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Students' Affective Skills Level and Their Impact on Mathematics Learning Outcomes

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Abstrak

Affective skills merupakan salah satu faktor yang wajib dimiliki siswa dan merupakan kunci keberhasil belajar, affective skille juga menjadi salah satu keterampilan yang dibutuhkan didunia kerja masa depan. Studi kuantitatif ini bertujuan menganalisis level affective skills dan pengaruhnya terhadap hasil belajar, serta menganalisis variabel yang berpengaruh dominan. Penelitian ini merupakan penelitian kuantitatif survei dilakukan pada Januari-Maret 2021 dengan melibatkan siswa SMA Negeri 4 sebanyak 155 orang. Variabel terdiri dari variabel eksogen yaitu affective skills (math interes, math axienty, math self-efficacy, beliefs, dan math attitude), sedangkan variabel endogen adalah hasil belajar. Instrumen yang digunakan untuk mengkur variabel eksogen adalah kuisioner angket yang memenuhi uji validitas dan realibitas. Sedangkan variabel endogen yaitu hasil belajar diperoleh dari nilai dokumentasi hasil belajar siswa di sekolah. Data diolah dengan analisis deskriptif dan analisis infrensial melalui structural equation modeling (SEM). Hasil penelitian menyimpulkan bahwa math self-efficacy dan math attitude berada pada kategori tinggi, beliffs dan math interest berada pada kategori cukup, serta math anxiety berada pada kategori rendah. Lebih lanjut, math interes, math self-efficacy, beliffs, dan math attitude ditemukan berpengaruh tidak signifikan terhadap hasil belajar yang bermakna bahwa math interes, math self-efficacy, beliffs, dan math attitude belum cukup memberi bukti bahwa dapat mempengaruhi hasil belajar secara signifikan, sedangkan math anxiety berpengaruh signifikan negative terhadap hasil belajar yang bermakna bahwa semakin rendah math anxiety yang dimiliki siswa, maka hasil belajar siswa tersebut akan semaik tinggi. Dengan demikian, maka math anxiety merupakan variabel yang berpengaruh dominan terhadap hasil belajar matematika

Kata kunci: Affective skills, Hasil Belajar, SEM

Abstract

Affective skill is one of the factors that students must possess and are the key to successful learning; affective skills are also one of the skills needed in the world of work in the future. This quantitative study aimed to analyze the level of affective skills and their influence on learning outcomes and the dominant influencing variables. This research was quantitative survey research conducted in January-March 2021 that involved 155 students at State Senior High School 4 Makassar. The variables consisted of exogenous variables, namely affective skills (math interest, math anxiety, math self-efficacy, beliefs, and math attitude), while endogenous variables are learning outcomes. The instrument used to measure exogenous variables was a questionnaire that met the validity and reliability tests. While the endogenous variable, namely understanding results obtained from the value of documentation of student learning outcomes at school. The data was processed by descriptive analysis and inferential analysis through structural equation modeling (SEM). The study results concluded that math self-efficacy and math attitude were in the high category, beliefs and math interest were in a suitable type. Math anxiety was in a low sort.

Furthermore, math interest, math self-efficacy, beliefs, and math attitude were found to have no significant effect on learning outcomes, which means that math interest, self-efficacy, ideas, and math attitude were not sufficient to provide evidence that they could significantly influence learning outcomes. Math anxiety had a significant negative influence on learning outcomes, which means that the less math anxiety students possessed, the higher the student's learning outcomes be. Thus, math anxiety was a variable that had a dominant impact on mathematics learning outcomes.
Keywords: Affective skills, Learning Outcomes, SEM

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Introduction

Mathematics is one of the essential subjects at the secondary school level, which takes precedence over reading (Adeniji et al., 2018). The process of changing behavior obtained from knowledge or skills is the main goal in studying mathematics. Learning mathematics teaches many things and emphasizes many aspects such as communication (Sfard, 2001; Tabach & Nachlieli, 2016); quantity, space, and structure (Seel, 2014); computing and problem-solving skills (Yeh et al., 2019).

Mastery and students' mathematical abilities can be seen from their learning outcomes. Learning outcomes are a manifestation of measuring students' success in understanding learning (Ohia, 2011). Learning outcomes describe the knowledge, skills, and attitudes that students have after participating in the learning framework (Mappeasse, 2009). Various methods can measure learning outcomes to recognize and accrediting student learning outcomes (Admiraal et al., 2015). Learning outcomes are statements about what students are expected to know, understand, and demonstrate at the end of the learning experience (Adam, 2004). Therefore, every student is required to obtain good learning outcomes. Many things can affect learning outcomes, including the affective factors of skills (Surmiyati, 2014).

Affective skills are something that a student must have because they can help students give positive reactions or adverse reactions to the situation at hand (Rofiq, 2009). The affective domain includes individual feelings, emotions, and attitudes, including accepting phenomena, responding to phenomena, assessing, organization, and characterization (Anderson, 2011). Affective abilities can include listening attentively to class lessons, responding to the phenomenon of involving students' active participation in class or during group discussions (Cannon & Feinstein, 2005).

Affective skills can contribute to learning outcomes as opinions (Savitz-Romer et al., 2015) that practical abilities are essential to students' academic success. Students with solid

practical skills will acquire, develop, strengthen, and demonstrate behavior and attitudes in learning (Ratka, 2018). These skills are essential because they are manifested in a set of behaviors, thought patterns, and dispositions that lead to understanding (Berger et al., 2012). Affective skills involve attitudes, feelings, emotions, and beliefs. Affective and cognitive skills cannot be separated (Tatar et al., 2013). Therefore, affective skills are essential to determine student skills.

A student who has affective abilities can maximize his ability to engage himself in seeing the value of something and expressing it. This includes the ability to share their views and ideas on various issues raised in the classroom, as well as attach importance to academic issues (Wilson, 2016). Affective abilities include feelings, enthusiasm, appreciation, values, interests, and attitudes towards things (Anderson & Krathwoll, 2001).

Affective skills consist of several indicators, which include self-efficacy (Hoffman & Schraw, 2009); mathematical interests and mathematical attitudes (Pimta et al., 2009; Spada et al., 2008); worry (Guven & Cabakcor, 2013); belief (Erdamar & Alpan, 2013; Saban & Yuce, 2012). Likewise, opinion (Coelho et al., 2020) that practical skills consist of self-efficacy, attitudes, anxiety, beliefs, and interests.

The indicators of affective skills are described as: The first is self-efficacy. Self-efficacy is defined as a belief in one's ability to organize and implement a program of action to meet the desired results (Bandura et al., 1999). Self-efficacy describes a person's belief so that he can successfully perform tasks in many cases and obtain performance achievements (Parajes, 2002; Pajares, 2003). Self-efficacy plays a strong role regarding choice, persistence, effort, strategy use, and interest in math problems. In addition, self-efficacy is positively related to mathematical achievement and problem solving (Lopez et al., 1997; Pajares & Miller, 1994; Pajares & Kranzler, 1995).

The second indicator is math interest. Math interest is a sense of interest in a learning activity without coercion (Roida, 2015). (Astuti, 2015) explains that interest is also a determinant of learning success. Several previous research results found that math interest can have a positive influence on mathematics learning outcomes include (Meriyati et al., 2018; Yustinaningrum, 2018; Waller, 2006).

The third indicator is math anxiety. Math anxiety is a student's belief that they will not be able to solve the math problems they face. Common reasons for the occurrence of math anxiety are perceptions that have low skills, lack of previous success, non-adaptive behavior, inadequate learning, lack of ability to prepare for study and tests, and genetic characteristics such as perception (Hoffman & Schraw, 2010). (Fisher et al., 1996) suggested that math anxiety

is one of the factors that affect student problem solving achievement. In his investigation concluded that there is a negative relationship between math anxiety and problem-solving achievement. Similar thing is also stated that math anxiety is affective factor that influence students' math achievement negatively (Bindak, 2005).

The fourth indicator is belief. Belief is a tendency to act like or dislike towards a mathematical problem-solving activity, belief is formulated as a student's subjective conception that is considered correct which affects mathematics learning and problem solving (Eynde et al., 2002). In the learning process, students' belief can provide ideas in learning so that students can excel. Belief plays an important role in directing students' perceptions and behavior so that it affects mathematics learning activities and student achievement (Lazim et al., 2004; Meiyue et al., 2010).

The fifth indicator is math attitude. Math attitude is a description of the attitude towards a person's tendency to respond positively or negatively to an object, situation or concept (Sarmah & Puri, 2014). Math attitude can change and develop over time (Syyeda, 2016), a positive attitude that is formed can improve student learning outcomes (Akinsola & Olowojaiye, 2008; Mutai, 2011). On the other hand, negative attitudes hinder effective learning and consequently affect subsequent learning outcomes (Joseph, 2013). Therefore, attitude is a fundamental factor that cannot be ignored. Math attitude is considered by many researchers as a major contributor to higher or lower performance in mathematics (Waheed & Mohamed, 2011; Mata et al., 2012; Ngussa & Mbuti, 2017).

Unfortunately, practical skills, which are one of the skills needed in the world of work in the future, have not been optimally owned by students in Indonesia, which can be seen from the low learning outcomes of mathematics when viewed from (PISA) 2018 released by the Organization for Economic Co-Operation and Development (OECD) Indonesia is ranked 71 out of 78 countries based on the accumulated score of three indicators (OECD, 2018). Thus, if seen in the national exam for mathematics at the high school level, only an average of 52.01 is in a low category (Puspendik, 2020). In addition, there are also several research results that report the expected learning outcomes of mathematics in Indonesia, such as (Amir & Kurniawan, 2016; Yahya & Bakri, 2020; Fitrianti et al., 2020).

Likewise, the reported students' affective skills were still low based on the findings (Sigiro et al., 2017); mathematics anxiety can have a negative impact on students' mathematics learning outcomes (Mu'azaroh, 2020); there is student anxiety in learning (Nurhayati et al., 2019); students show negative attitudes towards learning (Riajanto, 2020); low self-confidence

in learning (Mirawati, 2017); and students' lack of interest in learning mathematics (Lestari, 2015).

Various previous studies have been carried out in several countries related to affective skills, such as (Folloni et al., 2021) in Italy (Christiana et al., 2021; Mikus et al., 2021) in Germany. In Indonesia, there have also been many such practices (Muamar & Rahmi, 2017; Zamista, 2016); However, these studies are more likely to examine things that can improve the ability of affective skills, and no one has reviewed the level of affective skills and their impact on mathematics learning outcomes. Research on student affective skills has not been conducted during or after a pandemic. Even though research related to the level of affective skills is vital to do in the hope that it can provide an overview of the level and factors that can shape the creation of effective skills, in addition, the findings made can be used as a reference in developing effective skills in support of improving mathematics learning outcomes. The results can also be a reference for lecturers and teachers in developing the quality and results of mathematics learning. Therefore, the main objective of this research is to analyze and describe the level of affective skills and its influence on the mathematics learning outcomes. The research questions are: 1) What is the level of math interest, math anxiety, math self-efficacy, beliefs and math attitude, and students' math learning outcomes? 2) Do math interest, math anxiety, math self-efficacy, beliefs, and math attitude have a significant influence on students' mathematics learning outcomes?; and 3) Which dominant variable that influence on students' mathematics learning outcomes is?.

Research Method

This research was quantitative survey research conducted in January-March 2021. This study involved 540 students at State Senior High School 4 spread over three levels, namely class X-XII. Because there were three levels with different age ranges, the sampling was carried out using the stratified random sampling technique by choosing class from each grade, and the results were obtained as many as 155 students that spread into six classes.

The research procedure was carried out in four stages, namely (1) Preparation: by conducting an inductive study of the problem, studying literature and relevant sources and making a research plan, compiling and validating the instrument; (2) Implementation: giving questionnaires and tests, as well as collecting relevant data; (3) Data analysis: Data reduction and analysis through descriptive and inferential analysis with structural equation modeling

(SEM); (4) Drawing conclusions: analysis and evaluation to get a good picture in drawing the correct conclusions.

The research variables consisted of exogenous variables, namely affective skills consisting of math interest, math anxiety, math self-efficacy, beliefs, and math attitude. While the endogenous variable was learning outcomes. The operational definitions and variable indicators were described in Table 1.

Table 1. Operational Definitions and Variable Indicators

Variable	Operational definition	Indicator
Math interest	*Math interest* defined as a student's interest in learning activities without coercion	1. Students' desire to learn mathematics. 2. Students' joy in learning mathematics. 3. Emotional involvement of students in learning mathematics; and 4. Tendency of student activity related to mathematics course. (Syahlani & Setyorini, 2020)
Math anxiety	*Math anxiety* defined as the belief that students have that they will not be able to solve the math problems they face	1. Mathematics knowledge/understanding 2. Somatic 3. Cognitive 4. Attitude (Cooke et al., 2011)
Math self-efficacy	*Math self-efficacy* defined as belief in students that they have abilities to successfully solve problems	1. Dimensions of magnitude (Level). 2. Dimensions of strength (Strength). 3. Dimensions of generalization (Generality). (Bandura et al., 1999)
Beliefs	*Beliefs* defined as a condition that describes the tendency of students to act like or dislike towards a mathematical problem-solving activity	1. Beliefs about learning mathematics 2. Confidence about yourself 3. Beliefs about social context. (Izzatul, 2017)
Math attitude	*Math attitude* defined as a description of the tendency of students to respond positively or negatively to Math lessons	1. Trying to understand the problem or substance of a mathematical problem independently. 2. Trying to take logical action. 3. Trying to state things clearly and concisely. 4. Trying to find better things. (Katagiri, 2004)
Learning outcomes	Learning outcomes defined as a manifestation of student success benchmarks in understanding learning	1. Cognitive realm 2. Affective realm 3. Psychomotor domain (Bloom et al., 1976)

The instrument used to measure the exogenous variables was a questionnaire with a rubric on a scale of 1-5 with the following information:

1. The math interest questionnaire consisted of 8 question items developed from 4 indicators adopted from (Syahlani & Setyorini, 2020)
2. The math anxiety questionnaire consisted of 8 question items developed from 4 indicators adopted from (Cooke et al., 2011).
3. The math self-efficacy questionnaire consisted of 6 question items developed from 3 indicators adopted from (Bandura et al., 1999).
4. The beliefs questionnaire consisted of 6 question items developed from 3 indicators adopted from (Izzatul, 2017).
5. The math attitude questionnaire consisted of 11 question items developed from 4 indicators adopted from (Izzatul, 2017).

All the questionnaires met the validity test and the reliability test. While the endogenous variable, namely the results of learning mathematics obtained from the value of the documentation of students' learning outcomes at school.

The research data were processed with descriptive analysis to describe each category of variables and variable indicators by referring to the following Table 2.

Table 2. Variable Category Classification

Affective Skills Variable Category		**Category of Learning Outcomes Variables**	
Score	**Category**	**Score**	**Category**
1.00 - 1.80	Low	> 87	Very high
1.81 - 2.60	Less	75 - 86	High
2.61 - 3.40	Enough	63 - 74	Moderate
3.41 - 4.20	High	50 - 62	Low
4.21 - 5.00	Very high	<50	Very low
(F et al., 2000)		(Purwanto, 2012)	

Furthermore, inferential analysis is processed using structural equation modeling (SEM) analysis techniques through the Amos Version 21 program, which was used as a fundamental for answering the formulated problems.

Results

The results of this study consist of the results of the descriptive analysis and the results of the inferential analysis. The results of the descriptive analysis of each variable were presented in Table 3 below.

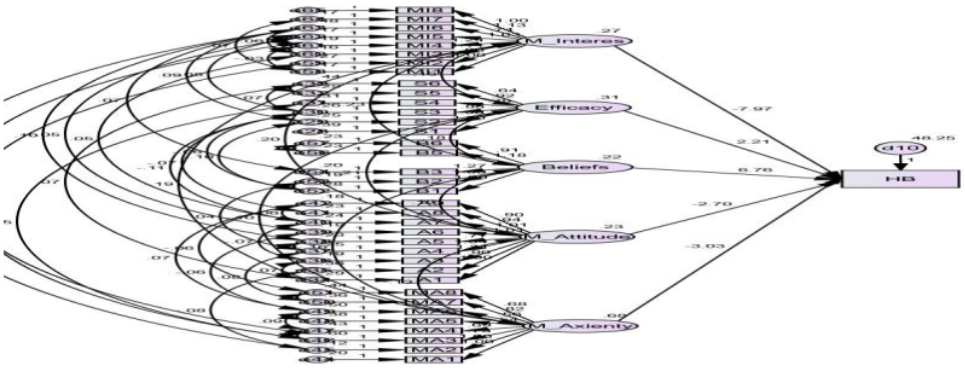
Table 3. The results of descriptive analysis of each variable indicator

Variable / Variable Indicator	Mean Value	Category
Affective skills	3.49	High
Math interests	3.55	Enough
Math anxiety	2.9	Less
Math self-efficacy	3.77	High
Beliefs	3.73	Enough
Math attitude	3.50	High
Learning outcomes	84.11	High

Based on table 2, affective skills were found to be in a high category. In contrast, the indicators of affective skills were found that math self-efficacy and math attitude were in the high category, beliefs and math interests were in the sufficient category, and math anxiety was in the poor category. Likewise, learning outcomes are reported to be in the high class. The results of this study found that math self-efficacy had a higher value than other variables. These findings reinforce the research results (Chandra & Royanto, 2019) that math self-efficacy has more effect on math performance than math anxiety.

Math anxiety was also found in the poor category, but the value was still relatively high. This illustrates that students in learning mathematics are still followed by anxiety (math anxiety); this is based on the findings (Imro'ah et al., 2019) that students experience anxiety when learning mathematics. (Hilliard et al., 2020) also explained that learning has the potential to cause anxiety for students, especially learning online, even though anxiety tends to cause low math performance (Lailiyah et al., 2021). Likewise found (Ariani et al., 2020) that students with a very high level of mathematics anxiety are not able to meet indicators in solving decision-making problems.

Furthermore, the findings of the inferential analysis with structural equation modeling (SEM). Testing the hypothesis using structural equation modeling (SEM) analysis was first tested for the construct validity of the variables to determine the validity of the indicators for each variable. The results of the analysis showed that there was one indicator namely beliefs variable that was excluded from hypothesis testing because the p value> 0.05. Furthermore, the upside of fit model was tested, the results of the analysis showed that the initial equation model did not match because the values of several benefit of fit criteria did not meet the values of GFI, TLI, CFI, RMSEA and AGFI. To get a match model, a modification index was carried out by connecting several parts of the model to be tested. The results of the analysis obtained the final model as shown in Figure 1 below.



Picture 1. Model Fit Structural Equation Modeling

The evaluation of the criteria for the goodness of fit indices is shown in Table 4 below.

Table 4. The results of the evaluation of the criteria for the goodness of fit indices

The goodness of fit index	Cut-off Value	Model Results *	Information
χ^2 - Chi-square	Small expected	841,941	Good
Sign of Probability	≥ 0.05	0.000	Good
CMIN / DF	≤ 2.00	1,462	Good
RMSEA	≤ 0.80	0.061	Good
GFI	≥ 0.90	0.748	Marginal
AGFI	≥ 0.90	0.693	Marginal
TLI	≥ 0.95	0.901	Marginal
CFI	≥ 0.95	0.914	Marginal

Furthermore, to see the influence of each exogenous variable on endogenous variables, it can be seen from the results of regression weights in Table 5 below.

Table 5. Regression Weights

Variable Relationships	Estimate	SE	CR	P	Estimate
Interest ← Learning outcomes	-7,967	7,382	-1,079	0.280	-0.554
Anxiety ← Learning outcomes	-3,027	0.948	-3,194	0.001	-0.331
Efficacy ← Learning outcomes	2,206	3,685	0.599	0.549	0.162
Beliefs ← Learning outcomes	6,758	7,186	0.940	0.347	0.425
Attitude ← Learning outcomes	-2,696	5,430	-0.497	0.619	-0.170

Based on table 4, it can be described as follows:

a. Math interest has no significant effect on learning outcomes based on the value of p = 0.280> α 0.05 with an estimated value of -7.967.
b. Math anxiety has a significant negative effect on learning outcomes based on the value of p = 0.001 <α 0.05 with an estimated value of -3.027.
c. Math self-efficacy has no significant effect on learning outcomes based on the value of p = 0.549> α 0.05 with an estimated value of 2.206.
d. Beliefs have no significant effect on learning outcomes based on the value of p = 0.347> α 0.05 with an estimated value of 6.758.
e. Math attitude has no significant effect on learning outcomes based on p = 0.619> α 0.05 with an estimated value of -2.696.

Discussion

The results showed that math interest had no significant effect on learning outcomes; this suggests that the data obtained from research subjects had not been able to prove that math interest had an impact on improving learning outcomes. This means that to improve learning outcomes, it is not enough to use math interests for learning. This finding supports the results of previous studies that there was no correlation between interest in learning and mathematics learning achievement that was found by (Ratnasari, 2017; Irwanti & Widodo, 2018), which explains that the mathematics learning outcomes of students with high learning interest have in common with students who have moderate and low interest. However, these findings are different from the research results (Lestari, 2015; Nugroho et al., 2020; Prastika, 2020; Sari & Fitri, 2019), who found that there was a significant effect of interest in learning on mathematics learning outcomes.

The following finding is that math anxiety has a significant negative impact on learning outcomes. This means that the lower or smaller the math anxiety students have, the better the student's learning outcomes will be. The results of this study are in line with the findings of previous studies conducted by (Villamizar Acevedo et al., 2020; Asrawati, 2021; Evy Novia Nanda Artama et al., 2020) with the finding that mathematics anxiety has a negative impact on mathematics learning outcomes, so do the results (Anita, 2014) that the negative correlation between mathematics anxiety and mathematical connection ability, and the mathematics learning outcomes of students who have high anxiety levels are lower than students with the low level of achievement (Meriyati et al., 2018). Therefore, this study explains that there is an agreement between the hypothesis and the existing data. At the same time, it strengthens the statement (Santri, 2017) that mathematics anxiety has a very negative impact on learning

outcomes; students who do not have anxious feelings will overcome learning problems and prepare themselves more thoroughly for learning (Vivin, 2019).

Furthermore, math self-efficacy was also found to have no significant effect on learning outcomes; this suggests that it turns out that self-efficacy is only able to have a very small effect on learning outcomes, so there is not enough evidence to say that self-efficacy can contribute to improving learning outcomes. The results of this study are in line with the results of the survey (Husna & S, 2018), which also found that there was no significant positive relationship between self-efficacy and mathematics learning outcomes. Likewise, the findings (Noer, 2013) show that there is no significant difference in the effect of self-efficacy on mathematics learning outcomes for students with high, medium, and low abilities. However, the results of this study are different from the research reports (Kaskens et al., 2020), which promotes that children's self-efficacy is very important for their mathematical development as well as a positive predictor of mathematics fluency; self-efficacy plays a crucial mediating role in the relationship between cognitive activation and mathematical achievement (Li et al., 2021); Likewise, self-efficacy is an aspect of student motivation that has been shown to play an essential role in student engagement, participation and retention in academic careers in science, technology, engineering, and mathematics (STEM) (Calendar et al., 2020).

The same thing can also be explained that beliefs have no significant effect on learning outcomes; this means that the data obtained from respondents illustrate that student beliefs have a very small effect on improving learning outcomes, so these findings are not sufficient to provide evidence that beliefs can affect outcomes. Learn significantly. The results of this study mean that to obtain or improve student learning outcomes, it is not enough just the ability of the beliefs but must be supported by other variables. Several previous research results also found that ideas did not have a significant effect on learning outcomes such as research results (Isharyadi, 2017) who also found the same thing, as well as the finding which states that students 'mathematics learning outcomes cannot be determined from students' beliefs because students who have firm, moderate or low beliefs actually have varying mathematics learning outcomes (Rozaqi et al., 2020). However, these findings are not sufficient evidence to support the statement (Eleftherios & Theodosios, 2007; Widjajanti & Wahyudin, 2010), which reveal that critical affective abilities are student beliefs that influence mathematical performance results and findings (Soesanto et al., 2020) that students with firm beliefs have higher learning independence.

The next finding is that math attitude does not have a significant effect on learning outcomes. It happens because math attitude is only able to have a very small effect on learning

outcomes. This means that the math attitude that students have has not been able to encourage students to improve their learning outcomes. Therefore, to obtain high learning outcomes, it is not enough just to have a math attitude alone but must be supported by other factors. This finding is in line with the findings (Leonard & Supardi, 2010) (Dahliani, 2019) that there is no positive and significant influence between student attitudes towards mathematics on learning outcomes. However, this study is different from the findings (Susilo & Agustin, 2015; Nurhayati, 2015; Purnomo, 2017; Hashim et al., 2021) that math attitude has a significant effect on learning outcomes. And also different from the research results (Hartati, 2015) that students who have a positive attitude towards mathematics will get higher mathematics learning outcomes than students who have negative attitudes towards mathematics.

In addition to the research findings reported, there are also limitations in the study that need to be considered, namely that even though the results of the evaluation of the goodness of fit indices criteria have met the fit model, there are indicators with marginal categories, besides that the participants in this study only involved one school and the results of the learning outcome data. Only taken from the value of documentation of student learning outcomes at school. However, further research is expected to measure learning outcomes with certain instruments and involve respondents from various schools so that the population is more heterogeneous.

Conclusion

In this study, the level of effective skills and their effects on students' mathematics learning outcomes has been analyzed. The results showed that math self-efficacy and math attitude were in the high category, beliefs and math interest were in the sufficient category, and math anxiety was in a low category. Furthermore, math interest, math self-efficacy, beliefs, and math attitude were found to have no significant effect on learning outcomes; this means that math interest, math self-efficacy, beliefs, and math attitude are not sufficient to provide evidence that they can significantly influence learning outcomes, while math anxiety has a significant negative effect on learning outcomes, it means that the lower the math anxiety students have, the higher the student's learning outcomes will be.

Based on the findings obtained in this study, it is highly recommended that math anxiety was minimized in various ways such as implementing fun learning and building a short of emotional relationships with students because this is proven to have a negative impact on learning outcomes. Likewise, math interest, math self-efficacy, beliefs, and math attitude,

although they are found to have no significant impact on learning outcomes, must still be things that need to be considered in improving student learning processes and outcomes. In addition, further research is recommended to examine strategies to improve student affective skills so that educators know the benefits of student affective skills and how to improve them.

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