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Research Article

Assessment Practices of Elementary School Teachers Based on Competency Mapping: An Equity-Oriented Perspective for Supporting Deep Learning

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Abstract

Assessment and feedback play a critical role in supporting meaningful learning and promoting students' higher-order thinking skills; however, many elementary school teachers continue to experience difficulties in designing student-centered assessments that support deep learning processes. This study aims to analyze elementary school teachers' assessment practices based on competency mapping within a deep learning perspective and an equity-oriented framework of teacher professional development. The study employed a quantitative descriptive approach using secondary data from teacher competency mapping conducted by Balai GTK Lampung in 2025 involving 19,384 elementary school teachers. Data were analyzed using descriptive statistical techniques to examine the distribution of pedagogical competencies, particularly in the assessment domain. The findings indicate that teachers demonstrate relatively adequate competence in establishing safe learning environments and implementing student-centered learning, while competencies related to formative assessment design and feedback provision remain comparatively lower than other pedagogical domains. These results suggest that assessment literacy supporting deep learning has not yet been optimally implemented in elementary classrooms and requires targeted professional development interventions. From an inclusive education perspective, strengthening assessment competence is essential for improving equitable classroom participation and supporting teachers' instructional agency and professional wellbeing. This study contributes to the literature by providing large-scale competency mapping evidence on teachers' assessment practices and highlighting assessment literacy as a strategic component of welfare-oriented and equity-responsive teacher development aligned with Sustainable Development Goals 4 and 5.

Keywords: Assessment Literacy; Competency Mapping; Deep Learning; Elementary School Teachers; Equitable Education.

INTRODUCTION

Assessment and feedback play a central role in supporting meaningful learning and promoting students' higher-order thinking skills. In the context of deep learning, assessment is not merely a tool for measuring learning outcomes but functions as a formative process that guides students' conceptual understanding, reflective thinking, and active engagement in learning. Formative assessment practices have been widely recognized as essential components of instructional strategies that foster deep learning and improve students' academic achievement across educational levels [1], [2], [3].

Despite its importance, many elementary school teachers continue to experience challenges in designing student-centered assessments and providing constructive feedback that supports deeper learning processes. Assessment literacy remains one of the most complex domains of pedagogical competence because it requires teachers to integrate instructional goals, evaluation strategies, and responsive feedback into classroom practice [4], [5]. Limited competence in assessment design may reduce teachers' instructional flexibility and affect the quality of classroom interaction, ultimately influencing students' opportunities to engage in meaningful learning experiences [6], [7], [8].

From an equity-oriented perspective, assessment competence also represents an important component of inclusive teaching practices and teachers' professional wellbeing within education systems. Teachers' ability to implement fair and responsive assessment practices contributes to the creation of supportive learning environments that accommodate diverse student needs and participation patterns [9], [10], [11]. In elementary education contexts, where teaching is largely supported by a predominantly female workforce, strengthening assessment literacy becomes closely connected to broader efforts to enhance equitable professional development opportunities and improve teachers' instructional agency [12], [13], [14]. Therefore, assessment competence should not only be understood as a technical pedagogical skill but also as part of a wider framework of teacher empowerment and welfare-oriented education improvement.

Furthermore, improving teachers' assessment practices is aligned with global commitments to strengthening education quality and equity, particularly within the framework of Sustainable Development Goal (SDG) 4 on quality education and SDG 5 on gender equality. Strengthening teachers' capacity to design student-centered assessments contributes to inclusive learning environments that support diverse learners and promote equitable participation in classroom processes [15], [16], [17]. Competency mapping data therefore provide important evidence for identifying areas of pedagogical strength and limitation that can inform targeted professional development policies and equitable teacher support systems.

In Indonesia, competency mapping initiatives conducted by teacher development institutions provide valuable large-scale data for understanding teachers' pedagogical readiness in implementing student-centered learning approaches. However, empirical evidence describing teachers' assessment-related competencies within the perspective of deep learning remains limited, particularly at the elementary school level. Existing studies have generally focused on instructional strategies and curriculum implementation, while fewer investigations have examined assessment practices as a structural component supporting inclusive and meaningful learning environments [18], [19], [20].

Therefore, this study aims to analyze elementary school teachers' assessment practices based on competency mapping within the perspective of deep learning. Using secondary data from teacher competency mapping conducted by Teacher and Education Personnel Development Center (Balai GTK) Lampung in 2025, the study examines the distribution of teachers' pedagogical competencies, particularly in the assessment domain. The findings are expected to provide evidence-based recommendations for strengthening assessment literacy and supporting professional development programs that promote inclusive, equitable, and welfare-oriented teaching practices in elementary education contexts.

METHODS

Research Design

This study employs a quantitative descriptive research approach to analyze elementary school teachers' assessment practices based on competency mapping within the perspective of deep learning. A quantitative approach was selected because the study aims to describe and interpret patterns of teachers' competencies using numerical data derived from large-scale competency mapping. Descriptive research is appropriate for this study because it focuses on describing existing conditions and identifying patterns of teacher competencies in assessment practices without manipulating variables.

The research relies on secondary data analysis, which allows researchers to utilize existing datasets generated from teacher competency mapping conducted by educational institutions. Secondary data analysis is widely used in educational research to explore large datasets and generate insights that can inform educational policy and professional development programs.

Population and Sample

The population of this study consists of elementary school teachers in Lampung Province who participated in the teacher competency mapping program conducted in 2025. The dataset includes 19,384 teachers, representing various districts and municipalities within the province.

Because the study utilizes existing competency mapping data, the research adopts a total sampling approach, meaning that all available data in the dataset are included in the analysis. This approach allows the study to provide a comprehensive overview of teachers' competencies across the entire population of elementary school teachers who participated in the competency mapping program.

Research Instrument

Data were gathered through secondary data analysis of teacher competency mapping results conducted by the Balai GTK of Lampung Province. The competency mapping instrument was designed to measure teachers' competencies across four main domains: pedagogical competence, professional competence, social competence, and personality competence.

For the purpose of this study, the analysis focuses on the pedagogical competence domain, particularly indicators related to assessment practices and feedback provided to students. The instrument used in the competency mapping includes several indicators that measure teachers' ability to: 1) create a safe and supportive learning environment; 2)

implement student-centered learning; 3) design and implement assessment practices; 4) provide feedback to support students' learning processes. These indicators are aligned with the teacher competency framework established in national educational policy.

Table 1. Teacher Competency Domains in the Competency Mapping Instrument

Description	Information
Description 1	Pedagogical Competence
Description 2	Professional Competence
Description 3	Social Competence
Description 4	Personality Competence

Data Analysis

Data analysis was conducted using descriptive statistical techniques to examine the distribution and average scores of teachers' competencies. Descriptive statistics allow researchers to summarize large datasets and identify patterns in teachers' assessment practices. The analysis includes: 1) calculation of mean scores for each competency domain; 2) analysis of frequency distribution of teacher competency levels; 3) comparison of competency scores across different pedagogical indicators.

Statistical analysis was performed using Microsoft Excel application, which enables efficient processing and interpretation of large datasets. The results of the analysis are presented in tables and graphical visualizations to facilitate interpretation and discussion.

RESULTS AND DISCUSSION

The results of this study are presented in a structured manner to highlight key findings related to elementary school teachers' assessment practices based on competency mapping. The findings focus primarily on pedagogical competence, particularly indicators related to assessment and feedback practices, which are considered essential components in supporting deep learning in classroom instruction.

Distribution of Teacher Competencies Based on Competency Mapping

The first finding describes the overall distribution of teacher competencies based on the results of competency mapping conducted among elementary school teachers in Lampung Province. The competency mapping results indicate variations in teachers' competencies across four main domains: pedagogical competence, personality competence, professional competence, and social competence.

Table 2. Distribution of Teacher Competency Scores

Competency Domain	Average Score	Category
Pedagogical Competence	60.23	Moderate
Personality Competence	59.22	Moderate
Professional Competence	57.63	Moderate

Competency Domain	Average Score	Category
Social Competence	52.34	Moderate

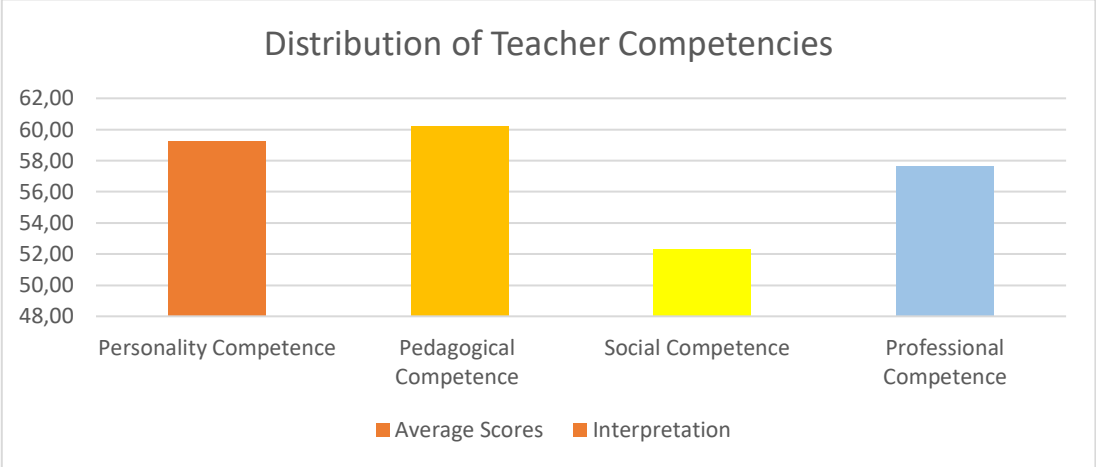

Figure 1. Distribution of Teacher Competencies

Based on Table 2 and Figure 1, the results show that pedagogical competence recorded the highest average score among the four competency domains. However, although pedagogical competence appears relatively higher compared to other competencies, further analysis indicates that several indicators within this domain remain relatively weak. Previous studies emphasize that teachers' competencies in instructional design and assessment practices are crucial for improving learning outcomes [21], [22].

Figure 1 illustrates the distribution of teachers' competencies across four domains: personality competence, pedagogical competence, social competence, and professional competence. Pedagogical competence recorded the highest average score (60.23), indicating that teachers generally demonstrate relatively stronger abilities in managing learning processes and facilitating classroom instruction. Personality competence followed with an average score of 59.22, while professional competence recorded 57.63.

In contrast, social competence obtained the lowest average score (52.34), which may indicate the need to strengthen teachers' communication and collaborative skills within educational environments. Although pedagogical competence shows the highest score, the differences among the four domains remain relatively small, suggesting that teachers' competencies are generally balanced but still fall within the moderate category.

These findings are consistent with international research indicating that teachers in many developing contexts demonstrate stronger competencies in classroom management than in instructional practices that promote deeper learning [23], [24], [25]. Therefore, strengthening teacher professional development programs remains essential to improve pedagogical practices that support meaningful learning experiences.

Distribution of Pedagogical Competence Indicators

Further analysis was conducted to examine the distribution of pedagogical competence indicators, particularly those related to classroom instruction and assessment practices.

Table 3. Pedagogical Competence Indicators

Aspects of Pedagogical Competence	Average Score	Interpretation
Safe Learning Environment	62.69	Good
Student-Centered Learning	60.63	Moderate
Assessment and Feedback	47.33	Moderate

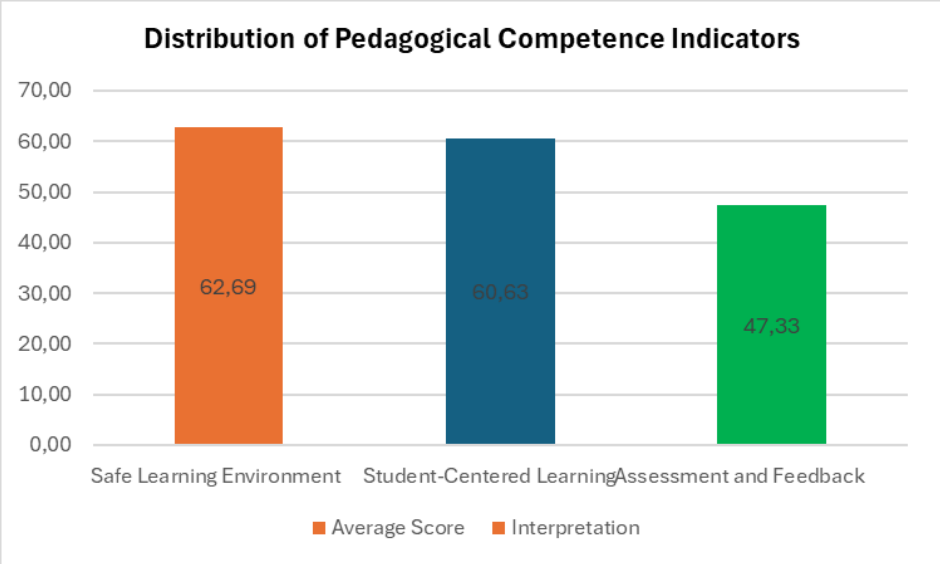

Figure 2. Distribution of Pedagogical Competence Indicators

Based on Table 3 and Figure 2, the results indicate that the assessment and feedback indicator recorded the lowest average score (47.33) compared to other pedagogical competence indicators. In contrast, the safe learning environment indicator obtained the highest score (62.69), followed by student-centered learning with an average score of 60.63. These findings suggest that teachers generally demonstrate stronger competencies in managing classroom environments and facilitating student-centered learning activities than in designing and implementing assessment strategies.

The relatively lower score in the assessment and feedback indicator indicates that teachers may still encounter challenges in developing assessment practices that effectively support meaningful learning. In many cases, teachers tend to focus more on evaluating learning outcomes rather than using assessment as a tool to monitor learning progress and provide constructive feedback to students. Further analysis also shows that the designing student-centered assessment indicator recorded an even lower score (32.88), suggesting that teachers may experience difficulties in designing assessment tasks that actively engage students in the learning process.

Recent studies highlight similar patterns in educational contexts worldwide. Research by Ndlovu [26] indicates that teachers frequently demonstrate stronger competencies in classroom management than in formative assessment practices. As a result, assessment is often implemented primarily as a summative evaluation tool, rather than as a formative process that supports students' learning improvement.

From the perspective of deep learning, assessment and feedback play a crucial role in supporting students' conceptual understanding and reflective learning. Effective assessment practices enable teachers to identify students' learning difficulties and adjust instructional

strategies accordingly [27], [28], [29]. Student-centered assessment, in particular, encourages students to engage in higher-order thinking, reflection, and knowledge application during the learning process. Therefore, strengthening teachers' competencies in designing formative assessment and providing meaningful feedback becomes an essential component of professional development programs aimed at improving instructional quality and promoting deeper learning experiences in classrooms.

Teachers' Competencies in Assessment Practices

To further understand the weaknesses in assessment practices, the analysis examined teachers' competencies in designing student-centered assessment strategies.

Table 4. Assessment Competency Indicators

Assessment Indicator	Average Score	Category
Designing Student-Centered Assessment	32.88	Low
Implementing Assessment	61.78	Moderate
Providing Feedback	47.33	Moderate

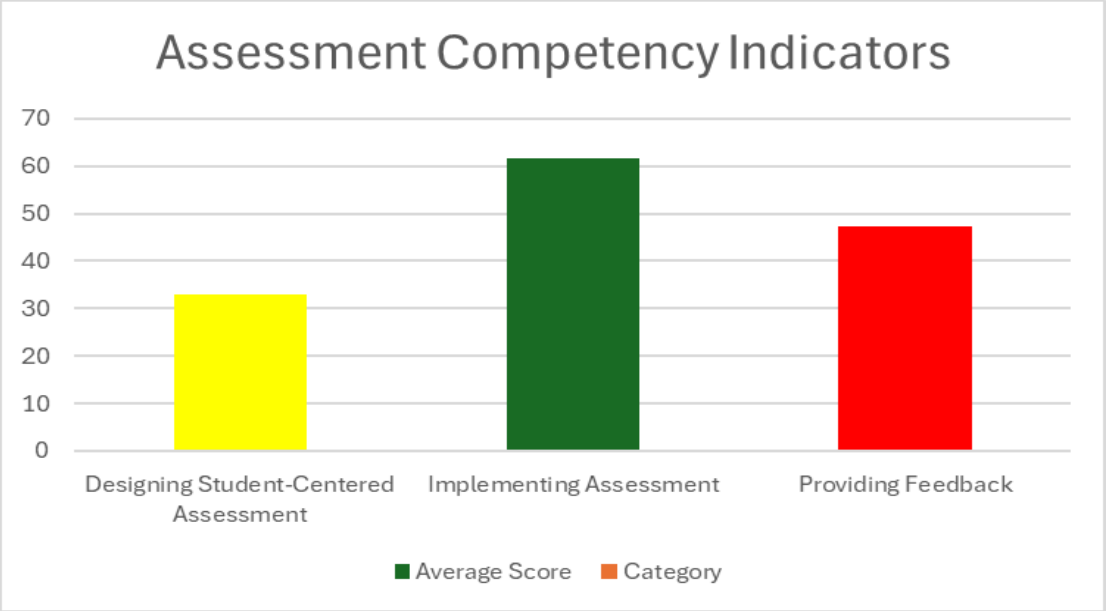

Figure 3. Assessment Competency Indicators

Based on Table 4 and Figure 3, the results indicate that the competency indicator designing student-centered assessment recorded the lowest average score (32.88) and falls within the low category. This finding suggests that many teachers still experience difficulties in designing assessment strategies that actively involve students in the learning process. Student-centered assessment requires teachers to develop tasks that encourage students to demonstrate understanding through inquiry, problem solving, reflection, and authentic learning activities.

In contrast, the indicator implementing assessment obtained the highest average score (61.78), indicating that teachers are generally capable of conducting assessment activities during the learning process. Meanwhile, the indicator providing feedback recorded a moderate

score (47.33), suggesting that feedback practices are implemented but may not yet function optimally as formative tools that support students' learning improvement.

These findings indicate that teachers are relatively able to carry out assessment activities, but they may still face challenges in designing meaningful assessment strategies and providing effective feedback that supports students' learning processes. Similar patterns have been identified in international studies showing that teachers often demonstrate stronger competencies in implementing routine assessment practices than in designing authentic or formative assessment tasks [30], [31], [32].

From the perspective of deep learning, assessment design and feedback are essential components that help students develop deeper conceptual understanding and reflective learning skills [33], [34]. Therefore, strengthening teachers' competencies in designing student-centered assessments and providing meaningful feedback is crucial for supporting the implementation of deep learning in classroom instruction.

Implications of Assessment Competency Distribution for Inclusive and Equitable Teaching Practices

The distribution of teachers' pedagogical competencies indicates that assessment-related competencies remain comparatively lower than other domains of instructional practice. Although teachers demonstrate relatively adequate competence in establishing safe learning environments and implementing student-centered instruction, their capacity to design student-centered assessments and provide constructive feedback appears less developed. This condition suggests that formative assessment practices supporting deep learning have not yet been optimally integrated into classroom instruction at the elementary school level.

From an inclusive education perspective, limitations in assessment competence may influence teachers' ability to provide differentiated feedback that supports diverse learners' participation and engagement. Student-centered assessment practices are essential components of equitable classroom environments because they enable teachers to respond to variations in students' readiness levels, learning styles, and socio-emotional needs. Therefore, strengthening teachers' assessment literacy becomes an important strategy for improving equitable instructional support in elementary classrooms.

To further illustrate the relative position of assessment competence compared with other pedagogical competency domains, Table 5 presents the distribution of competency indicators based on teacher competency mapping data.

Table 5. Distribution of Pedagogical Competencies Across Instructional Domains

Pedagogical Competency Domain	Competency Level Category	Relative Position
Safe learning environment implementation	High	Strong
Student-centered learning implementation	Moderately high	Adequate
Classroom interaction facilitation	Moderate	Developing
Feedback provision practices	Moderate	Needs strengthening
Student-centered assessment design	Low	Priority improvement area

The data presented in Table 5 show that competencies related to classroom climate and instructional interaction tend to be stronger than competencies associated with assessment design and feedback practices. The lowest indicator appears in teachers' ability to design student-centered assessments, which represents a critical component of formative assessment supporting deep learning processes. This finding indicates the need for targeted professional development programs focusing on strengthening assessment literacy at the elementary school level.

Furthermore, assessment competence also plays an important role in supporting equitable participation opportunities within classroom learning processes. Teachers who demonstrate stronger assessment literacy are more likely to provide adaptive instructional responses and meaningful feedback that encourage student engagement. In contrast, limited assessment competence may reduce teachers' ability to monitor students' conceptual understanding continuously and adjust instruction accordingly. Table 6 presents the implications of assessment competency levels for inclusive classroom practices.

Table 6. Implications of Assessment Competency Levels for Inclusive Teaching Practices

Assessment Competency Indicator	Instructional Implication	Equity-Oriented Impact
Student-centered assessment design	Supports differentiated instruction	Improves participation opportunities
Formative feedback provision	Enhances learning monitoring	Strengthens learning responsiveness
Learning progress evaluation	Guides instructional adjustment	Reduces learning disparities
Reflective assessment practices	Encourages metacognitive development	Promotes learner autonomy

As shown in Table 6, assessment competence contributes not only to instructional effectiveness but also to the creation of equitable learning environments that support diverse student needs. Strengthening formative assessment practices enables teachers to provide timely feedback and adjust instructional strategies based on students' learning progress. This condition supports the development of inclusive classroom practices aligned with deep learning principles.

In addition, competency mapping results highlight the importance of strengthening assessment literacy as part of broader teacher professional development strategies. Assessment competence functions as a foundational component of instructional agency that allows teachers to design responsive learning environments and support meaningful student participation. Therefore, improving teachers' capacity in designing student-centered assessments represents an essential step toward strengthening inclusive and welfare-oriented educational practices at the elementary school level.

Discussion

The findings of this study indicate that elementary school teachers demonstrate relatively adequate competence in creating safe learning environments and implementing student-centered instruction, but show comparatively lower competence in designing student-centered assessments and providing formative feedback. This pattern confirms that assessment literacy remains one of the most challenging domains of pedagogical competence, particularly in

supporting deep learning-oriented classroom practices. Previous research has consistently highlighted that teachers often experience difficulty integrating formative assessment strategies into instructional planning due to limited conceptual understanding and insufficient professional development opportunities [2], [35], [36]. The present study extends this evidence by demonstrating that similar challenges persist at a large-system level within elementary education contexts, suggesting that assessment competence remains a structural issue rather than an individual instructional limitation.

The relatively lower competence in student-centered assessment design identified in this study also has important implications for the implementation of deep learning approaches in elementary classrooms. Deep learning requires assessment practices that support inquiry, reflection, and conceptual understanding rather than memorization-based evaluation. However, when teachers' assessment literacy is limited, instructional practices tend to remain oriented toward summative measurement rather than formative learning support. This finding is consistent with earlier studies showing that effective formative assessment plays a central role in promoting higher-order thinking skills and meaningful learning engagement [26], [37]. Therefore, strengthening assessment competence is essential for ensuring the successful implementation of deep learning frameworks in primary education.

From an inclusive education perspective, the distribution of pedagogical competencies identified in this study suggests that limitations in assessment literacy may influence teachers' capacity to respond to diverse student learning needs. Formative assessment enables teachers to monitor learning progress continuously and adjust instructional strategies in ways that support equitable classroom participation. When such competencies remain underdeveloped, opportunities for differentiated instruction and responsive feedback may be reduced. This interpretation aligns with Kleinlein [18] argument that assessment practices play a critical role in building inclusive learning environments that accommodate diverse learners' cognitive and socio-emotional needs. Consequently, improving teachers' assessment competence represents an important strategy for strengthening equitable participation opportunities in elementary education contexts.

In addition to supporting instructional quality, assessment competence also contributes to teachers' professional agency and wellbeing within education systems. Teachers who possess stronger assessment literacy are more capable of making informed pedagogical decisions and adapting instruction based on students' learning progress. Conversely, limited assessment competence may increase instructional uncertainty and reduce teachers' confidence in implementing student-centered learning strategies. Previous studies have shown that access to structured professional development in assessment literacy is closely associated with improved instructional autonomy and professional empowerment among teachers [4]. In elementary education systems where teaching is largely supported by a predominantly female workforce, strengthening assessment competence can therefore be understood not only as a pedagogical priority but also as part of broader efforts to enhance equitable professional support and welfare-oriented teacher development.

Furthermore, the large-scale competency mapping data analyzed in this study provide important evidence for identifying priority areas in teacher professional development programs. While previous studies have typically examined assessment literacy using small-scale classroom-based samples, the present findings demonstrate the value of system-level

competency mapping for informing policy-relevant interventions in teacher training. This evidence supports earlier research suggesting that competency mapping frameworks can function as strategic tools for improving instructional quality through targeted professional development initiatives [38]. As a result, strengthening assessment literacy should be positioned as a central component of teacher capacity-building programs designed to support inclusive and deep learning-oriented instructional transformation.

The novelty of this study lies in its integration of large-scale competency mapping data with a deep learning perspective to examine elementary school teachers' assessment practices within an equity-oriented framework of teacher professional development. Unlike previous studies that primarily focused on classroom-level assessment implementation, this study provides system-level evidence describing the distribution of assessment competence across a large population of teachers, thereby offering a broader understanding of structural challenges affecting formative assessment practices in elementary education. The findings also contribute to the growing literature linking assessment literacy with inclusive teaching practices and teacher wellbeing, particularly in education systems where strengthening equitable professional support remains a key priority. Practically, the results of this study suggest the need for targeted professional development programs focusing on student-centered assessment design and formative feedback strategies as essential components of deep learning implementation. At the policy level, competency mapping data can be used as an evidence-based foundation for developing welfare-oriented teacher support systems aligned with Sustainable Development Goal 4 on quality education and Sustainable Development Goal 5 on gender equality, particularly in strengthening equitable access to professional learning opportunities for elementary school teachers.

CONCLUSION

This study demonstrates that although elementary school teachers show relatively adequate competence in creating safe learning environments and implementing student-centered instruction, their competencies in designing student-centered assessments and providing formative feedback remain comparatively lower. These findings indicate that assessment literacy continues to represent a critical area requiring strengthening to support the effective implementation of deep learning in elementary classrooms. From an equity-oriented perspective, improving assessment competence is essential not only for enhancing instructional quality but also for supporting inclusive learning environments and strengthening teachers' professional agency within education systems. The results highlight the importance of competency mapping data as an evidence-based foundation for designing targeted professional development programs that prioritize assessment literacy and responsive feedback practices. Strengthening these competencies can contribute to more equitable participation opportunities for students and support welfare-oriented teacher development aligned with Sustainable Development Goal 4 on quality education and Sustainable Development Goal 5 on gender equality.

LIMITATIONS

This study relies on secondary data derived from large-scale teacher competency mapping conducted by Balai GTK Lampung, which limits the possibility of examining contextual classroom-level variables influencing assessment practices. Although the dataset provides broad system-level insights into the distribution of pedagogical competencies, it does not capture teachers' instructional decision-making processes, classroom interaction patterns, or institutional support structures that may affect the implementation of formative assessment strategies. Future studies are therefore encouraged to combine competency mapping data with classroom observations or qualitative investigations to obtain a more comprehensive understanding of assessment literacy development in elementary education contexts.

In addition, the study focuses primarily on descriptive statistical analysis of competency distribution and does not explore demographic variations such as gender, teaching experience, certification status, or school characteristics that may influence teachers' assessment practices. As a result, further research incorporating disaggregated analyses across teacher background variables is necessary to better understand structural inequalities in access to assessment literacy development opportunities. Such investigations would provide stronger evidence for designing gender-responsive and welfare-oriented professional development policies that support inclusive and equitable teaching practices in elementary education systems.

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AUTHOR CONTRIBUTION

N.W. conceptualized the study, designed the methodology, conducted the interviews, analyzed the qualitative data, and led the manuscript drafting process. H. supervised the research design, provided methodological guidance, contributed to the refinement of the analytical framework, and critically revised the manuscript for intellectual content. Both authors reviewed and approved the final version of the manuscript.

CONFLICT OF INTEREST

"The authors declare no conflict of interest."

DECLARATION OF USE OF AI IN SCIENTIFIC WRITING

The authors used ChatGPT during the preparation of this work to design graphics and images. After utilizing the tool, the authors thoroughly reviewed and edited the content as necessary, assuming full responsibility for the publication's content.

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