

Multiliteracy Assessment Practice Gaps (Reading-Writing, Numeracy, Science, and Digital): A Case Study in Grade IV

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Abstract

21st-century learning demands the development of multiliteracy that encompasses reading-writing, numeracy, science, and digital literacy in a balanced manner. This study aims to: (1) describe multiliteracy assessment practices across each dimension; (2) identify the gaps between ideal assessment practices and actual field practices; and (3) analyze the contributing factors to these gaps. This research employed a qualitative approach with a case study design. The subjects were the fourth-grade teacher and representatives of fourth-grade students at SD Negeri Tapakrejo 01 Blitar. Data collection techniques included passive participant observation, semi-structured in-depth interviews, and documentation. The results indicate that multiliteracy assessment practices are highly uneven across dimensions. In reading-writing and numeracy literacy, assessments have been conducted but remain simplistic, portfolios are not yet used, and feedback is not individualized. In science literacy, assessments are conducted informally without rubrics or anecdotal records. In digital literacy, assessments are almost never explicitly performed due to limited facilities and teacher unpreparedness. The contributing factors include internal factors (limited knowledge, belief in the efficiency of written tests, and inadequate technical skills) and external factors (limited digital facilities, unsupportive school policies, and a lack of ongoing mentoring and training). Thus, it can be concluded that a significant gap exists between ideal multiliteracy assessment practices and actual practices at SD Negeri Tapakrejo 01 Blitar, particularly in science and digital literacy.

Keywords: Assessment, Multiliteracy, Reading-Writing, Numeracy, Science, Digital



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Introduction

The demands of the 21st century have fundamentally transformed the paradigm of literacy—which was once limited to the ability to read and write printed text—into a concept of multiliteracies that encompasses diverse forms of text and communication contexts. Multiliteracies education emphasizes students' ability to understand various forms of text, including visual, digital, and multimodal, and serves as a crucial approach that must be implemented in elementary schools to address the demands of the modern era (Rahmadani et al., 2023). The curriculum in Indonesia, through policies outlined in Presidential Instruction No. 7 of 2025, officially emphasizes the acceleration of learning digitalization at the elementary school level, aiming to strengthen the foundations of literacy, numeracy, science, and technology for future generations (Hotib, 2025). The logical consequence of this curricular orientation is that the learning process is not only required to integrate these four dimensions of literacy in a balanced manner, but the assessment system used by teachers must also be capable of addressing and measuring all dimensions of literacy proportionally and authentically.

In theory, assessment in multiliteracies education should ideally be diverse, formative, ongoing, and authentic, utilizing various techniques such as observation, assignments, portfolios, and tests tailored to the characteristics of each literacy dimension. However, the reality on the ground often reveals a significant gap between ideal assessment practices and the actual assessment practices carried out by teachers. Research on students' cognitive and technical readiness for the Computer-Based National Assessment (ANBK) indicates that the provision of questions and materials not integrated with classroom instruction, along with students' lack of readiness in operating computer devices, poses serious challenges in the implementation of literacy and numeracy assessments (Haryadi & Masjudin, 2025). Furthermore, current assessment practices by teachers tend to focus more on reading-writing and numeracy literacy, while assessments of science and digital literacy remain very limited, and are scarcely implemented systematically (Ashifa, 2024).

Based on the results of initial observations conducted in the fourth grade at Tapakrejo 01 Public Elementary School in Blitar, gaps in multiliteracies assessment practices were evident across each literacy dimension, each with distinct characteristics. In reading and writing literacy, teachers have employed a fairly diverse range of assessment techniques; however, the feedback provided on students' written work remains general in nature and is not yet individualized. In numeracy literacy, teachers have begun conducting process-based assessments by observing the problem-solving steps taken by students, but the consistency of implementation has not yet been maintained. Meanwhile, in science literacy, assessments are conducted informally without using structured rubrics, so evaluations of students' scientific processes—such as observing, asking questions, and drawing conclusions—have not been well documented. The most concerning situation occurs in digital literacy, where assessments of students' ability to operate digital devices for learning tasks or to select and evaluate information from digital sources are almost never explicitly conducted due to limited resources and the absence of specially designed instruments.

This imbalance in multiliteracies assessment practices has serious implications for the quality of learning and students' holistic literacy development. When assessments focus only on specific dimensions of literacy, students' abilities in other literacy dimensions—particularly science and digital literacy—are not accurately assessed. Teachers lack the diagnostic data needed to provide targeted remedial or enrichment instruction. Research on the evaluation of digital literacy programs in elementary schools reveals that the main constraints to implementing digital literacy include limited supporting infrastructure, a lack of learning resources related to digital literacy, and a lack of teacher understanding regarding digital literacy itself (Suratman et al., 2024). The accumulation of these various constraints results in suboptimal and uneven development of students' literacy, which in turn has the potential to widen the gap in students' abilities to meet the demands of the 21st century.

The concept of assessment in multiliteracies education is rooted in the understanding that literacy is multimodal and situational. Arya et al. (2022), in their study on critical reading assessment for fourth-grade students, emphasize the importance of transparency and feedback from various stakeholders in the assessment development process, as well as the potential affordances of various textual modalities to clarify students' comprehension skills. In the context of numeracy literacy, research on the impact of different personalization algorithms on learning outcomes indicates that significant differences were found in formative assessment scores, suggesting that assessment approaches need to be tailored to specific learning content and learner profiles (Sun et al., 2024). Meanwhile, for digital literacy, assessments should ideally include evaluations of device operational skills, the ability to critically evaluate information, as well as ethical and safe behavior in digital activities. Gaps arise when one or more of these dimensions of literacy are overlooked in daily assessment practices.

Several previous studies have identified similar gaps in literacy assessment practices in elementary schools, although most were conducted in schools with relatively adequate facilities and infrastructure. A study by Haryadi & Masjudin (2025) on the cognitive and technical readiness of elementary school students' numeracy literacy based on the National Basic Competency Test (ANBK) found that students demonstrated significant difficulties in making inferences (conclusions) and were

not yet able to connect information in the text with prior knowledge or provide critical evaluations of the text. Other findings reveal that challenges in numeracy literacy learning include students' low reading interest, lack of access to engaging reading materials, as well as teaching methods that are insufficiently varied and interactive (Lukito et al., 2026). However, research specifically examining the gap in multiliteracies assessment practices simultaneously across all four dimensions (reading-writing, numeracy, science, and digital) within a single school setting characterized by limited digital resources remains scarce, particularly in the context of elementary schools in rural or suburban areas such as Blitar.

The novelty of this study lies in its attempt to analyze gaps in multiliteracies assessment practices simultaneously and comparatively across all four dimensions of literacy in a single case study at Tapakrejo 01 Public Elementary School in Blitar, a school characterized by limited digital resources yet located in an area that is not entirely remote. Unlike previous studies that tended to focus on one or two dimensions of literacy, this study offers a holistic approach by treating the four dimensions of literacy as an inseparable unity within the learning assessment system. The qualitative case study approach allows for an in-depth exploration of teachers' assessment practices in a naturalistic setting, including an examination of the contextual factors underlying the gaps. Thus, this study is expected to provide both theoretical and practical contributions to the development of a more balanced and contextual multiliteracies assessment model, particularly for resource-limited schools in Indonesia.

Based on the background and identification of gaps described above, this study specifically aims to: (1) provide an in-depth description of the multiliteracy assessment practices carried out by fourth-grade teachers at Tapakrejo 01 Public Elementary School in Blitar; (2) identify the forms of gaps that occur between ideal assessment practices according to theory and actual practices in the field across each literacy dimension; and (3) analyze the factors causing these gaps, both internal (teachers' knowledge, beliefs, and skills) and external (facilities, school policies, and stakeholder support). The results of this study are expected to serve as a foundation for the development of teacher mentoring interventions and the design of multiliteracy assessment instruments that are simpler, more contextual, and more equitable.

Methods

This study employs a qualitative approach using a case study design. The qualitative approach was chosen because the research objective is to gain an in-depth understanding of the phenomenon of disparities in multiliteracies assessment practices within a natural setting in the fourth-grade classroom at Tapakrejo 01 Public Elementary School in Blitar, without any manipulation of variables or experimental treatments. Creswell (2017) defines qualitative research as an inquiry process based on specific methodological traditions that explore social phenomena and human problems, in which researchers construct complex descriptions, analyze words, report informants' views in detail, and conduct studies in natural situations.

This study was conducted at Tapakrejo 01 Public Elementary School, located in Kesamben Subdistrict, Blitar Regency, East Java. The data sources in this study consisted of primary and secondary data sources. The primary data sources were fourth-grade teachers responsible for implementing multiliteracy instruction and assessment, as well as fourth-grade students as the subjects undergoing the assessment process. In qualitative research, the selection of informants generally does not use the term "sample," but rather informants selected purposively based on specific criteria (Himam & Anam, 2026). Secondary data sources include learning documents such as lesson plans (RPP), student worksheets (LKPD), assessment result portfolios, as well as grade records and anecdotal notes kept by teachers.

Data collection in this study used three main techniques: observation, in-depth interviews, and documentation. The use of these three techniques aimed to obtain rich, in-depth data that could mutually confirm each other through the triangulation process. Observation was conducted as passive participant observation, where the researcher was present in the classroom during the learning process

but did not actively participate in learning activities. The instrument used for observation was a structured observation sheet developed based on indicators of multiliteracy assessment practices across the four literacy dimensions, as well as field notes to record important events not covered by the structured observation sheet (Id et al., 2025). In-depth interviews were conducted with the fourth-grade teacher using a semi-structured interview guide, allowing the researcher to explore not only facts about the assessment practices conducted, but also the teacher's reasons, beliefs, and obstacles faced. Semi-structured interviews were chosen because they provide a balance between focus on the research topic and flexibility to explore unexpected findings. Documentation was carried out by collecting and analyzing various relevant written documents, including lesson plans (RPP), assessment instruments previously used by the teacher (test questions, observation sheets, assessment rubrics), student work results, and records of student learning progress. This documentary study was important to complement data obtained through observation and interviews, as well as to verify consistency between what was planned, implemented, and documented by the teacher (Nurhayati et al., 2024).

Data analysis in this study used the interactive analysis model from Miles et al. (2014), which consists of four interrelated activity streams: data collection, data condensation, data display, and conclusion drawing and verification. These four streams are interactive and occur continuously and repeatedly throughout the research process until data saturation is achieved.

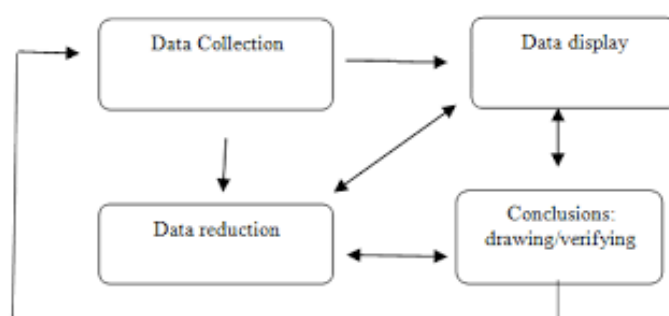


Figure 1. Stages of Qualitative Data Analysis by Miles et al. (2014)

The first activity, data collection, was conducted through observation, interviews, and documentation as previously described. The second activity, data condensation, refers to the process of selecting, focusing, simplifying, abstracting, and transforming data that appears in written field notes, interview transcripts, and collected documents. This data condensation process begins before data is actually collected (anticipatorily) and continues throughout data collection until the final research report is written. The third activity, data display, is conducted in the form of brief descriptions, charts, matrices, or graphs that allow the researcher to see the overall picture of the data and derive meaning from emerging patterns. In this study, the primary data display was in the form of structured narrative text and a comparison matrix of assessment practices across literacy dimensions. The fourth activity, conclusion drawing and verification, begins from the start of data collection, where the researcher starts seeking meaning, patterns, explanations, and possible configurations. Initial conclusions that are loose and open-ended are then verified with newly collected data, resulting in robust and accountable conclusions. The verification process is conducted through peer debriefing, member checking with the teacher and students, and triangulation across data sources and collection techniques. Research shows that the selection of data collection methods must be tailored to the analysis objectives so that research results accurately reflect the reality of practice; thus, this interactive, simultaneous analysis model is highly suitable for capturing the complex and contextual dynamics of practice (Sumilih et al., 2025).

Results and Discussions

1. Results

Based on the observations conducted using a structured observation sheet developed based on indicators of multiliteracy assessment practices across the four literacy dimensions, the following

data were obtained. Observations were carried out over three meetings. Field notes were used to record important events not covered by the structured observation sheet.

Table 1.
Observation Result

No	Aspect Observed	Result
1	Reading-Writing Literacy	
	Teacher uses diverse assessment techniques (observation, assignments, written tests, portfolio) to measure reading and writing abilities	Teacher uses written tests and assignments. Observation is conducted informally without systematic notes. Portfolio has not been collected in a structured manner.
	Teacher provides constructive feedback on student writing	Teacher gives brief verbal comments like "good, but pay attention to your capital letters". Written feedback is only in the form of scores without specific comments.
2	Numeracy Literacy	
	Teacher conducts process assessment while students solve numeracy problems	Teacher circulates observing students working on word problems, but does not record the thinking strategies used by individual students.
	Teacher uses assessment techniques that allow students to demonstrate their thinking strategies (think aloud, open-ended worksheets)	The teacher has asked one student to explain their calculation method in front of the class. Worksheets are closed (one correct answer).
3	Science Literacy	
	Teacher assesses students' scientific processes (observing, questioning, experimenting, concluding) through direct observation	Teacher observes during simple experiments, but the assessment is general and does not use rubrics. Anecdotal records are not made.
	Teacher assesses students' ability to connect science concepts with daily life	Teacher asks oral questions like "Can you mention an example at home similar to this experiment?" Students' answers are not documented individually.
4	Digital Literacy	
	Teacher assesses students' ability to operate digital devices for learning tasks	Teacher does not conduct assessment due to limited devices. Only occasionally do students use parents' phones to search for pictures at home, without assessment.
	Teacher assesses students' ability to select and evaluate information from digital sources	Not conducted. Teacher does not have instruments and feels unable to assess this aspect.

Source: Processed Researcher

Based on the observation results presented in the table and field notes, in general, the multiliteracy assessment practices conducted by the fourth-grade teacher at SD Negeri Tapakrejo 01 Blitar still show significant gaps among the four literacy dimensions. In reading-writing and numeracy literacy, the teacher has conducted assessments although they remain simple and less structured, such as the use of less diverse techniques, feedback that is not yet individualized, and process assessments that are not systematically documented. In science literacy, assessments are conducted orally and informally without using rubrics or anecdotal records, so the evaluation of

students' scientific processes is not well-documented. Meanwhile, in digital literacy, assessment practices are almost never explicitly performed due to limited digital device facilities and the teacher's unpreparedness to design assessment instruments. Field notes also revealed that the teacher actually realizes the importance of more comprehensive multiliteracy assessment but feels constrained by time limitations, lack of knowledge about varied assessment techniques, and the unavailability of practical guides for daily classroom use. This condition indicates a gap that needs to be immediately addressed through mentoring and the development of simpler assessment instruments that still can reach all four literacy dimensions in a balanced way.

Semi-structured interviews were conducted with one fourth-grade teacher and two representatives of fourth-grade students. The selection of informants was based on the consideration that the fourth-grade teacher has more than five years of teaching experience, while the two students were purposively selected based on the following criteria: one student with high academic achievement and one student with medium academic achievement. The interviews aimed to explore in depth the multiliteracy assessment practices, the obstacles faced by the teacher, and the students' experiences and perceptions of the assessments they have received.

Table 2.
Results of Teacher Interview

No	Question	Interview Result
1	What assessment techniques do you usually use to assess students' reading and writing abilities?	"I usually use written tests, sometimes ask them to read aloud one by one if there's time. I've also asked them to make story summaries. But not every week, because time is limited."
2	Have you ever used a portfolio to collect students' writing results?	"Never formally. It was suggested once, but I was confused about how to manage it. The papers would pile up. I prefer giving scores directly from assignments."
3	How do you assess students' numeracy abilities when they solve problems?	"I look at the final answer first. If it's wrong, I check the scribbles on the paper. But I don't record them one by one. The important thing is I know roughly who has understood."
4	Have you ever asked students to explain their thinking process in solving math problems?	"Sometimes, if someone has a different answer. But only occasionally, because if everyone had to explain, time would run out. It's more efficient for me to explain on the blackboard."
5	How do you assess students' scientific processes, such as observing, questioning, and concluding?	"I just observe. For example, during practicum, I see which students are active and which are quiet. But I don't use any special sheets. I give a grade based on general impression."
6	Have you ever recorded questions asked by students during science learning?	"Never. I think it's just part of regular discussion. So I don't include it in assessment. What I usually assess is just the practicum report."
7	How do you assess students' digital literacy, for example in operating devices or searching for information from the internet?	"Honestly, this is the most difficult. There are no computers or tablets at school. Students sometimes use their parents' phones at home. I can't monitor it. So I've never assessed it specifically."

No	Question	Interview Result
8	Do you have rubrics or assessment criteria for science or digital literacy assessment?	"Not yet. I usually use the teacher's guidebook, and that's only for written tests. For science and digital, I've never seen examples of practical rubrics."
9	What do you think are the main obstacles in conducting balanced multiliteracy assessment?	"Limited time, large number of students, and I don't fully understand the correct way to assess science and digital. Especially digital, there are no facilities. I've also never received multiliteracy assessment training."
10	Do you utilize assessment results to improve learning or provide remedial?	"If many scores are below the KKM, I repeat the material. But for all students, not specifically per individual. I don't have time to make special remedial programs."

Source: Processed Researcher

Table 3.
Results of Interview with AN (High Academic Achievement Student)

No	Question	Interview Result
1	In your opinion, how does the teacher assess your reading ability?	"Sometimes we're asked to read in front. Then the teacher says 'good' or 'not loud enough'. Never given a special grade."
2	Has the teacher ever given written comments on your writing?	"Yes, but only a numerical grade and the words 'try to pay attention to spelling'. Never long comments."
3	How does the teacher assess your math work?	"Looks at whether the answer is right or wrong. If correct, given a check mark. If wrong, crossed out. Never asked to explain why I chose that method."
4	Have you ever been asked to explain your thinking process when solving word problems?	"Once. At that time I used the drawing method first. The teacher said 'creative'. But the other friends weren't asked."
5	Has the teacher ever recorded questions you asked during science lessons?	"I don't think so. The teacher just answers the question, then continues. Never says 'your question is good, it will count towards your grade'."
6	Have you ever used a phone or computer for learning at school?	"Not at school. At home, I use my mom's phone to find assignments if the teacher asks. But rarely."
7	Has the teacher ever assessed how you search for information on the internet?	"Never. The teacher just says 'look for pictures of animals on Google', then we collect them tomorrow. How we do it isn't assessed."

Source: Processed Researcher

Table 4.
Results of Interview with RS (Medium Academic Achievement Student)

No	Question	Interview Result
1	In your opinion, how does the teacher assess your reading ability?	"I'm not confident reading in front. So sometimes we're asked to read silently then given questions. The grade is from the answer, not from the reading."
2	Has the teacher ever given written comments on your writing?	"Yes. Usually just given a grade. If there's a spelling mistake, it's circled. Never clearly told how to fix it."
3	How does the teacher assess your math work?	"Looks at the answer. If I'm wrong, I'm afraid to be asked. The teacher immediately gives the correct answer, but doesn't explain why I was wrong."
4	Have you ever been asked to explain your thinking process when solving word problems?	"Never. I'd be embarrassed if asked too. Usually, only the smart ones are pointed to."
5	Has the teacher ever recorded questions you asked during science lessons?	"I rarely ask questions. Afraid of being wrong. But my friend who asks usually just gets an answer, it's not recorded."
6	Have you ever used a phone or computer for learning at school?	"Never. At home, I don't have a phone either. I borrow from a neighbor if there's an assignment that requires searching for pictures. It's difficult."
7	Has the teacher ever assessed how you search for information on the internet?	"Never. I also don't really know how to search for information myself. I usually ask my sibling or neighbor for help."

Source: Processed Researcher

Based on the interview results with the fourth-grade teacher and two student representatives, several important findings related to multiliteracy assessment practices at SD Negeri Tapakrejo 01 Blitar can be identified. The teacher admits that the assessment techniques used are still limited to written tests and simple assignments, with portfolios never having been systematically managed due to time constraints and lack of technical understanding. In numeracy assessment, the teacher focuses more on the final answer rather than the student's thinking process, although occasionally asking students to explain their strategies, but this is not done consistently. Science literacy assessment is conducted informally through general observation without rubrics or anecdotal records, so the evaluation of students' scientific processes such as questioning and concluding remains undocumented. The biggest obstacle occurs in digital literacy, where the teacher admits to never having conducted explicit assessment due to the limited digital device facilities at school, lack of training, and the absence of practical assessment instruments.

The results of the interviews with students reinforce these findings. Informant AN, with high achievement, feels that assessments are more product-oriented (final results) than process-oriented, and rarely receives in-depth feedback. Informant RS, with medium achievement, even expressed fear of asking questions or being asked to explain their thinking process, and acknowledged difficulty in accessing digital devices for learning purposes. Both informants agreed that digital literacy assessments have never been formally experienced. The teacher also honestly admitted that the main obstacles are limited time, a large number of students, lack of understanding of science and digital assessments, and never having attended multiliteracy assessment training. These findings confirm the existence of a significant gap between the demands of ideal multiliteracy

assessment and field practices, especially in the dimensions of science and digital literacy, and indicate the need for technical assistance and the development of simple yet comprehensive assessment instruments.

2. Discussions

a. Gap in Reading-Writing Literacy Assessment: Between Technique and Feedback

The first finding of this study indicates that the fourth-grade teacher at SD Negeri Tapakrejo 01 Blitar has used fairly diverse reading-writing literacy assessment techniques; however, the feedback provided remains general and not individualized. The teacher uses written tests and assignments as the primary instruments, while observation is conducted informally without systematic notes, and portfolios are not yet managed in a structured manner. The feedback given by the teacher is mostly brief verbal comments such as "good, but pay attention to your capital letters" without being accompanied by specific written comments on the student's work. This finding indicates that although the teacher has technically attempted to conduct assessments, the quality of genuine formative assessment, which aims to advance learning, has not been fully achieved.

This condition aligns with research conducted by Widyaningrum et al. (2025), which found that teacher awareness in implementing multiliteracy assessment is at a level that still needs improvement, especially in terms of documentation and providing meaningful feedback. In that study, although teachers showed commitment to planning and implementing multiliteracy learning (with an average score of 3.79 in the implementation stage), the evaluation aspect faced similar challenges, namely limited time and large class sizes. Furthermore, Agustina et al. (2019), in their research on the multiliteracy model for narrative writing skills, found that the effectiveness of literacy assessment is greatly determined by the quality of feedback provided by the teacher, not merely the frequency of assessment implementation.

From a theoretical perspective, formative assessment in reading-writing literacy should ideally not only measure the final product (the written output) but also consider the thinking processes underlying the writing. As explained in the concept of multiliteracy learning, effective assessment must include evaluation of students' ability to organize ideas, use spelling and punctuation correctly, and revise their writing based on received feedback (Sakdulloh et al., 2022). In the context of SD Negeri Tapakrejo 01 Blitar, this gap occurs not because the teacher is unaware of the importance of individualized feedback, but due to time constraints and the lack of a practical documentation system.

b. Gap in Numeracy Literacy Assessment: Product versus Process

The second finding of this study reveals that in numeracy literacy assessment, the teacher has begun conducting process assessments by circulating to observe students working on word problems. However, these observations are not systematically recorded, and students' thinking strategies are not documented. The teacher focuses more on the final answer than on the thinking process students use to arrive at that answer. The worksheets used are closed-ended, providing only one correct answer, thus not providing space for students to demonstrate alternative thinking strategies. A student named Adi, who used a drawing method first to solve a word problem, received verbal praise "very creative," but this strategy was not documented as an example of good process assessment.

This phenomenon reflects a common challenge in numeracy assessment in primary schools, where the pressure to achieve mastery scores often shifts teachers' attention from students' thinking processes to the final product alone. Research on the pedagogical competence of upper-grade teachers in literacy and numeracy learning found that teachers with high awareness of the importance of process assessment tend to develop HOTS-based (Higher Order Thinking Skills) assessments and strong diagnostic abilities to distinguish the types of literacy and numeracy errors made by students (Zulfahmi et al., 2024). Unfortunately, in the case of SD Negeri Tapakrejo 01 Blitar, these diagnostic abilities have not been developed due to time constraints and large class sizes.

The theory of numeracy assessment in multiliteracy learning emphasizes that evaluating students' numeracy abilities should not be limited to the correctness of the final answer but must include an understanding of the strategies, representations, and mathematical reasoning used by students (Mulyasari & Nugraheni, 2025). The TSN Vocabulary Model (Technical, Sub-Technical, Non-Technical) developed to bridge literacy and numeracy contextually affirms that effective numeracy assessment must capture how students use language and visual representations to make meaning of mathematical concepts (Widiani, 2026). In the context of this research's findings, the teacher does not yet have adequate instruments to capture students' diverse thinking strategies.

c. Gap in Science Literacy Assessment: Informal without Rubrics

The third finding of this study indicates that science literacy assessment is conducted informally through general observation without using rubrics or anecdotal records. During a simple experiment on the water cycle, the teacher observed which students were active and which were passive, but the assessment was based only on general impression. Students' questions, which should be an important indicator of curiosity and scientific process, were never recorded or included in the assessment. The teacher honestly admitted not having assessment rubrics for science literacy and feeling confused about how to assess students' scientific processes practically in daily classroom activities.

This finding reinforces the research results of Parisu et al. (2025), which revealed that one of the main obstacles in developing science literacy in primary schools is the minimal use of interactive media and the absence of standardized assessment instruments for evaluating students' scientific processes. In research by Desta (2025), the use of Augmented Reality (AR)-based E-Smart Book media was shown to improve students' science literacy by up to 93.75% in the very good category; however, this improvement could only be measured because valid and reliable assessment instruments were available (with material expert validation of 98.75% and reliability $\alpha = 0.964$). Without adequate instruments, the potential for improving students' science literacy is difficult to detect and develop systematically.

Research by Juliani et al. (2025) on the multiliteracy model also affirms the importance of structured assessment in the science learning process. In that study, the use of the multiliteracy model succeeded in improving student learning outcomes. This success was inseparable from the existence of a clear assessment system, which allowed teachers to specifically identify students' weaknesses and design appropriate interventions. In the case of SD Negeri Tapakrejo 01 Blitar, the absence of rubrics and anecdotal records causes teachers to lose the diagnostic data needed to improve science literacy learning.

d. Gap in Digital Literacy Assessment: The Greatest Challenge

The fourth, and most concerning, finding of this study is that digital literacy assessment is almost never explicitly performed by the teacher. The limited digital device facilities at school are the main reason, coupled with the teacher's unpreparedness to design assessment instruments for this literacy dimension. The teacher admits to never having attended digital literacy assessment training and feels they have no practical guide to use. Students also confirm that they have never been assessed on operating digital devices or selecting information from digital sources. One student named RS, who does not have a personal phone, admitted difficulty accessing digital devices for learning purposes and had to borrow from a neighbor.

This gap reflects a broader structural problem in Indonesian primary education, especially in schools with limited digital facilities and infrastructure. Research on the development of multiliteracy primary schools for 21st-century education found that the main challenges of implementing multiliteracy in Indonesia include limited resources and teacher readiness, requiring policy support and further training for effective implementation (Nehru et al., 2026). More specifically, a study on students' cognitive and technical readiness for the Computer-Based National Assessment (ANBK) shows that providing questions and materials not integrated with classroom teaching materials, coupled with students' lack of readiness to operate computer devices, poses

serious obstacles to implementing digital-based literacy and numeracy assessments (Haryadi & Masjudin, 2025).

From a cognitive perspective, unequal access to digital devices creates what is known as a "digital cognitive gap," a disparity in thinking patterns between students accustomed to digital environments and those who are not (Utami et al., 2026). Students in digital environments are accustomed to non-linear thinking patterns, fast information searching, and multimedia data processing abilities, while students in remote areas remain heavily dependent on linear thinking patterns based on printed texts (Inayati et al., 2025). In the context of SD Negeri Tapakrejo 01 Blitar, the absence of digital literacy assessment not only means the loss of assessment data but also the loss of opportunities to train and develop cognitive abilities that are highly needed in the 21st century.

e. Factors Contributing to the Gaps

Based on the triangulation of data from observations and interviews, this study identifies three main factors causing the gaps in multiliteracy assessment practices at SD Negeri Tapakrejo 01 Blitar. First, internal teacher factors, including limited knowledge and skills in designing varied assessments, especially for science and digital literacy. The teacher admits to never having attended specific training on multiliteracy assessment and feels confused about how to apply it practically in the classroom. Second, external factors, including limited facilities and infrastructure, especially for digital literacy. The absence of computers, tablets, or adequate internet access at school makes optimal digital literacy assessment impossible. Third, managerial factors, including time constraints and large class sizes, which lead teachers to choose the most efficient methods (although not always the most effective) for conducting assessments.

This finding aligns with research by Kartika & Abidin (2025), which concluded that multiliteracy implementation in Indonesia faces serious challenges in terms of resources and teacher readiness, requiring policy support and further training to overcome these obstacles. Research by Widyaningrum et al. (2025) also affirms that teacher awareness is a key factor in the successful implementation of multiliteracy assessment, where teachers who are aware of the importance of student-centered learning will strive to prepare various ways to teach and assess multiliteracy. In the case of SD Negeri Tapakrejo 01 Blitar, the teacher actually shows fairly good awareness, as evidenced by their admission that science and digital assessment is important; however, this awareness is not yet accompanied by adequate technical capacity and system support.

f. Implications for Learning and Teacher Professional Development

The findings of this study have significant implications for two main aspects: first, for the quality of multiliteracy learning in the classroom, and second, for teacher professional development programs. From the learning perspective, assessment imbalance causes the profile of students' literacy abilities to be incomplete. Teachers lose the diagnostic data needed to design learning that is responsive to students' needs. As a result, students with specific difficulties in science or digital literacy are not identified and do not receive appropriate interventions. From the teacher professional development perspective, these findings indicate the need for ongoing mentoring programs, not merely one-time training, focusing on the development of simple yet comprehensive assessment instruments.

Research on multiliteracy learning models for enhancing holistic thinking skills emphasizes that the successful implementation of multiliteracy is highly determined by teacher readiness to design and implement integrated assessment (Sakdulloh et al., 2022). In that study, the application of the multiliteracy model in Islamic Religious Education learning showed that effective assessment must include the stages of pre-writing, observation, idea development, and review, a cycle that requires commitment and technical skills from the teacher. Similarly, research on the TSN Vocabulary Model emphasizes the importance of formulating clear learning objectives (using the A-B-C-D principle: Audience--Behavior--Condition--Degree) as a prerequisite for effective assessment (Ramdhan & Hakim, 2025).

Conclusion

Based on the research results and discussion presented, the following conclusions can be drawn in accordance with the three research objectives established.

First, the multiliteracy assessment practices conducted by the fourth-grade teacher at SD Negeri Tapakrejo 01 Blitar show uneven variation across literacy dimensions. In reading-writing literacy, the teacher has used fairly diverse assessment techniques including written tests, assignments, and informal observation; however, portfolios have not been systematically managed, and feedback remains general and not individualized. In numeracy literacy, the teacher has begun conducting process assessments by circulating to observe students working on word problems, but these observations are not systematically recorded, and the worksheets used remain closed-ended, thus not providing space for students to demonstrate alternative thinking strategies. In science literacy, assessment is conducted informally through general observation without using rubrics or anecdotal records, so the evaluation of students' scientific processes such as observing, questioning, and concluding is not well-documented. In digital literacy, assessment practices are almost never explicitly performed due to limited digital device facilities at school and the teacher's unpreparedness to design assessment instruments for this literacy dimension.

Second, there is a significant gap between ideal assessment practices according to theory and actual field practices for each literacy dimension. In reading-writing literacy, the gap lies in the lack of structured portfolio use and the suboptimal provision of specific and individualized feedback to each student. In numeracy literacy, the main gap occurs in the dominance of product assessment (final answer) over the assessment of students' thinking processes, and the unavailability of open-ended worksheets that allow students to express diverse problem-solving strategies. In science literacy, the most striking gap is the absence of assessment rubrics and anecdotal records to document students' scientific processes, resulting in assessment based only on the teacher's general impression. In digital literacy, the gap is very fundamental because the entire assessment practice is not carried out, whether in evaluating operational device skills, the ability to select and evaluate information from digital sources, or ethical and safe behavior in digital activities. The largest gap occurs in the digital literacy dimension, followed by science literacy, while reading-writing and numeracy literacy show relatively smaller gaps but still require improvement.

Third, the factors contributing to the gaps in multiliteracy assessment practices at SD Negeri Tapakrejo 01 Blitar can be classified into internal and external factors. The identified internal factors include: (a) the teacher's limited knowledge of the concepts and techniques of multiliteracy assessment, especially for science and digital literacy; (b) the teacher's belief that the most efficient assessment is through written tests focusing on the final product; and (c) the teacher's inadequate skills in designing assessment rubrics, anecdotal records, and systematic portfolios. The identified external factors include: (a) limited facilities and infrastructure, especially the absence of computers, tablets, or adequate internet access at school to support digital literacy assessment; (b) school policies that do not yet explicitly encourage the implementation of balanced multiliteracy assessment; and (c) a lack of stakeholder support in the form of ongoing mentoring and training focusing on developing practical and contextual multiliteracy assessment instruments. The combination of these internal and external factors creates conditions that hinder teachers from implementing ideal multiliteracy assessment, even though the teacher actually demonstrates fairly good awareness of the importance of comprehensive assessment.

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