ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 11 (November 2026)

Assessment Literacy and Practices of Mathematics Teachers in MSU-External Units

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Date Submitted:
September 15, 2026

Date Accepted:
October 03, 2026

Date Published:
November 12, 2026

DOI:
10.5281/zenodo.24155968

ABSTRACT

Assessment literacy enables teachers to design, implement, interpret, and use assessment to improve instruction and learning, yet little is known about the assessment competencies of mathematics teachers in the Community High Schools of the Mindanao State University (MSU) External Units, which serve geographically isolated and underserved communities. This study determined the assessment literacy and assessment practices of mathematics teachers in these schools, examined their relationships with educational attainment and length of service, tested the relationship between assessment literacy and assessment practices, and explored the challenges teachers encounter and their recommendations. A descriptive-correlational mixed-methods design was employed with 35 mathematics teachers from 12 MSU Community High Schools in Lanao del Sur and Lanao del Norte during School Year 2025–2026. Quantitative data were gathered using the Self-Reported Assessment Literacy Instrument and analyzed using frequency, percentage, mean, standard deviation, and correlation analysis, while semi-structured interview data were analyzed thematically. Results showed a very high level of assessment literacy (M = 4.40), with the highest rating in socio-emotional aspects of assessment (M = 4.58), and a high level of assessment practices (M = 4.31), with usual practices rated highest (M = 4.47) and constructivist practices lowest (M = 4.14). Educational attainment was significantly and negatively related only to the socio-emotional aspects of assessment ($r = -0.411$, $p = .014$), while length of service was not significantly related to any dimension. Assessment literacy had a strong, positive, and significant relationship with assessment practices ($r = 0.625$, $p < .001$). Teachers reported time constraints, learner diversity, and difficulty in assessing mathematical reasoning as major challenges and called for professional development, technological resources, and institutional support. The study concludes that strengthening assessment literacy through sustained professional learning and institutional support is key to improving classroom assessment practices in mathematics.

Keywords: *Assessment Literacy, Assessment Practices, Mathematics Teachers, Constructivist Assessment, Mixed-Methods Research, MSU External Units*

ISSN: 3116-3475
International Journal
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INTRODUCTION

Assessment literacy among teachers has become an increasingly important concern in contemporary education because of its direct influence on instructional quality and student learning outcomes. In mathematics education, assessment plays a critical role in monitoring learners' conceptual understanding, problem-solving abilities, and mathematical reasoning; mathematics teachers are therefore expected to possess sufficient assessment literacy to design valid assessment tools, interpret assessment data accurately, and use assessment results to improve instruction. The growing emphasis on standards-based and competency-based learning has further highlighted the need for effective classroom assessment, and assessment literacy has consequently attracted significant attention among educators and researchers worldwide (Pastore, 2023; Xu & Brown, 2016).

Assessment literacy refers to teachers' knowledge, skills, and dispositions related to the design, implementation, interpretation, and use of assessment processes and results (Pastore & Andrade, 2019). It encompasses teachers' understanding of assessment principles, ethical practices, feedback mechanisms, and the alignment of assessment with learning objectives. Teachers who possess adequate assessment literacy are better able to identify students' misconceptions, adjust instructional strategies, and promote meaningful learning (Black & Wiliam, 1998; Stiggins, 1995). Nevertheless, studies across educational contexts show that many teachers still struggle with designing assessments, interpreting results, and providing effective feedback, and that they recognize the importance of assessment while lacking sufficient competence in assessment design, scoring, and data interpretation (DeLuca & Klinger, 2010; Gaikwad et al., 2023). In mathematics classrooms, insufficient assessment literacy may result in overreliance on paper-and-pencil tests, limited use of formative assessment, and ineffective evaluation of higher-order thinking.

In the Philippine context, the implementation of the K to 12 curriculum and outcomes-based education has intensified the need for effective classroom assessment. The Department of Education (DepEd) emphasizes that classroom assessment should be aligned with learning competencies and used to support learner progress through feedback and instructional adjustment (DepEd Order No. 8, s. 2015). However, previous studies suggest that many Filipino teachers still encounter difficulties in test construction, in interpreting assessment results, and in using assessment information to improve instruction (Clores & Reganit, 2020; Napanoy & Peckley, 2020). Although several studies have examined teacher assessment literacy in general education contexts, limited research has focused specifically on mathematics teachers, and particularly on those in the Community High Schools of the Mindanao State University (MSU) External Units, which serve geographically isolated, disadvantaged, and culturally diverse communities in Lanao del Sur and Lanao del Norte where access to professional development may be limited.

This study therefore determined the assessment literacy and assessment practices of mathematics teachers in the MSU-External Units. Specifically, it sought to answer the following questions: (a) What is the demographic profile of the respondents in terms of school assignment, educational attainment, and length of service? (b) What is the level of assessment literacy of mathematics teachers in terms of conceptual knowledge on the assessment process, socio-emotional aspects of assessment, and conceptual knowledge on the nature of assessment? (c) What is the level of assessment practices of mathematics teachers in terms of usual, constructivist, and traditional assessment practices? (d) Is there a significant relationship between the respondents' educational attainment and length of service and their assessment literacy and assessment practices? (e) Is there a significant relationship between assessment literacy and assessment practices? and (f) What challenges do mathematics teachers experience in strengthening their assessment literacy and practices, and what recommendations may be proposed to improve both? It was hypothesized, at the 0.05 level of significance, that there is no significant relationship between the respondents' demographic profile and their assessment literacy (H_{01}) or assessment practices (H_{02}), and that there is no significant relationship between assessment literacy and assessment practices (H_{03}). The findings are expected to provide baseline information for professional development programs, school administrators, curriculum developers, teacher education institutions, and policymakers seeking to strengthen mathematics teachers' assessment competence.

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Literature Review

Assessment Literacy and Its Dimensions

Assessment literacy has emerged as one of the most important competencies expected of teachers as educational systems emphasize accountability, learner-centered instruction, and outcomes-based education. Pastore and Andrade (2019) defined assessment literacy as the knowledge, skills, beliefs, and dispositions required to design, administer, interpret, and use assessments to support student learning, extending beyond technical knowledge of assessment procedures to include ethical principles, fairness, validity, reliability, and the role of assessment in promoting learning. Xu and Brown (2016) similarly reconceptualized teacher assessment literacy in practice as a multidimensional construct that integrates knowledge, conceptions, and the ability to apply assessment information meaningfully in the classroom, and they argued that it develops through continuous professional learning and practical experience.

The present study examined assessment literacy through three dimensions. Conceptual knowledge on the assessment process refers to teachers' understanding of the principles, procedures, and techniques involved in planning, designing, administering, scoring, and interpreting assessments; without such knowledge, teachers may develop assessments that fail to capture students' actual learning (Mertler, 2009; Popham, 2009). The socio-emotional aspects of assessment pertain to teachers' beliefs, attitudes, confidence, and ethical sensitivity regarding assessment. Teachers' beliefs about assessment influence how they implement it: those who view assessment as a tool for learning tend to use formative and learner-centered approaches, whereas those who view it primarily as grading rely more on traditional testing (Latif & Wasim, 2022), and assessment literacy has been shown to improve teachers' teaching efficacy (Wang et al., 2022). Conceptual knowledge on the nature of assessment concerns teachers' understanding of the purposes, functions, and characteristics of assessment—why assessment is conducted and how it contributes to teaching and learning. Heritage (2013) argued that assessment should be viewed as an integral part of instruction rather than a separate activity, and Pastore's (2023) systematic review found that many teachers continue to perceive assessment primarily as a means of measuring achievement rather than as a tool for learning.

Assessment Practices in Mathematics Classrooms

Assessment practices refer to the actual methods, strategies, and procedures teachers employ to gather evidence of student learning, monitor progress, and evaluate outcomes; they translate assessment literacy into classroom action. Contemporary reforms advocate diverse assessment practices that support learning rather than merely measure achievement (Black & Wiliam, 2018). Usual assessment practices are the commonly employed methods of routine instruction—quizzes, seatwork, assignments, recitations, and examinations—that give teachers ongoing information on learner understanding and allow immediate feedback, although they may not always capture higher-order thinking.

Constructivist assessment practices are grounded in the view that learners actively construct knowledge, and they emphasize authentic assessment, performance tasks, portfolios, reflective journals, peer assessment, and self-assessment. Andrade and Brookhart (2020) described classroom assessment as the co-regulation of learning, in which assessment supports learners' goal setting, monitoring, and adjustment. Asamoah et al. (2024) found that teachers' assessment practices were shaped by the assessment climate of their schools, and Enu and Ngcobo (2024) reported that pre-service mathematics teachers generally recognized assessment as a process of gathering information about learning but still associated it largely with summative evaluation. In mathematics, constructivist assessment supports the evaluation of problem-solving, reasoning, communication, and conceptual understanding.

Traditional assessment practices refer to teacher-directed methods such as objective tests, quizzes, and written examinations that primarily measure factual knowledge and procedural skills. Popham (2020) noted that such assessments remain valuable because they provide efficient and standardized measures of achievement for grading, certification, and accountability. However, scholars caution against excessive reliance on them because

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
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they may not adequately capture higher-order thinking and authentic learning (Shepard, 2000; Wiggins, 1998), and they advocate balanced assessment systems that integrate traditional, formative, and authentic approaches.

Assessment Literacy in the Philippine Context

Philippine studies point to persistent gaps in teachers' assessment competence. Napanoy and Peckley (2020) found that public elementary school teachers in Indigenous communities in Northern Philippines demonstrated limited competence in some areas of assessment, particularly test construction and the interpretation of results. Clores and Reganit (2020) reported that teachers in private junior high schools possessed moderate levels of assessment literacy, with weaknesses in communicating results and using assessment information to improve instruction. Gepila (2020) found that professional development activities contributed to teachers' competence, while Malabo (2024) and Quileste (2026) linked assessment literacy to teachers' assessment-related performance and classroom decision-making. Gardon et al. (2025) developed and validated the Self-Reported Assessment Literacy Instrument for Filipino teachers, anchored on the three-dimensional model of Pastore and Andrade (2019) and on DepEd assessment policy.

Taken together, these studies establish that assessment literacy is multidimensional and closely related to classroom practice, but they focus mostly on general teacher populations, pre-service teachers, or other regions. Little is known about the assessment literacy and practices of in-service mathematics teachers serving underserved communities in Lanao del Sur and Lanao del Norte, about whether teachers' educational attainment and length of service relate to these competencies, or about the challenges such teachers face. The present study addresses these gaps.

Theoretical and Conceptual Framework

The study was anchored on the Assessment Literacy Framework of Pastore and Andrade (2019), Kolb's (1984) Experiential Learning Theory, and Shulman's (1987) theory of pedagogical content knowledge. Pastore and Andrade's framework holds that assessment literacy encompasses conceptual, socio-emotional, and practical dimensions, which served as the core constructs of the study. Kolb's theory posits that professional competence develops through experience, reflection, conceptualization, and active experimentation, suggesting that teachers' length of service may contribute to their assessment literacy. Shulman's theory emphasizes that effective teaching requires the integration of content and pedagogical knowledge, including the ability to assess learners' understanding, reasoning, and problem-solving; assessment literacy is thus an integral component of mathematics teachers' professional competence.

As shown in Figure 1, the study treated the socio-demographic profile of mathematics teachers—school assignment, educational attainment, and length of service—as variables examined in relation to assessment literacy, measured in terms of conceptual knowledge on the assessment process, socio-emotional aspects of assessment, and conceptual knowledge on the nature of assessment. Assessment literacy was in turn linked to assessment practices, measured in terms of usual, constructivist, and traditional practices, on the assumption that teachers with higher assessment literacy implement more effective practices. The framework also incorporated teachers' experiences, challenges, and recommendations, gathered qualitatively, to explain the quantitative relationships and provide a basis for interventions.

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International Journal
of Education, Research, and Innovation Perspectives
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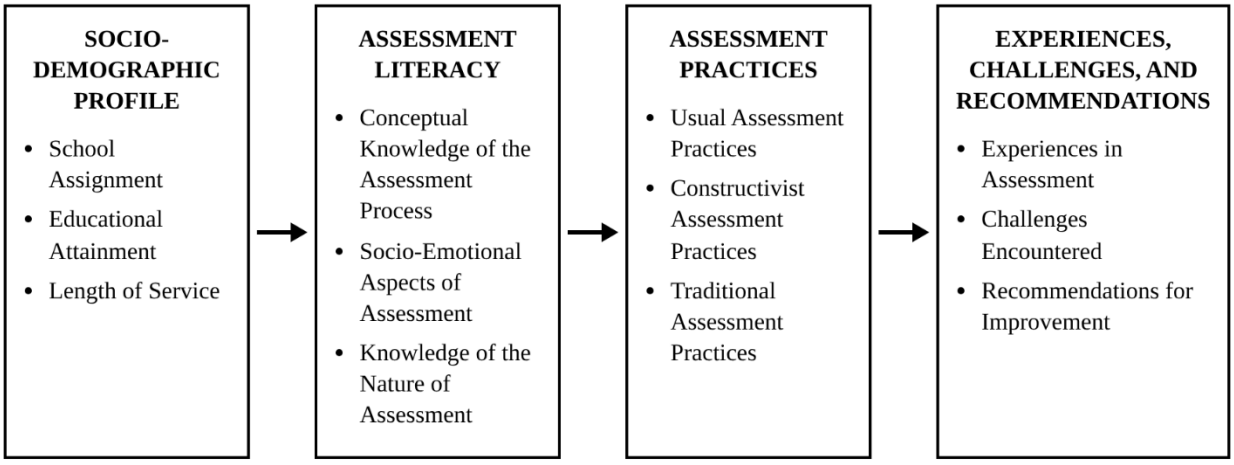


Figure 1. *Conceptual Framework of the Study*

METHODS

Research Design

The study employed a descriptive-correlational mixed-methods design. The descriptive component described the current status of the respondents' assessment literacy and assessment practices as they naturally occur (Creswell & Creswell, 2018), while the correlational component determined the degree and direction of relationships among the variables without manipulating them (Fraenkel et al., 2019). A qualitative component using semi-structured interviews explored teachers' experiences, challenges, and recommendations regarding assessment, providing deeper insight into and triangulation of the quantitative results.

Research Locale

The study was conducted in selected Community High Schools (CHS) of the MSU External Units, extension education sites established by Mindanao State University to expand access to quality secondary education in geographically isolated, disadvantaged, and underserved communities in Mindanao, largely inhabited by Maranao communities and neighboring groups. In Lanao del Sur, the study covered MSU-Balindong, Binidayan, Malabang, Marantao, Masiu, Saguiaran, Siawadatu, Tamparan, Taraka, Tugaya, and Wao Community High Schools; in Lanao del Norte, it included MSU-Baloi Community High School, the only MSU External Unit in that province. These schools vary in size, community context, and educational resources.

Participants and Sampling Technique

The respondents were 35 mathematics teachers from the 12 MSU Community High Schools during School Year 2025–2026, chosen because they are directly engaged in classroom instruction, assessment design, and evaluation of student learning. The distribution of respondents reflected differences in teacher population and school size, with MSU-Wao CHS contributing the most respondents (six) and MSU-Masiu, Tamparan, and Tugaya CHS contributing one each. Selected teachers among the respondents also participated in the semi-structured interviews and were identified by codes (e.g., Teacher 2).

Research Instrument

The primary instrument was the Self-Reported Assessment Literacy Instrument (SRALI) developed and validated by Gardon et al. (2025). The SRALI is a standardized self-report questionnaire anchored on the three-dimensional model of Pastore and Andrade (2019) and guided by DepEd assessment principles. It measures

assessment literacy through conceptual knowledge on the assessment process (eight items), socio-emotional aspects of assessment (six items), and conceptual knowledge on the nature of assessment (six items), rated on a five-point agreement scale, and assessment practices through usual (ten items), constructivist (five items), and traditional (five items) practices, rated on a five-point frequency scale. Mean scores were interpreted as follows: 4.20–5.00, Very High Literacy/All the Time; 3.41–4.20, High Literacy/Most of the Time; 2.61–3.40, Moderate Literacy/Sometimes; 1.81–2.60, Low Literacy/A Few Times; and 1.00–1.80, Very Low Literacy/Not at All. A semi-structured interview guide explored teachers' understanding of assessment literacy, their assessment preparation and strategies, the challenges they encounter in giving and checking assessments, and their suggestions for improvement.

Data Gathering Procedure

Permission was secured from the school heads of the selected MSU Community High Schools, and consent was obtained from the mathematics teachers after the purpose, procedures, and confidentiality of the study were explained. The SRALI was administered to the 35 respondents either personally or through coordinated distribution with school focal persons, depending on school accessibility, and respondents were given sufficient time to complete it. Semi-structured interviews were then conducted with selected participants, face-to-face or through other communication platforms according to their availability and preference; responses were recorded and transcribed. Completed questionnaires were retrieved, checked for completeness, and organized for analysis.

Data Analysis

Frequency and percentage were used to describe the respondents' profile, and mean and standard deviation were used to describe their levels of assessment literacy and assessment practices. Correlation analysis was used to test the relationships between educational attainment and length of service and the dimensions of assessment literacy and assessment practices, and between assessment literacy and assessment practices, at the 0.05 level of significance. Interview data were coded and analyzed thematically to identify recurring themes that explained and supported the quantitative findings.

Ethical Consideration

Participation was voluntary and based on informed consent. Respondents were informed of the purpose and procedures of the study, and confidentiality and anonymity were observed throughout; interview participants were identified only by codes, and their responses were treated with strict confidentiality.

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RESULTS AND DISCUSSION

Profile of the Respondents

Table 1 presents the profile of the respondents. The respondents came from 12 MSU Community High Schools, with MSU-Wao CHS having the largest share (17.14%) and MSU-Masiu, Tamparan, and Tugaya CHS the smallest (2.86% each). Most respondents held a master's degree (42.86%) or had earned master's units (34.29%), indicating that most mathematics teachers in the MSU External Units have pursued graduate education. The largest group had 6–10 years of service (37.14%), followed by those with 0–5 years (22.86%), showing that the respondents included early-career, mid-career, and experienced teachers.

Table 1. *Profile of the Respondents (n = 35)*

Profile	Frequency	Percentage (%)
School Assignment		
MSU-Balindong CHS	2	5.71
MSU-Baloi CHS	2	5.71
MSU-Binidayan CHS	4	11.43
MSU-Malabang CHS	4	11.43
MSU-Marantao CHS	3	8.57
MSU-Masiu CHS	1	2.86
MSU-Saguiaran CHS	4	11.43
MSU-Siawadatu CHS	3	8.57
MSU-Tamparan CHS	1	2.86
MSU-Taraka CHS	4	11.43
MSU-Tugaya CHS	1	2.86
MSU-Wao CHS	6	17.14
Educational Attainment		
Bachelor's degree	4	11.43
With master's units	12	34.29
Master's degree	15	42.86
With doctoral units	2	5.71
Doctoral degree	2	5.71
Length of Service		
0–5 years	8	22.86
6–10 years	13	37.14
11–15 years	4	11.42
16–20 years	5	14.29
21 years and above	5	14.29

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Level of Assessment Literacy of Mathematics Teachers

Table 2 presents the level of assessment literacy of the respondents across the three dimensions.

Table 2. *Assessment Literacy of Mathematics Teachers in MSU-External Units*

Indicators	Mean	SD	Interpretation
Conceptual Knowledge of the Assessment Process	4.15		High Literacy
I am well-versed in choosing the appropriate assessment tool to be used.	4.31	0.758	Very High Literacy
I have a deep understanding of the different strategies for monitoring learners' performance.	4.20	0.584	High Literacy
I know the different mechanisms of providing feedback to learners.	4.17	0.618	High Literacy
I have a comprehensive knowledge of developing assessment tools.	4.14	0.733	High Literacy
I effectively work with my fellow teachers and other stakeholders to make sense of my assessment practices.	4.14	0.772	High Literacy
I am well-versed in the different strategies for communicating assessment results to learners.	4.11	0.530	High Literacy
I am very knowledgeable in implementing different assessment strategies.	4.09	0.702	High Literacy
I am familiar with the different strategies for communicating assessment results to parents and/or guardians and other stakeholders.	4.00	0.728	High Literacy
Socio-Emotional Aspects of Assessment	4.58		Very High Literacy
I value ethical principles and standards of assessment.	4.77	0.731	Very High Literacy
I am completely aware of the impact of assessment practices and results on learners.	4.74	0.505	Very High Literacy
The learners' rights involved in assessment are very important to me.	4.69	0.796	Very High Literacy
I greatly value my role and responsibilities as an assessor of learning.	4.43	0.884	Very High Literacy
I always avoid doing different malpractices in assessment.	4.43	0.948	Very High Literacy
I am very familiar with the impacts of assessment practices and results on the parents/guardians and other stakeholders.	4.40	0.651	Very High Literacy
Conceptual Knowledge of the Nature of Assessment	4.46		Very High Literacy
I am completely aware of the different types of assessment (e.g., diagnostic, formative, summative).	4.71	0.519	Very High Literacy
I am very familiar with the different assessment tools (e.g., tests, performance-based assessment) used in teaching.	4.51	0.658	Very High Literacy
I have a detailed understanding of how to score assessment activities.	4.40	0.736	Very High Literacy
I have extensive knowledge of using assessment results in making decisions on students' learning progress.	4.40	0.651	Very High Literacy
I completely understand the principles of assessment.	4.37	0.731	Very High Literacy
I have extensive knowledge of the definition of assessment.	4.34	0.591	Very High Literacy
Overall Assessment Literacy	4.40		Very High Literacy

Note. Scale: 4.20–5.00 = Very High Literacy; 3.41–4.20 = High Literacy; 2.61–3.40 = Moderate Literacy; 1.81–2.60 = Low Literacy; 1.00–1.80 = Very Low Literacy.

The respondents demonstrated a very high level of assessment literacy overall (M = 4.40). Conceptual knowledge of the assessment process was rated high (M = 4.15); the highest-rated indicator was choosing the appropriate assessment tool (M = 4.31), and the lowest was familiarity with strategies for communicating assessment results to parents, guardians, and other stakeholders (M = 4.00), suggesting that partnerships with

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families remain an area for development. This supports Mertler (2009), who emphasized that assessment-literate teachers can select appropriate methods, develop tools, interpret data, and communicate results, and Popham (2009), who argued that understanding assessment processes allows teachers to monitor learning and make informed decisions.

The socio-emotional aspects of assessment obtained the highest rating (M = 4.58, Very High Literacy). Teachers most strongly valued ethical principles and standards of assessment (M = 4.77) and were highly aware of the impact of assessment on learners (M = 4.74), indicating that they place considerable importance on fairness, transparency, and responsibility. This is consistent with DeLuca and Klinger (2010), who asserted that assessment literacy includes ethical awareness, professional judgment, and an understanding of the consequences of assessment, and with Brookhart (2011), who highlighted ethical assessment and constructive feedback as essential teacher competencies. Conceptual knowledge of the nature of assessment was likewise very high (M = 4.46), with the highest rating for awareness of the different types of assessment (M = 4.71), supporting Xu and Brown (2016) and Stiggins (1995), who emphasized that assessment literacy requires a comprehensive understanding of assessment concepts, purposes, and principles.

Interview responses confirmed that teachers view assessment literacy as an applied competence that connects assessment with instructional decisions. Teacher 2 described it as "the ability to design, interpret, and use appropriate assessment methods to measure students' mathematical understanding and progress effectively," while Teacher 5 explained that it "is not just giving grades but understanding students' real learning needs and improving teaching strategies based on assessment results." Teachers also described aligning assessments with objectives and using multiple assessment purposes: "I make sure my assessment plan is aligned with objectives. I use diagnostic, formative, and summative assessments depending on the purpose of evaluation. I also use feedback and remediation based on results" (Teacher 15). These responses reflect DepEd Order No. 8, s. 2015, which requires classroom assessment to be aligned with learning competencies and used to support learner progress, and Corpuz and Salandanan's (2015) view that effective classroom assessment requires alignment, variety, and purpose-driven design.

Level of Assessment Practices of Mathematics Teachers

Table 3 presents the assessment practices of the respondents across the three dimensions.

Table 3. *Assessment Practices of Mathematics Teachers in MSU-External Units*

Indicators	Mean	SD	Interpretation
Usual Assessment Practices	4.47		All the Time
Assessment records are used to track the learners' progress.	4.77	0.490	All the Time
I record the assessment results of my learners.	4.71	0.490	All the Time
The learners are involved in the assessment process.	4.71	0.458	All the Time
I inform the learners of their progress based on their assessment results.	4.57	0.558	All the Time
Ethical principles and standards of assessment are observed.	4.49	0.612	All the Time
Assessment results are used to adjust instruction.	4.43	0.608	All the Time
In preparing my assessment tools, I consider the learners' higher-order thinking skills.	4.37	0.731	All the Time
I consider learners' comprehension when preparing assessment tools.	4.34	0.838	All the Time
My assessment tools cover the learners' application of knowledge.	4.29	0.750	All the Time
I use performance-based assessments.	4.00	0.642	Most of the Time
Constructivist Assessment Practices	4.14		Most of the Time
I give accurate feedback to my learners.	4.49	0.742	All the Time
Timely feedback is provided to learners.	4.29	0.710	All the Time
The learners' adherence to the learning objectives is considered when I evaluate them.	4.20	0.632	All the Time

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Indicators	Mean	SD	Interpretation
I use alternative assessment methods (e.g., self-assessment, portfolio assessment).	3.97	0.822	Most of the Time
I communicate the assessment results of the learners to their parents and/or guardians.	3.74	0.852	Most of the Time
Traditional Assessment Practices	4.33		All the Time
Class participation is considered in assessing learners.	4.66	0.639	All the Time
I evaluate learners based on their improvement.	4.46	0.657	All the Time
I consider the learners' effort to learn in assessing them.	4.43	0.655	All the Time
I use traditional types of assessment (e.g., multiple-choice tests, true or false).	4.09	0.702	Most of the Time
I administer my assessment activities using traditional methods (e.g., paper and pencil).	4.03	0.707	Most of the Time
Overall Assessment Practices	4.31		All the Time

Note. Scale: 4.20–5.00 = All the Time; 3.41–4.20 = Most of the Time; 2.61–3.40 = Sometimes; 1.81–2.60 = A Few Times; 1.00–1.80 = Not at All.

The respondents demonstrated a high level of assessment practices overall (M = 4.31). Usual assessment practices obtained the highest mean (M = 4.47), led by the use of assessment records to track learners' progress (M = 4.77), recording of assessment results (M = 4.71), and involvement of learners in assessment (M = 4.71), while the use of performance-based assessments was the lowest (M = 4.00). Indicators on higher-order thinking (M = 4.37) and application of knowledge (M = 4.29) were also relatively lower, suggesting a tendency to prioritize procedural and recall-based evaluation. This pattern aligns with Guskey (2003), who emphasized that effective teachers continuously use assessment information to monitor learning and adjust instruction, and with Shepard (2000) and Wiliam (2011), who observed that translating formative principles into cognitively demanding tasks remains challenging. The emphasis on records and tracking also echoes Broadfoot and Black (2004), who noted that many systems prioritize the documentation and accountability functions of assessment.

Constructivist assessment practices obtained the lowest mean (M = 4.14, Most of the Time). Accurate feedback (M = 4.49) and timely feedback (M = 4.29) were rated highest, consistent with Hattie and Timperley's (2007) finding that feedback is one of the most powerful influences on achievement. However, alternative assessment methods such as portfolios and self-assessment (M = 3.97) and communicating results to parents and guardians (M = 3.74) were practiced less frequently, indicating a partial shift toward learner-centered assessment (Jonassen, 1999) and gaps in school–home collaboration, which Epstein (2011) identified as important for student achievement. Traditional assessment practices were rated "All the Time" (M = 4.33), with class participation (M = 4.66), learner improvement (M = 4.46), and learner effort (M = 4.43) considered most often, and paper-and-pencil and objective tests still widely used (M = 4.03–4.09). This supports McMillan (2018), who noted that traditional assessments persist because they are efficient and easy to standardize, and Nitko and Brookhart (2014), who observed that classroom assessment often blends achievement with effort and participation. Overall, the results reflect a hybrid assessment culture in which routine and traditional practices dominate while constructivist approaches are gradually integrated.

Interviews confirmed this pattern. Teachers commonly reported using "recitation, short quizzes, seatwork, group work, and performance tasks… to check understanding and build skills" (Teacher 1) and diagnostic and formative assessment "before the lesson… after discussion… [to] measure prior knowledge and monitor learning progress" (Teacher 4). Others used assessment "to identify misconceptions early and adjust instruction in real time" (Teacher 6) and "real-life problem-solving tasks individually or by group… [and] board work with rubrics to assess performance" (Teacher 15). These practices are consistent with Sadler (1989), who argued that effective assessment provides feedback that closes the gap between current and desired performance, and with Lucas and Corpuz (2018), who noted that teachers in competency-based systems rely on continuous assessment to monitor progress and adjust instruction.

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Relationship Between Demographic Profile and Assessment Literacy and Practices

Table 4 presents the results of the correlation analyses between the respondents' educational attainment and length of service and their assessment literacy and practices.

Table 4. *Relationship Between Respondents' Demographic Profile and Their Assessment Literacy and Assessment Practices*

Profile	Variable	r	p-value	Remark
Educational attainment	Conceptual knowledge on the assessment process	−0.200	.250	Not significant
	Socio-emotional aspects of assessment	−0.411	.014	Significant
	Conceptual knowledge on the nature of assessment	−0.129	.462	Not significant
	Usual assessment practices	0.048	.784	Not significant
	Constructivist assessment practices	−0.014	.935	Not significant
	Traditional assessment practices	0.144	.409	Not significant
Length of service	Conceptual knowledge on the assessment process	0.174	.318	Not significant
	Socio-emotional aspects of assessment	0.223	.197	Not significant
	Conceptual knowledge on the nature of assessment	0.121	.489	Not significant
	Usual assessment practices	0.051	.771	Not significant
	Constructivist assessment practices	−0.077	.660	Not significant
	Traditional assessment practices	−0.078	.655	Not significant

Note. Significant at the 0.05 level of significance.

Educational attainment had no significant relationship with conceptual knowledge on the assessment process ($r = -0.200$, $p = .250$) or on the nature of assessment ($r = -0.129$, $p = .462$), but it had a significant negative relationship with the socio-emotional aspects of assessment ($r = -0.411$, $p = .014$). Thus, H_{01} was rejected only for the socio-emotional dimension. The negative relationship suggests that teachers with higher educational attainment may report slightly lower socio-emotional engagement in assessment, implying that advanced academic preparation does not automatically enhance the affective dimensions of assessment, which are often developed through classroom interaction and experience. Educational attainment also had no significant relationship with usual, constructivist, or traditional assessment practices, so H_{02} was not rejected for educational attainment. These results support Popham's (2011) view that assessment literacy is not guaranteed by academic degrees but is developed through continuous practice and professional engagement, and Brookhart's (2011) emphasis on classroom-based judgment as part of assessment competence.

Length of service was not significantly related to any dimension of assessment literacy or assessment practices; hence, H_{01} and H_{02} were not rejected for length of service. Both novice and experienced teachers demonstrated comparable assessment knowledge and similar practices, which may reflect standardized curriculum guidelines, institutional policies, and assessment frameworks that regulate teachers' practices regardless of tenure. This finding indicates that assessment literacy does not naturally improve over time without deliberate intervention and is consistent with Stiggins (2002), who argued that assessment literacy must be intentionally developed through structured learning opportunities, and with Black and Wiliam (1998, 2009), who found that teachers' assessment practice improves primarily through professional development in assessment for learning rather than through accumulated years of service.

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
Volume 2 Issue 11 (November 2026)

Relationship Between Assessment Literacy and Assessment Practices

Table 5. *Relationship Between Respondents' Assessment Literacy and Their Assessment Practices*

Variable	Variable	r	p-value	Remark
Assessment literacy	Assessment practices	0.625	< .001	Significant

Note. Significant at the 0.05 level of significance.

As shown in Table 5, assessment literacy had a strong, positive, and significant relationship with assessment practices ($r = 0.625$, $p < .001$); thus, H_{03} was rejected. Teachers with higher assessment literacy were more likely to demonstrate effective and appropriate assessment practices, being better able to align assessment tasks with learning objectives, interpret student performance accurately, and use assessment results to improve instruction. This finding is consistent with Philippine and international studies linking assessment literacy to the quality of classroom assessment: Clores and Reganit (2020) found that teachers' assessment literacy was reflected in their classroom assessment practices, Malabo (2024) examined assessment literacy among basic education teachers, and Quileste (2026) found that assessment literacy influences teachers' performance in assessment tasks and decision-making. It also supports the theoretical assumption, drawn from Pastore and Andrade (2019) and Shulman (1987), that knowledge of assessment underpins effective classroom practice.

Challenges and Recommendations in Strengthening Assessment Literacy and Practices

Thematic analysis of the interviews generated six themes, summarized in Table 6.

Table 6. *Themes on the Challenges and Recommendations of Mathematics Teachers*

Theme	Representative Responses
Challenges	
Time constraints in assessment implementation	"One of the difficulties I experience is the limited time to prepare, administer, and evaluate students' work, especially in large classes." (Teacher 2)
Diverse learner needs and comprehension difficulties	"I oftentimes encounter students who know how to solve and navigate the problem but they have a hard time comprehending the question." (Teacher 17)
Challenges in assessing mathematical reasoning and problem-solving	"I find it difficult to give points on the students who got the correct final answer but did not provide solutions." (Teacher 24)
Recommendations	
Need for professional development in assessment literacy	"Schools should provide teachers with more training on assessment design and effective evaluation techniques." (Teacher 26)
Technology and resource support for effective assessment practices	"Use digital tools that can reduce the workload in checking and recording scores." (Teacher 34)
Institutional and administrative support for assessment improvement	"Reducing teachers' workload and class sizes is important because it gives teachers enough time to prepare good assessments and provide detailed feedback." (Teacher 28)

Time constraints were among the most significant challenges, as checking problem-solving tasks requires evaluating both answers and solution processes, which increases workload and makes timely feedback difficult; McMillan (2018) and Guskey (2003) likewise noted that effective assessment requires sufficient time for scoring, interpretation, and feedback. Learner diversity posed a second challenge, as teachers encountered students with varying abilities— "most of our students are slow learners" (Teacher 3)—and with difficulty comprehending questions even when they possessed computational skills, underscoring the need for flexible and inclusive assessment (Brookhart, 2013; Shepard, 2000). Teachers also found it difficult to assess mathematical reasoning fairly because "students may use different strategies that need fair and consistent evaluation" (Teacher 6), highlighting the need for appropriate criteria and rubrics; Popham (2009) and the National Council of Teachers of

ISSN: 3116-3475
International Journal
of Education, Research, and Innovation Perspectives
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Mathematics (2014) emphasize assessing students' reasoning and problem-solving processes, not only final answers.

Teachers recommended continuous professional development through seminars, workshops, and training on assessment design and evaluation, consistent with Xu and Brown's (2016) view that assessment literacy develops through ongoing professional learning. They also called for ready-to-use assessment tools and digital resources that "speed up checking and grading" (Teacher 19), and for institutional support in the form of smaller classes, reduced workload, and "more support from the administration especially the school head" (Teacher 22). These recommendations align with Fullan (2007), who emphasized that improvement initiatives succeed when teachers receive strong institutional support, and with Darling-Hammond et al. (2017), who argued that supportive working conditions enable teachers to implement effective instructional and assessment practices. Overall, the themes indicate that effective assessment depends not only on teachers' assessment literacy but also on time, resources, professional learning opportunities, and organizational support.

CONCLUSION

Mathematics teachers in the MSU-External Units possess a very high level of assessment literacy, with particular strength in the socio-emotional aspects of assessment, reflecting a strong commitment to fairness, ethical standards, learner rights, and awareness of the impact of assessment on learners. They also demonstrate a high level of assessment practices, consistently integrating assessment into instruction through record-keeping, progress monitoring, feedback, and a combination of usual, traditional, and constructivist strategies, although performance-based and alternative assessments and communication of results to parents are not yet fully maximized.

Educational attainment and length of service are not major determinants of teachers' assessment literacy and practices, except for the negative relationship between educational attainment and the socio-emotional aspects of assessment, indicating that assessment competence is not automatically acquired through higher degrees or years of teaching but must be developed through continuous professional learning and reflective practice. The strong positive relationship between assessment literacy and assessment practices establishes assessment literacy as an important factor in promoting quality classroom assessment. Despite their high assessment literacy, teachers continue to face challenges related to time constraints, learner diversity, the assessment of mathematical reasoning and problem-solving, limited resources and technology, and insufficient professional development and institutional support.

Recommendation

Mathematics teachers are encouraged to continue enhancing their assessment literacy through seminars, workshops, webinars, and in-service training on classroom, formative, and authentic assessment; to strengthen the use of portfolios, project-based and performance tasks, self-assessment, and peer assessment to develop learners' higher-order thinking and problem-solving; and to improve the communication of assessment results to parents and guardians through progress reports, conferences, and digital platforms. School administrators are encouraged to provide structured training on the development of valid and reliable assessment tools, rubric construction, feedback strategies, and data-driven decision-making; to promote collaborative planning for consistent assessment across grade levels; and to ensure adequate instructional resources and technology, such as computers, internet access, and learning management systems, as well as manageable class sizes and workloads.

The MSU-External Units administration is encouraged to institutionalize a comprehensive and sustained assessment literacy development program for mathematics teachers that includes regular capacity-building activities, mentoring, and monitoring and evaluation mechanisms, and to encourage action research and innovation in classroom assessment to address time constraints, learner diversity, and the assessment of higher-order thinking. DepEd and other educational authorities may strengthen policies supporting continuous teacher development in assessment for learning, formative assessment, and competency-based evaluation. Future

researchers may involve larger populations and different settings, examine additional variables such as age, specialization, teaching style, school climate, and assessment training, use classroom observation and analysis of assessment documents to complement self-reports, and investigate the direct impact of assessment literacy on student achievement.

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