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FACTORS INFLUENCING STUDENTS' MOTIVATION TO LEARN MATHEMATICS IN JUNIOR HIGH SCHOOL

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ABSTRACT This study aims to identify the factors influencing students' motivation to learn mathematics at SMP Negeri 2 Kota Tasikmalaya. The research employs a quantitative approach with a factor analysis method. The study population comprises students from SMP Negeri 2 Kota Tasikmalaya, with a sample of 249 students selected using a cluster random sampling technique. Data were collected through a questionnaire designed to explore the factors affecting students' motivation to learn mathematics. Data analysis was conducted using confirmatory factor analysis (CFA), which included an analysis feasibility test, the construction of a correlation matrix, extraction process, factor rotation, and factor naming. The results indicate that students' motivation to learn mathematics is influenced by nine key factors: (1) school environment, (2) family environment, (3) talent, (4) aspirations, (5) interest, (6) perception of mathematics, (7) teacher, (8) community environment, and (9) attitude. These findings provide valuable insights for improving learning strategies in schools.

Keywords: school environment, factor analysis, mathematical perception, learning motivation

ABSTRAK Penelitian ini bertujuan untuk mengidentifikasi faktor-faktor yang mempengaruhi motivasi belajar matematika siswa di SMP Negeri 2 Kota Tasikmalaya. Penelitian ini menggunakan pendekatan kuantitatif dengan metode analisis faktor. Populasi penelitian terdiri dari siswa di SMP Negeri 2 Kota Tasikmalaya, dengan sampel berjumlah 249 siswa yang dipilih melalui teknik cluster random sampling. Pengumpulan data dilakukan dengan kuesioner yang dirancang untuk mengeksplorasi faktor-faktor yang memengaruhi motivasi belajar matematika. Analisis data dilakukan menggunakan teknik confirmatory factor analysis (CFA), yang mencakup uji kelayakan analisis, pembentukan matriks korelasi, proses ekstraksi, rotasi faktor, dan penamaan faktor. Hasil penelitian menunjukkan bahwa motivasi belajar matematika dipengaruhi oleh sembilan faktor utama, yaitu: (1) lingkungan sekolah, (2) lingkungan keluarga, (3) bakat, (4) cita-cita, (5) minat, (6) persepsi terhadap matematika, (7) guru, (8) lingkungan masyarakat, dan (9) sikap. Temuan ini memberikan wawasan penting untuk perbaikan strategi pembelajaran di sekolah.

Keywords: lingkungan sekolah, analisis faktor, persepsi matematika, motivasi belajar

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INTRODUCTION

Mathematics is an essential subject throughout time and plays a vital role in daily life. This aligns with the opinion of Ayui et al. (2021), who stated that mathematics plays a significant role in daily life because it enhances understanding and trains students' abilities to think rationally, critically, logically, analytically, and systematically. Based on this, it is evident that mathematics holds numerous roles in everyday life and can positively impact students. Meanwhile, mathematics learning itself is a process that provides students with learning experiences through carefully planned activities, enabling them to master the taught mathematics material (Muhsetyo et al., 2021). This process involves students in various systematically arranged activities to help them understand and apply mathematical concepts. Furthermore, mathematics learning can also boost students' confidence in using mathematics, connect mathematical knowledge with real-life situations, and prepare them for future academic and professional challenges.

On the other hand, research by Rismawati and Khairiati (2021) shows that mathematics is a subject that is often less favored by students. This lack of interest is often caused by the assumption that mathematics involves many formulas and calculations, which can make the learning process challenging. Consequently, students tend to dislike mathematics, which can affect their motivation to learn.

Motivation plays a crucial role in the learning process, encouraging students to engage actively in educational activities. Komariya et al. (2018) stated that learning motivation is the drive that can inspire students to learn and has the potential to influence individuals throughout the learning process. When students possess strong motivation, they will demonstrate a significant level of energy and enthusiasm in their learning process, and the opposite is true for those with low motivation. According to Uno (2016), motivation can be defined as a driving force that propels individuals to act. This driving force originates either internally or externally and compels individuals to act in alignment with the urges they experience. Based on this perspective, it can be concluded that learning motivation is an internal driving force that enables individuals to achieve their goals during the learning process.

Learning motivation itself is influenced by several factors, both internal and external. This aligns with Filgona et al. (2020), who stated that learning motivation encompasses internal and external factors. Internal factors refer to motivation arising from within the individual, which encourages them to participate in the learning process. Conversely, external factors pertain to stimuli originating outside the individual. Hendrawan and Hendriana (2021) explained that factors influencing students' learning motivation include aspirations, students' conditions, psychological states, family social environment, learning environment conditions, schools, and the community. Additionally, La Djalia (2022) found two types of factors affecting students' low learning motivation: internal and external factors. Internal

factors include physiological and psychological aspects, while external factors involve family, school, and community-related aspects.

Based on the explanation above, various factors influencing learning motivation can be identified. Therefore, this study aims to confirm which factors significantly impact learning motivation. This is crucial so that all parties involved in the learning process can gain a clear understanding of the factors that affect learning motivation, enabling them to prepare everything necessary to support the learning process and enhance students' motivation to learn. Additionally, understanding these influencing factors can help create a conducive learning environment, apply appropriate learning strategies, and more. Furthermore, this research aims to contribute to theoretical development by delving deeper into and analyzing existing theories. The specific objective of this study is to describe the factors that influence learning motivation in the subject of Mathematics at SMP Negeri 2 Kota Tasikmalaya.

METHODS

This study employs the factor analysis method. Factor analysis is a statistical technique used to reduce data dimensions by converting initial variables into linear combinations of several factors (Wijaya and Budiman, 2016). The population in this study includes all 7th and 8th-grade students at SMP N 2 Kota Tasikmalaya, totaling 364 students in 7th grade and 378 students in 8th grade. The research sample consists of 249 students, comprising 123 students from 7th grade and 126 students from 8th grade. The data collection technique used in this study is a questionnaire, distributed to respondents to gather information about the factors influencing learning motivation in mathematics. The questionnaire was developed based on expert opinions regarding the factors affecting learning motivation, synthesized by the researchers, and validated by experts. The data analysis technique employed in this study is confirmatory factor analysis, which involves the following steps: testing the feasibility of the analysis, examining the correlation matrix values, conducting extraction, performing rotation, and interpreting the rotated factor results.

The criteria for testing the feasibility of the factor analysis used in this study include the Kaiser-Meyer-Olkin (KMO) coefficient for sampling adequacy and Bartlett's sphericity test. The KMO test is used to determine whether the sample size is sufficient for analysis, while Bartlett's test is used to assess data normality. The KMO measure of sampling adequacy is an index that compares the observed sample correlation coefficients with partial correlation coefficients (Margono, 2013). This study applies a significance level of 5% or 0.05.

The extraction step involves examining the eigenvalues obtained. Eigenvalues measure the contribution of variance for each item in forming specific factors. Eigenvalues must be greater than 1, as factors with eigenvalues less than 1 are considered insignificant (Purwanto, 2018). The next step is performing rotation, followed by interpreting the rotation results as the final step.

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FINDING AND DISCUSSION

After completing the validity and reliability tests, the researcher found 73 valid questionnaire items with a reliability score of 0.955, which is categorized as high. Subsequently, the researcher collected data and analyzed it using confirmatory factor analysis. The first step in confirmatory factor analysis is to test the feasibility of the analysis by examining the KMO value and the results of Bartlett's test. The KMO value was 0.770, and Bartlett's test showed a significance value of 0.000. This indicates that the variables are suitable for factor analysis. Furthermore, the MSA values were checked, where variables with MSA > 0.5 can be further analyzed. There were 35 variables with MSA > 0.5.

The next step was extraction, which aimed to identify the core factors from the various manifest variables that were extracted. To determine the main factors, the eigenvalue must be greater than 1. Based on the extraction results, the 35 manifest variables tested were grouped into 9 factors, as some items or manifest variables measured the same dimensions. The eigenvalues for each factor were above 1.00, and therefore, all factors were retained. Factor rotation was then performed, and the results of the extraction and factor rotation are as follows:

Table 1. Extraction and Rotation Results

Factor	Variable	Eigenvalue and % of Variance
School Environment	Teaching methods (L1)	6.671 (19.01%)
	Teacher professionalism (L2)	
	Teacher-student relationships (L3)	
	Student-student relationships (L4)	
	School equipment (L5)	
	Building conditions (L6)	
	Classroom conditions (L7)	
Family Environment	Parenting methods (K1)	4.744 (13.556%)
	Home atmosphere (K2)	
	Family economic conditions (K3)	
	Family attention (K4)	
	Cultural background (K5)	
Aspirations	Awareness of strengths and weaknesses (C1)	4.556 (13.017%)
	Ideal future expectations (C2)	
	Conscious effort being undertaken (C3)	
	Goals to be achieved (C4)	
Talent	Ease of understanding (B1)	3.307 (9.450%)
	Enjoyment of challenges (B2)	
	Courage to take risks (B3)	
	Choosing the environment (B4)	
	Having achievements (B5)	
Interest	Feelings of enjoyment (M1)	2.681 (7.661%)

Factor	Variable	Eigenvalue and % of Variance
	Curiosity (M2)	
	Attention (M3)	
	Engagement in learning (M4)	
Perception of Mathematics	Acceptance (P1)	2.031 (5.803%)
	Understanding (P2)	
	Assessment (P3)	
Teacher	Subject mastery (G1)	1.941 (5.545%)
	Delivery of material (G2)	
	Student learning evaluation (G3)	
Community Environment	Community lifestyle (T1)	1.55 (4.430%)
	Peer group (T2)	
Attitude	Positive response (S1)	1.272 (3.653%)
	Negative response (S2)	

Based on Table 1, the grouping of variables into their respective factors can be observed. There are nine factors influencing learning motivation at SMP N 2 Tasikmalaya. These factors consist of aspirations, interest, talent, attitude, students' perception of mathematics, school environment, family environment, teachers, and community environment.

Based on the research findings, there are nine factors influencing learning motivation in Mathematics at SMP N 2 Tasikmalaya. These factors include aspirations, interest, talent, attitude, students' perception of mathematics, school environment, family environment, teachers, and community environment.

The school environment is identified as the primary factor influencing learning motivation in Mathematics. This is evident from the highest eigenvalue associated with the school environment factor, which is 6.671 or equivalent to 19.01%. Thus, the school environment contributes 19% to learning motivation in Mathematics. Moreover, the school environment is where students spend most of their time engaging in learning activities, making it pivotal in shaping students' motivation to learn.

The school environment factor includes teaching methods, teacher professionalism, teacher-student relationships, student-student relationships, school equipment, building conditions, and classroom conditions. Each of these aspects plays a role in motivating students to learn. For example, adequate learning facilities, such as comfortable classrooms, learning aids, and access to technology, can enhance students' learning experiences. When the school environment meets students' academic, emotional, and social needs, learning motivation tends to increase significantly. Conversely, a less supportive school environment can diminish students' enthusiasm for learning.

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This aligns with the views of Ernawati & Aminah (2017), who state that the school environment significantly impacts students' learning motivation. Their research also reveals that factors such as the physical condition of the school, learning facilities, supporting infrastructure, student interactions, teacher-student relationships, and the involvement of all school members, including administrative staff, play a role in influencing students' learning motivation.

The family environment is the second factor influencing learning motivation, with an eigenvalue of 4.744 or 13.566%. This indicates that the family environment contributes approximately 13.6% to learning motivation in Mathematics. Aspects of the family environment include parental upbringing, home atmosphere, family economic conditions, family attention, and cultural background. The family environment affects students' learning motivation because the family is the primary place where students receive emotional support, values, and study habits. Active parental involvement, such as providing motivation, assisting children in completing school assignments, or creating a comfortable study environment at home, can help increase students' enthusiasm for learning. This aligns with the opinion of Hidayati et al. (2022), who state that the family environment is an external factor influencing students' learning motivation. Additionally, research by Saputri et al. (2015) reveals that the family environment significantly impacts learning motivation during the learning process. Positive values and a comfortable and calm home atmosphere within the family environment can boost students' enthusiasm for learning.

Aspirations are the third factor influencing students' learning motivation, with an eigenvalue of 4.556 or 13.017%. This indicates that aspirations affect learning motivation in Mathematics by 13%. This study explains that aspirations include several aspects: awareness of strengths and weaknesses, hopes for an ideal future, ongoing efforts, and goals to be achieved. Students' aspirations play an essential role in enhancing learning motivation. Students with aspirations tend to be more enthusiastic in the learning process and strive harder to achieve the future they envision. This influence significantly impacts students' learning motivation. This finding aligns with the research of Muhammad C. Moslem et al. (2019), which shows that students' learning motivation increases if they have aspirations. Furthermore, aspirations are also related to students' desires; having a willingness within themselves can motivate them to study more diligently.

The fourth factor influencing learning motivation is talent. Talent has an eigenvalue of 3.307 or 9.450%, which means talent contributes 9% to learning motivation in Mathematics. Talent affects learning motivation because it represents the natural ability of students that can enhance their enthusiasm for learning. Furthermore, talent can boost students' confidence levels in a particular subject. Students who excel in specific subjects, such as Mathematics, tend to grasp the material more easily, motivating them to learn and develop their potential further. The sense of accomplishment they experience and recognition of their abilities can also increase their intrinsic motivation to achieve higher performance. This perspective aligns with

the findings of Desriandi and Suhaili (2021), who state that talent in the learning process influences students' motivation to learn. Students with talent are motivated to acquire knowledge and strive to deepen their understanding in alignment with their abilities.

The fifth factor influencing learning motivation is interest. With an eigenvalue of 2.681 or 7.661%, interest contributes approximately 7.6% to learning motivation in Mathematics. This study identifies several aspects of interest, including enjoyment, curiosity, attention, and student engagement in the learning process. Interest plays a critical role in motivating students to learn. Students' curiosity about Mathematics positively impacts their feelings. When students are interested, they are more likely to enjoy the learning process. Moreover, this curiosity drives students to focus more on the material being studied and actively participate in lessons. This aligns with Hurlock's opinion (as cited in Trygu, 2020), which states that interest is a source of motivation that encourages individuals to do what they desire while giving them the freedom to choose their preferred activities.

Perception is one of the factors influencing learning motivation. The perception of mathematics has an eigenvalue of 2.031 or 5.803%, indicating that this perception contributes 5% to learning motivation in Mathematics. This study identifies several aspects of the perception of mathematics, including acceptance, understanding, and evaluation. The perception of mathematics affects students' viewpoints toward the subject, impacting their motivation to learn. Students with a positive perception, such as viewing mathematics as a challenging yet enjoyable and manageable subject, tend to be more motivated to put in extra effort and innovate in solving problems. Conversely, a negative perception of mathematics, such as seeing it as difficult or irrelevant, can diminish self-confidence, directly lowering the motivation to learn. This statement aligns with Syaripah's (2016) research findings, which indicate that students who perceive mathematics as difficult and have negative experiences or impressions of it often experience decreased motivation to learn mathematics and face challenges in academic adjustment at school.

Teachers are the seventh factor influencing learning motivation. Based on the research findings, the teacher factor has an eigenvalue of 1.941 or 5.545%, indicating that teachers contribute approximately 5.5% to learning motivation in Mathematics. The teacher factor in this study includes mastery of the material, delivery of the material, and evaluation of students' learning outcomes. Students tend to be more motivated and enthusiastic about learning when the lessons successfully capture their attention. Additionally, a teacher's attitude, such as offering praise and showing concern for students' development, can strengthen students' motivation to continue learning. This is supported by Trygu (2020), who stated that during the learning process, every action of the teacher plays an important role in influencing students' motivation, whether positively or negatively.

The community environment also influences learning motivation. Based on Table 4.4, the community environment has an eigenvalue of 1.524 or 4.406%, indicating

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that the community environment contributes 4% to learning motivation. The aspects within the community environment include cultural forms and peer groups. Cultural values and peers with a strong interest in learning can foster enthusiasm and determination to learn. Peers with a high interest in studying can motivate and inspire others to learn. Additionally, a society that values and emphasizes the importance of education encourages students to work harder to achieve academic success. A supportive community environment motivates students to study and achieve educational success. This factor aligns with Dimyanti & Mudjiono (2018), who stated that the conditions of the community environment affect students' seriousness in learning. Students in a supportive environment are more motivated to study.

Attitude plays a significant role in influencing students' learning motivation in Mathematics. With an eigenvalue of 1.272 or 3.653%, attitude contributes 3.6% to overall learning motivation. This study identifies two key aspects of attitude: positive and negative responses, which reflect students' reactions to various learning situations. The findings reveal that attitude is a crucial factor affecting students' drive to learn. Students with a positive attitude tend to approach learning with enthusiasm, perseverance, and an openness to challenges, which can enhance their academic performance and engagement. Conversely, a negative attitude may hinder motivation and reduce their willingness to actively participate in learning activities. These findings align with the study by Putri & Rifai (2019), which highlighted that a positive attitude significantly boosts learning motivation, fostering a more proactive and committed approach to mastering mathematical concepts.

CONCLUSIONS AND RECOMMENDATIONS

Based on the research findings, it can be concluded that nine factors influence learning motivation in Mathematics at SMP N 2 Tasikmalaya. These factors include the school environment, family environment, aspirations, talents, interests, perceptions of Mathematics, teachers, community environment, and attitudes, with a total variance percentage of 82.158% affecting learning motivation in Mathematics. The primary factor influencing students' learning motivation is the school environment, which contributes 19.01%.

The school environment is the dominant factor affecting learning motivation in Mathematics. Therefore, it is recommended that schools pay attention to and optimize learning conditions. To enhance student motivation, schools should create a conducive learning environment by improving facilities and equipment, designing comfortable classrooms, and fostering positive interactions between teachers and students, as well as among students. By addressing these aspects, schools can create an atmosphere that supports and motivates students to learn more enthusiastically and effectively.

For future researchers, it is suggested to explore additional factors that may influence learning motivation in Mathematics but were not identified in this study.

New aspects, such as the impact of digital technology, a deeper examination of family roles, or social dynamics outside school, could be interesting areas for investigation. Furthermore, future research can utilize the findings of this study as a basis to deepen the understanding of how these factors interact and influence students' overall learning motivation.

REFERENCES

Ayu, S., Ardianti, S. D., & Wanabuliandari, S. (2021). Analisis faktor penyebab kesulitan belajar matematika. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika, 10*(3), 1611–1622. https://doi.org/10.24127/ajpm.v10i3.3824

Desriandi, R., & Suhaili, N. (2021). Pengaruh bakat terhadap motivasi belajar siswa dalam proses belajar dan pembelajaran. *Jurnal Edukasi, 1*(2), 104–113.

Dimyanti, & Mudjiono. (2018). *Belajar dan pembelajaran* (5th ed.). Jakarta: Rineka Cipta.

La Djalia, S. (2022). Analisis faktor-faktor yang memengaruhi rendahnya motivasi belajar siswa sekolah dasar. *TAKSONOMI: Jurnal Penelitian Pendidikan Dasar, 2*(2), 129–135. https://doi.org/10.35326/taksonomi.v2i2.2764

Ernawati, L., & Aminah, Y. S. (2017). Pengaruh kondisi fisik siswa dan lingkungan sekolah terhadap motivasi belajar bidang studi ekonomi siswa kelas X MA NU Ibtidaul Falah Kudus tahun ajaran 2015/2016. *Economic Education Analysis Journal, 6*(1), 268–276.

Filgona, J., Sakiyo, J., Gwany, D. M., & Okoronka, A. U. (2020). Motivation in learning. *Asian Journal of Education and Social Studies, 10*(4), 16–37. https://doi.org/10.9734/ajess/2020/v10i430273

Hendrawan, D. N., & Hendriana, B. (2021). Pola asuh orang tua siswa dengan motivasi belajar matematika tingkat tinggi pada masa pandemi COVID-19. *Mosharafa: Jurnal Pendidikan Matematika, 10*(3), 369–378. https://doi.org/10.31980/mosharafa.v10i3.1020

Hidayati, R., Triyanto, M., Sulastri, A., & Husni, M. (2022). Faktor penyebab menurunnya motivasi belajar siswa kelas IV SDN 1 Peresak. *Jurnal Educatio FKIP UNMA, 8*(3), 1153–1160. https://doi.org/10.31949/educatio.v8i3.3223

Komariya, K., Farida, N., & Vahlia, I. (2018). Pengaruh model pembelajaran FSLC terhadap kemampuan pemecahan masalah matematika ditinjau dari motivasi belajar siswa. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika, 7*, 96. https://doi.org/10.24127/ajpm.v7i1.1355

Margono, G. (2013). The development of instrument for measuring attitudes toward statistics using semantic differential scale. *2nd International Seminar on Quality and Affordable Education (ISQAE)*, 241–250.

https://doi.org/10.30606/absis.v7i2.2860

Muhammad, C. M., Komaro, M., & Yayat. (2019). Faktor-faktor yang menyebabkan rendahnya motivasi belajar siswa dalam mata pelajaran aircraft drawing di SMK. *Journal of Mechanical Engineering Education, 6*(2), 259–265. https://doi.org/10.17509/jmee.v6i2.21803

Muhsetyo, G., Krisnadi, E., Karso, H., Wahyuningrum, E., Tarhadi, & Widagdo, D. (2021). *Pembelajaran matematika SD* (2nd ed.). Tangerang Selatan.

Purwanto. (2018). *Instrumen penelitian sosial dan pendidikan* (4th ed.). Yogyakarta: Pustaka Pelajar.

Putri, Y. L., & Rifai, A. (2019). Pengaruh sikap dan minat belajar terhadap motivasi belajar peserta didik paket C. *Journal of Nonformal Education and Community Empowerment, 3*(2), 173–184. https://doi.org/10.15294/pls.v2i1.23448

Rismawati, M., & Khairiati, E. (2021). Analisis faktor yang memengaruhi rendahnya motivasi belajar siswa pada mata pelajaran matematika. *J-PiMat: Jurnal Pendidikan Matematika, 3*(1), 295–306. https://doi.org/10.31932/j-pimat.v3i1.1129

Saputri, R. U., Aminuyati, & Achmadi. (2015). Pengaruh lingkungan keluarga terhadap motivasi belajar siswa pada pelajaran ekonomi di SMKN 3 Pontianak. *Jurnal Pendidikan dan Pembelajaran Khatulistiwa, 4*(8), 1–12.

Syaripah. (2016). Pengaruh persepsi pembelajaran matematika terhadap motivasi belajar siswa dalam bidang matematika di sekolah SMAN 1 Curup Timur T.P 2015/2016. *Jurnal EduTech, 2*(2), 117–131. https://doi.org/10.30596/edutech.v2i2.604

Trygu. (2020). *Motivasi dalam belajar matematika*. Guerpedia.

Uno, H. B. (2016). *Teori motivasi dan pengukurannya* (14th ed.). Jakarta: Bumi Aksara.

Wijaya, T., & Budiman, S. (2016). *Analisis multivariat untuk penelitian manajemen*. Yogyakarta: Pohon Cahaya.