

## Exploring Secondary School Teachers' Assessment Literacy and Practices in English-Medium Instruction Classrooms

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### ABSTRACT

**Background and Objectives:** As English-Medium Instruction (EMI) becomes increasingly prevalent in Thailand, the role of assessment literacy among teachers has become more critical. With the rapid implementation of EMI programs, especially at secondary schools, there is a growing need to understand how well teachers comprehend and apply assessment principles in bilingual educational settings. However, limited research has specifically addressed the assessment competencies of teachers working in EMI classrooms in Thailand. This study aimed to investigate the level of assessment literacy among secondary school teachers who teach Science, Mathematics, and Physical Education through English as a medium of instruction in northeastern Thailand. It also aimed to explore the extent to which their classroom practices reflected their knowledge of assessment, highlighting the alignment between understanding and implementation in EMI contexts.

**Methodology:** A mixed-methods design was employed to gain a comprehensive understanding of the research topic. Data were collected from 54 foreign teachers of Science, Mathematics, and Physical Education working in English Program (EP) schools in northeastern Thailand. The data collection included a 30-item assessment literacy test, semi-structured interviews with 15 teachers (five from each subject area), and three classroom observation sessions, comprising one classroom observation per subject observed three times each.

**Main Results:** The findings revealed that most teachers demonstrated a moderate level of assessment literacy, with strengths in aligning learning objectives and understanding the purposes of formative and summative assessment. However, significant gaps remained in their knowledge of norm-referenced versus criterion-referenced assessment and assessment reliability. From the qualitative data, five key themes emerged: types of assessment used, the role of assessment in teaching, alignment with learning goals, use of formative assessment, and student involvement. Although teachers valued the role of assessment, their classroom practices did not always reflect this understanding. The integration of quantitative and qualitative results indicated that while teachers possessed a solid foundation in basic assessment principles, they struggled to apply these consistently in practice.

**Discussions:** The study highlighted a gap between teachers' theoretical knowledge and practical implementation. While interview responses showed awareness of effective assessment strategies, observations revealed a reliance on traditional, teacher-centered

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methods. Challenges such as language barriers, limited resources, and external testing pressures contributed to this disconnect. These findings suggest a need for targeted professional development to help EMI teachers apply assessment literacy more effectively in diverse bilingual classroom settings. Additionally, teachers' differing experiences across subject areas underscored the influence of contextual factors. The results further imply that EMI teachers require not only technical understanding but also pedagogical flexibility to balance content mastery with language development.

**Conclusions:** The study underscores the need for context-specific professional development that enhances both basic and advanced assessment literacy in EMI classrooms. Since English is used as a medium of instruction in these settings, attention must also be paid to how language proficiency impacts assessment practices. Findings contribute to policy and teacher training discussions in bilingual educational contexts. Future research should examine how improved assessment literacy influences student learning outcomes in EMI contexts.

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## Introduction

The rise of English-Medium Instruction (EMI), the use of English as the language of instruction for teaching academic subjects in countries where English is not the native language (Dearden, 2015; Macaro et al., 2023) has introduced new challenges in assessment. EMI has become increasingly common in non-native English-speaking countries, including Thailand (Galloway, 2020; Galloway & Rose, 2021). The implementation of EMI programs is motivated by the need to enhance citizens' English communication skills to be competitive in regional and international workplaces (Tanchai et al., 2022). EMI is also seen as a way to improve students' English proficiency and global competitiveness. However, the success of EMI programs depends heavily on effective assessment practices, which are complicated by the need to assess both content knowledge and language proficiency (Gronchi, 2024). Similar to many other educational contexts, EMI has grown rapidly in Thailand.

The rapid expansion of EMI in Thailand has been driven by national policies emphasizing bilingual education to prepare students for a globalized world and enhance their English proficiency (Laksanasut, 2020). In Thailand, many EMI programs are based on a bilingual education approach that uses English as the medium of instruction, combining content learning with language development to support both academic achievement and English proficiency (Taylor, 2022).

However, research on EMI in Thai contexts highlights persistent challenges, including variability in teacher preparedness, inconsistencies in assessment practices, and a lack of alignment between EMI goals and classroom implementation (Narathakoon et al., 2020). Furthermore, there is an ongoing debate over whether EMI should focus solely on content knowledge or also include language learning objectives. Effective assessment is critical to resolving this debate and ensuring that EMI programs achieve their intended outcomes (Thippayacharoen et al., 2023).

In recent years, assessment has become increasingly central to the educational system, serving as a critical tool for evaluating student competence and guiding the teaching and learning process. Assessment plays a pivotal role in identifying learning outcomes and providing evidence of student progress relative to instructional objectives (Chan & Luk, 2022; Meijer, 2023). Chappuis et al. (2012)

defines assessment as the process of gathering proof of actual learning and contrasting it with the desired proficiency levels. Furthermore, in educational settings, assessment encompasses the different approaches and instruments that teachers use to evaluate students' learning outcomes. Teachers apply diverse assessment techniques to monitor students' academic development, often focusing on areas such as their existing knowledge and the understanding they acquire after instruction (Thippayacharoen et al., 2023).

Assessment literacy, defined as the knowledge and skills required to design, conduct, and interpret assessments, is fundamental to effective teaching (American Federation of Teachers et al., 1990). Assessment-literate teachers understand what to assess, how to assess it, and how to use the results to inform instruction. Teachers with high levels of assessment literacy can align assessments with learning objectives, provide meaningful feedback, and make informed decisions about student progress. Assessment literacy also encompasses the knowledge, skills, and attitudes that educators need to effectively implement assessment strategies that support student learning and engagement (Pastore, 2023). Despite its importance, research continues to show that many teachers struggle with aspects of assessment literacy, such as implementing formative assessments effectively and distinguishing between norm- and criterion-referenced assessment (Estaji, 2024).

Assessment literacy has evolved over the years, with increasing recognition of its importance in both general and language education. In a recent systematic review of Assessment literacy, Pastore (2023) explored how teacher assessment literacy has been defined and studied over the past decade from 2013 to 2022. Pastore emphasizes the critical role of teacher assessment literacy in enhancing educational quality and calls for targeted efforts in teacher education to address gaps in knowledge and skills related to assessment practices. In the same period, Estaji (2024) attempted to examine English as a Foreign Language (EFL) teachers' perceptions about practical assessment and found that more teacher professional development programs are needed to improve teachers' assessment literacy. However, there are still significant gaps in teachers' understanding and application of assessment principles. These gaps can lead to inconsistent assessment practices, which may hinder student learning (Meijer, 2023). Effective assessment practices require teachers to integrate assessment with instruction, provide clear feedback, and involve students in the assessment process (Chappuis et al., 2012).

In EMI classrooms, assessment literacy seems to be more challenging as complexities are compounded by the dual task of assessing students' academic understanding through a second language (Inbar-Lourie, 2022; Gronchi, 2024). EMI instructors often report linguistic challenges and a lack of preparation to teach and assess in English (Lin et al., 2021). Understanding and improving teachers' assessment literacy is crucial to ensure the success and sustainability of EMI programs (Galloway & Rose, 2021; Wattnamongkol et al., 2025). Despite the growing prevalence of EMI, research on assessment practices in EMI contexts, particularly at the secondary school level, remains limited. Much of the existing research focuses on higher education, with little attention paid to teachers' assessment literacy and practices in secondary EMI classrooms (Galloway & Rose, 2021). This study aims to fill this gap by investigating the assessment literacy of secondary school teachers in Thai EMI classrooms and exploring how their assessment practices reflect their understanding of assessment principles.

The study was guided by two research questions:

1. What is the level of assessment literacy among secondary school teachers in Thai EMI classrooms?
2. To what extent do school secondary teachers' practices reflect their assessment literacy in Thai EMI classrooms?

By addressing these questions, the study aims to contribute to the broader understanding of assessment literacy in multilingual educational settings, specifically focusing on Thai EMI classrooms where language and content learning intersect. This context includes secondary

school environments where teachers navigate the dual demands of instructing academic content and supporting English language acquisition, often in resource-limited settings. Insights from this study aim to inform not only Thai educational practices but also similar multilingual EMI settings globally.

## **Literature Review**

The literature review examines the concepts of bilingual education in Thailand, EMI, assessment literacy, assessment practices, and framework of the study, emphasizing their interconnectedness and relevance to secondary school teachers in Thai EMI classrooms.

### ***Bilingual Education in Thailand***

Bilingual education in Thailand traditionally encompasses a range of program models (e.g., English Programs, Bilingual Programs, Content-and-Language Integrated Learning) that vary by intensity of English use and curricular goals (Laksanasut, 2020). The Thai Ministry of Education's encouragement of bilingual and EMI initiatives aims to enhance regional and global opportunities for learners; however, implementation faces systemic constraints, including inconsistent teacher preparation, varying program quality, and assessment misalignment (Tanchai et al., 2022).

Recent national and regional analyses underscore continuing challenges in Thai bilingual/EMI implementations — uneven teacher readiness, localized variability in practices, and structural resource constraints — which together limit program effectiveness and equity (Dhedchawanagon, 2023). These studies emphasize the pressing need for targeted professional development in both language and assessment literacies to ensure assessments validly capture combined language and content learning outcomes. This background contextualizes the challenges that EMI teachers face in aligning assessment practices with both content and language objectives, underscoring the need for research on assessment literacy within these bilingual environments.

### ***English-Medium Instruction (EMI)***

English-medium instruction (EMI) denotes instructional delivery of academic content in English in contexts where English is not the students' first language (Dearden, 2015). EMI is multi-faceted — pedagogical, political, and socioeconomic — and its expansion in non-Anglophone institutions is frequently motivated by internationalization aims and perceived employability benefits (Macaro et al., 2023).

Assessment in EMI presents particular complexities because teachers are required to evaluate both content mastery and language performance. Literature in recent years calls attention to the language assessment literacy needs of EMI teachers, particularly as EMI programs proliferate and digital/online modes of instruction expand (Gronchi, 2024). Studies of EMI classroom practices in Thailand report that teachers and students experience language-related assessment challenges and a need for stronger alignment between language objectives and content assessment (Taylor, 2022; Watnamongkol et al., 2025). These EMI-specific challenges form the basis for investigating how well-equipped teachers are in assessment literacy, especially in balancing the dual demands of language and content evaluation.

### ***Assessment Literacy***

Assessment literacy is a core professional competence for educators that includes the principles, knowledge, and skills necessary to design, implement, and interpret assessments that inform teaching and learning. Early definitions stress practical knowledge about what to assess, how to assess, and how to interpret results to improve instruction (American Federation of Teachers et al., 1990). Standards for teacher competence in educational assessment set out by professional bodies emphasize selecting appropriate methods, using assessment results to guide instruction, and communicating findings to stakeholders (American Federation of Teachers et al., 1990).

Contemporary research frames assessment literacy as an evolving, multidimensional construct that bridges theoretical knowledge and classroom practice. Systematic syntheses of the literature indicate that, although conceptual clarity and measurement instruments have improved, teachers frequently encounter difficulties transferring assessment knowledge into regular classroom practice (Pastore, 2023). Recent empirical reconceptualizations propose multi-dimensional frameworks that expand assessment literacy beyond technical knowledge to include attitudes, practices, and socio-emotional management of assessment activities (Chan & Luk, 2022). Understanding the scope and complexity of assessment literacy is central to this study, as it examines whether EMI teachers possess not only theoretical knowledge but also the ability to apply it effectively in real-world assessment scenarios.

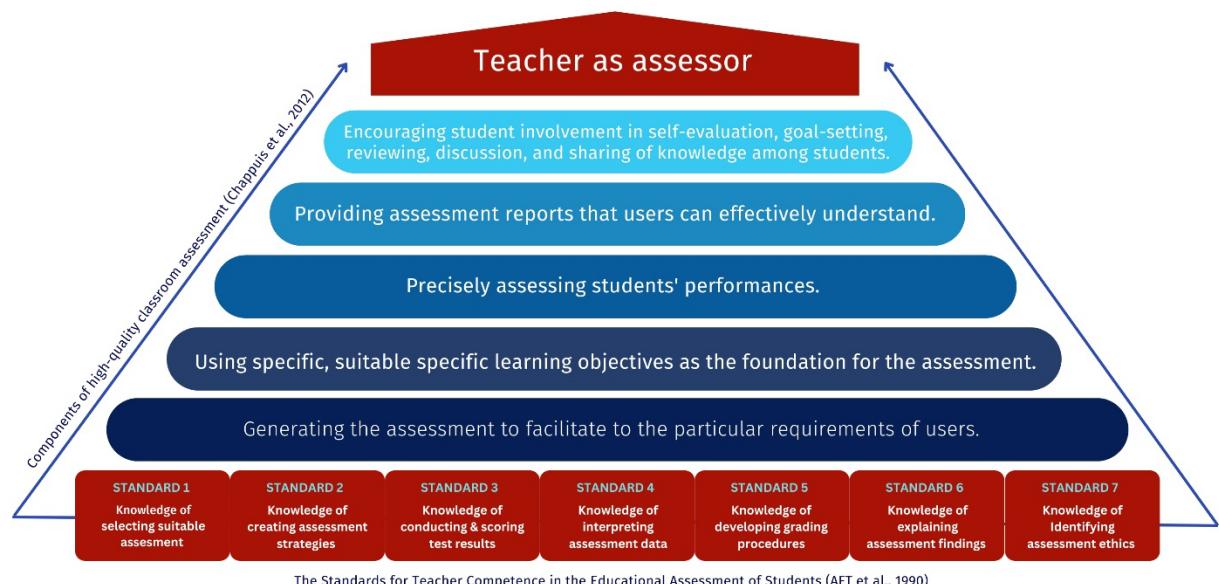
### ***Assessment Practices***

Assessment practices refer to the concrete methods teachers use to evaluate student learning, prominently formative assessment (ongoing feedback to guide instruction) and summative assessment (endpoint evaluation). High-quality practices align assessment tasks with learning objectives, provide actionable feedback, and involve learners in assessment processes (Chappuis et al., 2012).

Teachers' practices are shaped by their assessment literacy and by contextual pressures such as policy mandates, standardized testing regimes, and resource constraints. Recent reviews highlight a persistent implementation gap: although teachers often understand formative principles, they face barriers (such as time, policy, and training) when attempting consistent formative assessment practices in classrooms (Pastore, 2023). These challenges in practice further highlight the importance of assessing not just what EMI teachers know about assessment, but how they actually implement assessment strategies under real constraints.

### ***Framework of the Study***

The conceptual framework of this study adapts the Teacher Assessment Literacy in Practice model proposed by Xu and Brown (2016). This framework integrates the Standards for Teacher Competence in the Educational Assessment of Students (American Federation of Teachers et al., 1990) with the components of high-quality classroom assessment (Chappuis et al., 2012). In Thai EMI classrooms, teachers face distinctive demands, including delivering subject content in English while supporting students' language development and designing



**Figure 1** Teacher Assessment Literacy in Practice Framework

assessments that capture both content knowledge and language proficiency, adding complexity to assessment implementation. However, as illustrated in Figure 1, the framework takes the form of a pyramid, where foundational knowledge of assessment standards forms the base, and the upper tiers represent teachers' practical application of assessment literacy in the classroom

The framework allows analysis of teachers' competencies across three interconnected domains: (1) foundational knowledge, (2) practical application, and (3) alignment with EMI-specific demands. Quantitative data from assessment literacy tests and qualitative insights from interviews and observations were mapped onto these domains to evaluate how teachers integrate theoretical understanding into real-world assessment practices.

This model is particularly relevant for EMI contexts, where teachers must assess both language and content simultaneously. By applying Xu and Brown's (2016) framework, the study seeks to provide deeper insights into the assessment literacy of secondary school teachers in Thai EMI classrooms and to identify professional development areas that can enhance effective bilingual and content-language integrated assessment practices.

## **Method**

### ***Research Design***

This study employed a mixed-methods approach using a convergent parallel design, aiming to collect, analyze, and interpret both quantitative and qualitative data concurrently to compare and confirm findings from each strand (Creswell & Plano Clark, 2018). This design was chosen because it enables a comprehensive understanding of teachers' assessment literacy, integrating numerical test results with in-depth qualitative insights, in line with the multidimensional model of assessment literacy discussed in the literature review (Brown, 2016; Chan & Luk, 2022).

### ***Study Context, Population and Sampling***

The study was conducted in government secondary schools across 20 provinces in northeastern Thailand, all of which have implemented an English Program (EP). These schools were selected based on their established EMI practices, employment of foreign subject teachers, and alignment with bilingual education goals identified in prior studies (Laksanasut, 2020; Tanchai et al., 2022).

The target population comprised foreign teachers who taught Science, Mathematics, or Physical Education using English as the medium of instruction during the academic year of 2023. To ensure relevance, participants were required to have a minimum of one year of teaching experience.

Due to the researcher's proximity to the study area, a convenience sampling method was employed. This approach resulted in a sample of 54 teachers. The sample included 20 Science teachers, 18 Mathematics teachers, and 16 Physical Education teachers. This composition reflects the proportional distribution of teachers in these subjects across the participating schools. Among them, 39 teachers had over 3 years of EP teaching experience, while 15 had 1–2 years. Grade-level distribution showed 28 teachers teaching lower secondary and 26 teaching upper secondary levels.

To gain a comprehensive understanding of factors influencing assessment literacy, demographic information such as subject taught, grade level, and years of teaching experience was collected. This data is essential, as these factors can significantly impact teachers' assessment literacy and practices.

Ethical approval for this study was obtained from the Khon Kaen University Ethics Committee for Human Research, under the Center for Ethics in Human Research. The project was reviewed in accordance with the ethical principles outlined in the Belmont Report and followed Good Clinical Practice (GCP) guidelines for Social and Behavioral Research which was approved on 22 November 2023 with the reference number HE663328.

### ***Instruments***

This study employed three main instruments: an assessment literacy test, semi-structured interviews, and classroom observations, each rigorously designed to ensure validity and appropriateness for use in EMI classroom contexts.

First, the assessment literacy test was developed to evaluate teachers' understanding of core assessment principles. It was adapted from the EMI Classroom Assessment Practices (ECAP) questionnaire by Li and Wu (2018) and aligned with The Standards for Teacher Competence in Educational Assessment of Students (American Federation of Teachers et al., 1990). The test consisted of two parts: (1) demographic information (participant code, subject taught, number of years teaching in EP programs, and grade levels you teach) and (2) 30 true-or-false statements targeting key assessment concepts. To ensure content validity, three experts in educational assessment and EMI reviewed and refined the test items. The instrument's internal consistency reliability was confirmed using Cronbach's alpha ( $\alpha = 0.87$ ), indicating a high level of reliability.

Second, semi-structured interviews were conducted to gain in-depth insights into how teachers interpret and apply assessment literacy in EMI classrooms. The interview protocol comprised 10 open-ended questions focusing on challenges in assessment, integration of language and content evaluation, and alignment with assessment principles. The questions were developed based on the American Federation of Teachers (AFT) standards and the Chappuis et al. (2012) framework for high-quality assessments, ensuring construct alignment with the study's conceptual framework. To ensure instrument appropriateness, the protocol was piloted with two EMI teachers and reviewed by domain experts for relevance, clarity, and cultural sensitivity. Interviews were audio-recorded with consent and analyzed thematically, ensuring rigor in data interpretation and triangulation with other data sources.

Third, classroom observations were guided by a structured checklist based on Chappuis et al. (2012). Key elements included alignment with instructional goals, use of formative assessment, feedback quality, and student involvement in assessment. To ensure the credibility and reliability of the observations, each of the three selected classrooms (one per subject) was observed three times by the researcher. The checklist was reviewed by assessment experts, and observer consistency was maintained through reflective journaling and post-observation discussions. These classroom observations enabled the evaluation of how theoretical knowledge was translated into practical assessment behavior in EMI classrooms.

Overall, the triangulation of these three instruments and the quality assurance measures embedded in each ensured the robustness and appropriateness of the data collected.

### ***Data Collection***

The data collection process spanned seven weeks during the first semester of the 2023 academic year. The process began with obtaining formal permissions from school principals in participating institutions to ensure access to classrooms and teachers. Following this, an orientation session was conducted online for the participants to explain the study's objectives, their role in the research, and the procedures involved. Participants were informed about their rights, including confidentiality and the voluntary nature of participation.

The assessment literacy test was administered online during the second week of the study. Participants were provided with a link to complete the test at their convenience within a specified time frame, allowing for the collection of quantitative data on assessment literacy. In this study, participants were anonymized using codes that indicated both their order of participation and teaching subject. Semi-structured interviews were conducted in English during weeks three and four. Each participant was interviewed individually. Each interview lasted approximately 30 minutes and was recorded for thematic analysis.

Classroom observations were carried out during weeks five to seven. Three classrooms, representing Science, Mathematics, and Physical Education, were observed. Each classroom

was observed three times, resulting in a total of nine observation sessions. Each session lasted 60 minutes and was guided by a pre-designed checklist. This systematic approach ensured a comprehensive data collection process, enabling the triangulation of quantitative and qualitative data for robust findings.

## Data Analysis

The data analysis is divided into two parts to address the research questions. For Research Question 1, the assessment literacy test was quantitatively analyzed using descriptive statistics including frequencies, percentages, and mean scores. These measures provide an overview of teachers' knowledge of assessment principles, highlighting areas of strength and gaps in understanding. To interpret the results, score ranges were classified based on prior assessment literacy studies (Brookhart, 2011). A low level of assessment literacy was categorized as 0–10 correct responses (<33%), indicating a limited understanding requiring substantial training. A moderate level (11–20 correct, 34–66%) suggested a basic knowledge with notable gaps, while a high level (21–30 correct, >67%) reflected a strong understanding with effective application of assessment principles. In addition, true and false response frequencies were analyzed to determine common misconceptions and well-understood concepts. True frequency represented the number of participants who answered correctly, while false frequency reflected incorrect responses. Items with low correct response rates (<50%) indicated weaker understanding, while those with high accuracy (>80%) suggested well-established knowledge (Stiggins in AFT 1990; Meijer, 2023). This analysis helped identify areas of strength and weakness in assessment literacy among participants.

For Research Question 2, qualitative data from interviews and observations underwent thematic analysis. Interview transcripts were coded inductively to identify themes related to teachers' assessment beliefs, practical challenges, and EMI-specific assessment adaptations. Observation notes were analyzed deductively against the Chappuis et al. (2012) and Xu and Brown (2016) frameworks to evaluate practical enactment of assessment literacy. Findings from both strands were triangulated to generate a comprehensive picture of teachers' assessment literacy, ensuring integration between theoretical knowledge, observed practice, and contextual influences, a process consistent with the convergent mixed-method approach and the Teacher Assessment Literacy in Practice (TALiP) framework guiding this study.

## Findings

### RQ 1: What is the level of assessment literacy among secondary school teachers in Thai EMI classrooms?

The results from the 30-item assessment literacy test revealed an overall moderate level of assessment literacy, with a mean score of 19.4 out of 30. While 29 teachers (53.7% of participants) scored in the high range (21–30 correct answers), 25 teachers (46.3%) scored below 20, indicating notable knowledge gaps (Table 1).

**Table 1.** The Overall Performance of Teachers on the Assessment Literacy Test

| Score Range (Correct Answers) | Number of Participants | Percentage (%) |
|-------------------------------|------------------------|----------------|
| 0-10                          | 5                      | 9.3%           |
| 11-20                         | 20                     | 37.0%          |
| 21-30                         | 29                     | 53.7%          |
| Mean Score                    | 19.4                   |                |

These results indicate that while over half of the participants scored in the higher range (21–30 correct answers), a considerable portion of the teachers exhibited gaps in their understanding of certain assessment principles. This finding aligns with the foundational and intermediate levels of the framework outlined by Chappuis et al. (2012), which emphasize

foundational and theoretical knowledge of assessment literacy. This pattern also reflects Pastore (2023) and Chan and Luk (2022), who note persistent challenges in the transfer of theoretical literacy into practice across EMI and bilingual contexts.

To examine teachers' assessment literacy in greater depth, the quantitative data from the 30-item questionnaire were first analyzed by teaching subject. Table 2 summarizes the percentage of correct responses in key assessment domains.

**Table 2.** Teachers' Assessment Literacy by Subject Group Based on Questionnaire Data

| Assessment Area                         | Science Teachers<br>(n = 20) | Mathematics<br>Teachers<br>(n = 18) | Physical Education<br>Teachers<br>(n = 16) |
|---|------------------------------|-------------------------------------|--|
| Summative Assessment Understanding      | 95%                          | 90%                                 | 92%  |
| Alignment with Instructional Goals      | 95%                          | 94%                                 | 90%  |
| Assessment for Instructional Decisions  | 90%                          | 89%                                 | 88%  |
| Clear Learning Objectives               | 92%                          | 94%                                 | 88%  |
| Definition of Assessment Literacy       | 90%                          | 89%                                 | 85%  |
| Validity (Advanced Concept)             | 35%                          | 38%                                 | 31%  |
| Reliability (Advanced Concept)          | 30%                          | 34%                                 | 25%  |
| High-Stakes Assessment Purpose          | 25%                          | 33%                                 | 28%  |
| Norm-Referenced vs Criterion-Referenced | 55%                          | 39%                                 | 42%  |
| Authentic Assessments Misconception     | 47%                          | 50%                                 | 44%  |

Table 2 presents teachers' assessment literacy results disaggregated by teaching subjects (science, mathematics, and physical education). This format allows for clearer comparative insights into strengths and gaps across subject areas. Science teachers exhibited high proficiency in foundational assessment literacy concepts. Over 90% of them answered correctly on key items related to summative assessment, learning objectives, and instructional alignment. However, notable gaps were found in advanced areas—only 30% correctly understood reliability, and 25% identified the function of high-stakes assessments. Mathematics teachers also demonstrated solid foundational knowledge (94% on learning objectives and 92% on summative assessment). However, they performed slightly lower on advanced items: only 33% correctly identified the purpose of high-stakes testing, and less than 40% answered correctly on norm-referenced grading. Physical Education teachers showed strong foundational understanding (91% and above on basic items), but the lowest performance in advanced literacy concepts. Only 25% understood reliability, and 31% understood validity. This group showed the highest rate of misconceptions across multiple advanced assessment areas.

To provide a more detailed picture of teachers' knowledge at the item level, Table 3 presents a breakdown of the questionnaire responses across individual statements, identifying areas of strength and weakness in teachers' understanding of assessment principles.

**Table 3.** Teachers' Assessment Literacy Based on Questionnaire Data

| No.                         | Statement  | True Frequency | True Percentage | False Frequency | False Percentage | Mean Score |
|-----------------------------|--|----------------|-----------------|-----------------|------------------|------------|
| <b>Strong Understanding</b> |  |                |                 |                 |                  |            |
| 1                           | Assessment literacy refers to the understanding and knowledge of assessment methods and practices. | 50             | 92.59%          | 4               | 7.41%            | 0.93       |
| 5                           | Summative assessment is used to evaluate student learning at the end of a course or unit.          | 50             | 92.59%          | 4               | 7.41%            | 0.93       |
| <b>Strong Understanding</b> |  |                |                 |                 |                  |            |
| 16                          | Assessment literacy includes understanding the importance of clear learning objectives.            | 50             | 92.59%          | 4               | 7.41%            | 0.93       |
| 18                          | Assessment literacy helps teachers make informed decisions about instruction.                      | 50             | 92.59%          | 4               | 7.41%            | 0.93       |
| 24                          | Assessments should always be aligned with instructional goals.                                     | 50             | 92.59%          | 4               | 7.41%            | 0.93       |
| <b>Knowledge Gaps</b>       |  |                |                 |                 |                  |            |
| 15                          | Reliability ensures that an assessment measures what it claims to measure.                         | 19             | 35.19%          | 35              | 64.81%           | 0.35       |
| 7                           | Validity in assessment refers to the consistency of test scores over time.                         | 20             | 37.04%          | 34              | 62.96%           | 0.37       |
| 26                          | High-stakes assessments are typically used for diagnostic purposes.                                | 15             | 27.78%          | 39              | 72.22%           | 0.28       |
| 13                          | Norm-referenced grading is based on a predetermined distribution of grades.                        | 30             | 55.56%          | 24              | 44.44%           | 0.56       |
| 14                          | Authentic assessments are typically standardized tests.  | 26             | 48.15%          | 28              | 51.85%           | 0.48       |

According to Table 3, the findings reveal that while secondary school teachers in Thai EMI classrooms demonstrate a strong understanding of fundamental assessment principles, their knowledge of more advanced concepts remains inconsistent. Teachers exhibited a solid grasp of foundational assessment literacy, particularly regarding the purpose of summative assessments (92.59%), the importance of aligning assessments with learning objectives (92.59%), and the role of assessment in guiding instruction (92.59%). These findings align with Chappuis et al. (2012), who emphasize that effective assessment practices require a clear connection between learning objectives and evaluation methods. Additionally, teachers widely recognized the importance of assessment literacy in instructional decision-making, which is crucial for enhancing student learning outcomes (Brookhart, 2011).

Despite their strong foundation, teachers showed significant misconceptions in areas requiring more advanced assessment literacy. Only 19 teachers (35.19%) correctly identified reliability, while 20 teachers (37.04%) correctly defined validity, indicating confusion between the two. These findings are consistent with prior research (Pastore, 2023), which suggests that reliability and validity are among the most misunderstood concepts in educational assessment.

Such misconceptions can lead to inconsistent scoring and misinterpretation of student performance data. Furthermore, only 15 of the teachers (27.78%) correctly identified the purpose of high-stakes assessments, demonstrating a lack of clarity on how such assessments function in evaluating student learning. In teacher beliefs, personal theories and conceptions of assessment literacy: a tertiary EFL perspective (Latif & Wasim, 2022) examined tertiary EFL teachers' beliefs, conceptions and understanding of assessment literacy. They found that although teachers acknowledged key assessment terms (such as validity, reliability and fairness) as characteristics of good assessment, they nevertheless lacked a clear conceptual understanding of what validity and reliability truly mean in practice. Comparable findings were reported in Thippayacharoen et al. (2023) and Hasan et al. (2024), where EMI teachers faced difficulties in applying equitable assessment approaches in multilingual classrooms due to unclear assessment policies.

Another critical gap was found in the understanding of norm-referenced and criterion-referenced grading. Although 30 teachers (55.56%) correctly defined norm-referenced grading, nearly half of the teachers misunderstood its distinction from criterion-referenced assessment. This suggests a need for explicit training in assessment models, particularly given that EMI classrooms require assessments that fairly evaluate students with varying English proficiency levels. The challenges in this area align with Li and Wu (2018), who emphasize that assessment literacy training should focus on both theoretical knowledge and practical applications to ensure validity in diverse linguistic contexts.

These findings underline the need for targeted professional development programs that focus on enhancing teachers' understanding of reliability, validity, high-stakes assessment, and grading systems. While teachers demonstrate competency in fundamental assessment principles, misconceptions in key areas can impact their ability to implement fair and effective assessments in EMI classrooms. Future training should incorporate real-world applications, case studies, and collaborative learning experiences to help teachers bridge the gap between theoretical knowledge and classroom practice.

**RQ 2:** To what extent do secondary school teachers' practices reflect their assessment literacy in EMI classrooms?

Findings from semi-structured interviews and classroom observations revealed that while teachers had a foundational understanding of assessment principles and generally aligned their assessments with curriculum goals, inconsistencies emerged in the practical application of scaffolding, differentiated instruction, and formative assessments.

To systematically analyze teachers' assessment practices, five key aspects were identified based on Chappuis et al. (2012)'s assessment literacy framework and the Standards for Teacher Competence in Educational Assessment of Students (American Federation of Teachers et al., 1990). These aspects were categorized into different assessment literacy levels, including types of assessments used, role of assessments in teaching, alignment with objectives, use of formative assessments, and student involvement.

Table 4 provides a structured summary of how teachers' self-reported practices (from interviews) and observed classroom behaviors.

**Table 4.** Summary of Data from Semi-structured Interviews and Classroom Observations

| Themes                          | Key Findings from Interviews  | Observations in Classrooms  | Challenges Identified   |
|---------------------------------|---|---|---|
| Types of Assessments Used       | Teachers used a variety of assessments such as quizzes, exams, projects, and presentations. | Practical activities observed in science; limited diversity in Mathematics.       | Limited use of innovative methods.                            |
| Role of Assessments in Teaching | Teachers used assessments to identify gaps and adjust instruction.                          | Feedback provided but lacked formative depth in some cases.                       | Time constraints and focus on summative assessments.          |
| Alignment with Objectives       | Teachers ensured alignment with curriculum goals and objectives.                            | Alignment observed in most classes, but inconsistencies in clarity and relevance. | Difficulty in consistent articulation of learning objectives. |
| Use of Formative Assessments    | Teachers recognized importance but cited limited application.                               | Rarely observed due to time and resource constraints.                             | Pressure from standardized testing.                           |
| Student Involvement             | Teachers involved students in self- and peer assessments inconsistently.                    | Self-assessment was seen in Physical Education but minimal in other subjects.     | Lack of training to standardize these practices.              |

According to Table 4, the findings from semi-structured interviews and classroom observations provide a deeper understanding of how teachers' assessment literacy is reflected in their classroom practices. While the quantitative data from the assessment literacy test indicated that teachers possessed a moderate level of assessment literacy, the qualitative findings revealed inconsistencies in the practical application of assessment principles. Below is a breakdown of the key findings:

#### ***Types of Assessments Used***

Teachers reported using a variety of assessment methods, including quizzes, exams, projects, presentations, and practical activities. This aligns with the quantitative findings, where 50 of the teachers (92.59%) correctly identified assessment literacy as an understanding of assessment methods (Item 1). However, despite this awareness, the observations revealed a strong reliance on traditional assessments, such as multiple-choice tests, particularly in Mathematics. Teachers themselves acknowledged this limitation:

*"I use a mix of quizzes, projects, and presentations. For hands-on subjects like science, I prefer practical activities and experiments." (P3, Science)*

*"In math, problem-solving tasks are key. I also use group projects to foster collaboration." (P7, Mathematics)*

While practical assessments were more prevalent in Science and Physical Education, Mathematics teachers primarily relied on problem-solving tasks. This suggests that while teachers understand theoretical aspects of diverse assessment methods, their practical implementation is limited, indicating a gap between knowledge and practice.

#### ***Role of Assessment in Teaching***

The interview data showed that teachers recognized the importance of assessment in identifying student strengths and weaknesses, adjusting instruction, and tracking progress. This aligns with the quantitative results, where 46 of the teachers (85.19%) correctly indicated that

assessment literacy includes the ability to interpret results and make instructional decisions. Teachers described their use of assessment to adapt their teaching strategies:

*“Assessment helps me understand where my students are struggling and shape my lessons to address those areas.” (P1, Science)*

*“Regular assessments allow me to monitor progress and adjust my teaching strategies.” (P10, Mathematics)*

However, classroom observations contradicted some of these self-reported claims. While assessments were conducted regularly, formative assessments were underutilized due to external pressures, such as standardized testing requirements. This was consistent with the quantitative data, where only 8 teachers (14.81%) correctly identified that formative assessments should be conducted during instruction rather than after it. The disagreement between theoretical knowledge and practical application suggests that while teachers understand the benefits of formative assessments, they struggle to implement them effectively. Teachers expressed a structured approach to assessment design.

#### ***Alignment with Learning Objectives***

Most teachers reported that their assessments were aligned with curriculum goals, ensuring that tasks measured intended learning outcomes. This was supported by the quantitative findings, where 50 of the teachers (92.59%) correctly agreed that assessments should always be aligned with instructional goals. Teachers expressed a structured approach to assessment design:

*“I always state the learning objectives clearly before any assessment. Collaborating with colleagues ensures consistency.” (P6, Science)*

*“Using curriculum guidelines helps align assessments with course content.” (P12, Mathematics)*

However, classroom observations revealed inconsistencies in how clearly learning objectives were communicated. While some teachers explicitly linked assessments to stated objectives, others lacked clarity in articulating the connection. This inconsistency suggests that although teachers recognize the importance of alignment, variability in execution remains a challenge.

#### ***Challenges in Assessment Practices***

Teachers cited multiple challenges that impacted their ability to implement effective assessment practices, including language barriers, student English proficiency levels, and resource constraints. These qualitative findings reinforce the quantitative results, where only 30 teachers (55.56%) correctly understood norm-referenced grading, and 19 of them (35.19%) correctly identified reliability as ensuring consistency in measurement.

*“Language barriers are a big challenge. Simplifying language and providing translations help.” (P1, Science)*

*“Resource constraints are challenging, but we use technology and seek external support when possible.” (P2, Mathematics)*

Observations confirmed that language complexity in assessment materials often hindered student comprehension, particularly in Mathematics and Science. This reinforces the need for more support in developing assessments that cater to students' linguistic needs in EMI contexts.

### ***Student Involvement***

Teachers recognized the benefits of self-assessment and peer assessment, yet these strategies were inconsistently applied across subjects. The interview data revealed that while teachers encouraged self-reflection, structured self-assessment tools were rarely used.

*“Self-assessments help students reflect on their learning and identify areas for improvement.” (P11, Physical Education)*

*“Students set goals based on feedback and engage in peer reviews.” (P9, Mathematics)*

However, classroom observations revealed that self-assessment was more common in Physical Education but was rarely observed in Science and Mathematics. This finding correlates with the quantitative data, where only 26 of the teachers (48.15%) correctly identified authentic assessments as not being limited to standardized tests. The lack of consistent student involvement in assessments suggests a gap between teachers' knowledge of assessment strategies and their implementation.

To conclude, the integration of quantitative and qualitative findings highlights both strengths and weaknesses in teachers' assessment literacy and practices. While teachers demonstrated a foundational understanding of assessment concepts (as reflected in their test scores), their application of these principles varied across subjects. The quantitative data confirmed knowledge gaps in norm-referenced versus criterion-referenced assessments and formative assessment practices, which were further evidenced in classroom observations. While teachers valued assessment as an instructional tool, external constraints such as time limitations, standardized testing pressures, and language barriers hindered the practical application of effective assessment strategies. The mismatch between theoretical knowledge and classroom practices suggests a need for targeted professional development to bridge the gap between understanding and implementation.

## **Discussion**

The present study explored the assessment literacy levels and classroom assessment practices of secondary school teachers in Thai EMI contexts. By combining quantitative and qualitative data, the findings revealed a moderate level of assessment literacy overall, characterized by strong foundational knowledge but substantial gaps in advanced assessment concepts and inconsistent practical applications. These findings offer valuable insights into how EMI teachers in Thailand conceptualize and implement assessment principles in linguistically and pedagogically complex environments.

### ***Assessment Literacy Levels of EMI Teachers***

The results indicated that teachers demonstrated a strong understanding of foundational assessment principles, including the purposes of summative assessment, alignment of assessments with learning objectives, and the use of assessment data to inform instruction. Over 90 % of respondents correctly identified these elements, reflecting an awareness of core assessment competencies. This finding corresponds with the view that foundational knowledge of assessment is a necessary element of teacher competence and aligns with frameworks that highlight the multiple elements of assessment literacy (Pastore, 2023).

However, despite this solid foundation, teachers' understanding of more advanced assessment concepts—such as reliability, validity, norm-referenced and criterion-referenced

grading, and the purpose of high-stakes assessments—was notably limited. Some participants correctly answered items related to reliability and validity, and less than one-third correctly identified the purpose of high-stakes testing. These misconceptions reflect broader global trends: for example, past research has highlighted that teacher assessment literacy often remains weak in advanced domains (Meijer, 2023; Pastore, 2023), and recent systematic reviews confirm such persistent gaps (Pastore, 2023). The implications are serious: without a firm grasp of reliability and validity, teachers may interpret student data inaccurately, potentially undermining fairness and effectiveness.

### ***Subject-Specific Variations and Contextual Factors***

When disaggregated by subject area, Science and Mathematics teachers displayed slightly stronger assessment literacy than Physical Education teachers, particularly in aligning assessments with instructional objectives and using results for instructional decisions. Yet, across all subject groups, gaps persisted in advanced assessment concepts, suggesting that these limitations are systemic rather than discipline-specific. In the context of Thai EMI secondary programmes, this may reflect the dual challenge of content and language teaching, where teachers are expected to deliver subject matter via English and simultaneously assess student learning in this medium. Recent studies of EMI contexts in Thailand highlight that teachers face multiple constraints, including language proficiency demands and limited professional development focused on assessment in EMI contexts (Watnamongkol et al., 2025). Hence, the moderate overall literacy level likely reflects both individual knowledge and institutional/contextual constraints.

### ***Assessment Literacy and Classroom Practices***

The integration of qualitative findings provides further depth to understanding how teachers' assessment literacy translates into classroom practice. While teachers articulated a sound theoretical understanding of assessment principles, their practices often failed to fully reflect this knowledge. Teachers employed a range of assessment types: quizzes, projects, presentations, and practical tasks, yet classroom observations indicated a strong reliance on traditional summative tools, especially in Mathematics. This discrepancy suggests that awareness of diverse assessment strategies does not necessarily translate into implementation, aligning with observations in other international contexts (Macaro et al., 2023) where institutional pressures and workload limit formative practices.

Formative assessment practices were particularly underdeveloped. Although teachers recognized their importance, they reported limited use due to time constraints, large class sizes, and the dominance of a high-stakes testing culture. Observations corroborated this, showing infrequent use of formative feedback or student self-assessment. This finding resonates with the broader trend in assessment literacy research: while teachers may understand formative assessment in principle, their practice often remains summative-dominant (Pastore, 2023). In EMI contexts, this may be exacerbated by the additional burden of scaffolding for English-language learners and aligning assessments to both language and content objectives.

### ***Language and Pedagogical Challenges in EMI Contexts***

A recurring theme across interviews and observations was the influence of language on assessment practices. Teachers noted that students' English language proficiency often constrained their ability to understand assessment tasks, particularly in Science and Mathematics. These findings echo broader studies of EMI in Thailand and elsewhere in East Asia, which highlight language-related challenges in assessment design, implementation, and interpretation (Thippayacharoen et al., 2023). Consequently, assessment literacy in EMI settings must extend beyond technical knowledge of assessment to encompass linguistic and

intercultural competence, enabling teachers to develop fair and valid assessments for multilingual learners.

### ***Bridging the Gap Between Knowledge and Practice***

The mismatch between teachers' theoretical understanding and classroom implementation underscores the need for context-specific professional development. As the literature suggests, assessment literacy should be developed not only through theoretical training but also through reflective and experiential learning that connects theory to practice (Pastore, 2023). Professional learning communities (PLCs), peer observations, and assessment-focused workshops can foster such connections, encouraging teachers to collaboratively design and evaluate assessment instruments that align with curriculum objectives and students' linguistic needs.

Moreover, enhancing teacher understanding of reliability, validity, and grading systems is essential for ensuring consistency and fairness in student evaluation. Integrating practical assessment design tasks and real-world case studies into teacher training can help internalize complex assessment concepts. In EMI settings, professional development should also address the linguistic demands of assessment and offer strategies for scaffolding tasks to accommodate students' varying language proficiencies (Watnamongkol et al., 2025).

### **Implications**

The findings of this study offer several pedagogical and policy implications for improving assessment literacy among foreign teachers practicing EMI in Thai secondary schools. The moderate levels of assessment literacy demonstrated through quantitative results, combined with the inconsistencies observed in assessment practices, highlight an urgent need for context-responsive professional development tailored to the unique demands of EMI classrooms.

First, professional development programs should directly target the specific misconceptions identified in this study, particularly teachers' confusion between norm-referenced and criterion-referenced assessments and their limited application of formative assessment and scaffolding strategies. Recent studies emphasize that teacher learning is most effective when embedded in authentic classroom contexts and supported through iterative reflection and collaboration (Macaro et al., 2023; Pastore, 2023). Accordingly, training for EMI teachers should employ practice-based workshops that simulate real classroom challenges in science, mathematics, and physical education, allowing teachers to apply assessment theories *in situ* and receive ongoing feedback.

Second, sustained collaborative learning models, such as peer coaching, co-planning sessions, and professional learning communities (PLCs), should be integrated into teacher development programs. Such collaborative mechanisms enhance reflective practice, knowledge sharing, and long-term engagement with assessment reform (Pastore, 2023; Watnamongkol et al., 2025). These findings align with recent theoretical perspectives that frame assessment literacy as a socially constructed and situated competency rather than an individual attribute (Meijer, 2023).

Third, the results underscore the importance of language-aware assessment training that bridges content and linguistic objectives. EMI teachers face the dual challenge of evaluating subject mastery while accounting for learners' English proficiency levels. Current EMI research (Macaro et al., 2023; Thippayacharoen et al., 2023) supports integrating linguistically responsive assessment practices, such as simplified rubrics, multilingual feedback scaffolds, and multimodal assessment tasks. Therefore, EMI-specific assessment literacy frameworks should explicitly incorporate language-sensitive dimensions that promote equitable evaluation for multilingual learners.

Finally, policy-level action is essential. Educational policymakers and school leaders should develop contextually grounded assessment literacy standards for EMI teachers in

Thailand, informed by recent international frameworks (Pastore, 2023). These standards should guide teacher recruitment, certification, and ongoing professional growth. Institutional support must also include access to resources, digital tools, and administrative flexibility that allow teachers to implement diverse and formative assessment practices effectively. Addressing language-related barriers and ensuring alignment between curricular goals and assessment systems will be crucial to improving both teaching quality and student learning outcomes in Thai EMI settings.

### **Limitations and Recommendations**

This study was limited in several ways. First, the sample consisted of 54 foreign teachers teaching science, mathematics, or physical education in English programs within government secondary schools in northeastern Thailand. As such, the findings cannot be generalized to all EMI contexts in Thailand or other countries. The sample also relied heavily on self-reported data and researcher observation, which may introduce bias, despite triangulation efforts.

Given the regional and disciplinary focus, future studies should involve larger and more diverse populations across Thailand or within ASEAN to validate the findings. Incorporating students' perspectives or achievement data could also provide a richer understanding of the impact of teacher assessment literacy on learning outcomes.

Furthermore, it is recommended that future research investigate the effectiveness of context-specific professional development interventions designed based on the findings of this study. Mixed methods designs involving longitudinal data collection could capture shifts in practice and belief over time, while examining the influence of school leadership, national policy, and curricular demands on teachers' assessment behaviors.

### **Conclusion**

This study investigated the assessment literacy and practices of secondary school teachers in EMI classrooms within government secondary schools in northeastern Thailand. The study's findings advocate the importance of assessment literacy in ensuring effective teaching and learning in EMI contexts. Despite a moderate level of assessment literacy among the participants, significant gaps were identified in both the understanding and application of assessment principles. Specifically, areas such as norm-referenced versus criterion-referenced assessments and the role of high-stakes assessments emerged as critical points of concern.

The study revealed a disconnect between teachers' theoretical knowledge of assessment and their practical application in classrooms. While many teachers demonstrated a solid understanding of basic assessment concepts, this knowledge did not always translate into effective classroom practices. Formative assessments, self-assessment, and peer assessment were underutilized, and their implementation varied widely across different subjects. This inconsistency highlights the need for targeted interventions to bridge the gap between knowledge and practice.

Moreover, the study's findings suggest that the challenges faced by teachers in EMI classrooms are multifaceted, involving not only a lack of assessment literacy but also external factors such as time constraints, curriculum demands, and resource limitations. These factors contribute to the difficulties teachers face in implementing effective assessment practices that align with both instructional goals and the needs of their students.

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