P-ISSN 2527-5615
E-ISSN 2527-5607

Kalamatika: Jurnal Pendidikan Matematika
Volume 9, No. 1, April 2024, pages 49-64

ENHANCING PROBLEM-SOLVING SKILLS THROUGH NUMERACY INSTRUMENT DESIGN: INCORPORATING PANDEGLANG'S LOCAL WISDOM IN GEOMETRY CONTENT

Endah Isnaintri[1], Yuyu Yuhana[2], Abdul Fatah[3]

[1]Universitas Sultan Ageng Tirtayasa, Jl. Ciwaru Raya Cipare, Serang, Indonesia
7778220004@untirta.ac.id
[2]Universitas Sultan Ageng Tirtayasa, Jl. Ciwaru Raya Cipare, Serang, Indonesia
yuhana@untirta.ac.id
[3]Universitas Sultan Ageng Tirtayasa, Jl. Ciwaru Raya Cipare, Serang, Indonesia
abdulfatah@untirta.ac.id

ABSTRACT

Problem solving is a crucial aspect of the education curriculum, as it reflects the skills expected to be possessed by students. Indicating that the majority of students face difficulties in this process. Studies also indicate that numeracy literacy plays a significant role in enhancing mathematical problem-solving skills. This research aims to develop a numeracy literacy assessment that integrates Pandeglang Regency's local knowledge, with a particular emphasis on geometry, to enhance the mathematical problem-solving abilities of Grade IX. This study fits into the Tessmer formative research model, which is related to the category of development research. The study involved 35 ninth-grade students from MTsN 2 Pandeglang as participants. Various tools were used to gather data, such as validation sheets, interview guidelines, and numeracy literacy tests inspired by local knowledge in the Pandeglang Regency. The analysis process included assessing these tools' effectiveness, reliability, and precision through expert assessments and statistical methods. The study's conclusions show that the developed test's quality comprises moderate difficulty for each of the three items, good validity, and satisfactory item discrimination.

ARTICLE INFORMATION

Keywords

Numeracy
Problem-Solving
Local Wisdom

Article History

Submitted, *Dec 9, 2023*
Revised, *Apr 30, 2024*
Accepted, *May 3, 2024*

Corresponding Author

Endah Isnaintri
Universitas Sultan Ageng Tirtayasa
Jl. Ciwaru Raya Cipare, Serang
Email: 7778220004@untirta.ac.id

How to Cite

Isnaintri, E., Yuhana, Y., & Fatah, A. (2024). Enhancing Problem-Solving Skills through Numeracy Instrument Design: Incorporating Pandeglang's Local Wisdom in Geometry Content. *Kalamatika: Jurnal Pendidikan Matematika*, *9*(1), 49-64.

https://doi.org/10.22236/KALAMATIKA.vol9no1.2024pp49-64

INTRODUCTION

One of the fundamental mathematical skills that high school students should possess is the ability to solve problems. This skill is crucial as it correlates with high student achievement, emphasizing learning strategies that prioritize problem-solving. Moreover, problem-solving skills in mathematics can enable students to discover mathematical concepts and enhance their logical thinking abilities independently (Hasibuan et al., 2019). This assertion is echoed by Ilyas (2015) He defines mathematical problem-solving as an individual effort utilizing mathematical concepts, properties, principles, theorems, and reasoning to solve mathematical problems. It is expected that through problem-solving skills, students can independently discover mathematical concepts (Hendriana & Soemarmo, 2019).

Problem-solving skills are essential in nearly every competency standard and basic competency. However, not all students can effectively solve problems. Sugandi (2013), indicates that the results of students' mathematical problem-solving learning are still low, suggesting that the majority of students find the problem-solving process challenging. Proficiency in numeracy literacy notably impacts the enhancement of mathematical problem-solving abilities (Alfiah et al., 2020).

In today's era of technological and informational progress, mastery of numeracy literacy, which involves understanding and utilizing mathematical concepts in daily contexts, is recognized as a crucial skill (Meeks et al., 2014). Enhancing numeracy literacy not only impacts an individual's capability to address mathematical challenges but also holds significant importance in decision-making across various facets of daily life (Domu et al., 2023; Han et al., 2017).

In the 21st century, numerical literacy, also called mathematical literacy, must underscore the evolving dynamics intertwined with science, technology, and the professional landscape, all inherently linked to activities involving calculations and numerical concepts (Goos et al., 2011). According to Dikmen Kemendikbud (2021), numeracy involves using numerical information, data, and mathematical symbols and applying conceptual and operational skills to tackle practical challenges in everyday life and decision-making processes. This definition aligns with the definition of numeracy skills (2022) within the Minimum Competency Assessment (AKM) framework. It encompasses the aptitude to utilize mathematical concepts, methods, factual knowledge, and resources for critical thinking, enabling the resolution of everyday issues across various contexts pertinent to individuals as both Indonesian and global citizens.

In formal education, many students encounter difficulties in cultivating robust numerical literacy. Mathematics instruction often emphasizes mastering foundational concepts and skills, lacking explicit integration with real-world scenarios. Consequently, this approach may result in a dearth of student motivation and interest toward the subject. Researchers such as Agustina et al (2022); Mutmainah, (2022); Patta et al (2022), argue that learning within the context of everyday life offers a potent strategy for augmenting students' numerical literacy. This involves establishing connections between numerical concepts and skills and their application in real-life situations. Istiana et al (2020) Suggests that by incorporating real-world problems reflective of students' daily experiences, learners can discern the practicality and relevance of mathematics in familiar contexts. This approach helps students appreciate the significance of mathematics in surmounting challenges and making informed decisions based on numeracy applications in real life.

According to Lusiana (2018), local wisdom possesses distinct attributes that can be introduced and harnessed within the educational setting. Integrating local wisdom into developing numeracy literacy resources gives students a meaningful framework. This integration adds depth to mathematics education by linking mathematical concepts and skills with familiar real-life situations. Moreover, incorporating local wisdom into math teaching can ignite students' curiosity, promoting an appreciation for and acknowledgment of cultural diversity.

In the context of culturally based numeracy, several studies have been conducted. For instance, Juhaevah (2022) conducted research on the development of assessments focusing on mathematical problems while considering the Maluku culture. Darmawisada (2022) developed a numeracy test of the AKM type using the socio-cultural context of Bali. Another study by Sirait et al. (2022) explored students' abilities to solve numeracy problems infused with local wisdom on Pulau Buano. They explored the implementation of a cooperative learning approach rooted in local wisdom to elevate numeracy literacy levels in primary schools. In a separate investigation. Wardhani (2022) delved into the creation of instructional videos centered around numeracy and local wisdom for elementary school students. Furthermore, Putri et al (2022) scrutinized the design of Mathematics instructional resources incorporating the cultural practices of the Using tribe, assessing their influence on students numeracy abilities. Overall, the findings from these studies indicate that incorporating local wisdom effectively improves students' numeracy skills by integrating local cultural elements.

This study highlights the innovation in developing a numeracy literacy instrument design by incorporating local wisdom in the Pandeglang Regency. The research depicts efforts to integrate local values, traditions, and wisdom into the question items used to assess problem-solving abilities through numeracy literacy at the junior high school level. The questions to be developed focus on the geometry domain with cognitive levels of knowing, applying, and reasoning. Through this study, the author aims to create question items that assess problem-solving abilities through numeracy literacy and reflect the cultural context of daily lives in Pandeglang Regency. This research is grounded in the awareness of the importance of strengthening cultural identity and the relevance of mathematics to real-life situations. However, one drawback of using research in developing numeracy literacy questions with local wisdom is the limited generalization of results, and it can also create an imbalance in assessment, especially if students unfamiliar with the local wisdom find it difficult to answer the questions.

Researching the customs and environment of the local community and the local wisdom prevalent in Pandeglang Regency is a necessary step in creating question items. This study's content centers on the traditional fishing gear (Bubu), unique local foods (Jojorong Cake), and sailboats frequently used by Pandeglang's coastal communities. The author considers how to use these aspects of local wisdom when creating numeracy literacy questions to place students in meaningful and pertinent contexts. The study's results suggest combining numeracy literacy with local wisdom can boost mathematical problem-solving proficiency. However, recent literature reviews reveal the absence of numeracy literacy assessment tools integrating local wisdom to evaluate problem-solving capabilities, particularly within Pandeglang Regency's local wisdom. By adopting a creative methodology grounded in indigenous knowledge, this study promises to significantly improve problem-solving abilities through numeracy tools influenced by local wisdom. This study has the potential to significantly advance contextualized numeracy literacy assessments that improve the mathematical learning process for students in the Pandeglang Regency by adopting this creative approach based on local knowledge. Researchers, educators, and others working in education can all benefit from this article.

METHOD

A research and development framework was employed for this research methodology. Following Zulkardi (2002)The question development process comprised two main phases: the initial stage and the formative evaluation stage. During the formative evaluation stage, the approach aligned with Tessmer (1998) Methodology, encompassing self-assessment, prototyping (including expert review, one-to-one, and small group feedback), and field testing.

In the primary stage, the researcher assessed students, analyzed the junior high school curriculum, and modified numeracy literacy tools by integrating local wisdom. Subsequently, during the formative evaluation phase, the design of the question instruments, including the grid of numeracy literacy tools based on local wisdom, was carried out.

During the formative evaluation phase, the initial step involved self-assessment, where the researcher evaluated the results of the formulated questions. These results were referred to as prototype I. Subsequently, the prototyping phase included expert review, one-to-one, and small group interactions. The expert review phase constitutes a validity assessment conducted by experienced professionals or educators. They evaluate prototype I by thoroughly analyzing its content, structure, and language, providing recommendations documented in validation sheets and question cards. The specifics of this prototype are outlined in Table 1 below.

Table 1. Characteristics of Validation Sheets in the Expert Review Stage

No	Characteristics	Description
1	Content/ Substance	The items align with the problem-solving indicators, and the stimulus utilizes images, graphs, tables, and other elements pertinent to real-life situations.
2	Construction	The questions follow the guidelines for creating items to assess mathematical problem-solving skills. They are suitable for junior high school students and cover diverse concepts.
3	Language	Following PUEBI (Pedoman Umum Ejaan Bahasa Indonesia), the questions avoid ambiguous interpretations, and the constraints of both questions and answers are clearly defined.

Simultaneously with the expert review, the one-to-one stage was conducted. During this phase, Prototype I was tested on three selected students as testers. They were instructed to attempt the developed questions and provide comments or feedback based on their experience. The insights gained from the expert review and one-to-one stages were used to refine

Prototype I. After revising Prototype I, Prototype II was created. Subsequently, Prototype II underwent testing in the small group stage. In this phase, three students were assigned to solve the questions in Prototype II and offer feedback on their experience. The feedback and observations from this small group stage were considered in further refining Prototype II.

The outcomes of revising Prototype II are denoted as Prototype III. Prior to advancing to the field test phase, a preliminary trial was conducted to assess the difficulty level discriminative power, and reliability of the questions. The trial results were scrutinized and discussed to offer recommendations for enhancing Prototype III, aiming to create the ultimate prototype. This final prototype is slated for testing on the research subjects, comprising ten students from class IX J at MTs Negeri 2 Pandeglang during the second semester of 2022/2023. The field test results will be instrumental in calculating individual student scores and will serve as the foundation for evaluating numeracy literacy within the context of local wisdom.

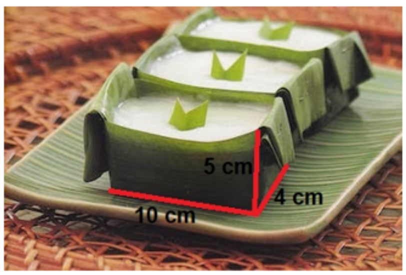
In this study, two types of data collection instruments were used, namely validation sheets and tests. Validation sheets were used to obtain information from experts as expert assessments aimed at providing input and suggestions regarding the questions generated. Meanwhile, tests were used to obtain information about the practicality and effectiveness of the developed questions and to measure the effectiveness of the local wisdom context.

The data analysis method employed in this study aimed to evaluate the developed instruments' appropriateness, quality, and accuracy. The criteria for instrument development were derived from Nieveen's framework (2007), which includes validity, practicality, and effectiveness. Validity is confirmed through expert validation, ensuring the questions are robust in content, structure, and language. Practicality is affirmed when the developed questions are considered applicable by all mathematics education practitioners, as validated by the experts. The content validity categories to be validated by validators are outlined in Table 1. The data analysis utilized in this research comprises qualitative descriptive analysis and quantitative analysis. Qualitative descriptive data encompass feedback, responses, critiques, suggestions, and enhancements from supervisors, teachers, and students regarding each point qualitatively described in the Tessmer flow development procedure. Meanwhile, quantitative analysis involves data collected from respondents filling out instrument sheets containing numeracy literacy questions based on local wisdom.

RESULT AND DISCUSSION

Preliminary Stage or Preparation Stage

In this stage, the content within the domain of Numeracy Literacy is identified by analyzing students, the junior high school curriculum, Numeracy Literacy questions, and local wisdom that can be integrated as context. This stage aims to identify and select significant materials that will serve as the content domain for the questions to be developed. The next steps include creating question cards, arranging question grids, and developing numeracy literacy instrument questions. Figure 1 shows an example question from the initial product (Prototype I) before being verified by experts.



Jojorong Cake

Jojorong Cake, a specialty of Pandeglang, Banten, is made from rice flour and coconut milk mixed with palm sugar. The cake is wrapped in a container resembling a rectangular prism made of banana leaves tied with toothpicks or skewers at each end.

Based on the information above, perform the following steps:

a) Sketch the shape of the Jojorong cake packaging into a solid figure you have learned before! Complete the drawing with known and inquired elements!
b) Is the data above sufficient to calculate the approximate volume of one package of Jojorong cake? If so, try to calculate the solutions to questions 2, 3, and 4!
c) Include the concepts and formulas used in each step of the solution.
d) Check the correctness of the solutions obtained!
e) Then, put a check mark (✓) in the box next to the following statements that are correct!

1	The vertical side of the cake container is rectangular.	
2	The approximate volume of one Jojorong Cake package contains 200 cm^3 of cake batter.	
3	If we have 2 liters of Jojorong Cake batter, it will produce 10 Jojorong Cakes with containers as shown in the picture.	
4	If the top of the Jojorong Cake is to be covered, at least 40 cm^2 of banana leaves are needed for each cake.	

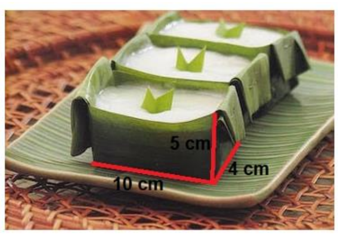
Figure 1. One Question in Prototype 1 Before Validation

Expert Review

Two validators with doctoral degrees and three junior high school mathematics subject teachers are involved at this stage. Based on the validation conducted by experts and peers, it can be concluded that the problem-solving questions developed demonstrate a satisfactory level of validity. However, adjustments are required, as per the suggestions and feedback provided by the validators. Out of the total of 3 questions, 2 require revisions based on the insights and comments provided by the validators.

One to One

During the one-to-one phase, Prototype I was formulated and administered to 3 students with varying proficiency levels: high, medium, and low. All these students were enrolled at MTsN 2 Pandeglang, Banten. Each student was given three questions to complete within a 30-minute timeframe. Additionally, they were asked to provide their opinions, comments, and suggestions on the questions. The objective of this phase was to observe the students' responses and identify any challenges encountered while addressing the questions. From the brief discussions with students regarding the feedback provided, it was determined that only 1 question required revision. This indicates that the formulated questions demonstrate a satisfactory level of practicality. Following feedback from experts, peers, and the one-to-one process, the questions in Prototype I were refined and revised. One of the questions that underwent revision in Prototype I, later referred to as Prototype II, can be observed in Figure 2.



Jojorong Cake

Jojorong Cake, a specialty of Pandeglang, Banten, is made from rice flour and coconut milk mixed with palm sugar. The cake is wrapped in a container resembling a rectangular prism made of banana leaves tied with toothpicks or skewers at each end.

Based on the information above, perform the following steps:

a) Sketch the shape of the Jojorong cake packaging into a solid figure you have learned before! Complete the drawing with known and inquired elements!
b) Is the data above sufficient to calculate the approximate volume of one package of Jojorong cake? If so, try to calculate the solutions to questions 2, 3, and 4!
c) Include the concepts and formulas used in each step of the solution.
d) Check the correctness of the solutions obtained!
e) Then, put a check mark (✓) in the box next to the following statements that are correct!

1	The vertical side of the cake container is rectangular.	
2	The approximate volume of one Jojorong Cake package contains 200 cm^3 of cake batter.	
3	If we have 2 liters of Jojorong Cake batter, it will produce 10 Jojorong Cakes with containers as shown in the picture.	

Figure 2. Revision of Prototype I (Prototype II)

Small Group

This phase aims to evaluate the feasibility of the problem-solving questions in Prototype II. The small group test involves five students from class IX J at MTsN 2 Pandeglang. These students are directed to solve the problem-solving questions provided by the author. Upon completing the numeracy literacy questions, students are asked to express their thoughts on the questions they worked on by responding to specific queries on the provided sheet. According to the results of the small group trial, it is evident that one out of the three questions requires revision, particularly in the stimulus section. Table 2 below will illustrate the modifications before and after the revision based on the results of the small group trial.

Table 2. Changes Before and After Revision

Findings/ Suggestions	Before Revision	After Revision
The stimulus sentence needs to be simplified, as students are still confused about understanding the spatial structure of the 'kue jojorong.' Therefore, it is necessary to mention the spatial structure that depicts the 'kue jojorong.	Jojorong cake is a traditional culinary delicacy from Banten, particularly Pandeglang Regency. It is crafted from rice flour and coconut milk, infused with palm sugar. The cake is enclosed in a container or mold resembling a rectangular prism made from banana leaves, with each end secured using toothpicks or small sticks.	Kue Jojorong is a specialty food from Banten, specifically from Pandeglang Regency. The cake bowl is made from banana leaves, shaped like a rectangular prism, and each end is tied using toothpicks or small sticks.
a) The stimulus sentence is overly lengthy and disconnected from the main question. Thus, it requires simplification to focus on the core query. b) The sentence in question 2a needs to be revised as it involves the triangle KLM in its congruency.	a) The boat is equipped with a sail to harness wind energy for propulsion. When the sail catches the wind, the wind exerts pressure on the sail, propelling the boat forward. Additionally, it helps conserve fuel or energy used to move the boat, making it a more environmentally friendly and economical choice. The adjacent diagram depicts a sailboat, where the black and red lines represent the ropes attaching the sailcloth to the mast. Triangle ABC is similar to triangle DEF. With the lengths of ropes AB = 6 m, BE = 4 m, KL = 3 m dan LM = 5 m. b) Sketch the shape of the similarity between triangles ABC and DEF! Complete the drawing with the known and unknown elements!	a) The boat equipped with a sail is designed to harness wind energy for movement. The diagram next to it depicts a sailboat, where the black and red lines represent the ropes attaching the sailcloth to the mast. Triangle ABC is similar to triangle DEF. With rope lengths AB = 6 m, BE = 4 m, KL = 3 m dan LM = 5 m. b) Sketch the similarity shapes between triangles ABC, DEF, and KLM! Complete the drawings with the known and unknown elements!
The students are still confused in interpreting the type of three-dimensional figure used in the fish trap, so the three-dimensional figure that represents the shape of the fish trap needs to be specified..	Bubu is a traditional fishing tool used in several coastal or aquatic regions. It is designed to catch fish by trapping them in a specific structure. This tool is typically made from solid weaving or net materials such as rattan, bamboo, or synthetic materials like nylon. The fish trapped in the fish trap are approximately 100 fish/m3, and the average weight of the fish is 80 grams. Here are some types of fish traps commonly used by fishermen.	Bubu is a traditional fishing tool used in several coastal or aquatic regions. The fish trapped in the fish trap are approximately 100 fish/m^3, and the average weight of the fish is 80 grams. Figure A shows a fish trap resembling a cylindrical structure, Figure B shows a fish trap resembling a combination of a cylindrical and cone structure, Figure C shows a fish trap resembling a cone, and Figure D shows a fish trap resembling a rectangular prism.

Before proceeding to the field test phase, Prototype II was tested with the participation of 10 students from class IX.J at MTsN 2 Pandeglang. According to the data in Table 3, it is evident that all three questions exhibit a moderate difficulty level and acceptable discriminative power, and they are considered valid with high reliability. The criteria for determining or interpreting the difficulty level, discriminative power, and reliability followed the classification suggested by Arikunto (2007). The levels of difficulty and discriminative power of the test items in the trial are presented in Table 3 below.

Table 3. Difficulty Index, Criteria Discrimination Index, and Reliability of Test Items

Test Item	Difficulty Index	Criteria Difficult Index	Discrimination Index	Criteria Discrimination Index	r_{hitung}	Criteria Validity	Reliability
1	0.59	Medium	0.42	Good	0.661	Valid	
2	0.55	Medium	0.45	Good	0.853	Valid	0.72
3	0.42	Medium	0.58	Good	0.933	Valid	

According to the data in Table 3, all three questions exhibit a moderate difficulty level and acceptable discriminative power, and they are considered valid with high reliability.

Field Test

After developing a valid and practical Prototype III, a field test was conducted to observe its potential impact on students' mathematical reasoning abilities. The field test was conducted in class IX.I at MTsN 2 Pandeglang, consisting of 20 students. Students were asked to choose the correct answer from the provided options and explain the reasons or steps they used to support their answers. An example of a student's response to Prototype III can be seen in Figure 3.

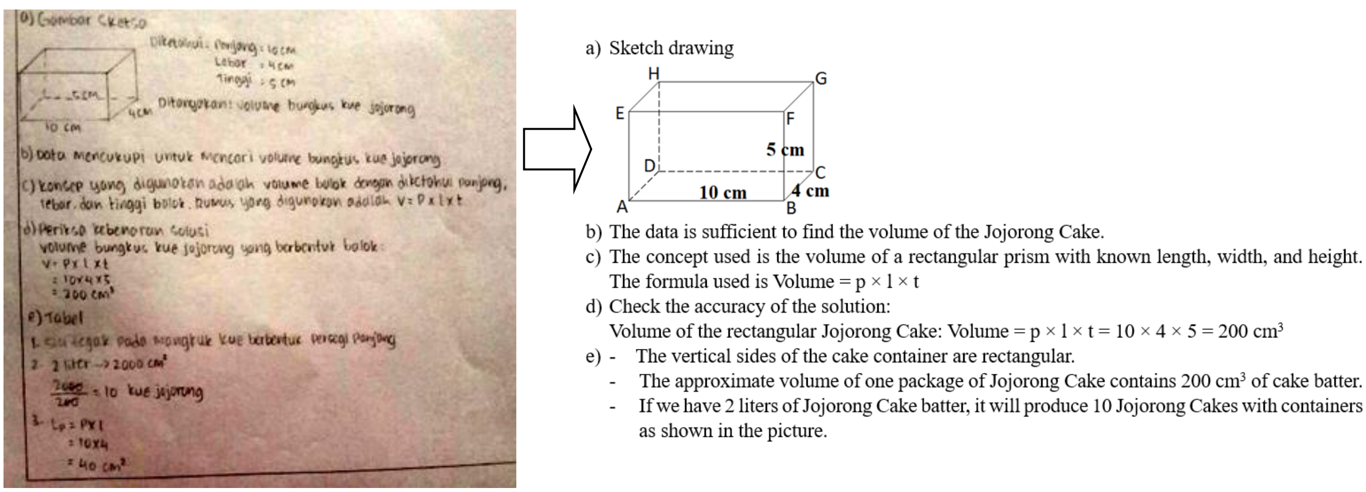


Figure 3. Example of Student's Response to Prototype III

The data obtained from the test, utilized to gauge students' mathematical problem-solving proficiency, were analyzed based on the cumulative scores achieved during the test. Subsequently, the data underwent analysis and conversion into qualitative data to ascertain the students' levels of mathematical problem-solving abilities. The categories for determining the students' mathematical problem-solving abilities are as follows:

Table 4**.** Determination of Categories of Students' Mathematical Problem-Solving Abilities (Arikunto, 2007)

Score	Category
76 – 100	Excellent
51 – 75	Good
26 – 50	Average
0 – 25	Passed Conditionally

Results of the analysis of students' problem-solving skills can be found in Table 5.

Table 5. Average Frequency Distribution of Student Test During Field Test

Score Interval	Category	Frequency	Average %
76 – 100	Excellent	4	20
51 – 75	Good	8	40
26 – 50	Average	7	35
0 – 25	Passed Conditionally	1	5
Number of Subjects		20	100
Average Score		59.45	GOOD

Based on the results of the mathematical problem-solving test during the field test with 20 students, it can be concluded that four students (20%) have excellent problem-solving skills, eight students (40%) have good problem-solving skills, seven students (35%) have satisfactory problem-solving skills, and one student (5%) has insufficient problem-solving skills. This study produced three items of mathematical problem-solving questions of numeracy literacy type based on local wisdom for Grade IX of Junior High School, covering the topic of shapes and space. The development process followed the steps outlined by Tessmer (1998). Experts' description of the preparation phase and the content validity test indicated that the developed questions align with the indicators of mathematical problem-solving within the numeracy literacy domain. Based on the analysis of student responses during the field test, it is evident that some students exhibit good mathematical problem-solving skills in answering the three numeracy literacy questions based on local wisdom. This is observed through the provided answers and solution steps on the answer sheets. Mathematical problem-solving indicators (Hendriana & Soemarmo, 2019), such as identifying sufficient elements for problem-solving, selecting and implementing strategies to solve problems, performing calculations, and interpreting and verifying the solution to the original problem, were evident in the students'. responses.

This is demonstrated by some students providing accurate answers and exhibiting indicators of mathematical problem-solving in their responses. Additionally, from the comments made by students during the field test, it is known that, in general, the numeracy literacy questions based on local wisdom provided can stimulate students to think more critically and require them to use their reasoning and logic in solving the problems. Students are also interested in the local wisdom context, closely related to their daily lives. The research asserts that proficiency in numeracy literacy contributes to effective problem-solving by empowering students to apply numerical concepts and mathematical skills daily.

The study by Mahmud & Pratiwi (2019) Indicates that numeracy literacy allows students to apply mathematical concepts in everyday life and analyze information to predict and draw conclusions. Meanwhile, the research by Aulia et al., (2023); Fajarini (2014); Wulandari & Puspadewi (2016) This study demonstrates that the application of local wisdom in educational contexts can enhance students' interest and enrich their learning experiences. By integrating numeracy literacy and local wisdom, learning can become more contextual and relevant for students, helping them develop better mathematical problem-solving skills while understanding and appreciating their local culture.

CONCLUSION

Based on the study's findings, it can be concluded that the local wisdom-based numeracy literacy problem-solving questions satisfy practicality and validity requirements. The theoretical validity is substantiated through the evaluations by validators, who unanimously agreed that the questions exhibit quality in terms of content, construction, and language. Concurrently, the one-to-one and small-group trial results affirm that all students can proficiently utilize the question instruments.

In this study, the author provides several suggestions for the future development of numeracy instruments. First, further testing of this numeracy instrument needs to be conducted with a larger sample size at all levels and in various regions in Indonesia. Second, developing numeracy instruments with more varied and diverse contexts of local wisdom in Indonesia is necessary. Third, training for mathematics teachers is needed to develop numeracy instruments that align with the context of local wisdom in their respective regions. Fourth, further research is needed to measure the effectiveness of using numeracy instruments in the context of local wisdom in improving students' mathematical problem-solving abilities.

REFERENCES

Agustina, Y., Mutaqin, E. J., & Nurjamaludin, M. (2022). Pengaruh Model Pembelajaran Realistic Mathematics Education (RME) Terhadap Kemampuan Literasi Numerasi. *02*(02). 142-149.

Alfiah, S., Mulyadi, M., & Apriyani, D. C. N. (2020). Hubungan antara Literasi Numerasi dengan Kemampuan Pemecahan Masalah Matematika Siswa Kelas VIII SMP Negeri 1 Pacitan Tahun Pelajaran 2019/2020. *Jurnal Penelitian Pendidikan*, *12*(1), 44–50. https://doi.org/10.21137/jpp.2020.12.1.7

Arikunto, S. (2007). *Dasar-Dasar Evaluasi Pendidikan (Edisi revisi).* Jakarta: Bumi Aksara.

Aulia, M., Karim, K., & Hidayanto, T. (2023). Pengembangan Instrumen Asesmen Kompetensi Minimum (AKM) Numerasi Konteks Kearifan Lokal Kalimantan Selatan Untuk Siswa SMA. *EDU-MAT: Jurnal Pendidikan Matematika*, *11*(1), 143-150. https://doi.org/10.20527/edumat.v11i1.15505

Darmawisada, I. K. A. Y. (2022). Pengembangan Tes Numerasi Tife Assesment Kompetensi Minimum Menggunakan Konteks Sosial Budaya Bali Di SMP [Undergraduate, Universitas Pendidikan Ganesha]. https://doi.org/10/1813011073-BAB%20III%20METODELOGI%20PENELITIAN.pdf

Dirjen PAUD, Dikdas, dan Dikmen Kemendikbud. (2021). *Panduan Penguatan Literasi dan Numerasi di Sekolah*. Direktorat Jenderal Pendidikan Anak Usia Dini, Pendidikan Dasar, dan Pendidikan Menengah Kementerian Pendidikan dan Kebudayaan.

Domu, I., Regar, V. E., Kumesan, S., Mangelep, N. O., & Manurung, O. (2023). Did the Teacher Ask the Right Questions? An Analysis of Teacher Asking Ability in Stimulating Students' Mathematical Literacy. *Journal of Higher Education Theory & Practice*, *23*(5).

Fajarini, U. (2014). Peranan Kearifan Lokal Dalam Pendidikan Karakter. *Sosio-Didaktika:* Social Science Education Journal, 1(2), 123-130.

Goos, M., Dole, S., & Geiger, V. (2011). Improving numeracy education in rural schools: A professional development approach. *Mathematics Education Research Journal*, *23*(2), 129–148. https://doi.org/10.1007/s13394-011-0008-1

Han, W., Susanto, D., Dewayani, S., Pandora, P., Hanifah, N., Miftahussururi, M., Nento, M. N., & Akbari, Q. S. (2017). *Materi pendukung literasi numerasi* (L. A. Mayani, Ed.). Direktorat Jenderal Pendidikan Dasar dan Menengah. https://repositori.kemdikbud.go.id/11628/

Hasibuan, A. M., Saragih, S., & Amry, Z. (2019). Development of Learning Materials Based on Realistic Mathematics Education to Improve Problem Solving Ability and Student Learning Independence. *International Electronic Journal of Mathematics Education*, *14*(1), 243–252.

Hendriana, H., & Soemarmo, U. (2019). *Penilaian Pembelajaran Matematika*. Bandung: Bandung: Refika Aditama.

Ilyas, M. (2015). *Metodologi Penelitian Pendidikan Matematika*. Pustaka Ramadhan.

Istiana, M. E., Satianingsih, R., & Yustitia, V. (2020). Pengaruh Realistic Mathematics Education terhadap Kemampuan Literasi Matematika Siswa. *UNION: Jurnal Ilmiah Pendidikan Matematika*, *8*(3), 423–430. https://doi.org/10.30738/union.v8i3.8446

Juhaevah, F. (2022). Developing Mathematics Problems Using Local Wisdom Context Of Maluku To Improve Students' Numeracy. *Jurnal Elemen*, *8.(1)*, 323–339. https://doi.org/https:/doi.org/10.29408/jel.v8i1.4524

Lusiana, L. (2018). Integrasi Kearifan Lokal Dalam Pembelajaran Matematika Dengan Pendekatan Contekstual Learning. *Wahana Didaktika : Jurnal Ilmu Kependidikan*, *16*(3), 376-386. https://doi.org/10.31851/wahanadidaktika.v16i3.2171

Mahmud, M. R., & Pratiwi, I. M. (2019). Literasi Numerasi Siswa Dalam Pemecahan Masalah Tidak Terstruktur. *Kalamatika: Jurnal Pendidikan Matematika*, *4*(1), 69-88. https://doi.org/10.22236/KALAMATIKA.vol4no1.2019pp69-88

Meeks, L., Kemp, C., & Stephenson, J. (2014). Standards In Literacy And Numeracy: Contributing Factors. *Australian Journal of Teacher Education*, *39*(7), 106–139.

Mutmainah, Y. H. (2022). Perbandingan Pengaruh Penerapan Pendekatan Realistic Mathematic Education (RME) Dan Pendekatan Saintifik Terhadap Kemampuan Literasi Numerasi Siswa Kelas XI [Skripsi, Universitas Muhammadiyah Ponorogo]. https://doi.org/10/DAFTAR%20PUSTAKA.pdf

Nieveen, N. (2007). *Formative Evaluation in Educational Design Research (Eds). An Introduction to Educational Design Research*. SLO.

Patta, R., Rahman, A., & Nur, A. S. (2022). Penerapan Pendekatan Realistic Mathematics Education (RME) Untuk Meningkatkan Literasi Numerasi Siswa Kelas V SD Negeri 157 Pasaraya Kecamatan Bontobahari Kabupaten Bulukumba. *Global Journal Basic Education*, *1*(4), 458-467. https://doi.org/10.35458/gjp.v1i1.508

Pusat Asesmen dan Pembelajaran Kementerian Pendidikan dan Kebudayaan. (2022). *Asesmen Nasional*. https://anbk.kemdikbud.go.id/

Putri, M. A. K., Pambudi, D. S., & Kurniati, D. (2022). Pengembangan perangkat pembelajaran berbasis lesson study for learning community bernilai Budaya Using untuk meningkatkan numerasi. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *11*(4), 2567-2578. https://doi.org/10.24127/ajpm.v11i4.6164

Sirait, S., Rahmadani, E., Syafitri, E., Anim, A., Mapilindo, M., Izzayu, N., & Andini, P. (2022). Pengaruh Model Contextual Teaching and Learning (CTL) Berbasis Etnomatematika Terhadap Kemampuan Literasi Numerasi Siswa. *Seminar Nasional Multi Disiplin Ilmu Universitas Asahan*, *5(1)*, 1-8. http://jurnal.una.ac.id/index.php/semnasmudi/article/view/2996

Sugandi, A. I. (2013). Pengaruh Pembelajaran Berbasis Masalah Dengan Setting Kooperatif Jigsaw Terhadap Kemandirian Belajar Siswa SMA. *Infinity Journal*, *2*(2), 144-155. https://doi.org/10.22460/infinity.v2i2.p144-155

Tessmer, M. (1998). *Planning And Conducting Formative Evaluations: Improving The Quality Of Education And Training*. London: Kogan Page.

Wardhani, I. S. K. (2022). Pengembangan Video Pembelajaran Berbasis Numerasi dengan Kearifan Lokal Untuk Siswa SD. *Jurnal Educatio FKIP UNMA*, *8*(3), 908-914. https://doi.org/10.31949/educatio.v8i3.2748

Wulandari, I. G. A. P. A., & Puspadewi, K. R. (2016). Budaya Dan Implikasinya Terhadap Pembelajaran Matematika. *Jurnal Santiaji Pendidikan*, *6*(1), 129201.

Zulkardi, Z. (2002). *Developing A Learning Environment On Realistic Mathematics Education For Indonesian Student Teachers* [Doctoral, University of Twente, Enschede]. http://doc.utwente.nl/58718/1/thesis_Zulkardi.pdf