

Mathematical Literacy: Ethnomathematics in PISA Leveling Representations

by Sugiman Matematika

Submission date: 12-Apr-2023 01:53PM (UTC+0700)

Submission ID: 2062343049

File name: Literacy-_Ethnomathematics_in_PISA_Leveling_Representations.pdf (323.93K)

Word count: 4736

Character count: 28367

Mathematical Literacy: Ethnomathematics in PISA Leveling Representations

Nila Ubaidah^{1,2*}, Zaenuri Zaenuri¹, Iwan Junaedi¹, Sugiman Sugiman¹

¹Universitas Negeri Semarang, Indonesia

²Universitas Islam Sultan Agung Semarang, Indonesia

*Corresponding Author: nilaubaidah@students.unnes.ac.id

Abstract. Mathematical literacy is logical reasoning in solving mathematical problems. But over time, the meaning of mathematical literacy also develops and is often associated with a person's ability to identify and understand problems in which mathematics plays a role in all areas of life. The purpose of this study is to represent Mathematics Literacy Problems in PISA leveling associated with ethnomathematics and can be used as examples to deliver teaching materials in schools. The research used is a qualitative descriptive study with the object of research is the Culture of the Kutai Society, which is represented in the Mathematical Literacy problem of the PISA Socio-Cultural Context Model. From the research, it was found that the Technique of Designing PISA Model Mathematical Literacy Questions Using the Socio-Cultural Context of the Kutai Community contained 3 things in designing the PISA model grids and math problems based on argumentation indicators. The problem design process is carried out by prototyping using three characteristics, namely content, construct, and language.

Key words: Mathematical Literacy; Ethnomathematics; PISA Leveling Representation

How to Cite: Ubaidah, N., Zaenuri, Z., Junaedi, I., Sugiman, S. (2022). Mathematical Literacy: Ethnomathematics in PISA Leveling Representations. *ISET: International Conference on Science, Education and Technology* (2022), 1249-1258.

INTRODUCTION

6 Mathematical literacy is not about mastering calculus, differential equations, topology, analysis, linear algebra, abstract algebra and mathematical formulas in depth, but a broad understanding and appreciation of what mathematics can achieve (Ojose, 2011). Ojose also emphasized that mathematical literacy is knowledge in understanding and applying mathematics in everyday life. People who are mathematically literate are able to make estimates, interpret data, solve everyday problems, reason in numerical situations, graphs and geometry, and communicate with mathematics. Jablonka (2003) suggests the definition of numeracy or mathematical literacy as follows:

"There are a number of perspectives on numeracy or mathematical literacy that vary with respect to the culture and the context of the stakeholders who promote it. It may be seen as the ability to use basic computational and geometrical skills in everyday contexts, as the knowledge and understanding of fundamental mathematical notions, as the ability to develop sophisticated mathematical models, or as the capacity for understanding and evaluating another's use of numbers and mathematical models."

Jablonka's definition means that there are

many perspectives regarding numeracy or mathematical literacy that depend on the culture and context of the people who support it. Mathematical literacy can be viewed as the ability to use basic calculations and geometry in everyday contexts, as fundamental mathematical knowledge and understanding, as the ability to develop mathematical models, or as the ability to understand and assess the mathematical abilities of others.

9 According to Jablonka (2003), the ability to relate to numbers and the ability to interpret quantitative information is an important literacy component in addition to the ability to speak, write and read. The term mathematical literacy is often equated with quantitative literacy, which according to Wilkins (2010) means a habit of mind characterized by the relationship between a person's understanding of mathematics, and that person's beliefs and dispositions toward mathematics. In contrast to mathematics which is a branch of science, mathematical literacy places more emphasis on habits of mind which are characterized by a person's motivation to use quantitative information.

To use smoothly and comfortably by yourself. Therefore, improving mathematical literacy is highly dependent on the communication opportunities created by the teacher (Özgen & Bindak, 2011; Thompson & Chappell, 2007). Recognizing the important role of

communication in the success of mathematics learning, despite the widely accepted but standard in mathematics practice and research that supports communication as an important part of learning, many mathematics teachers ignore the opportunity to combine communication and mathematical literacy building skills for students (Phillips et al., 2009). ; Seibert & Draper, 2008; Thompson & Chappell, 2007; Turner, 2011).

In addition to quantitative literacy, the term numeracy is also commonly used to refer to the concept of mathematical literacy. Some people argue that mathematical literacy, quantitative literacy or numeracy refers to a practical form or subset of mathematics. Others argue that mathematics is a technical form of mathematical literacy, quantitative literacy or enumeration which has a wider scope.

The five main elements of mathematical literacy are the use of basic mathematical content, the use of authentic real-life contexts, related to solving problems or questions both familiar and unfamiliar, involving decision-making and communication processes, and the use of content and/or problemsolving skills. In addition, one of the skills that need to be possessed in the 21st century is related to mathematical literacy where questions of this type train students to sort between relevant and irrelevant information.

Through the Program for International Student Assessment (PISA) organized by the OECD, the term mathematical literacy was defined and began to be widely known, but before that, NCTM had described the characteristics of a person called mathematically literate, namely being able to explore, make guesses, and reason logically, and use various mathematical methods effectively to solve problems. OECD (2016) defines mathematical literacy as follows:

“Mathematical literacy is an individual's capacity to formulate, employ and interpret mathematics in a variety of contexts. It includes reasoning mathematically and using mathematical concepts, procedures, facts and tools to describe, explain and predict phenomena. It assists individuals to recognize the role that mathematics plays in the world and to make the well-founded judgments and decisions needed by constructive, engaged and reflective citizens.”

The above definition means that mathematical literacy is a person's ability to formulate, use and interpret mathematics in various contexts or situations. This includes mathematical reasoning and the use of mathematical concepts, procedures, facts and tools to describe, explain

and predict phenomena. Mathematical literacy helps constructive, active and reflective citizens recognize the role of mathematics as well as in making judgments and making decisions. From the above definitions, it can be concluded that mathematical literacy is the ability of students to formulate, use, and interpret mathematical content in various life contexts.

Many studies support that ethnomathematics has a relationship with mathematical concepts. A study conducted by Arwanto (2017) about ethnomathematical exploration batik Trusmi Cirebon in uncover philosophy and draft mathematical show that in in batik Trusmi Cirebon contained elements mathematical, among them is concepts geometry symmetry, transformation (reflection, translation, and rotation), and congruence. In line with this research, research by Laurens (2016) about analysis ethnomathematics and implementation in increase quality learning show that a number of draft mathematics which taught through Maluku culture can be used to understand the concepts of numbers, fractions and geometry. Study other by Abi (2015) about exploration ethnomathematics on ethnic group Amanuban and its relation to mathematical concepts show that the concept of mathematics has owned Public since long. Thing this realized from form ethnomathematics of the Amanuban tribe which contains many mathematical concepts, especially in the field geometry and algebra.

Related research was also conducted by Zayyadi (2017) on ethnomathematical exploration on Madurese batik shows that the mathematical concepts contained in the motifs Madura batik are: straight lines, curved lines, parallel lines, symmetry, points, angles, squares length, triangle, circle, parallelogram and similarity concept. The concepts that there is on motive batik Madura the could utilized for introduce mathematics through culture local. Temporary that, a study about exploration ethnomathematics on culture Public Dayak border Indonesia.

Sanggau Borneo West which conducted by Hartoyo (2012) show that Ethnomathematics at a simple level is widely used by the Dayak community in live everyday life. The concept that is often used is the concept of counting, say, measure, weigh, determine location, designing, make get up- build symmetry. Further research on ethnomathematics in the numbering system on the Riau Malay community conducted by Nuh and Dardiri (2016) showed that the activity of

counting, the Riau Malay community has mastered the concept of counting, this can be seen from the publication of the manuscript "A Vocabulary of the English, Bugis and Malay" Language" in 1833. The manuscript contains a translation of numbers in the language Malay, such as salaksa (ten thousand) and saketu (one hundred thousand). Activities say other than applied to numbers, it is also found in the process of building a house and even related to religious traditions in the form of death feasts (niga days, seven days, four days) twenty and a hundred day) and birth.

From the results of research on ethnomathematics, it can be concluded that ethnomathematics possessed by each region has a relationship with mathematical concepts that could integrated in learning level school base and medium including culture Public kutai in Kutai kabupaten district Kartanegara province Borneo East. Ethnomathematics refers to mathematical concepts embedded in practical practice culture and confess that all culture and all person develop method unique for understand and change reality community culture. Next said that ethnomathematics a studies about difference method Public solve practical math problems and algorithms from a mathematical perspective Public alone. Ethnomathematics refers to on shapes mathematics which varied as consequence which embedded in activity culture. Ethnomathematics is one of the ways used to explain mathematics in a way that pleasant and interesting, so that easy understood. So could concluded that Ethnomathematics is a method used for learning mathematics through aspect culture local Public certain so that interesting and easy understood. Ethnic group Kutai is wrong one

ethnic group oldest in island Borneo, specifically in Borneo East Regency Kutai Kartanegara Subdistrict City Get up. Activity life Public daily no free from culture they have.

METHODS

This research is a descriptive research with a qualitative approach. According to Krisyanto (in Kusumawati, 2017: 10), qualitative descriptive methods are used to explain phenomena that occur through collecting data about facts in the field. The object of this research is the culture of the people of KUTAI, Kalimantan Indonesia and mathematical literacy in PISA leveling. The data in this study were obtained by observing the culture of the people of KUTAI, Kalimantan Indonesia and conducting interviews with people who know information about the culture of the people of KUTAI, Kalimantan Indonesia. In addition, research data is also obtained from document studies in the form of books, journals or from the internet.

RESULTS AND DISCUSSION

In a learning process, it cannot be denied that the ability and level of absorb each student vary. As consequence, speed mastery of the basic competencies that have been determined in a teaching material is not the same between student which one with which other. Competence on PISA classified on three group (cluster), namely reproduction, connection, and reflection. As for ability mathematics student in PISA shared Becomes six level (level), level 1 as the lowest level of achievement and level 6 the most tall. Each level shows the level of mathematical competence achieved by students. In more detail the levels which meant depicted on table 1.

Table 1. Six Level Ability Mathematics in PISA

Level	Aspect Literacy Mathematics
1	Students are able to answer questions in a general context as well as all Relevant information is clearly available. Able to identify information and receive all instructions based on clear instructions in the situation there is. Capable show something action in accordance with simulation which given.
2	Student capable interpret and recognize situation with context which requires immediate conclusions. Able to sort out relevant information from source which single and use method presentation single. Capable working on basic algorithms, using formulas, carrying out procedures or deal in solving problem. Capable conclude by appropriate from results the solution.
3	Student capable doing procedure with clear, including procedure which requires sequential decisions. Able to choose and implement strategiessolve problem which simple. Capable interpret and use representation based on information which different. Capable solve problems in the form of percentages, fractions and decimal numbers, and proportional. Capable describe based on results interpretation and reason they.

- 4 Students are able to work with certain methods effectively in situations complex but concrete that may involve obstacles or make assumptions. Be able to select and use appropriate representations different including on symbol, then connect it with aspect situation in life daily. Capable use Skills and his knowledge on context which clear. Capable explain his opinion based on on understanding, reason and formula they.
- 5 Students are able to develop and work with models for different situations complex, identify problems and establish assumptions. able to choose, compare and evaluate strategy for solve problem which complex associated with the model. Able to use thinking and his reasoning as well as by appropriate connect representation symbol with situation which faced. Capable describe and formulate results her job.
- 6 Student capable make draft, generalization and use information based on analysis and modeling in complex situations, and can use their knowledge in relatively non-standard contexts. Capable Connect and translate different sources of information flexibly. Capable think and reason mathematical level carry on. Capable apply understanding with mastery symbol and operation mathematics, develop new strategies and approaches in dealing with new situations. Able to reflect on his actions, formulate the results of his work appropriately with considering his discovery, interpretation, opinion and accuracy on situation real.

Table 3. Question mathematical literacy model PISA Context Social Culture Public of Kutai Kalimantan Indonesia

Level Question Literacy Mathematics Model PISA	Question Literacy Mathematics Model PISA Context Social Culture Public Kutai
--	--

CHARTS

In January, the new CDs of the bands 4U2Rock and The Kicking Kangaroos were released. In February, the CDs of the bands No One's Darling and The Metafolkies followed. The following graph shows the sales of the bands' CDs from January to June.

Month	4U2Rock	The Kicking Kang	No One's Darling	The Metafolkies
Jan	2100	1650	0	0
Feb	2050	1850	250	1000
Mar	1950	1550	1350	250
Apr	1850	1600	1250	500
May	1750	1700	1000	700
Jun	2050	1800	1750	900

Question 1: CHARTS

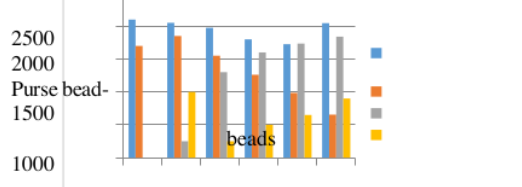
How many CDs did the band The Metafolkies sell in April?

A. 250
B. 500
C. 1000
D. 1270

PISA 2012 Released Items

Chart stem

A shop export souvenir kutai export beaded purses and handbags starting in January. Then in February, the shop also started to export doyo ulap (a typical woven cloth kutai) and dress beads. Following this is chart stem which show quantity export The souvenir is from January to the month of June.



Bags Anjat
Magic Doyo
500

CI

othes Beads
0

Jan Feb Mar April May Jun

How many many dress beads which exported on April?
A. 250
B. 500
C. 1000
D. 1270

Question 5: CHARTS

- 2 The manager of *The Kicking Kangaroos* is worried because the number of their CDs that sold decreased from February to June.
- What is the estimate of their sales volume for July if the same negative trend continues?
- A. 70 CDs
 B. 370 CDs
 C. 670 CDs
 D. 1340 CDs

Owner shop feel worry because bag anjat experienced a decline in export demand from month February to June. When the downward trend export Keep going continues, estimate how many fruit bag anjat exported in July? (Select one answer under this which according to You most Correct!)

A. 70 fruit
 B. 370 fruit
 C. 670 fruit
 D. 1340 fruit

Leve Question Literacy Mathematics Model PISA
 1
 PISA

WHICH CAR?

Chris has just received her car driving licence and wants to buy her first car.

This table below shows the details of four cars she finds at a local car dealer.



Model:	Alpha	Bolte	Castel	Dezal
Year	2003	2000	2001	1999
Advertised price (zeds)	4800	4450	4250	3990
Distance travelled (kilometres)	105 000	115 000	128 000	109 000
Engine capacity (litres)	1.79	1.796	1.82	1.783

3

Question 2: WHICH CAR?

Which car's engine capacity is the smallest?

- A. Alpha
 B. Bolte
 C. Castel
 D. Dezal

Question 3: WHICH CAR?

Chris will have to pay an extra 2.5% of the advertised cost of the car as taxes

- 4 How much are the extra taxes for the Alpha?

Extra taxes in zeds:

Question Literacy Mathematics Model
 PISA Context
 Social Culture Public Kutai

Choose Amplang?
 Udin wants to buy amplang at an SME shop Center on Jl. Kartini, Tenggarong. The table below by details show quality and price deep amplang packaging in store the.

Merek Amplang	A	B	C	D
Berat Kemasan (gr)	500	700	400	100
Harga (Rupiah)	70.000,-	100.000,-	71.000,-	130.000,-
Waktu Simpan (bulan)	12	10	6	9
Komposisi	30,79%	30,796%	30,82%	30,78%

Which brand has the most fish composition? a little?

If the store gives a 2.5% discount, how much discount earned Kiss if buy brand amplang C?

5

CLIMBING MOUNT FUJI

Mount Fuji is a famous dormant volcano in Japan.



Translation Note: Please do not change the names of locations or people in this unit; retain "Mount Fuji", "Gotemba" and "Toshi".

Question 2: CLIMBING MOUNT FUJI

PM942002 - 0

The Gotemba walking trail up Mount Fuji is about 9 kilometres (km) long.

Walkers need to return from the 18 km walk by 8 pm.

Toshi estimates that he can walk up the mountain at 1.5 kilometres per hour on average, and down at twice that speed. These speeds take into account meal breaks and rest times.

Using Toshi's estimated speeds, what is the latest time he can begin his walk so that he can return by 8 pm?

Boat Tour Mahakam Indonesia



The Mahakam tourist ship is one of the tourist rides in Indonesia city Samarinda. Boat the sail from Samarinda to Kumala Tenggarong island and back back to Samarinda. The length of the Samarinda river Tenggarong about 50 km. The speed of the ship going to Tenggarong around 25 km/hour and when return to samarinda, speed Becomes two time fold. With use estimation speed

Level Question Literacy Mathematics Model PISA
 PISA

Question Literacy Mathematics Model PISA
 Context
 Social Culture Public Kutai

the, o'clock how much most slow boat began to depart from Samarinda so that the ship it came back in samarinda hit 6 pm?

6

HELEN THE CYCLIST



Helen has just got a new bike. It has a speedometer which sits on the handlebar. The speedometer can tell Helen the distance she travels and her average speed for a trip.

Question 3: HELEN THE CYCLIST

PM957003 - 0 1

Helen rode her bike from home to the river, which is 4 km away. It took her 9 minutes. She rode home using a shorter route of 3 km. This only took her 6 minutes.

What was Helen's average speed, in km/h, for the trip to the river and back?

Average speed for the trip: km/h

kiss si Driver Bicycle

Azam received a gift in the form of a new bicycle which advanced. The bike has a speedometer that can measure bicycle average speed and distance go in one trip. kiss bicycle from house to garden City King through a route of 4 km. he is cycling During 9 minute. Then he go home to house through route other which more close that is only along 3 miles, so that he only need only for 6 minutes. What is the average speed flat kiss (in km/hour) for whole journey going to to garden City King untilreturn to his house?

Technique designing Question Literacy Mathematics Model PISA Use Context Social Culture of Kutai Kalimantan Indonesiaan people. The design of the PISA model grids and math

problems based on argumentation indicators. The problem design process is carried out by prototyping using three characteristics, namely: contents, constructs, and language.

Table 3. Technique designing Question Mathematical Literacy Model PISA

No	Characteristics	Information
1	Content	Make Question in accordance with content, level as well as cluster in PISA. Make question in accordance with context social culture Publickutai. make question in accordance with indicator question level PISA.
2	Construct	Use say ask or order which demand answerdecomposed. Give instruction which clear about method do the problem. Picture, chart or like served with clear andlegible.
3	Language	Suitability with Spelling Which Perfected (EYD). Sentence easy understand. Not there is sentence which give rise to interpretation double. Formulas sentence in question must communicative. Not use word/expression which could touch onany party

CONCLUSION

It is written in one paragraph without numbering. Answering the research objectives. Wrong one method in support literacy mathematics is innovation which implemented on learning mathematics, for example with enter element ethnomathematics in learning. Learning mathematics based culture (Ethnomathematics) is wrong one method which perceived could make learning mathematics more mean and contextual which related close with community culture. Besides that, learning mathematics based culture will Becomes an interesting, fun, and innovative learning alternative because it allows happening meaning by contextual based on on experience student as members of a cultural community so that they are expected to participate in supporting the movement literacy. Ethnomathematics provides a learning environment that creates motivation which good and more pleasant so that student have interest which big in follow learning mathematics which expected could influence ability their math, specifically ability literacy mathematics.

Ethnomathematics in its development is associated with political content that brings the issue of emancipation in mathematics learning, especially related to mathematical literacy. Load The politics that are brought are related to the cultural context of *indigenous peoples* as representation of primitive culture. This paradigm has become an obstacle to success student *indigenous* learn mathematics which have perspective and view different.

Indigenous is a term which means a group of people who inhabit an area place in a long period and has cultural heritage, values, and philosophical aspects different with Public other. *Indigenous* often associated with population

indigenous people of an area that has lagged behind in civilization and literacy. lag the possible by connection between Public which relatively closed and not yet adequate access to education. These conditions produce a paradox in the context learning scale national which require existence demands minimum in in curriculum

REFERENCES

Abi, MA (2015). Exploration Ethnomathematics on Tribe Amanuban and its Relationship with Concepts Mathematics . (Thesis). University Country Semarang, Semarang.

Adam, S., Alangui , W., & Barton, B. (2003). A comment on: rowlands & carson “where would formal, academic mathematics stand in a curriculum informed by ethnomathematics? A critical review” 1 . Educational Studies in Mathematics, 52, 327-335.

Arwanto , A. (2017). Exploration Ethnomathematics of Trusmi Cirebon Batik for Revealing Value Philosophy and Draft Math . Phenomenon: Journal of Mathematics and Natural Sciences Education, 7(1), 40-49.

Astuti , P. (2018). Ability Literacy Math and Abilities Higher Order Thinking . prism , Proceedings Seminar National Mathematics Vol. 1. thing . 263-268. <https://journal.unnes.ac.id/sju/index.php/prisma/article/view/19599/9515>

baroutsis , A& Lingard, B. (2018). PISA-shock: How we are sold the our idea PISA rankings are shocking and the damage it is doing to schooling in Australia . <https://www.aare.edu.au/blog/?p=2714>.

Breakspear, S. (2014). How does PISA shape education policy making ? Why how we measure learning determine what counts in education . Seminar series, Center for

- Strategic Education, (240), 1 - 16.
- BSNP. (2006). Standard Basic Competencies and Competencies . Mathematics Elementary School . Jakarta: Body Standard National Education
- Dafik . (2014). Skills think level high (HOTS) . <https://dafik-fkip-unej.org/news-199-high-level-thinking-skills-hots.html>.
- D'Ambrosio , U. (1985). Ethnomathematics and its place in the history and pedagogy of mathematics . for the Learning of Mathematics, 5(1), 44-47.
- De Lange, J. (2006). Mathematical literacy for living from OECD-PISA perspective. Tsukuba Journal of Educational Study in Mathematics. <https://doi.org/10.1.1.500.5073>.
- Dwinawan . (2017). What that context and why Thing that important in making product digital ? <https://medium.com/insightdesign/what-is-context-and-why-it-is-important-in-manufacturing-digital-product-e31d35e4e5c6>
- Education
GPS.Indonesia:Studentperformance(PISA 2018). <https://gpseducation.oecd.org/CountryProfile?primaryCountry=IDN&threshold=10&topic=PI>
- Ertl, H. (2006). Educational standards and the changing discourse on education: The reception and consequences of the PISA study in Germany. Oxford Review of Education, 32(5), 619-634. <https://doi.org/10.1080/03054980600976320>.
- Fahyuni , EF (2017). Technology , Information and Communication : Principles and Applications in Studies Islamic thought . Sidoarjo : University Muhammadiyah Sidoarjo .
- Fajriyah, E. (2018). Role Ethnomathematics Related Draft Mathematics in Support literacy. Prism, Proceedings Seminar National Mathematics, vol 1, Thing. 114-119. <https://journal.unnes.ac.id/sju/index.php/prisma/article/view/19589>
- My finances. (2014). Step Beginning Free Finance is Context and Content. <https://www.finansialku.com/step-awal-bebas-keuangan-dalam-konteks-dan-konten/>
- francois, K. (2010). The Role of Ethnomathematics Within Mathematics Education. In Proceedings of CERME 6, January 28 th - February 1 st 2009, Lyon France (pp. 1517-1526). INRP.
- Hartoyo. (2012). Exploration Ethnomathematics on Culture Public Dayak Border Indonesia-Malaysia Regency Sanggau West Kalimantan. Journal Study Education 13(1), 14-23.
- Izzati, P. (2014). It is important to understand context, not just content. <https://ziliun.com/what-we-think-important-understand-context-not-only-content/>
- Jablonka, E. (2003). Mathematical literacy. In Second International Handbook of Mathematics Education (pp. 75-102). Springer. https://doi.org/10.1007/978-94-010-0273-8_4.
- Johar, R. (2012). PISA Question Domain for Mathematical Literacy. Journal of Opportunity, Vol. 1, No. 1, FKIP Unsyiah
- Ministry Education and Culture. (2013). Regulation Minister Education and Culture Republic Indonesia Number 69 Year 2013 about Framework Base and Structure Curriculum School Intermediate Upper/Madrasah Aliyah.
- Ministry Education and Culture. (2019). Results PISA Indonesia 2018: Access Makin Expand , It 's Time to Improve Quality. <https://www.kemdikbud.go.id/main/blog/2019/12/hasil-pisa-indonesia-2018-access-makin-expand-time-improvement-quality>
- Ministry Education and Culture. (2019). Report National PISA 2018 Indonesia. <https://storedata.kemdikbud.go.id/index.php/s/tLBwAm6zAGGbofK>
- kohar, A. W., Zulkardi, & Darmawijoyo. (2014). developing PISA-like mathematics tasks to promote students' mathematics literacy. Proceeding the 2nd _ SEA-DR, (978), 14-26.
- Laurens, T. (2016). Analysis Ethnomathematics and Application in Increase Quality Learning. LEMMA 3(1), 86-96.
- Machaba, F. (2018). Pedagogical demands in mathematics and mathematical literacy: A case of mathematics and mathematical literacy teachers and facilitators. EURASIA Journal of mathematics, Science and Technology education, 14(1), 95-108. <https://doi.org/10.12973/ejmste/78243>.
- Mastuhu. (2010). Going to system education which more good welcome era new post orba. Jakarta: IAIN

- Muhammad. (2016). Change Curriculum in Indonesia: Studies critical about effort find education curriculum ideal Islam. *Raudhah*, IV(1), 49 - 70.
- Musadah, E. (2014). Influence media information in determination agenda policy. https://www.academia.edu/3620769/Pengaruh_Media_Informasi_dalam_Agenda_Kebijakan
- Natalia, EC (2018). Story Success Founding father Airbnb: Friend roommate which So billionaire. <https://www.cnbcindonesia.com/entrepreneur/20180704175350-25-21979/stories-success-airbnb-founder-roommate-turned-billionaire>
- NCTM. (2000). Principles and standards for school mathematics. <http://doi.org/10.15713/ins.mmj.3>.
- Noah, M. Z. & Dardiri. (2016). Ethnomathematics in System Counting on Public Malay Riau. *Kutubkhanah: Research Journal socio-religious* 19 (2), 220-238.
- Nur, A. S., Sukestiyarno, YL, Junaedi, I. (2019) Ethnomathematics In Perspective Problematic Learning Mathematics: Challenge On Student Indigenous. *Proceedings Seminar National Postgraduate (Prosnampas)*, Vol. 2, No. 1, Thing. 90-96. <https://proceeding.unnes.ac.id/index.php/snpsca/article/view/252>
- OECD. (2003). The PISA 2003 assessment frameworks: mathematics, reading, science and problem solving knowledge and skills. Paris: OECD Publishing.
- OECD. (2013a). PISA 2012 Assessment and analytical frameworks: mathematics, reading, science, problem solving and financial literacy. Paris: OECD Publishing. <https://doi.org/10.1787/9789264190511-en>.
- OECD. (2016a). PISA 2015 Assessment and analytical frameworks: science, reading, mathematics and financial literacy. Paris: OECD Publishing. <https://doi.org/10.1787/9789264255425-en>.
- OECD. (2017a). PISA 2015 assessment and analytical frameworks: science, reading, Mathematical, Financial Literacy and Collaborative Problem Solving. <http://www.oecd.org/publications/pisa-2015-assessment-and-analytical-framework-9789264281820-en.htm>
- OECD. (2018). PISA2022MathematicsFramework (Draft). <https://pisa2022-maths.oecd.org/files/PISA%202022%20Mathematics%20Framework%20Draft.pdf>
- OECD. (2018b). What is PISA? <http://www.oecd.org/pisa/>
- OECD. (2019). PISA2018AssessmentandAnalytical Framework. <https://doi.org/10.1787/b25efab8-en>
- OECD. (2019). PISA 2018: Insights and Interpretations. https://www.oecd.org/pisa/PISA_%202018%20Insights%20and%20Interpretations%20FINAL%20PDF.pdf
- Ojose, B. (2011). Mathematics literacy: are we able to put the mathematics we learn into everyday use? *Journal of Mathematics education*, 4(1), 89-100.
- Orey, D. C., & rose, M. (2006). Ethnomathematics: Cultural Assertions and Challenges Towards Pedagogical Action. *The Journal of Mathematics and Culture*, 6(1), 57-58.
- Parsons, W. (2011). Public Policy: Introduction Theory & Practice Analysis Policy. Jakarta: date.
- Powell, AB (2002). Ethnomathematics and the challenges of racism in mathematics education. In *Proceedings of the Third International MES conference*. Copenhagen: Center for Research in Learning Mathematics (pp. 1-15).
- Pratiwi, I. (2019). Effect Program PISA to Curriculum in Indonesia. Jakarta: Center Study Education Policy and Culture Balitbang Kemendikbud.
- President of the Republic of Indonesia. (2006). Regulation of the Minister of National Education Number 22 Year 2006 about Standard Contents.
- Rosa, M., & Orey, DC (2016). State of the Art in Ethnomathematics. In *ICME-13 Topical Surveys* (pp. 11-37). <https://doi.org/10.1007/978-3-319-30120-4>
- Sari, RHN, & Wijaya, A. (2017). Mathematical literacy of senior high school students in Yogyakarta. *Journal Research Education Mathematics*, 4(1), 100. <https://doi.org/10.21831/jrpm.v4i1.10649>.
- Schleicher, A. (2017). What is behind the PISA trends across the world? OECD directory for education and skills.
- Sjoberg, S. (2018). The power and paradoxes of PISA: Should Inquiry-Based Science Education be sacrificed to climb on the rankings? *NORDINA (Nordic Studies in Science Education)*, 14(2), 186-

- 202.<https://doi.org/10.5617/nordina.6185>
- Stacey, K. (2011). The PISA view of mathematics literacy in Indonesia. *English Mathematical Society Journal on Mathematics Education*, 2(2), 95-126. Retrieved from <http://files.eric.ed.gov/fulltext/EJ1078641.pdf>.
- Stacey, K. (2015). The International assessment of mathematical literacy: PISA 2012 framework and items. In *Selected Regular Lectures from the 12 years old International Congress on Mathematical Education*. https://doi.org/10.1007/978-3-319-17187-6_43.
- Stacey, K., & Turner, R. (2015). *Assessing mathematical literacy: The PISA experience*. Cham: Springer. <https://doi.org/10.1007/978-3-319-10121-7>.
- Turners, R. (2012). *Mathematical literacy: are we there yet?*, ICME-12, Topic Study Group 6.
- Uljens, M. (2007). The hidden curriculum of PISA: the promotion of neo-liberal policy by educational assessment. *FERA Congress in Vasa*, 22-23.112007, 1-11. http://www.vasa.abo.fi/users/muljens/pdf/the_hidden.pdf
- Waldow, F. (2009). What PISA did and did not do: Germany after the "PISA-shock." *European Educational Research journals*, 8(3), 476-483. <http://doi.org/10.2304/eej.2009.8.3.476>
- vijaya, A. (2016). students' information literacy: A perspective from mathematics literacy. *Journal on Mathematics Education*, 7(2), 73-82.
- Wilkins, J. L. M. (2010). Modeling quantitative literacy. *Educational and Psychological Measurements*, 70(2), 267-290. <https://doi.org/10.1177/0013164409344506>.
- Zayadi, M. (2017). Exploration Ethnomathematics on Batik Madurai. *Journal Sigma* 2(2), 36-40.
- Almukhambetov, B. M. T., & Nebessayeva, Z. (2015). The Application Of Figuratif Arts Capabilities In The Art-Pedagogical Activity Of A Teacher". *Journal Procedia Social and Behavioral Science*, 197, 1525–1529.

Mathematical Literacy: Ethnomathematics in PISA Leveling Representations

ORIGINALITY REPORT

11%

SIMILARITY INDEX

6%

INTERNET SOURCES

6%

PUBLICATIONS

5%

STUDENT PAPERS

PRIMARY SOURCES

1	Wikan Budi Utami, Fikri Aulia, Dian Permatasari, Muhammad Taqiyuddin, Sri Adi Widodo. "KETUPAT EID TRADITION OF THE NORTH COAST OF JAVA AS AN ALTERNATIVE MATHEMATICS LEARNING MEDIA", Infinity Journal, 2022 Publication	1%
2	myres.net Internet Source	1%
3	Submitted to Ateneo de Manila University Student Paper	1%
4	Submitted to General Sir John Kotelawala Defence University Student Paper	1%
5	Submitted to St Mary's University, Twickenham Student Paper	1%
6	www.acarindex.com Internet Source	1%

7	<p>Nila Ubaidah, Dwijanto Dwijanto, Scolastika Mariani. "Vygotsky Theory Based on Mathematics Literacy in The New Normal Era", Hipotenusa : Journal of Mathematical Society, 2022</p>	1 %
Publication		
8	<p>A S Marleny, Somakim, N Aisyah, Darmawijoyo, J Araiku. "Ethnomathematics-based learning using oil palm cultivation context", Journal of Physics: Conference Series, 2020</p>	1 %
Publication		
9	<p>etd.uwc.ac.za</p>	<1 %
Internet Source		
10	<p>Submitted to University of Lincoln</p>	<1 %
Student Paper		
11	<p>pdf.eu-jer.com</p>	<1 %
Internet Source		
12	<p>www.pmena.org</p>	<1 %
Internet Source		
13	<p>Pi-Jen Lin. "Using Research-Based Video-cases to Help Pre-service Primary Teachers Conceptualize a Contemporary View of Mathematics Teaching", International Journal of Science and Mathematics Education, 2005</p>	<1 %
Publication		

14

W Septiyana, E C M Asih, D Dasari. "The implementation of thinking actively in a social context learning model to improve the ability of mathematical literacy and self-efficacy of junior high school students", Journal of Physics: Conference Series, 2019

Publication

<1 %

15

www.nottingham.ac.uk

Internet Source

<1 %

16

Anisya Septiana. "Tingkat Adversity Quotient Matematis pada Mahasiswa Program Studi Tadris Matematika IAIN Curup", ARITHMETIC: Academic Journal of Math, 2019

Publication

<1 %

17

Fahruh Juhaevah. "Developing mathematics problems using local wisdom context of Maluku to improve students' numeracy", Jurnal Elemen, 2022

Publication

<1 %

18

www.pisa.tum.de

Internet Source

<1 %

19

Rusdiana Rusdiana, Auliaul Fitrah Samsuddin, Achmad Muhtadin, Petrus Fendiyanto. "Development of Mathematical Literacy Problems using East Kalimantan Context", Jurnal Cendekia : Jurnal Pendidikan Matematika, 2023

Publication

<1 %

20

edoc.site

Internet Source

<1 %

21

www.jurnal.unsyiah.ac.id

Internet Source

<1 %

22

www.udir.no

Internet Source

<1 %

23

Helmut Linneweber-Lammerskitten, Beat Wälti. "Is the definition of mathematics as used in the PISA assessment Framework applicable to the HarmoS Project?", Zentralblatt für Didaktik der Mathematik, 2005

Publication

<1 %

24

iiste.org

Internet Source

<1 %

Exclude quotes On

Exclude matches < 5 words

Exclude bibliography On

Mathematical Literacy: Ethnomathematics in PISA Leveling Representations

GRADEMARK REPORT

FINAL GRADE

/0

GENERAL COMMENTS

Instructor

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7

PAGE 8

PAGE 9

PAGE 10
