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The Effect of Motivation and Learning Style on Students' Mathematics Learning Achievement

Samuel Juliardi Sinaga✉

Universitas HKBP Nommensen, Indonesia

E-mail: samuel.sinaga@uhn.ac.id

Abstrak

Berdasarkan observasi lapangan yang saya lakukan pada pembelajaran Matematika di SMA Negeri 3 Pematangsiantar, masih banyak siswa yang respon belajarnya masih kurang dan siswa tidak mengerjakan tugas dan ketika ditanya mengapa tidak mengerjakan tugas mereka memiliki banyak alasan. Penelitian ini bertujuan untuk mengetahui pengaruh motivasi terhadap prestasi belajar matematika siswa, pengaruh gaya belajar terhadap prestasi belajar matematika dan pengaruh motivasi dan gaya belajar terhadap prestasi belajar matematika siswa.. Dalam penelitian ini, peneliti menggunakan metode penelitian kuantitatif. Metode kuantitatif merupakan metode positivistik karena didasarkan pada filosofi positivisme. Metode ini merupakan metode ilmiah karena telah memenuhi kaidah-kaidah ilmiah yaitu konkrit/empiris, objektif, terukur, rasional, dan sistematis. Populasi dalam penelitian ini adalah siswa kelas XI SMA Negeri 3 Pematangsiantar yang berjumlah 290 siswa. Hasil penelitian dan pembahasan terdapat pengaruh positif antara motivasi dan gaya belajar terhadap prestasi belajar matematika siswa. Berdasarkan hasil penelitian dan pembahasan dapat disimpulkan bahwa terdapat pengaruh yang positif dan signifikan antara motivasi terhadap prestasi belajar matematika siswa kelas XI SMA Negeri 3 Pematangsiantar.

Keywords: pengaruh motivasi dan gaya belajar, prestasi belajar, matematika

Abstract

Based on field observations that I did on learning Mathematics at SMA Negeri 3 Pematangsiantar, there are still many students whose learning responses are still lacking and students do not do assignments and when asked why they don't do their assignments they have many reasons. This study aims to determine the effect of motivation on students' mathematics learning achievement, the effect of learning styles on mathematics learning achievement, and the influence of motivation and learning styles on students' mathematics learning achievement. In this study, the researcher used quantitative research methods. The quantitative method is a positivistic method because it is based on the philosophy of positivism. This method is a scientific method because it has fulfilled scientific principles, namely concrete/empirical, objective, measurable, rational, and systematic. The population in this study was students of class XI SMA Negeri 3 Pematangsiantar totaling 290 students. The results of the research and discussion have a positive influence on motivation and learning style on students' mathematics learning achievement. Based on the results of the research and discussion, it can be concluded that there is a positive and significant influence between motivation on learning achievement in mathematics for class XI students at SMA Negeri 3 Pematangsiantar.

Kata Kunci: *the effect of motivation and learning style, learning achievement, mathematics.*

✉ Corresponding author :

Email : samuel.sinaga@uhn.ac.id

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INTRODUCTION

Education is a smart way to live in a world of intellect, so it must be done professionally. To get the education that benefits the community and the country, it is necessary to have the role of teachers as educators who can be processors in conducting learning with student-specific responsibilities Arifin & Hermino, (2017); Kardaş İşler & Dedeoğlu, (2019). In the Minister of Education and Culture Act No. 22 of 2016 in terms of the Process Standards, it is said that practices are the norms related to the conduct of learning in the academic disciplines so that they can learn skills Sabtu et al., (2019); Helda & Syahrani, (2022). Learning performance can be effective if done in a fun, inspiring, fun, challenging way, and students are encouraged to explore their potential, and develop skills, independence in accordance with learning styles that build students' physical and psychological abilities Wang, (2015); Hudson et al., (2015). Mathematics education is one of the fields of study that must be taught at every level of education and has a very dominant role in educating students by developing critical, analytical, and logical thinking skills. The main problem in mathematics education in Indonesia is the low learning achievement of students in mathematics at school.

The low learning achievement of mathematics students is shown by the 2018 PISA report taken from ratings of 600,000 15-year-olds in 79 countries with both high and medium-income PISA participants, by comparing the reading, math, and science performance of each student in all countries that are the object of PISA Bernardo, (2021); Gamazo & Martínez-Abad, (2020). Indonesian in 2018 was ranked 74 out of 79 PISA participating countries in the reading ability category, in the mathematics ability category Indonesia was ranked 73 out of 79. The data above shows the low achievement of mathematics students in Indonesia, this is something that is a very urgent problem considering mathematics is something of a great urgent lesson in technological progress Suna et al., (2020); Hwang et al., (2018).

Achievement study is something problem in history life man because along range life man always Chase achievement according to field and ability each. Achievement study at school is something gift value done by the teacher to student for knowing ability student in dominate Theory lessons that have been delivered. Every activity learning naturally always expects will produce maximum learning. Achievement study is really important because results achieved student after do learning Becomes reject the main measure for knowing success study students (Lassoued et al., 2020).

The results of the educational measurement and assessment survey by *The Third International Mathematics Science Study-Report* (TIMSS-R) in 2011 that "Indonesian students' learning achievement is still at a low level according to international benchmarks, and is ranked 40th out of 45 participating countries participating in TIMSS in under Malaysia and Thailand (Sari & Siregar, 2021). Indonesian students' mathematical ability is still far below the international median, no Indonesian students reach the advanced standard, for the high level it is only achieved by 2% while the middle level is 15% and cumulatively the mathematical ability of Indonesian students reaches a low level of 43% of 8th-grade students by Balitbang Ministry of Education and Culture (Rita Ningsih 2016:74). This is one indicator that shows the low achievement of students' mathematics learning.

Regarding the low student achievement, many factors influence. Factors that affect achievement in learning are classified into two factors, namely, from within (internal factors) and from outside (external factors) students. Factors from within students include attitudes, habits, interests, needs, motivations, emotions, self-adjustment. While factors from outside students include family, school, group, and community (Gross et al., 2015).

Based on field observations I did on learning Mathematics at SMA Negeri 3 Pematangsiantar, there were still many students whose learning responses were still lacking and students did not do assignments and when asked why they did not do their assignments, they had many reasons, one of which was lazy to study. They admit that they study just before the daily tests and exams, even when the teacher teaches through the zoom

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application, many students are preoccupied with other things that cause students not to focus on learning. It happened because of the lack of students' motivation to learn mathematics.

According to Andersen, (2016) someone is successful in learning if in himself there is a desire to learn. This desire or desire to learn is called motivation. Encouragement in this regard involves two things: (1) knowing what to study; and (2) understanding why it is worth studying. Based on these two motivating factors, it is a good place to start learning. If students are encouraged to learn, there will be effective learning that will ultimately lead to good learning success (Fauzi & Widjajanti, 2018). In contrast to students who do not have motivation in themselves, it will cause low learning outcomes. Learning motivation has a very important role. Its distinctive role is in growing passion, feeling happy, and being eager to learn (Wardani et al., 2020).

Another factor that influences learning achievement is the student's learning style in following the learning process. According to Rozi et al., (2020); Zamroni et al., (2022) learning strategies are a combination of how students capture, then organize, and process information. A person's learning style is the key to developing performance on the job at school and in interpersonal situations. The ability of a person to understand and take lessons is completely different from one another. Some are fast, medium and some are slow, so they often have to take different approaches to understand the same lesson. While often occur teacher class only focus on Theory without notice student already understand or not yet. Besides that students also often have difficulty in adapting style study they with style teaching teacher at school. This is what causes low values Duty and later repeat will impact on low results study students. Based on the description above, I am interested in conducting research with the title "The Effect of Motivation and Learning Style on Students' Mathematics Learning Achievement".

METHOD

In this study, researchers used quantitative research methods Strijker et al., (2020); Rahman, (2020). The plural system is a good method because it is based on the philosophy of positivism. This method is a scientific method because it fulfills the principles of science, i.e., composite/empirical, objective, measurable, logical, and systematic (Purba et al., 2021). In this study, the population is class XI SMA Negeri 3 Pematangsiantar Academic Year 2021/2022, totaling 231 students. The class division is as in table 1.

Table 1
Number of Class XI State Senior High School Students 3 Pematangsiantar TA. 2020/2021

Name Rombel	XI MIA-I	XI MIA-II	XI MIA-III	XI MIA-IV	XI-MIA V	XI-MIA VI	XI-MIA VII	XI IS-I	XI IS-II	XI-IS III	XI-IS -IV	**Total**
The number of students	30	29	29	30	29	30	30	30	30	29	29	290

The sampling technique used is simple sampling. It is said to be simple (easy) because the sampling of members from the volume is performed randomly without looking at the strata present in the volume. Arikunto, (2014) if the subject is less than 100, it is better to take all so that the research is a population study. Furthermore, if the number of subjects is large, it can be taken 10% to 15% or 20% to 25% or 26% to 30% or more. The sample in this study was taken from 2 classes which were determined by lottery, namely 26% of the 231 students of class XI, amounting to 75 students.

In this study the variables to be studied are as follows:

a. Free Variable (*independent variable)*

The independent variable is the variable whose influence is investigated. The independent variables in this study are the use of learning motivation (X1) and learning style (X2).

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b. Bound Variable (*dependent variable*)

The dependent variable is the variable that is affected or becomes the result of the independent variable. The variable in this study is student achievement in mathematics class IX (Y).

The questionnaire in this study used the Linkert Scale measurement. With the Linkert Scale, the variables to be measured are translated into variable indicators. The following is a table of alternative answers and a questionnaire grid of learning motivation and learning styles.

Table 2
Questionnaire Statement Score

No.	Information	Positive Score	Negative Score
1	Agree firmly	5	1
2	Agree	4	2
3	Doubt	3	3
4	Do not allow	2	4
5	Refuse to Disagree	1	5

Table 3
Learning Motivation Questionnaire Grid

Variable	Indikator	Item Number		Number of items
		Positive	Negative	
Motivation to learn	Perseverance in learning	1,3,4,6,8,10	2,5,7,9	10
	Tenacious in the face of adversity	11,14,15,	12,13,16	6
	Interest and sharpness of attention in learning	17.2	18,19	4
	Achievement in learning	21,24,25	22.23	5
	There is a conducive learning environment	26,28,29	27.3	5
Amount				**30**

Table 4
Learning Style Questionnaire Grid

Variable	Indikator	Item Number		Number of items
		Positive	Negative	
Visual Learning Style	Understand what you see	1	2	2
	Neat and orderly	3.4	5	3
	Likes to read	6.8	7	3
	Difficulty receiving verbal instructions	9	10	2
Auditory Learning Style	Learn by listening	11.13	12	3
	Likes to talk and discuss	15,16	14	3
	Likes to listen to music	17	18	2
	Weak to Visual activity	20	19.21	3
Kinesthetic Learning Style	Learning through physical activity	22	23	2
	Sensitive to expressions and gestures	24.25	26	3
	Like to try and not tidy	28	27	2
	Likes busy activities	30	29	2
Amount				30

A good instrument must meet two important requirements, namely valid and reliable.

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RESULT AND DISCUSSION

Results

Test results of the Motivation Questionnaire Instrument

Table 5
Validity of Motivation Questionnaire Items

Test X1 Validity				
Item Question	**r_{count} with excel**	**r_{count} with SPSS**	**r_{table}**	**Decision**
1	-1.00144	(-0.001)	0.444	Does not matter
2	1.425129	1.425	0.444	Does not matter
3	1.816242	1.816	0.444	It works
4	1.213931	1.214	0.444	Does not matter
5	1.4922	1.492	0.444	It works
6	1.63318	1.633	0.444	It works
7	1.415435	1.415	0.444	Does not matter
8	1.72159	1.722	0.444	It works
9	1.692242	1.692	0.444	It works
10	1.584185	1.584	0.444	It works
11	1.691095	1.691	0.444	It works
12	1.555706	1.556	0.444	It works
13	1.770228	1.770	0.444	It works
14	1.664575	1.665	0.444	It works
15	-1.02703	(-1.027)	0.444	Invalid
16	1.731176	1.731	0.444	It works
17	1.546264	1.546	0.444	It works
18	1.414363	1.414	0.444	Does not matter
19	1.58532	1.585	0.444	It works
20	1.461738	1.462	0.444	It works
21	1.417812	1.418	0.444	Does not matter
22	1.450552	1.451	0.444	It works
23	1.377946	1.378	0.444	Does not matter
24	-1.11641	(-1.116)	0.444	Does not matter
25	1.651733	1.652	0.444	It works
26	1.724884	1.725	0.444	It works
27	1.636634	1.637	0.444	It works
28	1.477028	1.477	0.444	It works
29	1.475313	1.475	0.444	It works
30	1.362593	1.363	0.444	Does not matter

Based on the table above, items that have an $r_{table\ value} > 0.444$ are valid questionnaire items, namely items 3,4,6,8,9,10,11,12,13,14,16,17,19,20,22, 25, 26, 27, 28 and 29. And vice versa, items that have a correlation value of $r_{table} < 0.444$ is an invalid questionnaire item or is declared invalid. So it can be concluded that the motivational instrument validity test is declared valid or invalid. The full calculation is in (Appendix 2 and 3).

a. Trial Results of Learning Style Questionnaire Instruments

Table 6
Validity of Motivation Questionnaire Items

Test X2 Validity				
Item Question	**r_{count} with Excel**	**r_{count} with SPSS**	**r_{table}**	**Decision**
1	1.670563	1.671	0.444	It works
2	1.510902	1.511	0.444	It works

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3	1.722223	1.722	0.444	It works
4	1.818358	1.818	0.444	It works
5	1.490694	1.491	0.444	It works
6	1.339781	1.340	0.444	Does not matter
7	1.606066	1.606	0.444	It works
8	1.774697	1.775	0.444	It works
9	1.848554	1.849	0.444	It works
10	1.303503	1.304	0.444	Does not matter
11	1.624562	1.625	0.444	It works
12	1.371477	1.371	0.444	Does not matter
13	1.779841	1.780	0.444	It works
14	1.586909	1.587	0.444	It works
15	1.656834	1.657	0.444	It works
16	1.318501	1.319	0.444	Does not matter
17	1.585109	1.585	0.444	It works
18	1.646062	1.646	0.444	It works
19	1.164405	1.164	0.444	Does not matter
20	1.360656	1.361	0.444	Does not matter
21	1.076844	1.077	0.444	Does not matter
22	1.301518	1.302	0.444	Does not matter
23	1.080413	1.080	0.444	Does not matter
24	1.304772	1.305	0.444	Does not matter
25	1.276808	1.277	0.444	Does not matter
26	1.162941	1.163	0.444	Does not matter
27	-1.12841	(-1.128)	0.444	Does not matter
28	1.799937	1.800	0.444	It works
29	1.554626	1.555	0.444	It works
30	1.092359	1.092	0.444	Does not matter

Based on the table above, items that have an $r_{\text{table value}} > 0.444$ are valid questionnaire items, namely 1,2,3,4,5, 7, 8,9,11,13,14,15, 17,18,28 and 29 items . On the other hand, items that have a correlation value of $r_{\text{table}} < 0.444$ is an invalid questionnaire item or is declared void. So it can be concluded that the test of the validity of the learning style instrument is declared valid or invalid.

Discussion

1. Motivational effect on the mathematics learning achievement of class XI students of SMA Negeri 3 Pematangsiantar FY 2021/2022.

The results of calculations using simple regression analysis are known that the value of the correlation coefficient (r1y) is 0.581. These results indicate that the correlation coefficient is positive, so there is a positive influence of motivational variables on learning achievement. While the coefficient of determination R 2 is 0.337 or 33.7%, which means that learning motivation can explain 33.7% changes in student learning achievement in mathematics. The results of the 5% significance of 2,000, then the value of t table < t count, it can be concluded that there are positive and important factors that contribute to the success of mathematical learning. The results of this study are in line with the research conducted by Cho & Heron, (2015); Barak et al., (2016) Explaining the major differences in student mathematical achievement can be explained by students' natural motivation, there is a positive and significant difference between encouraging learning and student success in mathematical learning. Learning motivation is a whole psychological driving force in students and it provides an opportunity to experience, to ensure continuous learning to achieve the same goal. Motivation plays a key role in learning success in the teaching and learning process. Because motivation can lead to student learning interest. Students who have a strong motivation will have a desire to carry out teaching and learning activities. So it is possible for students who have high enough intelligence to fail due to lack of motivation because learning outcomes will

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be optimal if there is the right motivation. As Cook & Artino Jr, (2016); Berkhout et al., (2018); Rapanta et al., (2020) said, "in learning activities, motivation leads to learning activities, ensuring the continuity of learning activities, so that the goals desired by the learning subjects can be achieved. So it is clear that the higher the motivation to learn, the higher the student's learning achievement.

2. The Effect of Student Learning Style on Mathematics Learning Achievement of Class XI SMA Negeri 3 Pematangsiantar FY 2021/2022.

The results of calculations using simple regression analysis are known that the value of the correlation coefficient (rx2y) is 0.32451. These results indicate that the correlation coefficient is positive, so there is a positive effect of learning style variables on learning achievement. While the coefficient of determination R 2 is 0.105 or 10.5%, which means that learning styles can explain 10.5% changes in student learning achievement in mathematics. The results of the 5% significance of 2,000, then the value of t table < t arithmetic, it can be concluded that there is a positive and significant effect of learning style on learning achievement in mathematics. The results of this study are in line with research conducted by Laurens et al., (2017); Zakaria & Syamaun, (2017), which shows that there is a significant effect on students' mathematics learning achievement. Learning style is one aspect that needs attention. An appropriate learning style is a key to personal success in learning. Therefore, in learning situations, students desperately need help and guidance to identify the most appropriate learning styles for their learning goals. A person's ability to understand and absorb lessons is different levels. Some are fast, medium and some are very slow. Therefore, they often have to take different ways to understand the same information or lesson. Some students prefer their teacher to teach by writing everything on the blackboard. That way they can read and then try to understand it. But some other students prefer their teacher to teach by conveying it orally and they listen to understand it.

3. The Effect of Motivation and Learning Style on Mathematics Learning Achievement of Class XI Students of SMA Negeri 3 Pematangsiantar FY 2021/2022

Based on the results of the double calculation, it shows a positive and significant influence between motivation and learning style on the mathematics learning achievement of class XI students at SMA Negeri 3 Pematangsiantar. The results of the analysis obtained the price of the correlation coefficient r x 1 x 2 y 0.402, the coefficient is positive, so there is a positive influence between motivation and learning style on students' mathematics learning achievement. The results of this study are in line with Ozerem & Akkoyunlu, (2015); A. Rahman et al., (2016). The results show that: there is a positive and significant influence on motivation and learning styles (visual, auditory, and kinesthetic) individually on student achievement. Motivation and learning style influence students' mathematics learning achievement. The existence of learning motivation can foster student interest in learning. Students who have a strong motivation will have a desire to carry out learning activities and try to achieve high learning achievement and the preferred learning style of students can also affect student achievement. This shows that the three variables have an influence. The better the level of motivation and learning style of students, the better the achievement of learning mathematics obtained by students.

CONCLUSION

Depending on the outcome of the research and the discussion, It can be concluded that the success of mathematical learning is a positive and important factor in the motivation of the study of class XI students of SMA SMA Negeri 3 Pematangsiantar TA 2021/2021. As an example for the academic year 2021/2022, there is a positive and significant influence on students' motivation and learning styles together on the mathematics learning achievement of class XI students of Exemplary Private High School 2021/2022.

REFERENCES

Andersen, E. (2016). Managing Yourself Learning to Learn. *Harvard Business Review*, *94*(3).

Arifin, I., & Hermino, A. (2017). The Importance of Multicultural Education in Schools in the Era of ASEAN Economic Community. *Asian Social Science*, *13*(4), 78. https://doi.org/10.5539/ass.v13n4p78

Arikunto, S. (2014). Metode penelitian kuantitatif, kualitatif, dan kombinasi (mixed methods). *Bandung: Alfabeta*.

Barak, M., Watted, A., & Haick, H. (2016). Motivation to learn in massive open online courses: Examining aspects of language and social engagement. *Computers & Education*, *94*, 49–60. https://doi.org/10.1016/j.compedu.2015.11.010

Berkhout, J. J., Helmich, E., Teunissen, P. W., van der Vleuten, C. P. M., & Jaarsma, A. D. C. (2018). Context matters when striving to promote active and lifelong learning in medical education. *Medical Education*, *52*(1), 34–44.

Bernardo, A. B. I. (2021). Socioeconomic status moderates the relationship between growth mindset and learning in mathematics and science: Evidence from PISA 2018 Philippine data. *International Journal of School & Educational Psychology*, *9*(2), 208–222. https://doi.org/10.1080/21683603.2020.1832635

Cho, M.-H., & Heron, M. L. (2015). Self-regulated learning: The role of motivation, emotion, and use of learning strategies in students' learning experiences in a self-paced online mathematics course. *Distance Education*, *36*(1), 80–99.

Cook, D. A., & Artino Jr, A. R. (2016). Motivation to learn: an overview of contemporary theories. *Medical Education*, *50*(10), 997–1014.

Fauzi, A., & Widjajanti, D. B. (2018). Self-regulated learning: the effect on student's mathematics achievement. *Journal of Physics: Conference Series*, *1097*(1), 012139. https://doi.org/10.1088/1742-6596/1097/1/012139

Gamazo, A., & Martínez-Abad, F. (2020). An Exploration of Factors Linked to Academic Performance in PISA 2018 Through Data Mining Techniques. *Frontiers in Psychology*, *11*, 3365. https://doi.org/10.3389/fpsyg.2020.575167

Gross, J. M. S., Haines, S. J., Hill, C., Grace, L., Blue-banning, M., & Turnbull, A. P. (2015). Strong School – Community Partnerships in Inclusive Schools Are " Part of the Fabric of the School …. We Count on Them ." *School Community Journal*, *25*(2), 9–34. http://files.eric.ed.gov/fulltext/EJ1085646.pdf

Helda, H., & Syahrani, S. (2022). National Standards of Education in Contents Standards and Education Process Standards in Indonesia. *Indonesian Journal of Education (INJOE)*, *3*(2), 257–269. https://doi.org/10.54443/injoe.v3i2.32

Hudson, B., Henderson, S., & Hudson, A. (2015). Developing mathematical thinking in the primary classroom: liberating students and teachers as learners of mathematics. *Journal of Curriculum Studies*, *47*(3), 374–398. https://doi.org/10.1080/00220272.2014.979233

Hwang, J., Choi, K. M., Bae, Y., & Shin, D. H. (2018). Do Teachers' Instructional Practices Moderate Equity in Mathematical and Scientific Literacy?: an Investigation of the PISA 2012 and 2015. *International Journal of Science and Mathematics Education*, *16*(S1), 25–45. https://doi.org/10.1007/s10763-018-9909-8

Kardaş İşler, N., & Dedeoğlu, H. (2019). Multicultural Children Literature in Preservice Teacher Education: Responses through Literature Circles. *International Journal of Progressive Education*, *15*(4), 130–141. https://doi.org/10.29329/ijpe.2019.203.10

Lassoued, Z., Alhendawi, M., & Bashitialshaaer, R. (2020). An Exploratory Study of the Obstacles for Achieving Quality in Distance Learning during the COVID-19 Pandemic. *Education Sciences*, *10*(9), 232. https://doi.org/10.3390/educsci10090232

Laurens, T., Batlolona, F. A., Batlolona, J. R., & Leasa, M. (2017). How does realistic mathematics education (RME) improve students' mathematics cognitive achievement? *Eurasia Journal of Mathematics, Science and Technology Education*, *14*(2), 569–578.

Ozerem, A., & Akkoyunlu, B. (2015). Learning environments designed according to learning styles and its effects on mathematics achievement. *Eurasian Journal of Educational Research*, *61*. https://dergipark.org.tr/en/pub/ejer/issue/30026/324167

Purba, Y. O., Fadhilaturrahmi, F., Purba, J. T., & Siahaan, K. W. A. (2021). *Teknik Uji Instrumen Penelitian Pendidikan*. https://repository.penerbitwidina.com/publications/349518/teknik-uji-instrumen-penelitian-pendidikan

Rahman, A., Ahmar, A., & Rusli, R. (2016). The influence of cooperative learning models on learning outcomes based on students' learning styles. *World Transactions on Engineering and Technology Education*, *14*(3).

Rahman, M. S. (2020). *The advantages and disadvantages of using qualitative and quantitative approaches and methods in language "testing and assessment" research: A literature review*.

Rapanta, C., Botturi, L., Goodyear, P., Guàrdia, L., & Koole, M. (2020). Online university teaching during and after the Covid-19 crisis: Refocusing teacher presence and learning activity. *Postdigital Science and Education*, *2*(3), 923–945.

Rozi, F., Bali, M., Firdaus, S., Wijaya, M., Mursyidi, R. A. Al, Haqiki, M. W., & Abidin, Z. (2020). Learning management; identifying learning styles of language learners in madrasah. *Proceedings of the International Conference on Industrial Engineering and Operations Management*, *5*, 3783–3790.

Sabtu, Rukun, K., Sukardi, Putri Permatasari, R. D., & Hayadi, B. H. (2019). Development of Digital Information Management Learning Media Based on Adobe Flash in Grade X of Digital Simulation Subject. *Journal of Physics: Conference Series*, *1363*(1), 12066. https://doi.org/10.1088/1742-6596/1363/1/012066

Sari, M. K., & Siregar, S. U. (2021). Analysis of Teacher Performance in the Mathematics Learning Process at SMP Negeri 2 Bilah Hulu. *Budapest International Research and Critics Institute (BIRCI-Journal): Humanities and Social Sciences*, *4*(1), 1479–1484. https://doi.org/10.33258/birci.v4i1.1776

Strijker, D., Bosworth, G., & Bouter, G. (2020). Research methods in rural studies: Qualitative, quantitative and mixed methods. *Journal of Rural Studies*, *78*, 262–270. https://doi.org/10.1016/j.jrurstud.2020.06.007

Suna, E., Tanberkan, H., & Özer, M. (2020). Changes in Literacy of Students in Turkey by Years and School Types: Performance of Students in PISA Applications. *Eğitimde ve Psikolojide Ölçme ve Değerlendirme Dergisi*, *11*(1), 76–98. https://doi.org/10.21031/epod.702191

Wang, A. I. (2015). The wear out effect of a game-based student response system. *Computers & Education*, *82*, 217–227. https://doi.org/https://doi.org/10.1016/j.compedu.2014.11.004

Wardani, A. D., Gunawan, I., Kusumaningrum, D. E., Benty, D. D. N., Sumarsono, R. B., Nurabadi, A., & Handayani, L. (2020). Student Learning Motivation: A Conceptual Paper. *Proceedings of the 2nd Early Childhood and Primary Childhood Education (ECPE 2020)*, 275–278. https://doi.org/10.2991/assehr.k.201112.049

Zakaria, E., & Syamaun, M. (2017). The effect of realistic mathematics education approach on students' achievement and attitudes towards mathematics. *Mathematics Education Trends and Research*, *1*(1), 32–40.

Zamroni, Z., Baharun, H., Rozi, F., Sholeha, W., & Anggraini, Y. (2022). Intercultural Communication: Strategy to Improve School Competitiveness Based on Public Demand. *Jurnal Obsesi: Jurnal Pendidikan Anak Usia Dini*, *6*(4), 2886–2895.