

Exploring Assessment Literacy & Practice among Geography Teachers In Indonesian Senior High Schools: A Survey Study

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Abstract: Assessment literacy is a critical competency that teachers must possess to support high-quality assessment practices and improve student learning outcomes. However, research on assessment literacy among geography teachers remains relatively limited, particularly in Indonesia. This study investigated the assessment literacy and assessment practices of Indonesian secondary school geography teachers using survey data collected from multiple regions and identified differences between public and private schools. The study employed a quantitative approach with a cross-sectional comparative survey design. A total of 271 geography teachers from various regions across Indonesia participated in the study. The research instrument was developed based on the concepts of Assessment for Learning (AfL) and Data-Based Decision Making (DBDM). Data were analyzed using descriptive statistics and comparative tests. The results revealed that geography teachers demonstrated moderate to high levels of assessment literacy and assessment practices. The highest competencies were observed in analyzing and interpreting assessment results (83.37%), providing feedback to students (83.33%), and principal support for assessment implementation (81.62%). In contrast, scores were relatively lower for the use of information technology in assessment (75.62%), teachers' attitudes and behaviors toward assessment (77.16%), and professional collaboration among teachers (78.58%). Furthermore, most dimensions of assessment literacy and assessment practices did not differ significantly between geography teachers in public and private secondary schools in Indonesia. These findings underscore the need for continuous professional development programs focused on strengthening digital assessment literacy, enhancing professional collaboration, and optimizing assessment as an integral part of instructional improvement. This study contributes to assessment literacy research in geography education and provides an empirical foundation for designing teacher training programs in Indonesia.

Keywords: assessment literacy, assessment for learning, assessment data, formative assessment, data-based decision making.

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■ INTRODUCTION

The massive escalation of globalization in the 21st century, which has implications for the rapid development of science and technology, poses a challenge for all countries, including Indonesia. In this recent era, education has been widely acknowledged as a key factor in preparing the younger generation as the vanguard of globalization with 21st-century skills (Asmawati et al., 2018). In education, teaching is a highly complex activity that involves various

components, including curriculum, subject matter, epistemology, and assessment and evaluation of learning (Azis, 2012). The essence of the educational process and schooling relates to what is taught, how content is taught and learned, and how learning is assessed and evaluated (Brown, 2008).

Assessment has been identified as an urgent matter to analyze (Russel & Markle, 2017) and is considered essential, making it inseparable from learning (Bijsterbosch et al., 2019; Sahin &

Subasi, 2019; Zulaiha et al., 2020). Stiggins (1999) stated that teachers spend 30%-50% of their professional time organizing assessments. Assessment is important because it helps improve the quality of learning. It helps diagnose students' learning achievements and provide feedback on strengths and weaknesses, offering valuable insights into the effectiveness and efficiency of instruction (Harlen & James, 1996; Omar et al., 2018; Rwanamiza, 2008). The urgency of assessment requires teachers to be assessment literate (Lutfiyyah et al., 2020; Soltanpour & Valizadeh, 2019).

Stiggins (1991) first introduced assessment literacy, defining it as teachers' understanding of the principles underlying assessment and the skills needed to assess students' learning competencies. Teachers with strong assessment literacy know what and how to assess, understand the crucial implications of assessment, and can address issues that arise from assessment results. Therefore, analyzing and exploring assessment literacy among teachers is urgent, as evidence shows that teachers' conceptions and perceptions of learning and the curriculum strongly influence their teaching practices (Rashid & Jaidin, 2014). Teachers' perceptions of assessment will also impact their assessment practices (Brown & Gao, 2015; Mellati & Khademi, 2018). Implementing quality assessment affects learning effectiveness and students' competency achievement, which is why teachers must have strong assessment literacy (Pastore & Andrade, 2019; Zulaiha & Mulyono, 2020). Teachers with strong assessment literacy can choose the best assessment options to support students' success in achieving learning competencies (Popham, 2009), and students may also have more positive perceptions of assessment implementation, which ultimately influences how they learn (Cho et al., 2020).

Various studies have revealed that many teachers still lack assessment literacy. These

include Benzehaf (2017), Guskey (2003), Kanjee (2015), Lam (2019), Nurdiana (2020), Rashid & Jaidin (2014), and Umam & Indah (2020). All studies state that many teachers still need to better understand assessment concepts, leading to poor assessment practices. Pastore, Manuti, & Scardigno (2019) state that many teachers have misconceptions about assessment, considering it solely as a means to measure students' cognitive abilities at the end of instruction rather than an integral part of learning that can be used as a reference to improve its quality. Similar issues are also highlighted in studies by Djoub (2017), Kruiper, Leenknecht, & Slof (2021), and Vlachou (2018). Furthermore, research indicates that many teachers have good awareness and knowledge of assessment, but this knowledge needs to be more effectively reflected in their classroom assessment practices (Rahman, 2017). Additionally, Maki (2002) raises a significant concern. Some institutions perceive assessment as a periodic activity to fulfill institutional accreditation requirements and become preoccupied with preparing assessment plans and various assessment methods solely for accreditation purposes (Qomariyah et al., 2019).

However, research on assessment literacy is predominantly conducted among language teachers. These studies include research by Luthfiyyah, Basyari, & Dwiniasih (2020), Nasr et al. (2018), Nurdiana (2020), Umam & Indah (2020), Zulaiha, Mulyono, & Ambarsari (2020), and Valizadeh (2019). However, assessment literacy is not limited to specific subjects; it is a general requirement for all teachers to possess strong assessment literacy in their teaching context (Zolfaghari & Ahmadi, 2016), including Geography. More studies are needed on assessment literacy among Geography teachers. Studies that have touched on this topic include research by Bijsterbosch, Beneker, Kuiper, & Schee (2019) and Bijsterbosch, Beneker, Kuiper, & Schee (2020). Previous studies by

Bijsterbosch, Schee, & Kuiper (2017) and Bijsterbosch, Schee, Kuiper, & Beneker (2016) have also focused on the knowledge, attitudes, and practices of assessment among Geography teachers, revealing that many teachers still struggle to develop high-quality assessment items aligned with higher-order thinking skills (HOTS) and meaningful learning. Other studies by Eze (2021) and Lane & Bourke (2017) indicate that limited research explicitly explores assessment literacy among Geography teachers and feedback provision during the assessment process. Existing studies focus more on implementing formative assessment, spatial reasoning, marking, content assessment analysis, or assessment strategies.

Based on this background, this study aims to analyze the level of assessment literacy among high school geography teachers in Indonesia and to compare competencies between teachers in public schools and teachers in private schools. To achieve this goal, this study poses three research questions, which include: (1) What is the level of assessment literacy and assessment practices among geography teachers? (2) Which indicators obtained the highest and lowest scores? (3) Is there a difference in the level of assessment literacy between teachers in public schools and teachers in private schools?

Based on the research questions and the comparative objective of this study, the study further formulated the following hypotheses. The null hypothesis (H_0) states that there is no statistically significant difference in assessment literacy between geography teachers in public and private schools. Conversely, the alternative hypothesis (H_a) states that there is a statistically significant difference in assessment literacy between geography teachers in public and private schools.

■ METHOD

Research Design

This study adopted a quantitative approach, using a cross-sectional comparative survey design

to compare levels of assessment literacy and classroom assessment practices among senior high school geography teachers by school status (public versus private) in Indonesia. The framework used to analyze assessment literacy and assessment practices was adapted from Kippers et al. (2018), which focuses on Assessment for Learning (AfL) and Data-Based Decision Making (DBDM).

Participants and Sampling Procedures

The participants consisted of 271 senior high school geography teachers in Indonesia, drawn from both public and private schools. Respondents were selected using snowball sampling, with the majority being members of the Geography Subject Teachers' Working Group (MGMP) at the district/city and provincial levels. Although the study involved geography teachers from several regions of Indonesia, the distribution of respondents was geographically uneven, with a substantial proportion coming from Central Java and East Java. This distribution reflects the recruitment pattern resulting from the snowball sampling approach and should be considered when interpreting the generalizability of the findings.

Data Collection and Research Instrument

Data were collected through an online questionnaire administered via Google Forms. The instrument in this study was adopted from the assessment literacy framework proposed by Kippers et al. (2018), which conceptualizes assessment literacy into three main domains: assessment domain, teacher domain, and context domain. This framework was not adopted directly in its original form; however, in this study, it was restructured and operationalized to better reflect the context of high school geography teachers in Indonesia. Several conceptually related dimensions were synthesized into seven operational indicators representing assessment literacy and assessment practices: (1) assessment

design, (2) analysis and interpretation of assessment results, (3) feedback provision, (4) teachers' attitudes and assessment behavior, (5) teachers' use of information technology, (6) principal facilitation, and (7) teacher collaboration.

This research instrument was developed through conceptual adaptation of an existing framework, and its psychometric items were

developed and evaluated using empirical statistical procedures and expert judgment. Prior to empirical statistical testing, the instrument items underwent validity testing to determine the Content Validity Index (CVI) through expert judgment. The expert judgment process involved six experts, comprising three academics and three practitioners (teachers). The results of the expert judgment are presented in Table 1.

Table 1. CVI based on expert judgment

Indicator	Number of items	I-CVI Range	S-CVI/Ave	Decision
Planning of Assessment	7	66.67 – 100	92.85	Acceptable
Feedback Provision	9	66.67 – 100	96.30	Acceptable
Teacher's Personal Attributes	3	100	100	Acceptable
Analysis and Interpretation of Assessment Results	6	83.33 – 100	97.22	Acceptable
Use of ICT in Assessment	4	100	100	Acceptable
Facilitation by the Principal	2	83.33	83.33	Acceptable
Collaboration Among Teachers	3	83.33 - 100	94.44	Acceptable
Source: Data Analysis, 2026				

After the expert judgment and revision process, the developed instrument was validated using Pearson correlation analysis and reliability testing with 30 respondents. The results indicated

that all items were valid, and the overall instrument demonstrated good reliability for both the assessment-literacy and assessment-practices variables (Table 2).

Table 2. Results of instrument validity and reliability testing

No. of items	Planning of Assessment	Feedback	Teacher's Personal	Result Analysis and Interpretation	Use of ICT in Assessment	Facilitation by Principal	Collaboration Among Teachers
P1	0.713	0.691	0.889	0.827	0.883	0.917	0.869
P2	0.693	0.753	0.877	0.790	0.921	0.869	0.869
P3	0.637	0.605	0.807	0.841	0.913		0.841
P4	0.619	0.780		0.768	0.875		
P5	0.519	0.738		0.856			
P6	0.669	0.893		0.816			
P7	0.786	0.827					
P8	0.691	0.632					
P9	0.753	0.724					
CA	0.779	0.888	0.801	0.897	0.918	0.738	0.814

Note: Column values represent the calculated Pearson correlation coefficient (r); values in the bottom row represent Cronbach's alpha (CA). Questionnaire items are considered valid if r calculated $> r$ table (0.361). The instrument is considered reliable if $CA > 0.7$.

Source: Data Analysis, 2026

Before data collection, all respondents were informed of the study's purpose, benefits, and their right to participate voluntarily. All respondents provided informed consent before completing the questionnaire. Respondents were also free to discontinue participation at any time without consequences. To maintain data confidentiality, this study did not collect any personally identifiable information, and all data were analyzed anonymously. The data obtained were used solely for scientific research purposes.

Data Analysis

Data were analyzed using descriptive statistics and comparative tests. An independent-samples t-test was used when the data met the assumptions of normality and homogeneity; otherwise, the Mann-Whitney U test was used. These techniques described the level and characteristics of assessment literacy and assessment practices among geography teachers in Indonesia. Quantitative descriptive analysis was also used to examine each indicator in greater detail, identifying strengths and weaknesses in the teachers' assessment literacy and practices. A comparative test was conducted to determine whether there were statistically significant differences in assessment literacy and assessment practices between geography teachers in public and private senior high schools in Indonesia.

To facilitate the interpretation of the overall assessment literacy scores, the mean scores were transformed into percentage scores. The percentage score was calculated by dividing the observed mean score by the maximum possible score and multiplying the result by 100. Because the instrument used a four-point Likert scale, the percentage score was

calculated as $P = (X / 4) \times 100$, where P represents the percentage score, and X represents the mean score. The calculation used unrounded mean scores to minimize rounding effects.

Prior to comparative analysis, the distribution of the assessment literacy scores was examined using the one-sample Kolmogorov–Smirnov test with Lilliefors significance correction. A significance level of $\alpha = .05$ was used to evaluate the normality assumption. The results indicated statistically significant departures from normality across all seven assessment literacy dimensions. Therefore, a non-parametric Mann–Whitney U test was used to compare assessment literacy scores between public- and private-school teachers.

■ RESULT AND DISCUSSION

Overall Assessment Literacy Profile

The assessment literacy and assessment practices questionnaire was completed by 271 geography teachers from various senior high schools across Indonesia, representing both public and private institutions. Table 3 presents the general demographic profile of the respondents.

Of all respondents, 38.7% (N = 105) were from Central Java, 17% (N = 46) from East Java, 10% (N = 27) from West Java, 10.7% (N = 29) from DKI Jakarta and Banten, 4.1% (N = 11) from the Special Region of Yogyakarta, 2.6% (N = 7) from Bali and West Nusa Tenggara, 9.3% (N = 25) from Sumatra, 4.8% (N = 13) from Kalimantan, and 3% (N = 8) from Sulawesi.

The profile of assessment literacy levels among geography teachers in public schools Moreover, Figure 1 presents the profile of assessment literacy levels among geography teachers in private schools across seven dimensions. Overall, the measurement results indicate that geography teachers in both types of schools possess a high level of assessment literacy. This is evidenced by mean scores across all dimensions that consistently exceed 3.00 on a scale of 0.00 to 4.00. Mean scores for public school teachers ranged from 3.02 to 3.35, while those for private school teachers ranged from 3.07 to 3.33.

Table 3. Demographic overview of respondents

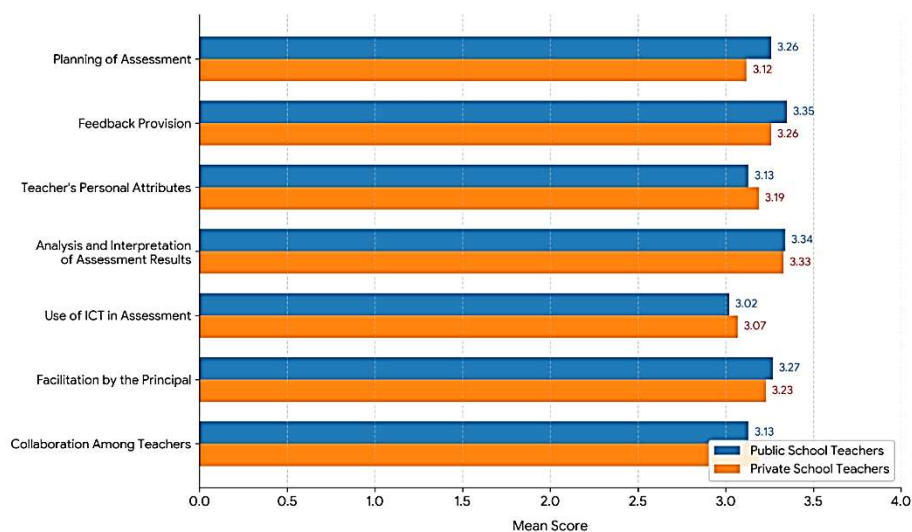
Province	School Status	
	Public (N=214)	Private (N=57)
Aceh	2 (1%)	-
Bali	1 (0.5%)	-
Banten	17 (8%)	1 (2%)
Bengkulu	1 (0.5%)	-
Special Region of Yogyakarta	9 (4%)	1 (2%)
Special Region of Jakarta	6 (3%)	5 (9%)
Gorontalo	2 (1%)	-
West Java	17 (8%)	10 (18%)
Central Java	80 (37%)	25 (44%)
East Java	34 (16%)	12 (21%)
West Kalimantan	3 (1%)	-
South Kalimantan	4 (2%)	-
Central Kalimantan	5 (2%)	-
North Kalimantan	1 (0.5%)	-
Bangka Belitung Islands	1 (0.5%)	-
Riau Islands	3 (1%)	-
Lampung	1 (0%)	1 (2%)
West Nusa Tenggara	5 (2%)	1 (2%)
South Papua	1 (0%)	-
Riau	6 (3%)	1 (2%)
West Sulawesi	1 (0.5%)	-
South Sulawesi	4 (2%)	-
West Sumatera	4 (2%)	-
South Sumatera	1 (0.5%)	-
North Sumatera	5 (2%)	-

Based on an indicator analysis, feedback provision and analysis and interpretation of

assessment results emerged as the two highest-performing aspects for both groups of teachers. Public school geography teachers recorded their highest mean score in the feedback provision dimension ($M = 3.35$), followed by Analysis and interpretation of assessment results ($M = 3.34$). Among private school teachers, the analysis and interpretation of assessment results dimension achieved the highest score ($M = 3.33$), followed by feedback provision ($M = 3.26$). These findings indicate that geography teachers in both school groups demonstrate excellent proficiency in processing learning evaluation data and providing constructive feedback to students.

Normality Assessment

Before conducting the comparative analysis, the normality of the assessment literacy scores was examined using the one-sample Kolmogorov–Smirnov test with Lilliefors significance correction. As presented in Table 4, all seven assessment literacy dimensions showed statistically significant departures from normality. The Kolmogorov–Smirnov statistics ranged from 0.101 to 0.217, with all p-values below .001. Thus, the null hypothesis of a normally distributed score was rejected for all seven dimensions. Given the non-normal distribution of the data and

**Figure 1.** Assessment literacy profile

the comparison of two independent groups, the Mann–Whitney U test subsequently employed to examine differences in assessment literacy between public and private school teachers.

Table 4. Normality test result

Indicator	N	K-S Statistic	p-value
Planning of Assessment	271	0.101	< 0.001
Feedback Provision	271	0.102	< 0.001
Teacher's Personal Attributes	271	0.192	< 0.001
Analysis and Interpretation of Assessment Results	271	0.135	< 0.001
Use of ICT in Assessment	271	0.178	< 0.001
Facilitation by the Principal	271	0.217	< 0.001
Collaboration Among Teachers	271	0.187	< 0.001
Source: Data Analysis, 2026			

Comparison of Assessment Literacy Between Public and Private Schools

Next, the presentation of literacy characteristics and teacher assessment practices consists of the mean and standard deviation for each indicator, along with the results of comparative tests across public and private

schools. Overall, the results indicate no significant differences in literacy characteristics and teacher assessment practices across public and private schools (Table 5).

Overall, the assessment indicator planning showed that teachers in both public and private schools demonstrated moderate to high levels of

Table 5. Comparison of mean scores for assessment literacy indicators among public and private school teachers

Indicator	Public		Private		p-value
	mean $\pm$ st.dev	category	mean $\pm$ st.dev	category	
Planning of Assessment	3.26 $\pm$ 0.46	high	3.12 $\pm$ 0.52	moderate	0.070
Feedback Provision	3.35 $\pm$ 0.43	high	3.26 $\pm$ 0.53	high	0.258
Teacher's Personal Attributes	3.13 $\pm$ 0.64	moderate	3.19 $\pm$ 0.62	moderate	0.528
Analysis and Interpretation of Assessment Results	3.34 $\pm$ 0.48	high	3.33 $\pm$ 0.51	high	0.894
Use of ICT in Assessment	3.02 $\pm$ 0.59	moderate	3.07 $\pm$ 0.59	moderate	0.465
Facilitation by the Principal	3.27 $\pm$ 0.66	high	3.23 $\pm$ 0.68	moderate	0.561
Collaboration Among Teachers	3.13 $\pm$ 0.64	moderate	3.19 $\pm$ 0.62	moderate	0.528

practice. Although the overall mean score was slightly higher in public schools (3.26) than in private schools (3.12), the difference was not statistically significant. The highest scores in both groups were recorded for the sub-indicator “assessment is designed based on the material delivered,” with means of 3.57 (public) and 3.30 (private). The comparative test revealed a statistically significant difference ($p < 0.01$) for

this sub-indicator, indicating that public school teachers were more consistent in aligning assessments with the material taught than their private school counterparts.

For the other sub-indicators, p-values exceeded 0.05, suggesting no significant differences between the two groups. Similarities were observed in aspects such as alignment with core competencies and learning objectives,

inclusion of assessment in lesson plans, implementation of assessment during the learning process, consideration of cognitive dimensions, and the use of varied difficulty levels and discrimination indices. However, instrument validity and reliability received the lowest scores, falling into the moderate category. This finding indicates that testing assessment instrument quality through validity and reliability procedures remains infrequently applied in both public and private schools.

The feedback provision indicator showed high overall mean scores in both public and private schools. Most aspects of this indicator showed no statistically significant differences ($p > 0.05$) between the two school types. Nevertheless, most aspects showed slightly higher mean scores in public schools than in private schools.

Regarding fostering students' sense of responsibility for their assessment outcomes, public and private schools differed significantly. This indicates that public school teachers more frequently implemented efforts to cultivate students' responsibility for their assessment scores compared to private school teachers. In contrast, providing time for self-assessment and informing students about their strengths and weaknesses showed slightly higher (though not statistically significant) scores in private schools. This suggests that teachers in both public and private schools used similar practices to support student self-reflection and provide information about students' strengths and weaknesses during the assessment process.

The teacher's personal attributes indicator (attitudes and behaviors toward assessment) recorded lower overall mean scores compared to the planning of assessment and feedback provision indicators. Additionally, the mean scores for each item fell into the moderate category, with no statistically significant differences ($p > 0.05$) between public and private school teachers.

The largest score difference was found in the sub-indicator of revising lesson plans based on field conditions, with private school teachers showing higher scores. This suggests that some private school teachers were more intensive in adjusting teaching and learning plans based on direct classroom observations. The sub-indicator of providing additional material for students who have not achieved mastery received moderate scores, indicating that this practice needs improvement among teachers in both public and private schools.

The analysis and interpretation of assessment results indicators revealed that teachers in both public and private schools demonstrated good and comparable practices ($p > 0.05$) in utilizing assessment results to evaluate the teaching and learning process and outcomes. This is evidenced by the high overall mean scores in both public (3.34) and private (3.33) schools. It can therefore be concluded that both groups of teachers exhibited relatively similar patterns in using assessment results to monitor learning mastery, track student progress, and evaluate the effectiveness of the instructional process.

The highest scores in both groups were in monitoring student mastery, indicating that learning mastery remains the primary focus of teachers when evaluating assessment results. In addition, monitoring students' achievement progress recorded high mean scores in both public and private schools. These findings suggest that teachers are not only oriented toward outcomes but also pay attention to the development of students' abilities throughout the learning process. Similar patterns were observed in monitoring student progress. The mean scores indicate that teachers in both public and private schools engaged in comparable activities. The largest score difference between the two groups occurred in analyzing the teaching methods used. The data showed moderate scores among public school teachers and high scores among private

school teachers; however, the difference was not statistically significant.

Meanwhile, the indicator of information technology use in assessment recorded overall mean scores in the moderate category for both public and private schools. The mean scores for each item showed only small differences between the two groups, and statistical testing indicated no significant differences. These results suggest that teachers' use of technology for assessment purposes still needs improvement in both public and private schools.

The lowest scores were recorded for mapping students' strengths and weaknesses and monitoring the development of students' abilities using technology, in both public and private schools. This indicates that technology is used more often to support assessment implementation than for in-depth analysis of assessment results. Therefore, greater effort is needed to enhance the use of various digital tools and platforms to process, analyze, and interpret assessment data and obtain valid mappings of student assessment outcomes.

Regarding principal facilitation, teachers in both public and private schools received moderate levels of support. Both the mean scores and statistical test results showed relatively similar values across all items in public and private schools. These results indicate that principals in both public and private schools have provided reasonably good opportunities and support for teachers to enhance their teaching skills through training. In addition, principals in both types of schools showed similar performance in issuing clear guidelines regarding assessment procedures.

The final measurement of assessment literacy and practices is the indicator of collaboration among teachers. The analysis showed that collaboration among teachers fell into the moderate category for all items in both public and private schools. The mean scores also indicated relatively small differences, and statistical testing revealed no significant differences ($p >$

0.05). This suggests that collaboration among teachers in analyzing and mapping assessment results still needs to be strengthened.

Data also indicate that collaboration among teachers in interpreting assessment results, identifying the strengths and weaknesses of the learning process, and developing innovative learning tools and processes remains in the moderate category. This suggests that these aspects can be further developed to support improvements in learning quality more effectively.

Statistical testing across the seven indicators of assessment literacy and practices showed no significant differences between teachers in public and private schools for most indicators. This indicates that school status is not a major differentiating factor in teachers' assessment practices. Geography teachers in both public and private schools exhibited relatively similar assessment practices, with primary strengths in providing feedback and using assessment results to evaluate learning. This observation is further supported by the Figure 2. Percentage of assessment literacy and practices for each indicator comparative analysis of total percentage scores presented in Figure 2.

Further data analysis reveals a trend: most teachers demonstrated weaknesses in assessment planning and in the use of ICT in assessment. Conversely, most demonstrated strengths in analyzing and interpreting assessment results and providing feedback. However, although teachers exhibited strengths in analysis/interpretation and feedback provision, these were not adequately supported by their attitudes and behaviors toward assessment, which remained at a moderate level. The subsequent trend indicates that weaknesses in assessment planning and the use of ICT in assessment align with relatively weak collaboration among teachers in learning assessment.

The findings of this recent study indicate that, on average, geography teachers possess a moderate level of assessment literacy and

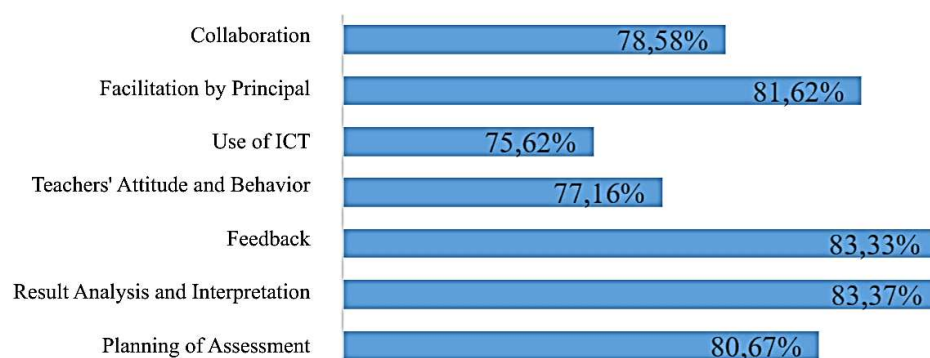


Figure 2. Percentage of assessment literacy and practices for each indicator

practice. This study presents more favorable results than the studies conducted by Bijsterbosch, Schee, & Kuiper (2017) and Bijsterbosch,

Schee, K., & Beneker (2016), which focused on geography teachers in the Netherlands. Those studies found that many teachers needed help developing high-quality assessment items aligned with Higher Order Thinking Skills (HOTS) and meaningful learning.

Indeed, previous studies have produced diverse findings. Many of these studies have revealed that teachers have insufficient or low assessment literacy skills. Studies by Janatifar & Marandi (2018), Nurdiana (2020), Zulaiha & Mulyono (2020), and Nejar-M, Khodabakhshzadeh, & Metallaebzadeh have shown that many teachers still possess low assessment literacy skills. Similar findings have been reported in studies by Shams & Iqbal (2018), Umam & Indah (2020), and Lam (2019).

Another study by Zulaiha, Mulyono, & Ambarsari (2020) demonstrates that teachers have good assessment literacy skills. This study reveals that teachers have strong knowledge of assessment and practical assessment practices in planning, implementation, monitoring, recording, and dissemination. However, the study also highlights that although teachers claim strong knowledge and assessment practices, interview and document analysis indicate a need for more

evidence confirming the quality of their assessment practices.

Furthermore, studies that have yielded similar findings, indicating that teachers possess moderate levels of assessment literacy, include studies by Lutfiyah, Basyari, & Dwiniasih (2020), Muhammad et al. (2020), Wardani, Suryadi, & Purnawarman (2020), and Puspawati (2019). Other studies reporting similar results include Lam (2017) and Sultana (2015). These studies show that teachers have strong assessment literacy skills in certain areas. However, in practice, teachers still need help in implementing high-quality assessments (Pratama et al., 2025).

One urgent aspect of assessment literacy is how teachers use assessment results to improve the quality and effectiveness of learning. This aligns with the concept of assessment, which states that assessment is not just about data collection techniques, but a systematic process that plays a crucial role in learning by identifying learning objectives and making decisions based on the goals achieved (Linn & Grolund, 2021). Smith (2016) also emphasizes that assessment is a systematic process of collecting, analyzing, and interpreting data.

For a long time, many educators viewed assessment as a measure of final learning outcomes, often through summative assessment (Jones et al., 2025). However, educators have recently begun to broaden the concept of assessment beyond simply measuring learning

outcomes at a specific time to determine pass or fail. They now see assessment as a means to enhance learning by modifying the quality of teaching and learning and using assessment results to modify student learning (Rabinowitz, 2010; Berry, 2011).

This paradigm expansion reinforces the importance of assessment for learning, also known as formative assessment. Formative assessment provides teachers with information to modify their teaching activities, differentiate instruction, and understand students' learning approaches (Campos et al., 2026). The information collected through formative assessment is well-suited to improving the teaching and learning process. This information enables teachers to gain accurate, up-to-date insights, helping them enhance learning while it is still in progress (Abdulla, 2016).

Assessment results can help teachers make decisions to improve the learning process, also known as data-based decision-making. As McMillan (2015) expressed, classroom assessment is designed to help teachers make informed decisions. Assessment data is crucial because it informs teachers' instruction and shows which elements need development to improve students' learning outcomes (Gelderblom et al., 2016). Data-informed learning is built on the idea that teachers can plan instruction more effectively when they clearly understand what students already know and what they still need to comprehend (Tomlin et al., 2023). Several studies highlight the importance of using data to make decisions that improve teaching and enhance students' learning achievements.

However, teachers still need help using data, either because they cannot use it effectively or because they do not use it at all. Teachers' decisions on instructional design and adaptation are often based on intuition rather than data, leading to ineffective development and various problems. Kippers, Wolternick, Schildkamp, Poortman, & Visscher (2018) found that although teachers use various classroom assessment methods to identify students' learning

achievements, they need to integrate systematic data analysis into their practice to support the teaching process. Furthermore, assessment results are not effectively used to provide student feedback but are instead prioritized for assessment and ranking purposes (Acar-Erdol & Yildizh, 2018).

Choi et al. (2021) also found similar results, stating that teachers have yet to use assessment data to effectively transform and enhance learning effectiveness. A lack of pedagogical competence among teachers is a barrier to using assessment data for instructional decision-making. Therefore, professional development focused on pedagogical approaches should be pursued. Gelderblom et al. (2016) added that although teachers claim to be aware of and understand the importance of data use, using data to improve learning outcomes remains challenging.

Many teachers and practitioners still need clarification about how to use assessment results. Bao, Y., Wang, M., Liu, Y., Tang, H., Liu, X., Zhang, H., Ni, X., & Liu, Z. (2026) state that the meaning of using assessment results encompasses four main elements: (1) teachers assess using appropriate instruments that directly measure student learning in line with the intended learning outcomes, (2) they intervene by creating pedagogical modifications based on the assessment results, (3) they reassess using the same instruments, and (4) they find that student learning has improved compared to the pre-intervention assessment results.

In line with that, Corbacho-Cuello (2026) adds that teachers should be able to identify measurable goals for all students in the classroom. Teachers need to gather data to identify any gaps. Teachers should analyze and interpret the data to determine actions to reduce gaps, such as making instructional changes. New data is also needed to evaluate the effectiveness of instructional changes.

The findings of this study and the studies mentioned above indicate that assessment literacy remains a global concern. Xu & Brown (2017)

propose essential factors that can contribute to teachers' lack of assessment literacy. The first factor relates to the lack of policies or regulations on assessment and operational standards that ensure quality assurance for teachers conducting assessments. With clear standards, teachers can assess whether they have made valid and reliable decisions in their assessment practices. Similarly, administrators or supervisors need guidelines to evaluate teacher assessment literacy. The second factor is inadequate assessment training in pre-service and in-service teacher education programs. However, training should be a crucial part of preparing teachers to develop their skills in designing, implementing, assessing, and using assessment results in accordance with assessment theories and principles.

Jiang (2020) presented similar findings, identifying factors influencing the lack of assessment literacy at the individual, institutional, and socio-cultural levels. Due to insufficient training, the individual aspect relates to teachers' need for more knowledge of assessment, including theory, objectives, methods, and feedback. Vogt & Tsagari (2014) also state that a teacher's assessment literacy is largely determined by the level of assessment training they receive during pre-service and in-service periods. Furthermore, Jan-Nesar, Khodabakhshzadeh, & Motallebzadeh (2020) state that serious issues in assessment literacy include a negative washback effect, low self-confidence among teachers, lack of experience, impractical teacher training courses, and an inability to master technology-based assessment.

One insightful finding of this study is that most dimensions of assessment literacy and assessment practices did not differ significantly between geography teachers in public and private secondary schools in Indonesia. This finding suggests that school status may no longer be a decisive factor influencing teachers' assessment competencies and classroom assessment practices. However, because participants were

selected using a non-probability snowball sampling technique, the findings should be interpreted with caution and cannot be generalized to all geography teachers in Indonesia.

Several explanations can account for this phenomenon. First, the implementation of national education policies, including recent curriculum reforms and a stronger emphasis on formative assessment, may have contributed to a more standardized assessment culture across schools. Teachers in both public and private schools are required to apply similar assessment principles and procedures, thereby reducing disparities in assessment practices. Second, professional development opportunities, such as teacher working groups, subject teacher working group (MGMP), in-service training programs, and online learning platforms, have become increasingly accessible to teachers regardless of school status. These initiatives facilitate the dissemination of assessment knowledge and best practices among teachers from diverse institutional backgrounds.

This finding also implies that challenges related to assessment literacy among geography teachers tend to be systemic rather than institution-specific. In other words, the identified weaknesses in areas such as assessment design, integration of information and communication technology (ICT), and professional collaboration appear to be experienced by teachers across different school sectors. Therefore, efforts to improve assessment literacy should not target specific types of schools alone but should adopt broader, more inclusive professional development strategies that address the common needs of geography teachers throughout Indonesia.

Theoretical Implication

The results indicate that geography teachers' assessment literacy in Indonesia is at a moderate level. Most previous studies have stated that teachers' assessment literacy in Indonesia is still at a low level, with only a few studies indicating

that some teachers have a high level of assessment literacy. Some studies also suggest that, in theory, teachers have good assessment literacy. However, in practice, they still need help implementing effective assessment practices and may need more clarification about assessment. This study analyzed geography teachers' assessment literacy only through a questionnaire, and further in-depth practical analysis is needed.

Future studies should conduct a more detailed analysis of teachers' assessment literacy, going beyond theoretical levels. The analysis should delve deeper into practical aspects to understand the assessment practices teachers implement. Data collection through interviews, teacher document studies, and classroom observations can yield more detailed and realistic data. These methods will provide insights into the assessment practices teachers actually use and shed light on their experiences and challenges. By exploring the practical aspects of assessment literacy, future studies can contribute to a more comprehensive understanding of teachers' assessment practices and inform the development of effective strategies and interventions to enhance assessment literacy among teachers.

Future studies are also expected to emphasize using or utilizing teacher assessment results for instructional decision-making. This is because data-informed decision-making poses significant challenges and is often problematic for teachers in the assessment process. Often, teachers stop interpreting the results without making further efforts to utilize them to improve the quality and effectiveness of instruction. Therefore, future studies should explore how teachers can effectively utilize assessment data to inform their instructional practices. By addressing this aspect, researchers can provide valuable insights and recommendations to support teachers in making data-driven decisions and improving the overall quality of teaching and learning.

Analyzing teachers' ability to use technology to support the assessment process is also crucial and needs to be conducted. So far, research on teachers' use of information technology (IT) in assessment has been limited. The use of IT in assessment is closely related to the assessment planning process, instrument development, assessment implementation, and, most importantly, the processing of assessment results, interpretation, and supporting decision-making based on those interpretations.

This study also has other limitations that must be considered when interpreting the results. The study used snowball sampling, a type of non-probability sampling. Although respondents were recruited from several regions of Indonesia, the sample was disproportionately concentrated in Java, particularly Central Java (38%) and East Java (17%). This imbalance is partly attributable to snowball sampling, through which participant recruitment may have been influenced by existing professional and geographical networks. Consequently, the sample cannot be considered geographically representative of Indonesia's geography teachers, and the findings should be interpreted as evidence from the participating teachers rather than as nationally representative estimates. Future studies are expected to use probability sampling techniques and involve a broader, more representative sample to increase the external validity and generalizability of the results. Furthermore, involving teachers from various educational levels and geographic regions will also provide a more comprehensive understanding of assessment literacy in geography teachers.

Practical Implication

The research results highlight the urgency of assessment literacy among geography teachers. Assessment courses should be integrated into teacher qualifications and requirements. Teacher training in assessment should be a long-term,

continuous need and obligation to ensure teachers possess strong assessment concepts and skills. Moreover, assessment knowledge should be highly relevant to assessment practices in the field, meaning that assessment literacy should be developed within the educational context and needs of the field (Akhtar et al., 2021; Muhammad & Bardakci, 2019). Therefore, training programs and educational initiatives that develop assessment literacy should bridge the gap between theory and practice through practice-based, long-term, comprehensive curriculum education.

Educational reform should not only focus on changing textbooks and pedagogical approaches but should also encompass the concept of assessment, its principles, and procedures in line with other aspects (Muhammad & Bardakci, 2019). Furthermore, educational development should involve improving knowledge about assessment and expanding contexts and interconnectedness among competencies, such as teacher independence, identity as an assessor, and critical perspectives (Coombe et al., 2020). Additionally, an authentic approach to assessment training is highly needed to support the expansion of assessment concepts with various new and innovative methods (Nimehchisalem & Bhatti, 2019).

Assessment training is crucial for both in-service and pre-service teachers. Assessment training for in-service teachers aims to address deficiencies in pre-service education, making it a remedial effort (Semivel-Sahin & Subasi, 2019). Assessment training for in-service teachers is essential because teachers need long-term, continuous, and comprehensive training in assessment methods and alternatives. Training programs for teachers should also emphasize practicality and solutions to the challenges teachers face. Teachers should receive adequate materials and resources on the latest and innovative assessment methods (Fard & Tabatabaei, 2018).

Meanwhile, assessment training for pre-service teachers aims to provide them with the necessary skills before entering the workforce, balancing both theoretical and practical aspects. This effort can balance technical knowledge, practical skills, theoretical knowledge, and a solid contextual understanding of the role and function of assessment in education and society (Semivel-Sahin & Subasi, 2019). Additionally, Oz & Atay (2017) suggest the inclusion of assessment as a specific subject in pre-service teacher education and providing opportunities for them to apply what they have learned

■ CONCLUSION

This study revealed that the assessment literacy and practice of senior high school Geography teachers in Indonesia were at a moderate to high level, with an average achievement score of 80.83%. Teachers demonstrated relatively strong competencies in providing feedback, analyzing and interpreting assessment results, and receiving support from school principals. However, several aspects still require improvement, particularly assessment planning, the use of information technology in assessment, teachers' attitudes toward using assessment results, and collaboration among teachers. The use of information technology was identified as the weakest indicator, indicating that technology integration in assessment practices has not yet been fully optimized.

The findings further emphasize that assessment should not merely function as a tool for assigning final grades, but also as a basis for decision-making to improve the quality of learning through assessment for learning. Although teachers generally had adequate theoretical understanding of assessment, implementing high-quality assessment practices still faced several challenges, including limited training opportunities, inadequate technological competence, and insufficient use of assessment data for instructional improvement. Therefore, continuous and

practice-oriented assessment training programs are necessary, particularly those focusing on technology integration and the effective use of assessment data to support more meaningful and effective learning processes.

■ DECLARATION OF GENERATIVE AI USAGE IN THE WRITING PROCESS

During the preparation of this article, the author used ChatGPT (OpenAI) to improve the language quality, sentence structure, and overall clarity of the manuscript, as well as to enhance the organization and presentation of the discussion. AI tools were not used to generate research ideas, collect and analyze data, interpret statistical results, or compile conclusions. All scientific content, interpretations, and conclusions are the responsibility of the authors. The authors conducted a thorough review and revised the AI-generated output to ensure the accuracy, originality, and integrity of the final manuscript.

Supplementary Files

Research instruments, research data, and research data analysis results can be accessed at the following link: <https://docs.google.com/spreadsheets/d/13owVVLIV11IqCL36d52DgGqdpYOhalFA/edit?usp=sharing&ouid=103920530413674501849&rtfpof=true&sd=true>

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