data collected from the questionnaire was analyzed quantitatively in the form of a percentage. Furthermore, an interview was used to know the extent of Indonesian teachers' understanding the action learning within the context of mathematics education and whether they could use motivation and action learning to improve the understanding of mathematics concepts

### 3.2. Data Analysis

The Interactive analysis method was used in the current study. This method is used as a model when data reduction and data presentation are processed along with data collection. In other words, three analysis components -- data reduction, data presentation, and conclusion) interact after all necessary data has been collected (Sugiyono 2010) (Figure 1).



**Figure 1.** Method of Collecting Data (Sugiyono 2010)

### 3.3 Statistical data analysis

A mathematical method was used for presenting the data analysis. This implies that the outcome of the analysis is presented in a numerical form. In this analysis, all data obtained from questionnaires are presented in the form of numbers. All the information is quantitatively processed, evaluated, coded and analyzed using the Statistical Package for Social Studies (SPSS), Windows version 17.0. in the end, the data are screened and cleaned to identify any significant outliers or missing values.

### 3.4. Ethical considerations

Prior to the start of this study, ethical approval was sought from Research and Development Internal Review Panel at Universitas Muhammadiyah Purwokerto. The permission of research ethics committee was not needed for this study because it was deemed to be part of service evaluation. However, it was ensured to collect voluntary consent of all respondents. The ensuring confidentiality and privacy were also key ethical concerns in this study. This was achieved by ensuring that all questionnaires returned to the researcher remained confidential and untraceable. All participants agreed to spontaneously participate in this study and also gave the consent to publish the findings of this study in a scientific journal.

## 4. Results and Discussion

### 4.1. Teachers' belief on student motivation

Table 2 describes the result of teachers' belief on student's motivation questionnaire. In general, the percentage

rate of teachers' belief on motivation is high at 75%. The first indicator called 'student's expectation of success' shows the total percentage of teachers' expectations of success at 77%, with the high score falling on the 'Always' option (39.3%). The second indicator is 'Encouragement and needs to study'. The total percentage of teachers' belief on encouragement of study was 69%, in which teachers' belief on high score is 'Sometimes' (46.4%) and 'always and 'often' options are seen at the same level (20%).

The third indicator is the 'Desire for a good future'. The total percentage of teachers' belief on the desire for a good future is shown at 75.15%, with the teachers' belief high score showing on the option 'often' (40%). The fourth indicator is the 'Appreciation of learning'. The total percentage of teachers' belief in learning appreciation is at 72%. The student's high score is on the answer 'Always' at (30.6%). The fifth Indicator is 'Interesting activity in the learning'. The total percentage of teachers' belief in learning activity was at 76.4%, in which the student's high score (34%) is on the answer 'often'. The last indicator is the 'Convenient zone during learning'. The total percentage of student's confidence in a suitable zone was measured 72.9%, in which the student's high score (34%) is on the answer 'often.'

**Table 2.** Questionnaire Results of Teachers belief on students' motivation

Indicators of concept motivation	Always (5)	Often (4)	Sometimes (3)	Seldom (2)	Never (1)	Score
	%	%	%	%	%	%
Expectation of success	39.3	30	22.2	6.07	1	77
Encouragement and needs to study	20.5	20	46.4	18	2.2	69
Desire for a good future	21.2	40	28.2	9.1	1	75.15
Appreciation of learning	30.6	30	25.8	6.8	1.1	72
Interesting activity in learning	20.3	34	29.3	12	1	76.4
Convenient zone during learning	19.2	34	28.4	18	0%	72.9
The percentage rate of Concept motivation						75%

*Note: The numbers 1, 2, 3, 4, and 5 represent the score for each option (the score for the option always is 5, often is 4, sometimes is 3, seldom is 2, and never is 0);*

The interview results revealed that teachers who took part in the study felt that mathematics was a major problem for many students. Therefore, teachers must develop competencies and create novel methods that they can use to enhance the learning process. Moreover, the respondents stated that teachers need to engage in professional development standards and collaboration with colleagues in learning new ways of meeting educational standards. One respondent said that "yes, I strive to motivate my students because if I fail to do so, they will lose interest in the activities taking place in class. I also motivate them to consider mathematics as an important subject that will help them in a wide range of areas of life." Another teacher noted that "throughout my teaching career, I always strive to develop a meaningful relationship with all my students and assist them in mastering complex concepts in mathematics." The statements highlight the importance of motivation in a class.

In terms of motivation, all the respondents agreed that teachers need to motivate their students to master mathematics. One of the main themes that emerged at the end of the study was fostering an evolving mindset in mathematics classes. One of the teachers reported: "one of the main tools that I use to motivate my students is to praise them when they complete tasks and assignments. I also tell my students that they can improve their abilities by continuously practice mathematics. At times, it may not be easy as the students have a negative attitude about the subject." Another respondent stated that "I use phrases such as you are smart, congratulations; you are making improvements to motivate my students. I know that they have different abilities and learn at a different pace. However, it is my duty to make them know that mathematics can be fun." Another teacher stated that "it is important to incorporate both summative and formative assessments in mathematics classrooms to

monitor the progress of students and identify leaders that require additional help. Even those who are struggling to master mathematics concepts should not be looked down upon."

Some teachers believed that motivating students entailed developing and maintaining respectful and positive relationships in the classrooms. In one case, a participant stated that "I have a duty to motivate and inspire all my students regardless of their background. The students are like my children, and I try to understand what they are going through to be able to assist them in learning mathematics." Another teacher stated that "yes, motivating all students may be a problem. At one time, I had to let my students know how I also struggled with mathematics at certain stages of my education. It was not easy, but I wanted to share my personal experience and motivate them." Another participant in this study noted that "all my students learn differently. It is my responsibility to determine the method that works and motivate students." Another teacher believed that educators must learn to be inspirational people in the life of the students. In particular, the teacher noted that "I try to be a role model to my students and let them know that we can all make mistakes and learn from them." Finally, the importance of creating a community of learners in mathematics classroom was highlighted in the study. One of the teachers noted that "I try my best to understand my students and interact closely with them. I have also realized that students feel motivated when I give them the chance to take part in collaborative learning tasks." The responses show that educators in Indonesia appreciate the importance of motivation in mathematics classrooms.

#### **4.2. Teachers belief on Action Learning**

Interview was used to know the teacher's belief on active learning. The participants in the current study perceived action learning in different ways. One of the respondents stated that action learning "entailed creating an environment where the students involve in learning activities." Another respondent said, "I understand and appreciate the importance of active learning because it can help address complex mathematics tasks. I try to give my students an active role in mathematics classrooms so that they can become motivated." Another respondent stated that "my students usually perform best when they are involved in collaborative tasks. I try to engage them in learning activities and assist them in understanding complex concepts." In another case, a respondent stated that "action learning entails creating and using supportive teaching style. I also try to give students autonomy in mathematics classrooms to explore new ideas and concepts. In other cases, I strive to be responsive and supportive to my students by listening to them and giving hints when dealing with complex issues."

#### **4.3. Use of Motivation and Active Learning in Mathematics Classes**

In the current study, a sample population consisting of 350 teachers from Indonesian schools was interviewed. The survey revolved around the teaching of mathematics and the strategies that are used to motivate students in order to promote action learning. The responses provided by the teachers were carefully assessed and used to identify significant themes relating to the way teachers motivate their students and embrace action learning. All the respondents in the study revealed that motivation and action learning are critical in mathematics teaching. One participant stated that "I don't think it is possible to teach students who are not motivated." Another respondent argued that "my students understand that mathematics is a complex subject, and the only way that we can master the concepts is through continuous practice." In another case, a respondent stated that "...we are in an era of technology. In our school, we have adopted technological solutions that allow us to motivate learners and promote action learning. I believe the students enjoy using such tools to grasp complex tasks." The responses reveal that Indonesian teachers believe that motivation and action learning can lead to positive mathematics classroom outcomes.

The negative attitudes associated with mathematics teaching and action learning have motivated researchers to carry out studies on the subject (Brown and Principles, 2011; Woodley, 2004). In the present case, the focus was on exploring how Indonesian high school teachers understand motivation and action learning. From the data gathered during the survey, it is evident that teachers believed that students may perform better when they are motivated to learn. The results agree with previous studies that have highlighted the need for teachers to motivate learners continuously. In particular, teachers have been assisting their students in mastering complex concepts and applying mathematical concepts in their everyday lives. Second, the study showed that action learning is an important strategy that can improve mathematics performance among high school students. The process entails creating an environment where learners can participate in collaborative

learning activities (Marton, 2015; Gutierrez and Boero, 2006; Kember, 2000; Lizzio and Wilson, 2007).

The study also entails creating real-life settings where students can apply concepts that are learned in the classroom. The study shows how teachers in Indonesia develop a positive attitude towards motivation and action learning when it comes to the teaching of mathematics (Lerman, 2001; Lachance and Confrey, 2003; Davies and Dunnill, 2008; Lo and Marton, 2012; Lo and Marton, 2004). A research by Meyer, et al. (1997), mentions that students' motivation and strategy in mathematics classes indicate a paradigm shift. While a few challenge seekers report tolerance for failure, learning goal orientation, and self-efficacy that are higher than average in mathematics; on the other hand, challenge avoiders self-report higher adverse effects after failure, goal orientation more focused on performance, lower self-efficacy in mathematics, and use of larger surface strategies (for example, strategies that require minimal information processing). The respondents believed that the two strategies could be used to help students master complex subjects and enhance their academic performance. Hannula (2006) states that as a potential, motivation cannot be observed directly. This can only be observed because it manifests itself in influence and cognition, such as beliefs, values, and emotional reactions. This potential is structured through needs and goals. The findings are supported by previous empirical studies that have identified action learning and motivation as some of the factors that may affect the overall student's success in mathematics. Therefore, the concepts need to be integrated into mainstream learning in Indonesia.

## 5. Conclusion

To sum up, the data collected in this study shows that high school teachers in Indonesia believe that they motivate their students and engage them actively in the mathematics classroom to improve academic performance. Furthermore, the respondents have argued that the two strategies – motivation and action learning might help to change the negative perceptions that students may have regarding the subject of mathematics. This study established that mathematics is one of the subjects that many students struggle to master. Teachers therefore need to develop strategies that can be used to assist students in grasping complex mathematical concepts and applying them in their everyday life. Motivation and action learning are considered to be among those strategies that can be utilized to enhance the mathematics learning process. When generalizing the results of this study, it is also important to consider the inherent limitations. First, the study was limited to teachers in a single region in Indonesia. Second, the results are based on the subjective responses provided by the teachers. Therefore, there is a need to carry out an empirical study with a far bigger sample size and geographically diverse to quantify how motivation and action learning can affect mathematics performance among high school students.

## 6. References

- Abramovich, S., & Grinshpan, A. Z. (2008). Teaching mathematics to non-mathematics majors through applications. *PRIMUS*. <https://doi.org/10.1080/10511970601182772>
- Abramovich, S., Grinshpan, A. Z., & Milligan, D. L. (2019). Teaching Mathematics through Concept Motivation and Action Learning. *Education Research International*. <https://doi.org/10.1155/2019/3745406>
- Stringer, E. (2008). Introduction to Action Research: Social Research for Social Change [Book Review]. *Qualitative Research Journal*. <https://doi.org/10.3316/qrj0801087>
- Ladel, S., and Kortenkamp, U. (2013). An activity-theoretic approach to multi-touch tools in early mathematics learning. *Int. J. Technol Math Educ*, 20(1), 141–145.
- Lerman, S. (2001). *Making sense of mathematics teacher education*, Kluwer.
- Lizzio, A., and Wilson, K., (2007). Action learning in higher education: an investigation of its potential to develop professional capability, *Studies in Higher Education*, 29(4), 469–488. <https://doi.org/10.1080/0307507042000236371>
- Lo, M.L., and Marton, F. (2004). *Classroom discourse and the space of learning*. Lawrence Erlbaum.
- Marton, F. (2015). *Necessary conditions of learning*, Routledge.
- Meyer, D. K., Turner, J. C. and Spencer C. A. (1997). Challenge in a Mathematics Classroom: Students' Motivation and Strategies in Project-Based Learning, <https://www.journals.uchicago.edu/doi/abs/10.1086/461878>.

- Muenks, K., Wigfield, A., Yang, J. S., and O'Neal, C. (2017). How true is grit? Assessing its relations to high school and college students' personality characteristics, self-regulation, engagement, and achievement, *J. Educ. Psychol*, 109, 599–620. doi: 10.1037/edu0000153.
- National Council of Teachers of Mathematics (2000). *Principles and standards for school mathematics*, National Council of Teachers of Mathematics,
- Norton, L. (2009). *Action research in teaching and learning: A practical guide to conducting pedagogical research in universities*. Routledge.
- Phillips, L. (2010), *Using action learning to support the development of primary teachers' mathematical knowledge*, The National Teacher Research Panel.
- Plante, I., O'Keefe, P. A., and Théorêt, M. (2013). The relation between achievement goal and expectancy-value theories in predicting achievement-related outcomes: A test of four theoretical conceptions, *Motiv, Emot*, 37, 65–78. doi: 10.1007/s11031-012-9282-9.
- Sugiyono. (2010) *Memahami Penelitian Kualitatif*. Bandung: Alfabeta.
- Susanti, Dwi Erna. (2015). *The Investigation of Students' Perception Of English Teacher and Their English Learning Motivation in The First Grade Of Vocational High School 1 Tengaran*. State Institute For Islamic Studies (IAIN).
- Schwinger, M., Steinmayr, R., and Spinath, B. (2016). Achievement goal profiles in elementary school: antecedents, consequences, and longitudinal trajectories, *Contemp. Educ. Psychol*, 46, 164–179. doi: 10.1016/j.cedpsych.2016.05.006.
- Skaalvik, E. M., and Skaalvik, S. (2002). Internal and external frames of reference for academic self-concept, *Educ. Psychol*, 37, 233–244. doi: 10.1207/S15326985EP3704\_3.
- Woodley, (2004). A., *Handbook on practitioner research and evaluation skills training in open and distance learning: Commonwealth of learning*, SAGE.

**APPENDIX**

**Questionnaire of teachers’ belief on students concept motivation (Modified from Susanti,2015)**

**Instruction:**

- a. Read every statement correctly.
- b. Fill the following questionnaire by marking (V).
  - AL = Always
  - OF = Often
  - SM = Sometimes
  - SL = Seldom
  - NV = Never
- c. Answer the questionnaire honestly.

Indicators	Statements	AL	OF	SM	SL	NV
Expectation of success	1. Whenever a task is given, My Students do it by myself well.					
	2. Whenever My Students face difficulties in understanding Math material, My Students usually ask a question to the teacher first.					
	3. Whenever My Students face difficulties of understanding English material, My Students usually ask a question to my friends first.					
	4. If My Students do individual Mathematics task, My Students will find the answer by reading books and repeating it. After assuming it true, My Students submitted it.					
	5. If my Mathematics score is bad, My Students will try to fix it on the next quiz.					
	6. If the Mathematics score is well, My Students will not be quickly satisfied with the score and will be more enthusiastic to learn.					
Encouragement and needs to study	7. Before the Mathematics subject is started, My Students have read the books related to the subject material.					
	8. Whenever the teacher explains, My Students always focus on the explanation.					
	9. Whenever spare time is provided, My Students chose to discuss the subject with friends or the teacher.					
	10. Whenever a break session is provided, My Students					

		Read books in the library.					
	11.	If Mathematics homework or task is given, My Students will submit it on time.					
	12.	At my home, My Students always review the Mathematics material given by the teacher.					
	13.	I am active to write the additional material which is not mentioned in my Mathematics books.					
The desire for a good future	14.	My Students are diligent in studying Mathematics because they know its benefits in the future.					
	15.	My Students are diligent in studying Mathematics due to pursuing a promising future.					
	16.	To achieve my desire for the future, My Students have been preparing it by industrious study.					
Appreciation of learning	17.	I want to be a successful student so that whenever a Mathematics exam is given, My Students are intended to pursue the best score.					
	18.	To make teacher and parents proud of me, My Students study Mathematics frequently.					
	19.	Students like to help my friends when they face difficulties in understanding Mathematics material.					
	20.	If My Students achieved the best Mathematics score, My Students will not be quickly satisfied with the score, and I will be more enthusiastic about learning.					
	21.	If My Students achieved the worst score, My Students will be more dynamic to study to get the good score on the next quiz.					
	22.	If My Students commanded to come forward to answer a Mathematics quiz, I am not shy to go ahead though my answer is not always true.					
	23.	If My Students failed to finish the Mathematics task, My Students will not intend to fail anymore.					

	24.	If My Students given a new task or past task, My Students will be enthusiastic to finish it.					
Interesting activity in learning,	25.	My Students are active in asking and give opinions during the Mathematics subject is held because the teacher explains Mathematics material interestingly.					
	26.	My Students are enthusiastic and focused better when my teacher teaches me by using exciting media. For example, LCD.					
	27.	My students are enthusiastic and focused better when the teacher teaches me by using an interesting method, such as discussion.					
Convenient zone during learning	28.	Despite focusing on noisy or not noisy condition in the class, my students insist on being focused to receive the Mathematic material.					
	29.	My students always focus on receiving the subject material even though my friend's voice's disturbance exists.					
	30.	If the Mathematics task is finished, My students will evaluate again and will not choose to play or chat in the class.					