UJMER 11 (1) (2022) 80 - 87

Unnes Journal of Mathematics Education Research

http://journal.unnes.ac.id/sju/index.php/ujmer

Mathematical Literacy Pattern Considered by Students' Interests in ICARE Learning Through Smart Apps Creator with Performance Assessment

Rodhi Rodhi ✉, Kartono Kartono, Iwan Junaedi

Universitas Negeri Semarang, Indonesia

Article Info

Article History:
Received :
10 Marc 2022
Accepted:
20 April 2022
Published:
30 June 2022

Keywords:
Mathematical Literacy Model, Students' Interests, ICARE, Smart Apps Creator, Performance Assessment

Abstract

This study aims to find patterns of mathematical literacy in terms of student interest in ICARE learning through smart apps creators with performance assessments. This type of research is a mixed-method explanatory type, with a quasi-experimental type of nonequivalent control group design. The research subjects were students of class IXF SMP 1 Jekulo. Methods of collecting data are obtained by observation, literacy tests, and interviews. Data analysis was based on 7 components of mathematical literacy, namely communication, mathematization, representation, reasoning, and argumentation, planning strategies, using symbolic, formal, and technical language as well as arithmetic operations, and using mathematical tools. The results of the study there were 3 different literacy patterns for high, medium, and low interest. The pattern of students' interest in learning is high, the average mastery of the minimum components is good: very good all components and good representation; four components are excellent and good for mathematization, representation and using tools; four components are very good and good for mathematizing, planning strategies, and representation. The average pattern of mastery of the components is minimal enough: good for all components except for sufficient mathematization; the second and third patterns are almost the same, namely all are good except that they use sufficient tools. Meanwhile, for the low-average pattern, there are less-criteria: all components are good except for using symbols and category tools enough; all components are minimal enough except for lack of mathematization; everything is minimal enough and less to use symbols.

✉Correspondence:
Loram Wetan RT 01 RW 01 gang Suporoyo Jati Kudus
E-mail: rodhidanendrsa@gmail.com

p-ISSN 2252-6455
e-ISSN 2502-4507

INTRODUCTION

National education functions to develop capabilities and shape the character and civilization of a dignified nation in the context of educating the nation's life, aiming at developing the potential of students to become human beings who believe and fear God Almighty, have a noble character, are healthy, knowledgeable, capable, creative, independent., and become a democratic and responsible citizen (UU Sisdiknas No 20: 2013). To realize this, the government formulates the education curriculum.

According to the Ministry of Education and Culture (2014a), the 2013 curriculum was developed based on internal challenges, external challenges, improving mindsets, as well as strengthening curriculum governance and strengthening materials. External challenges are related to the flow of globalization and various issues related to environmental problems, advances in technology and information, the rise of creative and cultural industries, and the development of education at the international level.

The development of education at the international level can be seen in Indonesia's participation in TIMSS and PISA which shows that the achievement of mathematical literacy scores of Indonesian students is ranked 79th out of 91 participating countries with a score of 379 which is still below the international average score (OECD, 2018).

Analysis of the results of the final assessment of the odd semester for the 2020/2021 school year of *SMP 1 Jekulo*, many grade IX students were unable to work on questions related to mathematical literacy. The low value of mathematical literacy is caused, among other things, by the weak strength of students' mathematical reasoning and the ability to apply it in everyday life (Murdaningsih & Murtiyasa, 2016); Indonesian students are less trained in solving problems with characteristics such as questions on TIMSS and PISA (Rumiati, 2011); the number of test materials asked in TIMSS and PISA is not included in the Indonesian curriculum (Kemendikbud, 2014); only a small number of students can evaluate solutions and can formulate real problems (real words) contained in the questions (Utami, Sukestiyarno, & Hidayah, 2020); the ability of the mathematical process/mathematical component of junior high school students is low (Wardono, et. Al, 2018). Therefore, students must be trained to carry out mathematical reasoning activities by solving non-routine problems according to mathematical literacy.

According to the Ministry of Education and Culture (2016), mathematics education in schools is expected to contribute to supporting the achievement of the competencies of primary and secondary education graduates through learning experiences, so that they can (1) understand concepts and apply mathematical procedures in everyday life; (2) perform mathematical operations for simplification, and analysis of existing components; (3) perform mathematical reasoning which includes making generalizations based on existing patterns, facts, phenomena or data, making assumptions and verifying them; (4) solving problems and communicating ideas through symbols, tables, diagrams, or other media to clarify the situation or problem; (5) foster positive attitudes such as logical, critical, careful, thorough, and not easily give up in solving problems. The formulation of the objectives of mathematics education is in line with and following the demands of mathematical literacy skills.

The definition of mathematical literacy according to the PISA 2018 framework states that mathematical literacy is an individual's capacity to formulate, use and interpret mathematics in various contexts. These abilities include mathematical reasoning and the use of concepts, procedures, facts and mathematical tools to describe, explain and predict phenomena. The PISA assessment framework formulates seven mathematical components that correspond to the three problem-solving processes in mathematical literacy, namely communication, mathematization, representation, reasoning and argumentation, planning strategies, using symbolic, formal, and technical language as well as arithmetic operations, and using mathematical tools (OECD, 2003). 2018).

Mastery of mathematical literacy helps individuals to recognize the role that mathematics plays in the world and to make the judgments and reasoned decisions required of constructive, actively engaged and reflective citizens (OECD, 2018). This is in line with statement (Janah, Suyitno, & Rosyidah,

2019) that mathematical literacy enables individuals to make decisions based on constructive mathematical thinking patterns. Mathematical literacy ability is also related to how individuals can apply knowledge to real-world problems (Budiono & Wardono, 2014).

Seeing the importance of the role of mathematical literacy in helping students to solve problems in everyday life, it indicates that learning mathematics must be able to make students recognize and use it in contexts outside of mathematics. Teachers are expected to be able to make mathematical ideas into the real world that can be accepted by students with the hope that teachers can encourage students to make more realistic relationships between mathematics and students' lives to make mathematics more meaningful. This is in line with (Budiono & Wardono, 2014) that learning mathematics must be adapted to the times and can be applied in real life. The same opinion was also conveyed (Jayanti, Waluya, & Rusilowati, 2014) in order to keep up with the times in global competition, students need to be equipped with the ability to reason, argue and solve problems in real life.

According to (Wardono & Kurniasih, 2015), that one of the efforts that can be made by educators to improve students' mathematical literacy skills is to innovate learning and develop learning assessment instruments. The same opinion was conveyed (Hasanah, Wardono, & Kartono, 2016) that through learning innovation and assessment development can improve students' literacy skills. (Wardono & Mariani, 2014) in their research also said the same thing that one of the efforts made by teachers to improve student literacy was by making fun innovations in learning mathematics and developing learning assessment instruments.

To address the problems of learning mathematics in schools and to carry out distance learning with the WhatsApp application, it is necessary to choose a learning model that is in accordance with online characteristics. One of the learning models that can be used is the ICARE model which includes Introduction, Connection, Application, Reflection and Extension as done by (Yumiati & Wahyuningrum, 2015) in his research stating that ICARE is justified as a learning model that can make e-learning learning effective in improving mathematical problem-solving ability. According to (Dwijayani, 2017) that the development of ICARE learning media can provide variety in learning and can direct students to think critically and creatively. The same opinion was also expressed (Ayuningsih & Ciptahadi, 2020) that the mathematical communication skills of students taught with the ICARE learning model were better than conventional learning.

The ICARE model is designed for online learning. As expressed by (Wahyudin & Susilana, 2012), ICARE is designed to help students learn through online effectively. ICARE's principle is to present essential material for each topic. An effective teaching strategy in an e-learning environment and satisfying for students is the ICARE learning model (Salyers et al., 2010). In another study (Handayani, Agoestanto, & Masrukan, 2013) said that the ICT learning model that prioritizes the characteristics: active, creative, and fun (joyful learning) is the ICARE model. The use of e-learning is still limited to sending assignments by e-mail. Not familiar with e-learning that can be used in virtual classroom learning. WhatsApp is one of the familiar social network-based e-learning, in its use with smart apps creators it has not been widely used in virtual classrooms. This is in line with research (Wisudawati, Kuntarto, & Kurniawan, 2020) which states that there are many media used for online learning, one of which is the Smart Apps Creator application which is used through WhatsApp, if it is understood there is the possibility of having a positive impact on the learning process.

According to (Masrukan & Mufidah, 2017) that in addition to using a learning model, assessment of students also needs to be considered as one of the important aspects in the learning process. Performance assessment is an assessment based on the results of the assessor's observations of student activities as they occur (Suryati, Masrukan, & Wardono, 2013). During the learning process student activities will be observed by the teacher in the Student Activity Observation Sheet (LPAS) or assessed using a questionnaire. As stated (Masrukan, 2017: 8) that "all learning activities must pay attention to the process including the assessment of learning outcomes so that the assessment must contribute significantly to the learning process".

According to (Handayani, Agoestanto, & Masrukan, 2013) performance assessment can help students get used to showing performance in understanding and solving problems.

Based on the description above, the formulation of the research problem is to describe the pattern of mathematical literacy in terms of student interest in ICARE learning through smart apps creators with performance assessments.

METHOD

This research method uses mixed research methods, with a sequential explanatory research design. (Sukestiyarno, 2020: 323) explained that Sequential explanatory design is a research design that combines quantitative research methods and qualitative research methods which are carried out sequentially at different times with the first order using quantitative methods and the second using qualitative methods. This type of research for experimental activities uses a quasi-experimental design type nonequivalent control group design. Subjects in the experimental group and control group were not chosen randomly (Sugiyono, 2020: 138). The research was carried out at *SMP 1 Jekulo* in the academic year 2021/2022 with the material of geometric transformation. In this study, the population as well as the sample were all students in class IX, class IXE as the control class, and class IXF as the experimental class. The research subjects were selected from the experimental class which were grouped based on the characteristics of interest in learning mathematics in the high, medium, and low categories.

Quantitative data analysis consists of analysis of initial data and final data. The initial data comes from the results of the end of the odd semester assessment conducted by normality test, homogeneity test, and average similarity test. The final data is the result of the posttest of mathematical literacy which is carried out by testing the proportion of mathematical literacy mastery, different tests of mathematical literacy averages, and increasing mathematical literacy. Qualitative data analysis follows the concept of Milles & Huberman (Sugiyono, 2010:337) which uses three main steps, namely data reduction, data presentation, and drawing conclusions.

RESULTS AND DISCUSSIONS

Based on the analysis of the results of the questionnaire on interest in learning mathematics, which was validated by the experts, the data obtained from students were grouped in the following table:

Table 1. Interest in Learning Mathematics for Class IXF

Category Interests in Learning Mathematics	Amount of Students	Percentage
High	8	26.7%
Middle	15	50.0%
Low	7	23.3%
Total	30	100%

The results of the mathematical literacy test are based on students' learning interests, as shown in Figure 1.

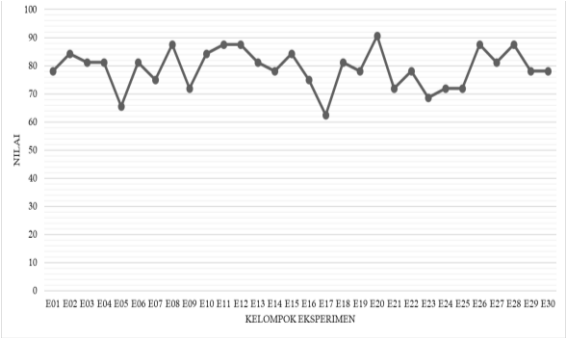

Figure 1. Mathematical Literacy Test Results Based on Student Interests

The results of the analysis of mathematical literacy tests and interviews showed that the root causes of the low mathematical literacy of students at *SMP 1 Jekulo* were caused by their low ability to imagine, construct and communicate explanations in the context of the problem (communication); the ability to create ideas in interpreting or representing mathematically (representation), this is in accordance with the results of research (Putra, Zulkardi, & Hartono, 2016) that students are not accustomed to working on PISA model math problems, students have difficulty communicating and representing problems in context ; the ability to identify the

variables or mathematical structures contained in the problem (mathematization), this is in accordance with the results of research (Wardono, et. al. 2018) which says that the ability of the mathematization process/mathematical component of junior high school students is low; the low ability to make arguments or conclusions with multiple (reasoning and argumentation) this is in accordance with the results of research (Murdaningsih & Murtiyasa, 2016) which says that the weak strength of students' mathematical reasoning and the ability to apply it in everyday life; low ability to plan strategies or form problem frameworks (strategy planning); the low ability to recognize mathematical structures or describe relationships (using mathematical tools), this is in accordance with the opinion (Utami, Sukestiyarno, & Hidayah, 2020) which states that only a small number of students are able to evaluate solutions and can formulate real problems (real words) that is in the question.

There are several different patterns for each category of student interest in mastering the components of mathematical literacy. Each pattern has a characteristic mastery of different mathematical literacy components depending on students' learning interests.

The pattern of mathematical literacy for students in the category of high learning interest is divided into three different patterns. The first pattern is that students with high learning interest can master the six components of mathematical literacy (communication, mathematization, reasoning & argumentation, planning strategies, using symbols, language, formal and arithmetical techniques, and operations, and using mathematical tools) with very good criteria and one component. mathematical literacy (representation) good criteria; The second pattern is that students with high learning interest are able to master the four components of mathematical literacy (communication, reasoning & argumentation, planning strategies, and using symbols, language, formal, and arithmetical techniques and operations) with very good criteria and three components of mathematical literacy (mathematization, representation). , using mathematical tools) good criteria; while the three patterns of learners with high learning interest are able to master the four components of mathematical literacy (communication, reasoning & argumentation, using symbols, language, formal, and arithmetical techniques and operations, and using mathematical tools) with very good criteria and three components of mathematical literacy (mathematization). , planning strategy, and representation) criteria are good.

The three patterns of mathematical literacy that are formed in students with high learning interest are in very good and good criteria, the only difference being the grouping in mastering the components of mathematical literacy. Students with high learning interest can master 4 s.d. 7 components of mathematical literacy in the very good category and the other components in the good category.

The pattern of mathematical literacy for students in the category of moderate learning interest is divided into three different patterns. The first pattern is that students with moderate interest in learning can master the four components of mathematical literacy (communication, reasoning & argumentation, planning strategies, using symbols, language, formal, and techniques and arithmetic operations) with very good criteria, two components of mathematical literacy (representation and using tools). mathematics) good criteria, and one component of mathematical literacy (mathematization) on sufficient criteria; The second pattern is that students with moderate learning interest can master the three components of mathematical literacy (mathematization, planning strategies, using symbols, language, formal, and arithmetical techniques, and operations) with very good criteria, and three components of mathematical literacy (communication, representation, and reasoning). argumentation) good criteria, and one component of mathematical literacy (using mathematical tools) on sufficient criteria; while the three patterns of learners with moderate learning interest can master two components of mathematical literacy (communication and reasoning & argumentation) with very good criteria, and four components of mathematical literacy (mathematization, representation, planning strategies, using symbols, language, formal, and techniques and operations). count) good criteria, and one component of mathematical literacy (using mathematical tools) on sufficient criteria.

Students with moderate interest in learning are on average able to master 2 s.d. 4 components of mathematical literacy in the very good category, 2 to d. 4 components of mathematical literacy are in good category, and the rest are in sufficient category.

While the pattern of mathematical literacy for students in the category of low learning interest is divided into three different patterns. The first pattern is that learners with low learning interest are able to master two components of mathematical literacy (communication and mathematization) with very good criteria, three components of mathematical literacy (representation, reasoning & argumentation, and planning strategies) with good criteria, and two components of mathematical literacy (using symbols, language, formal, and arithmetical techniques and operations, and using mathematical tools) on sufficient criteria; The pattern of the two learners with low learning interest is able to master one component of mathematical literacy (using symbols, language, formal, and techniques and arithmetic operations) with very good criteria, three components of mathematical literacy (communication, representation, reasoning & argumentation) good criteria, and two a component of mathematical literacy (planning strategies, and using mathematical tools) with sufficient criteria and one component of mathematical literacy (matization) on the criteria of being lacking; while the three patterns of learners with low learning interest are able to master one component of mathematical literacy (communication) with very good criteria, three components of mathematical literacy (mathematization, representation, and reasoning & argumentation) with good criteria, and two components of mathematical literacy (planning strategies, and using mathematical tools) with sufficient criteria, and one component of mathematical literacy (using symbols, language, formal, and arithmetical techniques and operations) on the less criteria.

Students with low learning interest can master 1 s.d. 2 components of mathematical literacy in the very good category, 2 to d. 3 components of mathematical literacy are in good category, and the rest are insufficient or less categories. From the description above, it can be said that for all groups of interest in learning mathematics, the communication component includes very good criteria, the mathematization and representation components are included in good criteria. The reasoning and argumentation components are included in very good criteria for the high category of interest in learning mathematics, good and very good criteria for the medium category group, and sufficient criteria for the low category group. Meanwhile, the strategy planning component includes very good criteria for the moderate category of interest in learning mathematics, criteria between good and very good for the high category group, and sufficient criteria for the low category group. The components using symbol, formal, and technical language as well as arithmetic operations and using mathematical tools include very good criteria for the high category of interest in learning mathematics, good criteria for the medium category group, and sufficient criteria for the low category group.

CONCLUSION

Based on the analysis and discussion, it can be concluded that the root causes of the low mathematical literacy of students are the low ability to imagine, construct, communicate problems, identify variables, create ideas, make arguments and conclusions with multiple, planning strategies, recognizing mathematical structures, and describing relationships. The category of high mathematics learning interest has three different patterns of mathematical literacy. The first high pattern of students can master the six components of mathematical literacy with very good criteria, and one good criterion for the representation component. The second high pattern of students was able to master the four components of very good criteria, and for the mathematical component, representation, using mathematical tools with good criteria, while the third pattern of students was able to master the four components of very good criteria and good criteria for the components of mathematization, planning strategies, and representation. The category of moderate interest in learning mathematics has three different patterns. In the first moderate pattern, the students were able to master the four criteria components very well, and for the representation component and using mathematical tools the criteria

were good, and the criteria were sufficient for mathematization. In the moderate pattern, both students were able to master the six components of the minimum criteria well, and one criterion was sufficient to use mathematical tools. While the moderate pattern, the three students were able to master the six components of the minimum criteria well, and the components using mathematical tools with sufficient criteria. The category of low interest in learning mathematics has three different literacy patterns. The first low pattern of students can master mathematical literacy with at least good criteria for five components, and sufficient criteria for components using symbols, language, formal, and arithmetic techniques, and operations, and using mathematical tools. The second low pattern of students is able to master mathematical literacy with a minimum of good for five components, sufficient criteria for the component planning strategies, and using mathematical tools and less criteria for the mathematical component, while the third low pattern of students is able to master mathematical literacy with minimum criteria good for four components, sufficient criteria for components of planning strategies and using mathematical tools; and less criteria for components using symbols, language, formal, and arithmetical techniques and operations.

SUGGESTION

Based on the conclusions, the researcher suggests (1) Students have different interests in learning mathematics; this affects students' interest in solving mathematical problems, especially in dealing with literacy problems. Therefore, different treatment is needed, especially for students who have low and moderate interest in learning. (2) Students in the category of low learning interest give up easily and have a lazy nature to work on difficult or complex questions. Therefore, teachers must innovate and increase learning creativity so that student interest can continue to be increased and provide individual assistance or counseling. For students in the category of moderate learning interest, sometimes they can understand the problem well, but sometimes they cannot answer. Therefore, the teacher must be able to arouse student interest. (3) Further research studies on ICARE model learning through smart apps creators with performance assessments on materials other than geometry need to be carried out to improve students' mathematical literacy.

REFERENCES

Ayuningsih, N. P. M., & Ciptahadi, K. G. O. (2020). "Pengaruh Model Pembelajaran ICARE Terhadap Kemampuan Komunikasi Matematika Siswa". *Seminar Nasional Tehnologi Komputer & Sains (SAINTEKS*) *1*: 152–155.

Budiono. CS & Wardono. (2014). "Pbm Berorientasi Pisa Berpendekatan Pmri Bermedia Lkpd Meningkatkan Literasi Matematika Siswa Smp". *Unnes Journal of Mathematics Education.*, *3*(3): 210–219.

Dwijayani, N. M. (2017). "Pengembangan Media Pembelajaran ICARE". *Kreano, Jurnal Matematika Kreatif-Inovatif*, *8*(2): 126–132.

Handayani, P., Agoestanto, A., & Masrukan (2013). "Pengaruh Pembelajaran Berbasis Masalah dengan Asesmen Kinerja Terhadap Kemampuan Pemecahan Msalah". *Unnes Journal of Mathematics Education*, 2(1): 70–76.

Hasanah, U., Wardono, & Kartono. (2016). "Keefektifan Pembelajaran Murder Berpendekatan Pmri Dengan Asesmen Kinerja Pada Pencapaian Kemampuan Literasi Matematika Siswa Smp Serupa Pisa". *Unnes Journal of Mathematics Education.*, *5*(2): 101–108.

Janah, S. R., Suyitno, H., & Rosyida, I. (2019). "Pentingnya Literasi Matematika dan Berpikir Kritis Matematis dalam Menghadapi Abad ke-21". *PRISMA, Prosiding Seminar Nasional Matematika*, *2*: 905–910.

Jayanti, D.E., Waluya, St. B., & Rusilowati, A. (2014). "Analisis Pembelajaran Dan Literasi Matematika Serta Karakter Siswa Materi Geometri Dan Pengukuran". *Unnes Journal of Mathematics Education Research*, *3*(2): 79 – 83.

Kemendikbud. 2014a. Permendikbud Republik Indonesia nomor 58 tahun 2014 tentang Kurikulum 2013 Sekolah Menengah Pertama/Madrasah Tsanawiyah Lampiran I.

Kemendikbud. 2016. Silabus Mata Pelajaran Matematika SMP/MTs

Masrukan. (2017). *Asesmen Otentik Pembelajaran Matematika Mencakup Asesmen Afektif dan Karakter*. Semarang: CV. Swadaya Manunggal.

Masrukan, & Mufidah, N. A. (2017). "Geometry Problem Solving Ability and Tolerance Character of Students 8th Grade with Assessment Project". *Journal of Physics: Conference Series*, *824:* (012046).

Murdaningsih, S., & Murtiyasa, B. (2016). "An Analysis on Eight Grade Mathematics Textbook of New Indonesian Curriculum (K-13) Based on Pisa's Framework". *JRAMathEdu (Journal of Research and Advances in Mathematics Education)*, *1*(1): 14–27.

OECD. (2018). PISA 2018 Insights and Interpretations. https://www.oecd.org/pisa/PISA%202018%20Insights%20and%20Interpretations%20FINAL%20PDF.pdf. (Diunduh 17 Agustus 2021)

Putra, Y. Y., Zulkardi, Z., & Hartono, Y. (2016). "Pengembangan soal matematika model PISA konten bilangan untuk mengetahui kemampuan literasi matematika siswa". Jurnal Elemen, 2(1), 14-26.

Rumiati, S. W. (2011*). "Instrumen Penilaian Hasil Belajar Matematika SMP: Belajar dari PISA dan TIMSS"*. Yogyakarta: Pusat Pengembangan Dan Pemberdayaan Pendidik Dan Tenaga Kependidikan (PPPPTK) Matematika.

Salyers, V., Carter, L., Barrett, P., & Williams, L. (2010). "Evaluating Student and Faculty Satisfaction with a Pedagogical Framework". *The Journal of Distance Education / Revue de l'Éducation à Distance*, *24*(3): 1–15

Sukestiyarno. (2020). *Metode Penelitian Pendidikan*. Semarang: UNNES Press.

Sugiyono. (2020). *Metode Penelitian Kuantitatif, Kualitatif dan Kombinasi (Mixed Methods)*. Bandung: Alfa Beta

Suryati, Masrukan, & Wardono. (2013). "Pengaruh Asesmen Kinerja dalam Model Pembelajaran. *Unnes Journal of Mathematics Education*. 2(3): 7–13.

Undang-Undang Sistem Pendidikan Nasional Nomor 20 Tahun 2013.

Utami, N., Sukestiyarno, Y. L., & Hidayah, I. (2020). Kemampuan Literasi dalam Menyelesaikan Soal Cerita Siswa Kelas IX A. *Prisma, Prosiding Seminar Nasional Matematika*, *3*: 626–633.

Wardono & Kurniasih, A. W. (2015). "Peningkatan Literasi Matematika Mahasiswa Melalui Pembelajaran Inovatif Realistik E-Learning Edmodo Bermuatan Karakter Cerdas Kreatif Mandiri". *Kreano: Jurnal Matematika Kreatif-Inovatif*, *6*(1): 93– 100.

Wardono & Mariani, S. (2014). "The Realistic Learning Model with Character Education and PISA Assessment To Improve Mathematics". *International Journal of Education and Research*, *2*(7): 361–372.

Wardono, Waluya, St. B., Kartono, Mulyono, Mariani, S (2018). "Literasi Matematika Siswa SMP Pada Pembelajaran Problem Based Learning Realistik Edmodo Schoology". Prisma, Prosiding Seminar Nasional matematika. (1) 477–498. https://journal.unnes.ac.id/sju/index.php/prisma

Wahyudin, D. & Susilana, R. (2012). *Kurikulum & Pembelajaran: Inovasi Kurikulum dan Pembelajaran*. Rajawali Pers.

Wisudawati, N., Kuntarto, E., & Kurniawan, A. R. (2020). "Persepsi Guru Terhadap Aplikasi Edmodo Sebagai Alat Bantu Kegiatan Belajar Di Sekolah Dasar". *JRPD (Jurnal Riset Pendidikan Dasar),* 3(1): 87-96.

Yumiati, & Wahyuningrum, E. (2015). "Pembelajaran Icare (Introduction, Connect, Apply, Reflect, Extend) Dalam Tutorial Online Untuk Meningkatkan Kemampuan Pemecahan Masalah Matematis Mahasiswa UT". *Infinity Journal*, *4*(2): 182–189.