

Bridging the Gap: Pre-Service Science Teachers' Understanding of Ideal Assessment Versus Real Classroom Practices in Schools

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Abstract

Alignment between university based teacher education curricula and school practices is essential to ensure that pre-service teachers develop adequate assessment competencies. This study aims to explore the gap between theoretical assessment concepts learned in higher education and the actual assessment practices implemented by pre-service science teachers during their teaching practicum in secondary schools. A qualitative approach was employed using in depth interviews with pre-service teachers. Data were collected through semi structured interviews and analyzed using descriptive qualitative techniques, including data reduction, data display, and conclusion drawing. The findings indicate that pre-service teachers gained meaningful experience in conducting science learning assessments, particularly in designing assessment instruments and implementing classroom evaluation. However, a significant discrepancy exists between the ideal theoretical frameworks acquired at the university and the assessment practices in schools. School-based assessments tend to focus on cognitive evaluation through written tests, while the assessment of students' skills and attitudes is not optimally implemented. This gap is influenced by curriculum misalignment, limited instructional time, and administrative demands.

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INTRODUCTION

A well-trained and qualified teaching workforce is widely recognized as crucial for achieving education quality and equity. UNESCO has emphasized that teachers “are one of the most influential and powerful forces for equity, access and quality in education” and must be at the center of education reform (Harris & Sass, 2011). In the global Education 2030 agenda, aligning teacher preparation with classroom practice is a priority and stakeholders have called for curriculum, teacher policy, and assessment to be jointly aligned to realize Sustainable Development Goal 4 (quality education) (Grobler & Dittrich, 2024). Assessment, in particular, is regarded as a “leading force in education, advocated both as a powerful tool of educational policy and school improvement and as a fundamental component of teacher instructional practice” (Pastore, 2023). In many systems, assessment is even described as a core principle underlying the curriculum and a key dimension of teacher professionalism and quality (Pastore, 2023). In short, international discourse makes clear that teacher education and assessment must work together if learning outcomes are to improve.

Despite these ideals, however, a persistent “theory–practice gap” exists worldwide between what teacher candidates learn about assessment and what they actually implement in schools. Research across diverse countries shows that new teachers often struggle to enact the formative, holistic assessment approaches taught in their programs. Atjonen et al. note that while student teachers in Finland can develop a fairly versatile *knowledge base* and understanding of assessment concepts through coursework, assessment remains “not an easy topic for student teachers to discuss or translate into practice” (Atjonen et al., 2022). In fact, one estimate suggests teachers may spend as much as a third or even half of their working time on assessment activities, yet many teachers lack sufficient practical training to use this time effectively. As DeLuca and colleagues observe, traditional pre-service instruction in assessment tends to be theory heavy and disconnected from the “daily assessment practices” of the classroom (Atjonen et al., 2022). These and other international studies show that even when teachers acquire rich conceptual knowledge about assessment, they often revert to familiar summative methods (tests and quizzes) in their own classrooms, failing to implement the broader skill and attitude focused strategies espoused by modern curricula (Pastore, 2023).

Recent literature on teacher assessment highlights the problem from several angles. Systematic reviews find that preservice teachers generally enter the profession with weak assessment literacy, for example, (Hull & Vigh, 2026) conclude that “assessment literacy is essential for improving teaching, learning, and accountability,” and that teacher education plays a *crucial* role in developing it. However, these reviews also emphasize that existing evidence is fragmented, few studies systematically examine how teacher candidates internalize or apply assessment theory. In one meta review, Konadu et al. (2025) report that “pre-service teachers are deficient in understanding assessments” and call for stronger integration of both theory and practice of assessment into teacher training programs (Konadu, 2025). Similarly, Atjonen et al. (2022) and others have documented that student teachers often possess only rudimentary knowledge of assessment while their conceptions tend to be dominated by the long established culture of testing, with minimal appreciation for formative feedback strategies (Atjonen et al., 2022). Across contexts, therefore, scholars describe beginning teachers as underprepared for effective classroom assessment, they hold limited skills and sometimes negative attitudes toward assessment, often mimicking the test oriented approaches they experienced as learners.

This gap between theory and practice is not confined to any one country or subject area. For example, DeLuca and Bellara (2013) observed that teacher candidates who receive almost all of their assessment education in coursework emerge with low confidence and an ingrained reliance on familiar testing methods (DeLuca & Klingerb, 2010). Similarly report from (Macken et al., 2020) that novice teachers in various systems tend to apply the same strategies they were taught in school, and rarely innovate with the varied assessment techniques promoted by current pedagogy. Indeed, (Atjonen et al., 2022) summarize that “*newly qualified teachers’ assessment literacy (TAL) level is low*” (i.e., teacher assessment literacy). In short, by the time most preservice teachers complete their studies, they have absorbed

assessment theory but often lack the practical know, how or confidence to implement it effectively in diverse classroom contexts.

Multiple factors contribute to this persistent gap. Classroom realities – such as large class sizes, limited instructional time, and heavy administrative loads – frequently inhibit the application of complex assessment strategies. Stiggins (2014) noted that even though teachers may spend up to half their time on assessment tasks, practical constraints force them into quick solutions (Stiggins, 2014). In many contexts, there is also a mismatch between the emphasis of teacher training and the conditions in schools, policy documents may call for competency-based, student-centered assessment, but inexperienced teachers find themselves in under resourced environments. For instance, Tekir and Akar (2019) studied beginning teachers in Turkey and found that despite policy mandates emphasizing the use of rich assessment materials, new teachers showed low competence because their teacher education had been “potentially misaligned” with policy standards (Tekir & Akar, 2019). This misalignment means PSTs may learn *about* innovative assessment forms in theory but have few opportunities to practice or see them modeled under real conditions.

Research specifically on Indonesian teacher education suggests similar dynamics. Prastikawati et al. (2025) examined Indonesian pre-service EFL teachers and found that while participants *understood* the principles of assessment design, they felt constrained by school environments. The study reports that large class sizes, fixed curricula, and limited time for each subject made it “challenging to implement ideal assessments” (Prastikawati et al., 2025). In essence, the crucial *design* skills of assessment could not be fully enacted because classroom realities demanded efficiency and routine. These findings echo the broader literature, educational stakeholders often recognize the importance of assessment skills in theory, but systemic constraints (curriculum overload, exam pressures, administrative work) reduce teachers’ ability to enact those skills (Prastikawati et al., 2025; Tekir & Akar, 2019). In short, unless teacher training explicitly addresses these contextual factors, the difference between *knowing* assessment theory and actually *doing* it remains wide.

Several Indonesian studies illustrate the localized consequences of the theory–practice gap in assessment. Cirocki et al. (2025) surveyed 320 Indonesian pre-service English teachers and found only moderate language assessment literacy and respondents across different universities indicated they needed far more hands on practice with real classroom assessment tasks. Their recommendations included increasing practical assessment training and integrating new tools (including digital and AI based methods) into teacher education (Cirocki et al., 2025). In the school setting, Sekarsari et al. (2026) observed that the gap between curriculum ideals and actual practice can be stark. For example, while the national curriculum envisions *diagnostic assessment* that informs personalized instruction, in practice Indonesian language teachers often limit diagnostics to a simple written “pre-test” of cognitive knowledge, without integrating students’ attitudes or skills (Treagust, 2006). This narrow focus meant classroom differentiation was ineffective and student affect largely ignored, highlighting how institutional and tradition bound practices can sideline broader assessment goals.

Another recent Indonesian study by (Blegur et al., 2025) directly connects policy and practice in teacher assessment. They found that existing teacher evaluation instruments in Indonesia were outdated and “not aligned” with the latest competency requirements stipulated by new regulations. In particular, key student centered skills like “evaluating and designing improvements” were missing from the tools used to assess teachers. Blegur et al. call for new, contextualized assessment instruments that reflect current policy and better support the development of teacher practices – essentially arguing that systemic policy shifts have not yet translated into the classroom. Complementing this, recent science education research reveals that Indonesian teachers (and future teachers) are still developing familiarity with assessment approaches like *Assessment as Learning*. For instance, (Setyawarno et al., 2025) studied science classes and reported that teachers’ understanding of assessment for learning concepts averaged only ~50%, and actual implementation of these techniques was only moderate. Taken together, these local studies paint a consistent picture. Indonesian teacher candidates encounter a substantial gap between the holistic, formative assessment ideals promoted by curricula and the reality of traditional, test centric schooling.

Despite the extensive scholarship on assessment literacy and theory–practice tensions, a notable gap remains. To date, no published research has specifically examined science pre-service teachers in Indonesia in terms of their assessment knowledge versus practices during teaching practicums (PPL). Hull and Vigh (2026) have even noted a lack of comprehensive studies on how PSTs’ assessment literacy is operationalized in teacher education programs (Hull & Vigh, 2026). While some Indonesian studies touch on related issues (e.g. general teacher competency or language teacher assessment skills (Cirocki et al., 2025), they do not capture the unique challenges faced by science education students and the particular nature of science instruction. In other words, we do not yet have a detailed account of how Tadris IPA (science education) students at IAIN Sorong conceptualize the “ideal” assessment strategies from their coursework, compared to the specific assessment methods they actually use in secondary science classes. This gap is important because science teaching often involves practical labs, experiments, and skills development areas where assessment practices can differ greatly from the cognitive tests typical in many classrooms. Understanding this has been identified as “little known” in the broader field of teacher education research.

Filling this gap is urgent for both educational policy and practice. UNESCO’s global declarations make it clear that teacher preparedness directly impacts educational equity and effectiveness. In Indonesia, growing attention to 21st century skills and STEM education means science teachers must be especially adept at assessing not just factual knowledge but critical thinking and investigative skills. If prospective science teachers complete their education confident in assessment theory but unable to apply it, reforms will falter. For example, if teachers continue to rely solely on cognitive tests (as (Setyawarno et al., 2025) report), then important student competencies in inquiry, collaboration, and attitudes will remain undervalued. Blegur et al. (2025) warn that without contextualized assessment tools, even well intentioned policies cannot support better learning outcomes (Blegur et al., 2025). In practical terms, a gap in assessment understanding means new teachers may enter schools

unprepared for the real demands of classroom evaluation, potentially worsening the very learning gaps the national curriculum seeks to close. Therefore, identifying and addressing the theory–practice mismatch is critical to ensure that teacher training actually translates into improved science teaching and learning in Indonesian schools.

This study makes several novel contributions to the field. First, it targets the specific context of science pre-service education at an Indonesian Islamic university (IAIN Sorong) an area that has not been examined before. Unlike broader calls to improve assessment training, our focus is on the actual *alignment* between what is taught and what is done. We will directly compare the idealized assessment models from the university curriculum (for example, emphasis on formative and skill based assessment) with the concrete assessment approaches PPL students employ in secondary science classes. In doing so, the study goes beyond general discourse and provides detailed, context rich evidence of the disconnect. Methodologically, we will use qualitative interviews and document analysis to capture both teacher student perspectives and concrete assessment artifacts, giving a richer picture than survey based studies. The expected outcome is both a clear description of the nature of the gap and practical recommendations. In other words, our research not only highlights shortcomings but also suggests how teacher education can be improved, thereby offering a solution oriented contribution not found in prior literature.

Therefore, this study aims to identify and analyze the discrepancies between the assessment concepts taught in pre-service science teacher education and the actual assessment practices observed during their teaching practicum in secondary schools. Specifically, it will document where and how pre-service teachers’ understanding of the “ideal” assessment (gained from campus coursework) diverges from what they implement on the ground. By addressing this directly, the research will fill the noted gap in the literature and provide actionable insights for aligning science teacher training with classroom realities.

RESEARCH METHOD

This study employed a descriptive qualitative approach, which is widely recognized as an appropriate design for exploring social phenomena within their natural context and for capturing participants’ lived experiences in depth (Creswell et al., 2018). A qualitative design was selected to obtain a comprehensive understanding of the differences in pre-service teachers’ conceptualizations of assessment, particularly between theoretical knowledge acquired at the university and its practical implementation during teaching practicum. Through a descriptive framework, the study provides a detailed account of how pre-service science teachers conceptualize, design, and enact assessment of science learning outcomes in authentic school environments. This approach emphasizes the collection of qualitative data in the form of narratives, documents, and observational records, followed by inductive analysis to construct meaning from participants’ perspectives (Patton, 2014) .

The object of this study focused on the practices of designing and implementing science learning assessment conducted by pre-service teachers during their teaching practicum. The participants consisted of four students from the Science Education (Tadris IPA) undergraduate program at Sorong State Islamic Institute who had completed coursework in

educational assessment and were actively engaged in the practicum program. Participants were selected using purposive sampling, a strategy commonly employed in qualitative inquiry to identify information rich cases that are most relevant to the research objectives (Patton, 2014). In this study, participants were deliberately chosen based on their demonstrated engagement with both theoretical and practical approaches to assessment. The broader population included all Science Education students undertaking the practicum. However, a selective sample was used to ensure representation of diverse tendencies in assessment approaches.

Data collection was conducted through methodological triangulation, integrating semi structured interviews, participant observation, and document analysis. Semi structured interviews were employed to explore participants' conceptual understanding of science learning assessment, including their perspectives on assessment principles, instrument design, and implementation strategies. This method allows flexibility in probing participants' experiences while maintaining consistency across core questions (Kallio et al., 2016). Participant observation enabled the researcher to directly examine how pre-service teachers planned and implemented assessment practices in classroom settings, including cognitive, affective, and psychomotor domains. In addition, relevant documents such as lesson plans, assessment instruments, scoring rubrics, and reflective journals were collected to provide supporting evidence. The combination of these techniques facilitated triangulation, which is essential in qualitative research to enhance the credibility and depth of findings (Denzin, 2017).

The research instruments included a semi structured interview guide, an observation checklist, and documentation protocols. The interview guide consisted of open ended questions designed to elicit rich, reflective responses from participants. The observation checklist was used to systematically record classroom practices related to assessment implementation, ensuring consistency in observational data collection. Documentation protocols were used to identify and gather relevant written and digital artifacts related to participants' assessment practices. The research procedure was conducted in several stages, beginning with preparation, which involved identifying participants, developing and validating instruments, and gaining access to the research setting. This was followed by the data collection phase, conducted in alignment with the practicum schedule to ensure ecological validity. The final stage involved data analysis and interpretation.

Data analysis was carried out using a descriptive qualitative approach following the interactive model proposed by (Miles MB, Huberman AM, 2007) which consists of three concurrent flows of activity, include data reduction, data display, and conclusion drawing/verification. In the data reduction phase, interview transcripts, observation notes, and documents were carefully reviewed, coded, and organized to focus on relevant information aligned with the research objectives. Subsequently, the data were displayed in the form of thematic narratives and summary matrices, facilitating pattern recognition and comparison of theoretical and practical assessment approaches. Finally, conclusions were drawn and continuously verified through iterative analysis, ensuring that interpretations remained grounded in the data.

To ensure the trustworthiness of the findings, several validation strategies were employed, including credibility, transferability, dependability, and confirmability (Guba & Lincoln, 1994). Credibility was enhanced through triangulation and member checking. Methodological triangulation involved comparing data obtained from interviews, observations, and documentation, while source triangulation involved cross checking information across participants. Member checking was conducted by returning preliminary findings to participants for confirmation, ensuring that the interpretations accurately reflected their experiences. Dependability and confirmability were strengthened through maintaining an audit trail that documented all research processes, as well as through ongoing reflexivity by the researcher (Nowell et al., 2017).

As a descriptive qualitative study, this research did not employ inferential statistical analysis. Instead, the analytical focus was on qualitative comparison, examining differences between theoretical and practical approaches to assessment based on empirical findings. The study was conducted over one academic period, aligned with the university's academic calendar and the implementation of the teaching practicum. The scope was limited to pre-service science teachers at Sorong State Islamic Institute and their assessment practices in secondary schools. Therefore, the findings are context specific and are not intended for broad generalization. Nevertheless, this methodological approach provides rich, contextual insights into how theoretical assessment knowledge is translated into practice, contributing to a deeper understanding of the preparation of pre-service science teachers in real educational settings.

RESULT AND DISCUSSION

The findings of this study reveal significant discrepancies between students' theoretical understanding and actual practice in the assessment of science learning outcomes in secondary schools. The findings are organised into three main themes that capture students' empirical experiences during their Field Experience Practice (FEP) activities, with supporting interview data cited as empirical evidence.

In terms of experience, instruments and evaluation, students demonstrated a sufficient conceptual understanding of assessment tools, ranging from assessment frameworks to the development of test items. However, when implementing these in a real classroom setting, they encountered challenges that were not fully predictable from theoretical learning. One of the main challenges is adapting the language of the questions to the students' level of understanding, as well as developing practical assessment rubrics, particularly for practical activities. This is illustrated in a respondent's statement: *"I thought that to create science questions, it was enough just to look at the indicators in the lesson plan. But at school, I had to | adapt the language of the questions so the children wouldn't be confused. I'm learning how to create assessment rubrics that I can actually use when they're doing practical work in the lab, although to be honest, I spend more energy on creating written test questions."* This quote shows that there is a shift from procedural understanding towards contextual needs in assessment practice.

In terms of the relationship between theory and practice, it was found that cognitive assessment dominated the implementation in the field. In theory, students have been

equipped with the concept of authentic assessment, which encompasses the assessment of attitudes and skills through various techniques such as self-assessment, peer assessment, and portfolios. However, time constraints and the need to cover the syllabus meant that the implementation of such assessments was not optimal. Students tend to rely on written test-based evaluation instruments, which are more practical and efficient. This situation is reinforced by a respondent's statement: *"At university, we are taught very ideal forms of assessment, including self-assessment, peer assessment, and detailed portfolios. But in schools, we end up running out of time trying to cover the curriculum. Consequently, I more often use quizzes at the end of a chapter or daily pen-and-paper tests. I only assess attitudes through brief observations because I don't have time to fill out complex observation sheets every day."* This statement highlights a gap between conceptual ideals and practical constraints within the school environment.

Furthermore, this study identifies the main factors causing the gap between theory and practice. Three dominant factors that emerged are differences in curriculum orientation, limited learning time, and a high administrative burden. The curriculum in partner schools tends to be oriented towards achieving subject content targets within a limited timeframe, thereby reducing the scope for the implementation of comprehensive authentic assessment. Moreover, the high administrative burden also influences teachers' and students' preferences towards simpler and more easily measurable forms of assessment. This is cited in the following quote: *"The most pressing constraints are in administration and time. The school curriculum demands a great deal of content to be covered in a short time. If I were to use the ideal assessment model as per university theory, I'd be worried that this vast science curriculum wouldn't be completed. Not to mention that the mentor teacher also reminds me about filling in marks in the report book, which has a standardised format and requires more test scores."* This quote emphasises that structural pressures within the school education system also shape assessment practices that tend to be pragmatic.

The integration of interview data into these findings reinforces the argument that the mismatch between theory and practice is not merely a subjective perception, but an empirical phenomenon consistently experienced by students. This highlights the need to reconstruct the approach to assessment-based learning in higher education to make it more contextual, adaptive, and responsive to educational practices in secondary schools.

The study reveals a significant gap between students' theoretical understanding and actual assessment practices in the field. Undergraduate students on the Science Education (Tadris IPA) placement programme generally demonstrate the ability to design assessment instruments and rubrics (adequate conceptual knowledge), yet real-classroom practice presents unexpected complexities. Three main themes were identified, first, the experience of designing simpler assessment tools on campus transforms into a need for contextual adaptation in schools (adjusting the language of questions, developing practical rubrics), second, the dominance of cognitive assessment (written tests) in schools compared to the authentic ideal assessments studied (self-assessment or peer assessment, portfolios), Third, structural factors such as public utility, time constraints, and high administrative burdens are the main causes of this weakening. Student quotes reinforce these findings, with statements such as "a lot of energy is spent on creating written test questions" and concerns

about maintaining the completion of the syllabus if an ideal assessment model were used, indicating a shift from procedural understanding towards the need for contextual adaptation in assessment practice.

These findings are consistent with previous research on the development of students' concepts and assessment practices. For example, (Xu & He, 2019) reported that during their teaching practice, students' assessment conceptions changed rapidly, shifting from an understanding focused solely on academic grades to an understanding of the diverse purposes and processes of assessment. This study highlights personal (beliefs, abilities), contextual (school practices, teacher guidance), and external (policies, school culture) factors that influence these changes. Similarly, (Hull & Vigh, 2026) emphasise that literacy among trainee teachers is shaped by the interaction of personality factors, training opportunities, institutional culture, and external policies. In the context of this research, the orientation of supervising teachers and the culture of partner schools that place greater emphasis on target content significantly influence students' practices. The findings of (Oo et al., 2021) confirm similar dynamics. Students who understand the principles of Assessment for Learning (AfL) and wish to apply them often experience tension with mentor teachers who prioritise high levels of control, meaning that the majority of students are unable to utilise these assessment strategies optimally. Only students granted greater autonomy are able to experiment and use assessment results to improve their learning (Oo et al., 2021). In other words, although our students are conceptually proficient, actual practice depends on permission and support from the school environment.

Regarding the second finding (cognitive vs authentic focus), the literature reveals a similar pattern. Shafii and Berger (2025), in an observational study in Tanzania, noted that a high-stakes testing culture reinforces teacher-centred teaching methods and marginalises formative assessment strategies. They found that teachers' practice of formative assessment activities was constrained by poor assessment literacy, large class sizes, a lack of resources, and the dominance of traditional approaches tailored for national examinations (Shafii & Berger, 2025). In the context of this study, students tended to use quizzes and daily written tests due to time and material constraints—in line with these findings. Rukmini & Saputri (2017) even explicitly noted that the implementation of authentic assessment is often "complex and time-consuming" for teachers (Rukmini & Saputri, 2017), supporting our students' complaints that developing practical rubrics and other assessment materials consumes a great deal of energy. Conversely, although (Agi et al., 2018) reported that teachers hold a positive attitude towards affective and psychomotor domain assessment, the reality in classroom practice is often different. This implies that while teachers' and students' attitudes towards non-cognitive assessment are high, its implementation is determined by structural factors. This study's finding that students' attitudinal aspects are assessed only superficially aligns with the phenomenon that feelings related to thought are often overlooked as administratively impractical, despite being ethically significant.

These findings confirm that the gap between theory and practice in assessment is not a new phenomenon in the field of education. Konadu (2025), in his systematic review, found that many trainee teachers lack a critical understanding of assessment (Konadu, 2025). The

results of this study differ from others in this respect, as the respondents actually possessed an adequate conceptual understanding of instrument development. This difference may be due to our rigorous curriculum and PPL selection process, but it underscores that the main challenge is not merely knowledge of how to create assessments, but rather how to adapt them to real-world conditions. This aligns with Davison's (2013) view that AfL literacy requires teachers to make assessment decisions that are highly contextual, fair, and reliable (Davison, 2013). This implies that conceptual thinking must be accompanied by the ability to adapt based on students' situations as demonstrated by our students when they modified the language of questions and rubrics to suit learners' understanding.

These findings have significant implications for educational theory and practice. Theoretically, this research reinforces the framework of assessment literacy as a dynamic, context-dependent process (Hull & Vigh, 2026). Consequently, the development of an ideal assessment literacy model should account for the role of practical factors and the school environment, as suggested by (Xu & He, 2019). Students' shift towards test-based assessment confirms that assessment literacy does not occur automatically through theory alone, but rather through practical experience, aligning with Xu & He's recommendation that teacher education curricula should help students connect theory with practice (Xu & He, 2019).

For teachers and trainee teachers, these findings emphasise the importance of being prepared to handle time and content challenges when designing authentic assessments. Trainee teacher training must involve simulations of real-world contexts (e.g. case studies, microteaching with feedback from a mentor teacher) so that students become accustomed to modifying assessments according to pupils' needs (Lestari & Yusuf, 2025). A similar point is made by (Güngör & Güngör, 2023), student involvement in practical placements that include assessment development enhances their assessment literacy and understanding of the relationship between theory and practice. Therefore, teacher education programme leaders should incorporate structured field experience into assessment modules, rather than relying solely on theoretical lectures. Mentor teachers at partner schools also need training to understand the AfL model, so that they can support students in applying a wider range of assessment techniques, such as rubrics and self- or peer-assessment, during their teaching practice.

For policymakers and school administrators, these findings underscore the need to consider curriculum and administrative burdens. National or school curricula that demand the rapid completion of content may compromise the quality of assessment. Time constraints and rigid report card formats, as mentioned by respondents, encourage teachers and students to opt for simple and easily measurable instruments. More flexible policies are needed to reduce teachers' daily administrative workload, provide dedicated time for designing assessments, or allow project-based assessment to create space for more meaningful practice. Education authorities should provide ongoing training on authentic assessment implementation, tailored to the needs of teachers in the field.

In practical terms, this research suggests that the development of assessment literacy skills must be grounded in classroom realities. University curricula could be reviewed to avoid being overly confined to procedural theory. Instead, problem-based learning strategies

or ‘authentic learning’ could integrate discussions of real-world cases. In a global context, our findings align with the shift in the educational paradigm that prioritises critical thinking skills and 21st-century skills (Vlachopoulos & Makri, 2024). However, these new objectives will only be achieved if students are assessed using methods that also reflect these skills, rather than mere rote learning. In short, bridging this gap requires a double-loop reform that transforms how trainee teachers are trained whilst providing structural support within schools.

Some of our research findings are surprising when compared to the literature. Firstly, although (Konadu, 2025) found that pre-service teachers generally lack an understanding of assessment literacy, respondents in this study actually demonstrated relatively good knowledge in designing assessment instruments. This may reflect a strong PPL curriculum at IAIN Sorong, but it highlights that even students with a strong theoretical foundation still face difficulties in real-world practice. Furthermore, research (Agi et al., 2018) indicates that teachers hold positive attitudes towards affective/psychomotor assessment, whereas in practice these positive attitudes are not reflected in student performance. This contradiction suggests that the theory-practice gap is not caused by students’ resistance to values or lack of interest, but rather by external factors (time, administration, support) that hinder implementation.

This study has limitations in terms of its small sample size and its nature as a contextual qualitative study. Consequently, the findings cannot be broadly generalised to the entire population or educational levels. Data collection via in-depth interviews and documentation provides depth to the study, but relies on the truthfulness and memory of the respondents. Furthermore, the focus on a single subject and a single teaching practice period may limit the phenomena covered. Nevertheless, the strength of this study lies in its in-depth analysis and data triangulation, which provide a contextual understanding of student assessment practices in secondary schools. The researcher’s ongoing reflection also ensures that the findings remain authentic. These limitations should be balanced against the strengths of the descriptive qualitative method we employed, namely its ability to reveal the nuances of field experiences that are difficult to obtain from surveys alone.

These findings clearly address the research question, demonstrating that there is a significant gap between students’ idealised understanding of assessment and the reality of assessment practices in schools. This gap is consistently experienced by students empirically, rather than being merely a perception, as evidenced by the interviews and documentation available. The need to reconstruct the approach to assessment in higher education has become urgent in order to balance theoretical ideals with the actual dynamics of the classroom. Our study recognises the contextual understanding that assessment literacy is not achieved through theory alone, it requires experience, reflection, and environmental support. By integrating these findings into educational policy and teacher training curricula, it is hoped that future science teachers will be able to address these shortcomings and implement more holistic, fair, and effective assessment in student learning.

CONCLUSION

This study highlights a persistent and meaningful gap between pre-service science teachers' theoretical understanding of ideal assessment and the realities of assessment practices in secondary school contexts. The findings demonstrate that while participants possess adequate conceptual knowledge of assessment principles particularly in designing instruments and understanding authentic assessment frameworks their implementation in real classroom settings remains constrained by contextual and structural factors. In practice, assessment tends to be dominated by cognitive evaluation through written tests, whereas the assessment of affective and psychomotor domains is often underdeveloped.

The study further identifies key factors contributing to this discrepancy, including curriculum misalignment between higher education and school systems, limited instructional time, and substantial administrative demands. These constraints shape a more pragmatic orientation toward assessment, leading pre-service teachers to prioritize efficiency over pedagogical completeness. As a result, the ideal models of assessment promoted in teacher education programs are not fully realized in authentic teaching environments.

Theoretically, this study contributes to the discourse on assessment literacy by emphasizing the need to reconceptualize teacher preparation programs to better integrate contextual realities into assessment training. Practically, the findings underscore the importance of designing more adaptive and practice oriented assessment courses, strengthening collaboration between universities and schools, and simplifying administrative requirements to support the implementation of comprehensive assessment strategies.

Despite its contributions, this study is limited by its small sample size and context-specific focus, which may restrict the generalizability of the findings. However, the depth of qualitative insights provides valuable understanding of the complexities faced by pre-service teachers in bridging theory and practice. Bridging the gap between theoretical and practical assessment requires a systemic and collaborative effort involving teacher education institutions, schools, and policy stakeholders. Future research is encouraged to explore scalable models of contextualized assessment training and to examine how institutional reforms can better support the development of holistic assessment competencies among pre-service teachers.

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