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The effect of integrating society, science, environment, technology, and collaborative mind mapping (ISSETCM2) model on mathematical literacy in terms of adversity quotient

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Abstract

The implementation of this study aims to ensure the effectiveness of the Integrating Society, Science, Environment, Technology, and Collaborative Mind Mapping (ISSETCM2) learning model on mathematical literacy skills in terms of adversity quotient (AQ). This research design is quasi-experimental, with the population being all eighth-grade students in the academic year 2021/2022. The research sample was selected by cluster random. The average value of the mathematical literacy ability of the experimental class students is 72.03, and that of the control class is 50.34. Based on data interpretation and analysis of variance (ANOVA) of two-path unequal cells with a significant value of $(\alpha) = 0{,}05$. The value of Sig is 0.001, so Sig $< \alpha$. Based on the data, there are differences in the results of mathematical literacy skills between the learning model (ISSETCM2) and direct instruction learning models. Also, there are differences in adversity quotient categories (climbers, campers, and quitters) on mathematical literacy abilities. There is no interaction between learning model factors and adversity quotient on the results of students' mathematical literacy abilities. From these data, it can be concluded that there is an effect of the ISSETCM2 learning model on mathematical literacy skills in terms of the adversity quotient of class VIII. The research results show that each student has a different adversity quotient, which can affect students' mathematical reasoning abilities. For this reason, students need to know the adversity quotient to maximize their abilities.

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INTRODUCTION

21st Century education requires students to develop all their competencies to understand conceptual knowledge and think critically and use mathematical literacy skills in solving problems (Florea & Hurjui, 2015; Sumirattana et al., 2018; Pratama & Retnawati, 2018). The learning paradigm emphasizes students' critical thinking skills, connecting knowledge with the real world, mastering information technology, and communicating (Kivunja, 2016). One of the skills needed to face the challenges of the 21st Century is mathematical literacy (Jailani et al., 2020; Novita & Herman, 2021). Mathematical literacy skills are very important for students to have because mathematics is closely related to everyday life (Muzaki, 2019; Prabawati et al., 2019). Mathematical literacy can help students understand the role or use of mathematics and use it to make the right decisions (Mansur, 2018; Ojose, 2017). Mathematical literacy relates to a person's ability to formulate, apply, and interpret mathematics in various contexts, including the ability to reason mathematically and use concepts, procedures, and facts to describe, predict, or explain phenomena or events (Kusuma et al., 2022; Rizki & Priatna, 2019; Suharta & Suarjana, 2018). Mathematical literacy also emphasizes students' ability to analyze, give reasons, and communicate ideas effectively in solving mathematical problems they encounter (Masjaya & Wardono, 2018; OECD, 2015).

The agency that pays great attention to literacy is called the Organization for Economic Cooperation and Development (OECD) (Setyawan, 2018). The OECD has surveyed for three years and produced a program called the Program for International Student Assessment (PISA) (OECD,

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2015), which has been discussing student literacy since 2000. This survey aims to provide an overview of student literacy in various countries. The survey was carried out in four fields, one of which was mathematics (OECD, 2015). Based on the results of the 2015 PISA study, Indonesia is included in 10 countries with low literacy skills, occupying the 69th position out of 72 countries, with an average student mathematical literacy score of 386, below the average score of OECD countries, which is 490 and still included in level 1. The results of the PISA study show that mathematical literacy in Indonesia still needs to improve (Fitriyani & Mastur, 2017). Students' mathematical literacy skills are divided into six levels (grades), with level 6 being the highest level of achievement and level 1 being the lowest (Suharyono & Rosnawati, 2020). These levels describe the ability of mathematical literacy to solve problems. PISA focuses on evaluating the literacy skills of students aged 15. Students in this age range are in class IX, which is nearing the final stage of evaluating junior high school education (Rahmawati & Usodo, 2015).

Based on the pre-research in one of the junior high schools, the results of the student's mathematical literacy ability test still scored below the KKM. So, the students' mathematical literacy skills are classified as low (Masfufah & Afriansyah, 2021). Therefore, a learning model is needed to train and develop students' mathematical literacy abilities. Based on this, it is necessary to have a solution so that students' mathematical literacy skills can develop. One is the Integrating Society, Science, Environment, Technology, and Collaborative Mind Mapping (ISSETCM2) model. The ISSETCM2 learning model not only studies mathematics but can also be linked to technology, the environment, and society, making it easier for students to understand the many things they will learn (Rahmawati et al., 2022). This integration makes learning more interesting and fun so students can understand the knowledge.

Student learning success is also influenced by several factors, including the adversity quotient (AQ) (Rukmana & Paloloang, 2020). In general, students experience difficulties solving problems related to mathematical literacy (Rahmawati, 2022). According to Paul (2018), AQ intelligence can regularly face and overcome learning difficulties. It can indicate how strong someone can continue to survive in the face of a problem. From here, the adversity quotient (AQ) is considered to have a role in the profile of students who face difficulties solving problems related to mathematical literacy. The Adversity Quotient is divided into three categories: the quitter type (low AQ), which is a student who easily gives up and gives up when faced with a problem; the camper type (medium AQ), which is a student who does not use all of his abilities but will stop when he feels he cannot do anything after they try; and the climber type (high AQ), which is a student who is optimistic in learning because they will always try and never give up when faced with problems (Anggraini & Mahmudi, 2021).

Several studies related to the use of the ISSETCM2 learning model have been found, including that the learning model has a good effect on students' ability to relate elements of science, environment, technology, society, and culture using CM2, and that students can gain direct experience through scientific work on the impact of environmental pollution and mathematical reasoning (Mujib et al., 2022). Similarly, some of them stated that AQ affected self-efficacy (Suryadi & Santoso, 2017), problem-solving (Fauziah et al., 2020; Purnamasari et al., 2019), logical thinking (Ahmar et al., 2018), and learning achievement (Safi'i et al., 2021).

Based on previous research, there has yet to be any research related to learning that is used to look at the interaction between the ISSETCM2 learning model and mathematical literacy abilities and look at student categories in the adversity quotient intelligence (climbers, campers, and quitters) The findings can serve as the foundation for future research in mathematics. The results can also be used as a basis for teachers to choose learning models that need innovation so that learning follows the goals to be achieved. Therefore, the objectives of this study are: 1) To determine the effect of the ISSETCM2 learning model on mathematical literacy skills in terms of adversity quotient, 2) To determine differences in students' mathematical literacy abilities with the AQ category (climbers, campers, and quitters), 3) To determine the interaction between methods of learning and adversity quotient (climbers, campers, and quitters) on students' mathematical literacy abilities.

METHOD

The type of research used in this study is quantitative with a quasi-experimental design. The research design used in this study was a 2x3 factorial design.

Table 1. Research Design

Learning Model (A)	Adversity Quotient		
	Climbers (B_1)	Campers (B_2)	Quitters (B_3)
ISSETCM2 (A_1)	A_1 B_1	A_1 B_2	A_1 B_3
Group Discussion (A_2)	A_2 B_1	A_2 B_2	A_2 B_3

This study involved 223 students from a junior high school in class VIII at the same ability level. The cluster random sampling technique was used to determine the sample. The result was class VIII A (32 students) as the experimental class with the ISSETCM2 learning model. On the other hand, class VIII C (32 students) is the control class with the conventional learning model (Direct Instruction). The ISSETCM2 learning model syntax is presented in Figure 1.

Figure 1. ISSETCM2 Learning Model Syntax

Even though the two classes received different forms of learning, the research in both classes was conducted in the same number of meetings, namely, four meetings with material on statistics. Data collection techniques through tests and questionnaires. Essay tests are used to determine students' mathematical literacy skills. At the same time, the questionnaire was distributed to find out the AQ score. The data analysis technique uses prerequisite tests for normality and homogeneity. Two Way Analysis of Variance using SPSS 16 was used in data analysis to compare the mean differences between groups. The indicators used in this study can be seen in Figure 2 (Stacey & Turner, 2015).

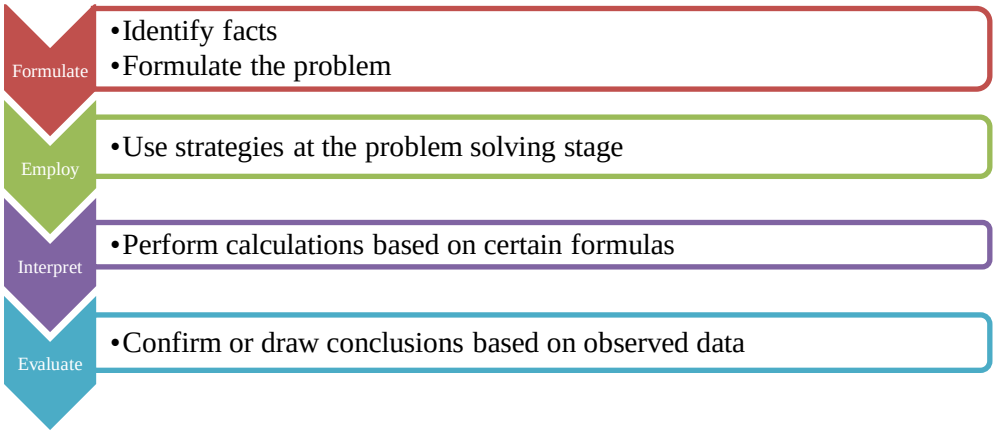

Figure 2. Mathematical Literacy Ability Indicator

RESULTS AND DISCUSSION

Data on the results of students' mathematical literacy abilities in statistical material can be seen in Table 2.

Table 2. Description of Posttest Observation Data Mathematical Literacy Ability

Group	X_{max}	X_{min}	Measures of Central Tendency			Group Size Variation	
			$\bar{X}$	M_e	M_o	R	SD
Experimental	87	57	72.03	72.00	78	30	8,411
Control	72	33	50.34	48.00	48	39	10,524

Table 2 shows that the value of the mathematical literacy ability in the experimental class is higher than the value of the mathematical literacy ability in the control class. The data obtained is then subjected to prerequisite tests, namely the normality test and the homogeneity test. The results of the calculation of the data normality test for mathematical literacy ability based on class and adversity quotient in the climbers, campers, and quitters categories obtained a significance level α (0,05) of p-value > 0.005 so that the data is normally distributed. The results of the homogeneity test of mathematical literacy ability based on class and adversity quotients with a significance level $\alpha = 0{,}05$obtained were p-values of 0.118 and 0.243, respectively. So, it can be concluded that the data is homogeneous. Then a hypothesis test was carried out with a two-way ANOVA with different cells, with the results shown in Table 4.

Table 3. Results of Two-Directional Variance Analysis of Unequal Cells Tests of Between-Subjects Effects

Source	Type III Sum of Squares	Df	MeanSquare	F	Sig.
Corrected Model	9880.908 [a]	5	1976.182	35,043	.000
Intercepts	57618.254	1	57618.254	1.022E3	.000
Class	764,455	1	764,455	13,556	001
Category	680,562	2	340,281	6034	.004
Class * Category	28,766	2	14,383	.255	.776
Error	3270842	58	56,394		
Total	252762000	64			
Corrected Total	13151.750	63			

Table 3 shows that (1) H_{0A} is rejected because the significance level in the learning model is obtained by a value of $0.001 < 0.05$, which means that there is a difference between the Integrating Society, Science, Environment, Technology, and Collaborative Mind Mapping (ISSETCM2) learning model and conventional learning models on students' mathematical literacy abilities. (2)H_{0B} was rejected because the level of significance in the adversity quotient category was $0.004 < 0.05$, indicating that there are differences in students' mathematical literacy abilities in the adversity quotient category (climbers, campers, and quitters). (3)H_{AB} was accepted because the significance level shows an interaction of $0.776 > 0.05$, which means no interaction between the learning model and the adversity quotient on students' mathematical literacy abilities.

According to the findings, the ISSETCM2 model improved students' mathematical literacy skills. When learning using the ISSETCM2 learning model, students are required to be able to relate learning materials for mathematics, science, technology, the environment, and society as assisted by CM2. Students can find out the applications of mathematics in the world of science that have something to do with technology, the environment, and society. Therefore, students get a more realistic learning experience in reasoning which can increase their creativity and intelligence. The experimental class learning process using the ISSETCM2 learning model is also carried out in groups, so students play an active role in learning, being directly involved in

designing and conducting their experiments, which then allows CM2 to student creativity. In the CM2 step, students seem more enthusiastic because this mind-mapping collaboration allows students to express their creative ideas and re-record material that educators have delivered through concept maps or mind maps in groups. Therefore, students don't get bored easily and become more productive and easily remember the material presented by the teacher (Arsana et al., 2019).

In the control class, conventional learning model was used. In working on problems or questions, students tended to be reluctant to ask the teacher because they were not used to being more active in the learning process (Gasiewskii, 2015). This problem causes students to need help understanding the material that has been presented. Therefore, the students' mathematical literacy skills will be better taught using the ISSETCM2 learning model compared to conventional learning models. It can be seen from the research results that the value of the mathematical literacy ability in the experimental class is higher than the value of the mathematical literacy ability in the control class. Based on this, the ISSETCM2 learning model affects students' mathematical literacy abilities.

The next result of the Adversity Quotient (AQ) is that there are different types of AQ or an influence of AQ on students' mathematical literacy skills, both in the experimental and control classes. Previous research by Suryaningrum et al. (2020) discovered a link between the climbers' adversity quotient and students' mathematical literacy abilities in formulating problems mathematically, using concepts, facts, procedures, interpreting, applying, evaluating, and reasoning to obtain solutions. Research by Hulaikhah et al. (2020) said that students need AQ to solve problems related to mathematical literacy.

The two-way analysis of variance with unequal cells shows no interaction between the ISSETCM2 learning model and the Adversity Quotient category (climbers, campers, and quitters) on students' mathematical literacy skills. In other words, students' mathematical literacy abilities are good in class using conventional learning, and both conventional and experimental classes using ISSETCM2 learning did not have significant interactions with the Adversity Quotient category (climbers, campers, and quitters). Research previously conducted by Hidayat and Prabawanto (2018) stated that there was no interaction between the learning model and the AQ type on students' mathematically creative thinking abilities. Students with the AQ type of climbers are very suitable for being given the open-ended learning model. Still, it is not suitable for students with the AQ type of quitters because open-ended learning requires students to solve problems based on their knowledge, and students will find difficulties when learning. Meanwhile, students with AQ types, like quitters and campers, tend to need help to adapt to the open-ended learning model.

The research results on the ISSETCM2 learning model point to learning models that require students to be active and able to interact with other students. In the ISSETCM2 learning model, all students must be active during learning. Learning using the ISSETCM2 learning model and conventional learning is very different. In conventional learning, less active students are so dominant. Situations like this make the interaction between students and their teachers, as well as between students and their environment, could be better (Fauziah et al., 2020). This problem resulted in students' mathematical literacy abilities needing to be more optimal, which affected their learning outcomes (Irwan et al., 2019). Based on the research results, each student has a different adversity quotient, which can affect students' mathematical reasoning abilities. For this reason, students need to know their adversity quotient to maximize their abilities. The limitation of this study is that there are only data discussing differences in mathematical literacy abilities by providing ISSETCM2 and conventional learning methods, which are limited to the scope of class VIII SMP.

CONCLUSIONS

Based on the results of the research, review of several theories, and analyzes, as well as referring to problem formulation and discussion, there are differences between the (ISSETCM2) and conventional learning models on students' mathematical literacy abilities. There are differences in students' mathematical literacy abilities with the AQ category (climbers, campers, and quitters). There is no interaction between learning methods and adversity quotient (climbers, campers, and quitters) on students' mathematical literacy abilities. So, the ISSETCM2 learning model influences mathematical literacy abilities in terms of the adversity quotient.

Based on the conclusions above, there are several suggestions. In this study, ISSETCM2 students' learning was based only on their intelligence level. This research needs to be tested with a larger scope for further improvement. Researchers only looked at two variables that affected mathematical literacy skills: the ISSETCM2 learning model and the adversity quotient (AQ). Other factors affecting students' mathematical literacy skills, such as IQ level, learning motivation, and self-confidence, can be studied. Future research can look for other learning models that further influence mathematical literacy skills or use the same model with different effects.

AUTHOR CONTRIBUTIONS STATEMENT

NH : Conceptualization, design, data acquisition, analysis, and drafting the manuscript
BSA : Correction, designed research instruments, and final approval
KI : Editing, reviewing, supervision, proofreading, and technical support

REFERENCES

Ahmar, AS, Rahman, A., & Mulbar, U. (2018). The analysis of students' logical thinking ability and adversity quotient, and it is reviewed from cognitive style. *In Journal of Physics: Conference Series, 1028* (1), 012167. IOP Publishing. https://doi.org/10.1088/1742-6596/1028/1/012167

Anggraini, TW, & Mahmudi, A. (2021). Exploring the Students' Adversity Quotient in Online Mathematics Learning during the COVID-19 Pandemic. *Journal of Research and Advances in Mathematics Education, 6* (3), 221-238. https://doi.org/10.23917/jramathedu.v6i3.13617

Anggoro, BS (2016). Analisis Persepsi Siswa SMP terhadap Pembelajaran Matematika Ditinjau dari Perbedaan Gender dan Disposisi Berpikir Kreatif Matematis. *Jurnal Pendidikan Matematika*, *7*(2), 153–166.

Arsana, IK, Suarjana, M., & Arini, NW (2019). Pengaruh Penggunaan Mind Mapping berbantuan Alat Peraga Tangga Garis Bilangan terhadap Hasil Belajar Matematika. *International Journal of Elementary Education*, *3*(2), 99-107. https://doi.org/10.23887/ijee.v3i2.18511

Fauziah, M., Marmoah, S., Murwaningsih, T., & Saddhono, K. (2020). The Effect of Thinking Actively in a Social Context and Creative Problem Solving Learning Models on Divergent-Thinking Skills Viewed from Adversity Quotient. *European Journal of Educational Research, 9* (2), 537-568. https://doi.org/10.12973/eu-jer.9.2.537

Fitriyani, I., & Mastur, Z. (2017). Kemampuan literasi matematika siswa ditinjau dari kecerdasan emosional pada pembelajaran CPS berbantuan hands on activity. *Unnes Journal of Mathematics Education Research*, *6*(2), 139-147.

Florea, NM, & Hujui, E. (2015). Critical thinking in elementary school children. *Procedia-Social and behavioral sciences, 180*, 565-572. https://doi.org/10.1016/j.sbspro.2015.02.161

Gasiewski, JA, Eagan, MK, Garcia, GA, Hurtado, S., & Chang, MJ (2015). From gatekeeping to engagement: A multi-contextual, mixed method study of student academic engagement in introductory STEM courses. *Research in higher education, 53* (2), 229-261. https://doi.org/10.1007/s11162-011-9247-y

Hidayat, W., & Prabawanto, S. (2018). Improving students' creative mathematical reasoning abilities through adversity quotient and argument driven inquiry learning. *In Journal of*

Physics: Conference Series, 948 (1), 012005. IOP Publishing. https://doi.org/10.1088/1742-6596/948/1/012005

Hulaikah, M., Degeng, I., & Murwani, FD (2020). The Effect of Experiential Learning and Adversity Quotient on Problem Solving Ability. *International Journal of Instruction, 13* (1), 869-884. https://doi.org/10.29333/iji.2020.13156a

Irwan, AP, Usman, U., & Amin, BD (2020). Analisis Kemampuan Literasi Sains Peserta Didik Ditinjau Dari Kemampuan Menyelesaikan Soal Fisika Di SMAN 2 Bulukumba. *Jurnal Sains Dan Pendidikan Fisika*, *15*(3).

Kivunja, C. (2014). Do You Want Your Students to Be Job-Ready with 21st Century Skills? Change Pedagogies: A Pedagogical Paradigm Shift from Vygotskyian Social Constructivism to Critical Thinking, Problem Solving and Siemens' Digital Connectivism. *International journal of higher education, 3* (3), 81-91. https://doi.org/10.5430/ijhe.v3n3p81

Komarudin, K., Monica, Y., Rinaldi, A., Rahmawati, ND, & Mutia, M. (2021). Analisis Kemampuan Berpikir Kreatif Matematis: Dampak Model Open Ended dan Adversity Quotient (AQ). *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *10*(2), 550-559. https://doi.org/10.24127/ajpm.v10i2.3241

Kusuma, D., Sukestiyarno, YL, & Cahyono, AN (2022). The Characteristics of Mathematical Literacy Based on Students' Executive Function. *European Journal of Educational Research, 11* (1), 193-206. https://doi.org/10.12973/eu-jer.11.1.193

Mansur, N. (2018). *Melatih Literasi Matematika Siswa dengan Soal PISA*. *1*, 140–144.

Masfufah, R., & Afriansyah, EA (2021). Analisis kemampuan literasi matematis siswa melalui soal PISA. *Mosharafa: Jurnal Pendidikan Matematika*, *10*(2), 291-300. https://doi.org/10.31980/mosharafa.v10i2.825

Masjaya, & Wardono. (2018). Pentingnya Kemampuan Literasi Matematika untuk Menumbuhkan. *Prosiding Seminar Nasional Matematika*, *1*, 568–574.

Mujib, Mardiyah, & Suherman. (2022). Model Integrating Society, Science, Environment, Technology And Collaborative Mind Mapping mempengaruhi Penalaran Matematis dan Multiple Intellegences. *Jurnal Pendidikan*, *8* (1), 110–129. https://doi.org/10.55210/attalim.v8i1.769

Muzaki, A. (2019). Analisis Kemampuan Literasi Matematis Siswa Mosharafa : Jurnal Pendidikan Matematika Program for International Student (Organisation for Economic Cooperation. *Mosharafa : Jurnal Pendidikan Matematika, 8* (9), 493–502. https://doi.org/10.31980/mosharafa.v8i3.557

Novita, R.,& Herman, T. (2021). Digital technology in learning mathematical literacy, can it help? In *Journal of Physics: Conference Series*, 177(1), 012027. IOP Publishing. https://doi.org/10.1088/1742-6596/1776/1/012027

Organisation for Economic Co-operation and Development. (2017). *PISA 2015 assessment and analytical framework: Science, reading, mathematic, financial literacy and collaborative problem solving*. OECD Publishing.

Ojose, B. (2017). Mathematics literacy: Are we able to put the mathematics we learn into everyday use. *Journal of mathematics education*, *4*(1), 89-100.

Paul G. Stolz. (2018). Adversity Quotient : Turning Obstacles into Opportunities . PT. Grasindo.

Prabawati, MN, Herman, T., & Turmudi, T. (2019). Pengembangan Lembar Kerja Siswa Berbasis Masalah dengan Strategi Heuristic untuk Meningkatkan Kemampuan Literasi Matematis. *Mosharafa: Jurnal Pendidikan Matematika*, *8*(1), 37–48. https://doi.org/10.31980/mosharafa.v8i1.383

Pratama, GS, & Retnawati, H. (2018). Urgency of higher order thinking skills (HOTS) content analysis in mathematics textbook. *In Journal of Physics: Conference Series*, 1097 , (1), 012147. IOP Publishing. https://doi.org/10.1088/1742-6596/1097/1/012147

Purnamasari, FE, Sujadi, I., & Slamet, I. (2019). Effect of adversity quotient of junior high school students on reflective thinking process in mathematical problem solving. *In Journal of*

Physics: Conference Series, 1321 (2), 022128. IOP Publishing. https://doi.org/10.1088/1742-6596/1321/2/022128

Rahmawati, ND (2022). *Pemecahan Masalah Literasi Matematis Ditinjau Dari Adversity Quotient (AQ).* CV Jejak.

Rahmawati, ND, Mardiyana, M., & Usodo, B. (2015). Profil siswa SMP dalam pemecahan masalah yang berkaitan dengan literasi matematis ditinjau dari adversity quotient (AQ). *Jurnal Pembelajaran Matematika*, *3*(5), 508-517.

Rahmawati, ND, Purnomo, T., & Kuntjoro, S. (2022). Profile of SETS approach to improve student's critical thinking skills during 2015 to 2022. *IJORER: International Journal of Recent Educational Research*, 3 (3), 340-353. https://doi.org/10.46245/ijorer.v3i3.214

Rizki, LM, & Priatna, N. (2019). Mathematical literacy as the 21st century skills. In *Journal of Physics: Conference Series*, 1157 (4), 042088. IOP Publishing. https://doi.org/10.1088/1742-6596/1157/4/042088

Jailani, J., Retnawati, H., Wulandari, NF, & Djidu, H. (2020). Mathematical literacy proficiency development based on content, context, and process. *Problems of Education in the 21st Century*, 78 (1), 80-101. https://doi.org/10.33225/pec/20.78.80

Rukmana, I., Hasbi, M., & Paloloang, B. (2016). Hubungan adversity quotient dengan hasil belajar matematika siswa kelas XI SMA Negeri Model Terpadu Madani Palu. *Jurnal Elektronik Pendidikan Matematika Tadulako*, *3*(3), 325-333.

Safi'i, A., Muttaqin, I., Hamzah, N., Chotimah, C., Junaris, I., & Rifa'i, MK (2021). The effect of the adversity quotient on student performance, student learning autonomy and student achievement in the COVID-19 pandemic era: Evidence from Indonesia. *Heliyon* , 7 (12), e08510. https://doi.org/10.1016/j.heliyon.2021.e08510

Setyawan, U. (2018). Strategi SMPIT Bina Anak Sholeh Yogyakarta Dalam Membudayakan Literasi Bagi Siswa. *Saliha*, *1* (1), 101–118. https://doi.org/10.54396/saliha.v1i1.6

Stacey, K., & Turner, R. (2015). The evolution and key concepts of the PISA mathematics framework. *Assessing Mathematical Literacy*. https://doi.org/10.1007/978-3-319-10121-7_1

Suharta, I., & Suarjana, I. (2018). A case study on mathematical literacy of prospective elementary school teachers. *International Journal of Instruction*, 11 (2), 413-424. https://doi.org/10.12973/iji.2018.11228a

Suharyono, E., & Rosnawati, R. (2020). Analisis Buku Teks Pelajaran Matematika SMP ditinjau dari Literasi Matematika. *Mosharafa: Jurnal Pendidikan Matematika*, *9*(3), 451-462. https://doi.org/10.31980/mosharafa.v9i3.819

Sumirattana, S., Makanong, A., & Thipkong, S. (2017). Using realistic mathematics education and the DAPIC problem-solving process to enhance secondary school students' mathematical literacy. *Kasetsart Journal of Social Sciences*, 38 (3), 307-315. https://doi.org/10.1016/j.kjss.2016.06.001

Suryadi, B., & Santoso, TI (2017). Self-efficacy, adversity quotient, and students' achievement in mathematics. *International Education Studies*, 10 (10), 12-19. https://doi.org/10.5539/ies.v10n10p12

Suryaningrum, CW, Susanto, H., Ningtyas, YDWK, & Irfan, M. (2020). Semiotic reasoning emerges in constructing properties of a rectangle: A study of adversity quotient. *Journal on Mathematics Education*, 11 (1), 95-110. https://doi.org/10.22342/jme.11.1.9766.95-110