

Development of Numeracy, Writing, Listening, and Speaking Literacy Assessment Models for Elementary School Students in Makassar City

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Abstract

The purpose of this study was to identify the current conditions of numeracy, writing, listening, and speaking literacy assessments in elementary schools, develop a local wisdom-based literacy assessment model that is appropriate for elementary school students, and test the effectiveness of the local wisdom-based assessment model in improving students' literacy skills. The method used is research and development (R & D) with the ADDIE model (Analysis, Design, Development, Implementation, Evaluation). The result show that total overall indicator of the effectiveness of improving the previous assessment results of 81.86 with a good category, there was an insignificant increase with a total score of 82.98 which is also in the good category. Based on the results of the development of the local wisdom-based literacy assessment model for numeracy, writing, listening, and speaking in Elementary School students in Makassar City, improvements and revisions need to be made to improve the quality of the assessment, especially literacy and numeracy skills in Elementary Schools.

Keywords: *Assessment, Literacy, Numeracy, Writing, Local Wisdom.*

Introduction

Education is crucial for both individuals and countries. A country with high-quality education will be able to compete internationally and have reliable people resources. Implementing literacy is one of the many comprehensive and integrated initiatives needed to accomplish high-quality education. One of the most important abilities that everyone, including kids, has to have in a time when information and technology are developing at a breakneck pace is literacy. The development of literacy at the primary school level is one of the crucial educational stages. Students in the early age group are known as early-grade students. This early stage of a child's growth is crucial. Thus, it is necessary to support all of the students' potential at this time (Madani, 2019).

Language and literacy skills are areas of student development that require focus. There is more to literacy than just being able to read and write. Because it is believed that by establishing literacy habits at a young age, pupils will be able to develop literacy habits for the future, elementary school was selected as the setting for literacy instruction. The goal of early childhood education is to maximize children's potential by fostering all facets of their development (Alatalo & Westlund, 2021). Based on the Ministry of Education, Culture, Research, and Technology's Curriculum and Education Assessment Agency's Head of Standards' Decree No. 008/H/KR/2022 on Early Childhood Learning Outcomes, which covers religious values and character, identity, literacy fundamentals, mathematics, science, technology, engineering, and the arts. One of the results of schooling is the development of literacy skills. The abilities of reading, writing, speaking, and listening are then enhanced by literacy. Nowadays, literacy is regarded to include knowledge of a far greater range of topics that are equally or more important than reading and writing. Over the years, the idea has grown in scope. These changes are caused by a number of variables, such as changes in analogies, the

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extension of meaning due to more usage, and the growth of information technology (Mirra & Garcia, 2021).

Literacy is a significant thing to note since it is the initial ability that students must possess for their future. The capacity to employ reasoning is known as numerical literacy (Umbara & Suryadi, 2019). The ability of pupils to construct, apply, and understand mathematics in a variety of real-world situations that involve mathematical reasoning is the main focus of numeracy literacy. Numeracy abilities are one of the qualities that students need to learn in mathematics. A person's ability and confidence in gaining knowledge and skills to use mathematics in all facets of life is known as numeration. The capacity to use precise mathematical concepts and terminology in day-to-day operations is known as numeracy (Rakhmawati & Mustadi, 2022).

Reading literacy assessment has been developed and is part of the minimum competency assessment, a local government policy in 2021 (Syafuddin, 2022). Meanwhile, literacy assessments on writing, listening and speaking skills have yet to be developed. The terms text, context, and context always appear in the communication process. Likewise, Numeracy Literacy has existed, but its assessment model still needs to be developed (Rachman et al., 2023). In the 21st Century Literacy Discourse in 2020 with the theme "New Vision for Education: Unlocking the Potential of Technology", it is stated that literacy and numeracy skills are one of the nineteen mandatory skills that today's students must have. Instilling literacy as early as possible must be realized because it is the principal capital in realizing an intelligent and cultured nation. Therefore, literacy culture needs to be cultivated for students, especially children, not only in reading and writing but also in numeracy, listening and speaking literacy to understand the ideas contained in the contents of the writing or discourse (Ulu-Aslan & Baş, 2023; Lechner, 2023). The problem faced by Indonesia is low literacy mastery, as evidenced by the Programme for International Student Assessment (PISA) survey. Practically, to achieve success in literacy culture, it is necessary to understand the contents of the reading by listening, consisting of hearing, understanding, remembering, evaluating and responding, then proven to be fond of writing with the stages of the reflective writing process which then speaks with storytelling activities (Zhang, 2023).

The idea of literacy has undergone a great deal of evolution and transformation. Limited use of literacy was observed in the domains of language and communication skills, including speaking, writing, listening, and reading. At the moment, cultural literacy is one of the other forms of literacy that must be taken into consideration, even though reading and writing are the most fundamental skills that must be learned. Ethnicity or culture is a national asset that needs to be protected since it keeps people's national identity and ethnic culture intact while balancing the advancement of the times (Eaglestone, 2020). Cultural literacy specifically refers to the information and abilities needed to comprehend and act upon Indonesian culture as a national identity. All topics, including mathematics, can benefit from the integration of cultural literacy accomplishments into learning, habits, and development. The goal of mathematics as a discipline is to help students become more adept at recognizing, comprehending, and applying the fundamentals of the subject that they will require in their daily lives. As a result, integrating cultural literacy into instruction is difficult for educators. In order for students to select and classify the nation's noble cultural ideals that are pertinent to serve as the foundation for acting, performing, and acting in a variety of ways. In order for students to utilize the cultural diversity of their localities to create works that maintain the national culture and encourage pupils to work hard, educators must also incorporate cultural literacy into the curriculum. Enhancing cultural literacy abilities is one kind of learning with culture, where students are exposed to culture as a means of studying specific subjects (Latif & Talib, 2021).

Literacy and numeracy studies have been conducted by experts. Fisher (2018) uses play-based interactive technology in a classroom setting to help students strengthen their numeracy skills. Yalcin (2019) looks into how gender affects students' reading, numeracy, and problem-solving skills. Hwang (2020) examined how fourth-grade kids' learning ability in mathematics was impacted by early numeracy activities at home. Numerous prior researchers in Indonesia have undertaken various initiatives to enhance and expand students' numeracy. According to Andika et al. (2019), board game activities will help students' numeracy skills by enhancing their self-concept. Samad et al. (2021) have confirmed that traditional games can help pupils become more proficient in numeracy. Additionally, Prabowo et al. (2018) use lesson study to help

students become more proficient in numeracy. In addition, Rohendi (2019) claimed that games with a multimedia component could help kids improve their numeracy abilities.

The urgency of this research is due to education in Indonesia, which faces challenges in developing literacy, especially in assessments, which are the foundation for measuring student abilities. Literacy development is focused on numeracy, writing, listening and speaking in elementary school students. Using less relevant assessments in the local context often helps ensure an accurate assessment of student abilities. Therefore, integrating local wisdom in the assessment model provides a more meaningful and relevant context to increase student motivation and understanding. Based on the explanation above, it is necessary to develop an instrument to measure student literacy and numeracy. This can be formulated that the aim of this research is to identify the current conditions of numeracy, writing, listening, and speaking literacy assessments in elementary schools. The goal is to develop a literacy assessment model based on local wisdom that is not only appropriate for elementary school students but also has the potential to significantly improve their literacy skills. The impact of this research could be transformative, potentially revolutionizing the way literacy is taught and assessed in elementary schools.

Research Method

Research Design

The research location was conducted in Makassar city by taking two sample locations: private schools in the city center (Athirah Islamic Elementary School) and a State Elementary School with lots of culture in the school (Pampang State Elementary School). The differences in school culture and culture between expensive private schools in the city center and public schools in the suburbs with accessible facilities reflect various aspects related to the social, economic, and educational environment.

Implementing a local wisdom-based literacy assessment model improves the quality of education because every student can absorb learning. Research in mathematics education has conducted several studies on integrating mathematics and local culture. The research explored ethnomathematics on geometric patterns in kandaure motifs, traditional foods, houses, carvings, banua Toraya Nosu, and traditional games in Toraja. The development of the content and products of this research was directed at creating a literacy assessment. Requires collaboration between the principal, teachers and students in conducting assessments and implementing self-development with a positive psychology approach to absorb learning faster according to the interests and talents of children. So, the holistic literacy, numeracy, writing, listening, and speaking learning assessment model can improve students' knowledge, motivation, interests, and talents (Alneyadi et al., 2023).

Research Procedure

This study uses the Research and Development (R&D) method with the ADDIE (Analysis, Design, Development, Implementation, Evaluation) model. The Research Procedure is the stages: 1) Analysis, namely identifying the needs and problems of current literacy assessment and determining relevant local wisdom context elements; 2) Design, namely developing a local wisdom-based assessment model design and creating a test instrument based on the design, 3) Development, namely creating an appropriate instrument and testing the instrument to ensure its validity and reliability, 4) Implementation, namely teacher training on the design of the assessment model and then implementing it in class, 5) Evaluation, namely formative evaluation to assess during the process and summative evaluation to assess effectiveness after implementation of the assessment model. Research Flowchart of ADDIE Model shown in Figure 1.

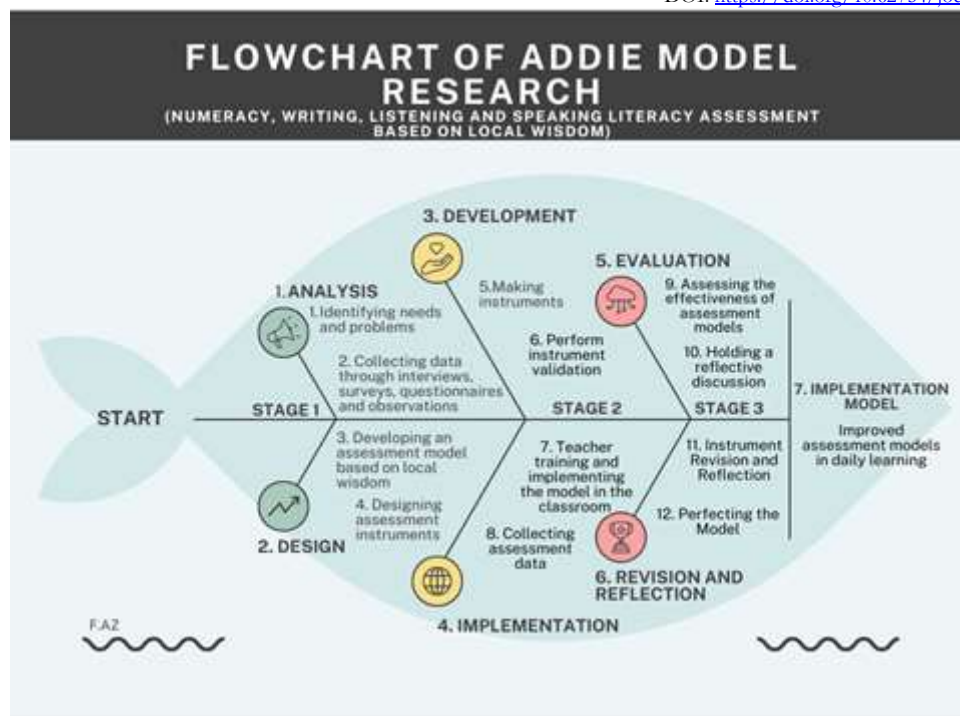


Figure 1. Research Flowchart of ADDIE Model

The Flowchart above visualizes the research workflow including the stages that have been completed and the steps that will be taken to achieve the final objectives of the research. The first stage of analysis is to identify needs and problems in the assessment of literacy numeracy, writing, listening and speaking, then collect data through interviews with teachers, principals, student surveys and classroom observations. Then continue with design, namely developing an assessment model based on local wisdom. Then development by designing instruments, designing questions, numeracy, writing assignments, listening and speaking texts and assessment rubrics, then validating the instrument by involving local wisdom experts, teachers and revisions. Furthermore, in the second stage, instrument development is done by compiling a valid instrument to be implemented, namely implementing the assessment model in the classroom through teacher training, including conducting tests and assessment tasks until obtaining student assessment data. Then, evaluate the model's effectiveness with quantitative analysis (scores) and qualitative (observation, interviews and questionnaires), then hold discussions with teachers and students for feedback. Next, the third stage of revision and refinement of the model by revising the assessment instruments and procedures based on the evaluation results to perfect the assessment model and sustainable implementation. Finally, sustainable implementation by using the refined assessment model in everyday life and periodic motoring and evaluation to improve the quality of sustainable assessment.

Data Analysis

The study population was fourth and fifth grade students in elementary schools in Makassar City. Samples were taken purposively by 60 people from two different schools. Data collection instruments using questionnaires, numeracy literacy tests, writing tests, listening tests, speaking tests, interviews, observations, assessment rubrics, and local wisdom content analysis.

Data analysis using a mixed method, namely quantitative data analyzed using descriptive and inferential statistics (t-test) and qualitative data analyzed using thematic analysis techniques. The expected results in this study can present findings on the current condition of literacy assessment, development of assessment models, and tests of the effectiveness of assessment models based on local wisdom, especially in numeracy, writing, listening and speaking literacy.

In this study, four aspects will be reviewed (Table 1), namely numeracy and literacy; writing, listening, and speaking, especially for elementary school students. The numeracy aspect includes numbers, measurement and geometry, data and uncertainty and algebra. The writing aspect includes pre-writing, writing and post-writing. The listening aspect includes understanding the content of the story and remembering the content of the story. The speaking aspect includes show-and-tell language games and singing.

Table 1. Aspects to Be Reviewed

	Writing	Listening	Speaking	Numeracy
Content	<ul style="list-style-type: none"> Pre-writing: Literacy tree and question framework. Writing: Draft of writing/questions. Post-writing: Revised writing/reflection. 	<ul style="list-style-type: none"> Understand the content of story questions or the content of the question material. Remember that the content of story questions is related to problem-solving. 	<ul style="list-style-type: none"> Show and tell by showing and explaining problem-solving. Language games emphasize sound emphasis so you can better understand the meaning. Singing by linking content with notes to make it easier to understand. 	<ul style="list-style-type: none"> Numbers. Measurement and geometry. Data and uncertainty. Algebra.
Cognitive processes	<ul style="list-style-type: none"> Create a problem-solving framework. Write a problem-solving letter based on the framework. Revise the appropriateness of the problem-solving content. 	<ul style="list-style-type: none"> Answer questions. Sort the pictures, the flow of the content of the story problem. Tell the story and return the contents of the story. 	<ul style="list-style-type: none"> Show something, whether an object, picture or something else, to the audience. Explain or describe the thing. 	<ul style="list-style-type: none"> Understanding Application Reasoning
Context	Personal, social, cultural, scientific			

Table 1 shows four aspects that will be reviewed: numeracy literacy, writing, listening, and speaking in elementary school students. The numeracy aspect includes numbers, measurement, and geometry. The writing aspect includes pre-writing, writing, and post-writing. The listening aspect includes understanding the content of the story and remembering the content of the story. The speaking aspect includes show and tell and language games. In addition, a written test is given with questions designed to measure students' skills. Indicators of numeracy, writing, listening, and speaking abilities in students are detailed in Table 2.

Table 2. Category Criteria

Score Intervals	Category
90-100	Very Good
80-89	Good
70-79	Enough

Data Analysis

The collected data was analyzed using thematic analysis, a method that allows for the identification, analysis, and interpretation of patterns or themes within the data. This approach is particularly suitable for qualitative research, as it enables the researcher to systematically explore key themes that emerge from the participants' responses, providing insights into their experiences, challenges, and strategies. Thematic analysis offers flexibility, allowing both a detailed and broad exploration of the data, making it ideal for understanding the complexities of the seaweed farmers' practices and the impacts of the long-line method on their livelihoods.

The analysis follows a structured process, which typically involves at least five stages. First, the researcher becomes familiar with the data by reading and re-reading the interview transcripts. Second, initial codes are generated, systematically identifying significant features across the dataset. Third, these codes are grouped into broader themes that capture patterns in the data. Fourth, the themes are reviewed and refined to ensure they accurately represent the data and are coherent. Finally, the themes are defined, named, and interpreted, allowing the researcher to draw meaningful conclusions that align with the research objectives. This multi-stage approach not only ensures a rigorous and systematic analysis but also provides the flexibility to uncover unexpected insights, making thematic analysis a robust tool for exploring the diverse experiences of the seaweed farmers.

Results and Discussion

We provide a more thorough examination of the results from every ADDIE process step in this section. The phases of the ADDIE development process—analysis, design, development, implementation, and evaluation—are used to provide a more thorough explanation of the research's findings.

Analysis

At the analysis stage, identification of how to assess the literacy skills of numeracy, writing, listening, and speaking in Elementary School students and integrating elements of local wisdom in learning. How to assess the relevance of local wisdom in improving students' literacy skills is done by looking at phenomena that are happening in society, then linking them to local wisdom in the form of literacy, reading discourses about local wisdom, and asking what the contents of the discourse they have read are or asking students to retell the contents of the discourse that students have read, solving problems related to local culture, such as finding the area of a rectangular Makassar traditional house, creating projects that integrate local wisdom, such as writing stories or reports based on local traditions or values. This is important to do because students need to know about the local wisdom that exists around them. The use of local wisdom in literacy assessments can be very beneficial because it can train students to improve their writing and train students' creativity in creating a work that must be carried out to determine students' writing abilities; very effective in developing their communication skills, creativity, and critical thinking. Local wisdom makes literacy materials more relevant and directly related to students' daily lives. In addition, this is also very useful because it can preserve local culture in the city of Makassar, so that students are more familiar with local wisdom without having to study in depth about the culture of each region.

Based on the results of observations and interviews with teachers about the elements of local wisdom introduced at Athirah Islamic Elementary School related to the use of artificial intelligence to get to know the surrounding environment, the implementation of outing classes, and the implementation of methods and curriculum based on local wisdom projects by making traditional food at school. At the same time, the results of observations and interviews with teachers about the elements of local wisdom at Pampang State Elementary School are related to everyday language, traditional games, snacks, conditions of the household environment, and the school environment.

Design

At this stage, an assessment model design is carried out, including literacy in numeracy, writing, listening, and speaking for elementary school students. The numeracy aspect includes numbers, measurement, and geometry. The writing aspect includes pre-writing, writing, and post-writing. The listening aspect includes understanding the content of the story and remembering the content of the story. While the speaking aspect includes show and tell and language games. The types of questions used are essays, writing, and oral. At this stage, an assessment is also made using categories. All questions and assessment indicators are directed at the context and content of local wisdom. Both questions and students' abilities interpret the context of local wisdom in everyday life and students collect information and increase students' insight in the context of culture through storytelling.

Development

At this stage, the assessment instrument development was designed, and experts carried out validation tests. Content validity assesses that the questions cover all the material to be measured and are by the curriculum. This assessment was conducted by two senior elementary school mathematics teachers and four education experts (two in mathematics, one in psychology, and one in supervision). The numeracy questions analyzed were numbers, measurement, and geometry. Five questions measured the concept of numbers, including addition, subtraction, multiplication, and division. All questions were valid because they were by essential competencies and covered all aspects of numbers. Of the five questions related to measurement (length, weight, and time), two questions were considered less by the depth of the time measurement material. These questions need to be revised because they must match the understanding level of fifth-grade students. In the geometry questions, all were by the competency indicators, especially in introducing basic shapes and area calculations. Therefore, questions about numbers and geometry were considered valid, and two measurement questions were revised to match the depth of the expected measurement concept. The results of the reliability test are shown in Table 3.

Instrument	Cronbach's Alpha	Number of items
Numbers	0.89	5
Measurement	0.72	5
Geometry	0.87	5

Reliability Criteria:

$\alpha \geq 0.70$: Reliable instrument

$\alpha < 0.70$: Unreliable instrument

The reliability test results in Table 3. show that questions related to number material have excellent reliability (0.89), with consistent results in various trials. Questions related to measurement are pretty reliable (0.72), although two questions related to time and weight measurement need to be revised. Meanwhile, geometry questions are reliable (0.87), consistently measuring students' abilities related to this material. The reliability test of mathematical story questions covering number, measurement, and geometry materials for grade V of elementary school shows that this instrument has excellent reliability. This means this instrument is consistent and can be relied on to measure students' abilities in the three materials.

Implementation

At the implementation stage, it is carried out by applying the assessment model in the classroom. The implementation of the learning process is by the prepared module, then providing local wisdom assessment questions to fourth and fifth grade students of Elementary School. The number of fourth-grade students at Pampang Elementary School is 60, and the number of fifth-grade students is 60. In comparison, at Athirah Elementary School, the number of fourth-grade students is 30 people, and the number of fifth-grade students is 30. The implementation is carried out by each class teacher, adjusted to the material in the module, which is done by reinforcing the material at the beginning, then providing numeracy, writing, listening, and speaking literacy assessment questions according to the phase of grade IV and grade V levels.

The pre-test results are taken from the numeracy data of each class teacher, and the post-test data are taken from the assessment results using previously validated local wisdom questions.

Evaluation

Numeracy ability

The results of the analysis of the effectiveness of numeracy ability are shown in Table 4.

Table 4. Analysis Result of the Effectiveness of Numeracy Ability

Indicator	Numeracy Ability		Total	Average
	N1	N2		
Pre-test	81.3	81.1	162.4	81.2
Post-test	86.4	85	171.4	85.7

Numeracy Description

N1 : Concept Understanding (basic mathematical operations (addition, subtraction, multiplication, division) and the process of solving them

N2 : Calculation Accuracy (accuracy of calculation steps to the final result)

Based on the results in Table 3, it is known that N1 (Conceptual Understanding) increased by 6.28%, which shows that students have made significant progress in understanding the basic concepts of mathematical operations. N2 (Calculation Accuracy) increased by 4.81%, which shows an improvement in the accuracy of student's calculations, although the increase is slightly lower than conceptual understanding. Based on the calculations above, it can be concluded that the program or intervention carried out on students' numeracy skills effectively improves conceptual understanding (N1) and calculation accuracy (N2), with a total increase of 5.54%. This shows that students have made significant progress in their numeracy skills after participating in learning or intervention.

Writing Ability

The results of the analysis of the effectiveness of writing ability are shown in Table 5.

Indicator	Writing Ability			Total	Average
	S1	S2	S3		
Pre-test	82. 3	81. 6	81	244. 9	81.6333333
Post-test	81. 6	80. 9	81. 1	243. 6	81.2

Writing Description:

S1 : Pre-writing (Determining the title of the writing)

S2 : Writing (Describing ideas in written form)

S3 : Post-writing (Presenting the results of the writing)

Based on the results in Table 4. it is known that S1 (Pre-Writing) and S2 (Writing) both showed a decline, respectively -0.85% and -0.86%. This indicates that the intervention or program in this aspect could be more effective in improving the ability to determine titles and describe ideas in writing. S3 (Post-Writing) showed a minimal increase of 0.12%, indicating a slight improvement in the ability to present writing, but this change was minimal. Overall, the average decline in writing ability was -0.53%, indicating that the intervention or learning program on writing skills did not improve writing skills in general. Based on the above analysis, the program or intervention to improve writing skills appears ineffective. A more structured approach or modification of the material may be needed to attract student's attention and enhance their understanding and expression in writing. It is also essential to integrate with the educational context you are targeting, namely local wisdom, especially at the elementary school level, to ensure that the materials and methods are appropriate to the age and abilities of students.

Listening Ability

The results of the analysis of the effectiveness of listening ability are shown in Table 6.

Table 6. Analysis Result of the Effectiveness of Listening Ability

Indicator	Listening Ability		Total	Average
	K1	K2		
Pre-test	81.5	81.4	162.9	81.45
Post-test	81.8	82.3	164.1	82.05

Listening Description:

K1 : Content Understanding

K2 : Response to Questions

Based on the results in Table 5. it is known that K1 (Content Understanding) increased by 0.37%, indicating a slight increase in students' understanding of the material being listened to. K2 (Response to Questions) showed a more significant increase of 1.11%, meaning that students were better at responding to questions after participating in the program or intervention. Overall, the average increase in listening ability was 0.74%, indicating a slight but positive increase in listening ability. To further increase effectiveness, the learning program could focus more on Content Understanding with activities encouraging students to go deeper into understanding the content being listened to.

Speaking Ability

The results of the analysis of the effectiveness of speaking ability are shown in table 7.

Table 7. Analysis Result of the Effectiveness of Speaking Ability

Indicator	Speaking Ability			Total	Average
	B1	B2	B3		
Pre-test	84. 4	82. 4	81.3	248.1	82.7
Post-test	82. 8	83. 2	84.2	250.2	83.4

Speaking Description:

B1 : Clarity and Fluency

B2 : Use of Local Wisdom in Conversation

B3 : Mastery of Material

Based on the results in Table 6. it is known that (Clarity and Fluency) decreased by -1.90%, indicating that students' clarity and speaking fluency slightly reduced after the intervention. B2 (Use of Local Wisdom in Conversation) increased by 0.97%, indicating a slight increase in the use of local wisdom in conversation, although the change was insignificant. B3 (Mastery of Material) showed the most significant increase of 3.57%, indicating a substantial increase in mastery of the material after the intervention or program. Overall, there was a slight increase in speaking ability, with an average increase of 0.85%. Overall, this increase indicates that the program or intervention provided good results, especially in improving mastery of the material. Still, there needs to be improvement in clarity and fluency in speaking.

Speaking Ability

Data on improvements in the assessment results of numeracy, writing, listening, and speaking literacy for the entire sample data are shown in Table 8

Table 8. Analysis Result of Numeracy, Writing, Listening, And Speaking.

Improvement	Numeracy	Writing	Listening	Speaking	Total
Pre-test	81.25	81.63	81.45	82.7	81.76
Post-test	85.76	81.2	82.05	83.4	83.10

Based on the results in Table 7. it is known that for the total overall indicator of the effectiveness of improving the previous assessment results of 81.86 with a good category, there was an insignificant increase with a total score of 82.98 which is also in the good category. The increase in each indicator is:

Numeracy: an increase of $85.76 - 81.25 = 4.51$, this shows a fairly significant increase. The percentage level is 5.55%

Writing: An increase of $81.25 - 81.6 = -0.35$, this shows a slight decrease. this is a concern for further evaluation with interviews. The percentage level is -0.43%

Listening: An increase of $82.12 - 81.5 = 0.62$. This shows a slight increase in the listening indicator, but this increase is still not too significant. The percentage level is 0.76%

Speaking: Improvement: $83.45 - 82.72 = 0.73$, this shows a slight increase in speaking ability. The percentage level is 0.88%

From the data above, it is known that total pre-test score is 81.86. Total post-test score is 82.98. The improvement is $82.98 - 81.86 = 1.12$. The percentage level is 1.37%. From the total, although there is an increase, this change is relatively insignificant. This shows that the program or intervention's effectiveness has yet to be fully optimal in improving the overall assessment results. Although there is an increase in some indicators, such as numeracy, the increase in other indicators is relatively small; there is even a slight decrease in the writing indicator.

Based on the results of the validity analysis, most of the questions were considered valid. However, Questions 7 and 8 related to time measurement require revision to align with everyday life's context, and students can understand the problem and answer more practical test questions. Numeracy is the use of mathematical concepts, procedures, facts and tools in thinking to solve everyday problems from various situations relevant to the individual. This is also in line with the opinions of Hu (2020) and Geiger et al.

(2014) that numeracy does not only include mathematics but is broader than that, namely the use of mathematical abilities and skills to solve contexts (problems) in real life. The practicality test, according to Risnawati et al. (2019), was conducted to determine the extent to which students actually used the instruments that were produced. The instrument's inquiries can be phrased practically on the basis of this. Nonetheless, the development of students' conceptual understanding and numeracy abilities depends on student-centered learning and engaging them in the learning process (Nurjanah et al., 2020; Sadijah et al., 2021). Numerous significant concerns need to be looked at in each area within the diverse and rich field of numeracy research, according to Geiger (2015). Nonetheless, the development of students' conceptual understanding and numeracy abilities depends on student-centered learning and engaging them in the learning process (Mursalin et al., 2018; Nurjanah et al., 2020; Sadijah et al., 2021). Numerous significant concerns need to be looked at in each area within the diverse and rich field of numeracy research, according to Geiger (2015).

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This study serves as the foundation for future research that will use the numeracy test produced by this study to investigate students' arithmetic skills from other themes. Because Indonesian students' numeracy at the national level has recently altered the format and pattern of assessment, this study is crucial. It is also anticipated that the application of the study's findings will affect Indonesia's national evaluation more broadly. As a result, creating valid, practical, and feasible evaluation tools to gauge numeracy proficiency is crucial.

Conclusion

The result show that the total overall indicator of the effectiveness of improving the previous assessment results of 81.86 with a good category, there was an insignificant increase with a total score of 82.98 which is also in the good category. Based on the results of the development of the local wisdom-based literacy assessment model for numeracy, writing, listening, and speaking in Elementary School students in Makassar City, improvements and revisions need to be made to improve the quality of the assessment, especially literacy and numeracy skills in Elementary Schools. The quality of the assessment cannot only be reviewed from four aspects of ability; other aspects may affect the abilities of Elementary School students, so the assessment results have yet to show a significant increase in results. Further study is needed on other aspects, both internally and externally.

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