


Pre-Service Teachers' Understanding and Perceptions Toward Assessment Literacy: A Systematic Review

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Abstract

The study determined pre-service teachers' understanding and perceptions toward assessment literacy. The study utilized a systematic review and synthesis of peer-reviewed empirical research publications from journals. Twenty-one peer-reviewed journal articles were acquired using a search utilizing the keywords: assessment literacy and pre-service teachers with teaching experience, sourced from EBSCO and Advanced Google Search. Seventeen of the twenty-one identified journal articles were then evaluated. The findings from these articles indicated that preservice teachers are deficient in understanding assessments and have perceptions toward assessments. Knowledge in assessment is very crucial for teachers in general to enhance their teaching practices in the classroom, which in turn improves upon students' learning outcomes. In view of this, stakeholders of teacher training institutions should factor more in assessment literacy, both theory and practice into the curriculum to equip their pre-service teachers with more skills in assessment.

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INTRODUCTION

Assessment plays a crucial part in education (Ainscow, Beresford, Hopkins, Southworth & West, 2012) and therefore influences the instructional methods of teachers and the learning outcomes of students at both the classroom and institutional levels (Baird, 2013). Assessment is recognized as a fundamental principle in curricula throughout numerous global educational systems and is also a critical component of teacher professionalism (Cochrane-Smith, Piazza, & Power, 2013; O'Neill & Adams, 2014). The increasing interest in this subject is attributed not only to accountability demands and the recognition of assessment as a catalyst for educational reform (Heitink, Van der Kleij, Veldkamp, Schildkamp, & Kippers, 2016), but also to the necessity for educators to enhance student learning by devising and executing effective assessments in their classrooms (DeLuca, Chavez, Bellara, & Cao, 2013; DeLuca, Klinger, Pyper, & Woods, 2015; Hill, Cowie, Gilmore, & Smith, 2010; Lam, 2015; Popham, 2011). Significant efforts have been undertaken to assist both rookie and experienced educators in comprehending the facets of assessment practice, including development, administration, scoring, and the communication of assessment results to students (DeLuca & Bellara, 2013). Assessment literacy is defined as "an individual's understanding of the fundamental assessment concepts and procedures" (Popham, 2011, p. 267). Educational research (DeLuca, Chavez, & Cao, 2013; Stiggins, 2010) and various policies and standards (JCSEE, 2000; 2003; NBTS, 2003; NCATE, 2006 in the US; Australian Professional Standards for Teachers, 2012 and ACACA, 1995 in Australia; JAC, 1993 in Canada) have sought to inform teacher practice and promote the assessment literacy deemed essential for proficient teachers.

The acknowledgment of the essential function of teacher assessment literacy as a proficient and effective means (Popham, 2018) to address accountability requirements and enhance student learning in the classroom (DeLuca & Bellara, 2013; McMillan, 2017; Scheerens, 2016) is manifest in policy documents and standards in the United States and beyond (DeLuca, LaPointe-McEvan, & Luhanga, 2016). Therefore, the capacity of teachers to conduct classroom assessments and apply assessment data is essential to effective assessment practices (Pastore & Andrade, 2019). Teachers typically govern classroom assessment environments by establishing the evaluation methods for students, the frequency of these assessments, and the approach to providing feedback, as noted by Koloi-Keaikitse (2017). Teachers bear substantial responsibility for evaluating student learning, making their assessment skills and techniques of paramount importance (Pastore & Andrade, 2019). In classroom assessment, instructors' perceived assessment skills are vital as they affect their actual assessment practices, prompting them to frequently participate in activities they consider themselves adept at (Acar-Erdol & Yıldızlı, 2018; Brown, Gebriel & Michaelides, 2019). The perceived assessment skills refer to educators' beliefs of their proficiency in data collection, analysis, and evaluation to monitor student learning outcomes and guide educational practices (Brown et al., 2019; Pastore and Andrade, 2019). The method by which educators assess their students is crucial, as it is intimately connected to both instruction and student learning outcomes (Crichton & McDaid, 2016). These procedures encompass assessment design, administration, scoring and interpretation, grading, as well as the utilization and evaluation of assessment data (Koloi-Keaikitse, 2017).

Also, Scarino (2013) emphasizes the significance of assessment literacy in teacher education and suggests that teachers' educational background and training may significantly impact their assessment literacy, hence affecting the quality of assessment practices. Likewise, Paiva et al. (2022) conducted an extensive analysis of automated assessment in computer science education. The results demonstrated that educators with higher academic qualifications are more adept at effectively employing and executing advanced assessment technology. Palau et al. (2015) conducted a study on educational assessment, demonstrating that teachers with advanced degrees exhibit greater proficiency in utilizing diverse assessment methodologies to effectively measure student development. It is well observed that as teachers attain higher qualifications, their evaluative skills and

perspectives develop, thereby affecting their assessment techniques (Brown et al., 2019; Yan & Brown, 2021).

Also, the impact of teachers' pedagogical experience on their assessment competencies and methodologies has received significant scholarly attention. Shepard et al. (2018) emphasized the need of integrating formative assessment, grading procedures, and large-scale evaluation, suggesting that teachers' expertise in utilizing these assessment methods is influenced by their teaching experience. Deeley et al. (2017) found that faculty members with less than six years of teaching experience had lower assessments of teaching efficacy in course and assessment design than those with more than six years of experience. This study demonstrates that the evaluation skills and methodologies of experienced educators are effectively amalgamated. Gamage et al. (2020) did research on the online application of pedagogical approaches and discovered that teaching experience substantially impacts the efficacy of assessment procedures. Research indicates that seasoned educators have profound understanding of assessment principles and possess a cohesive ability to apply both formative and summative assessment procedures. This underscores the vital significance of teaching experience in enhancing teachers' evaluative abilities and methodologies.

Research by Black and Wiliam (2018) highlighted the connection between classroom assessment and pedagogy, demonstrating that experienced instructors have a deeper comprehension of assessment techniques and are more skilled at aligning assessments with instructional goals. Moreover, it is underscored that teaching experience is vital in the evaluation activities of educators, as it enables them to learn from their mistakes and formulate ways to adjust to the dynamic character of the learning process (Barnes et al., 2017; Coombs et al., 2018).

Previous studies have assessed the correlation between teaching experience of teachers and assessment practices and have shown significant influence on each other. Therefore, it become necessary to know the assessment literacy level of student-teachers (pre-service teachers) who are going to the field to teach since they are required to yield positive results in their students. In this regard, the present study determined pre-service teachers' understanding and perceptions toward assessment literacy. Specifically, the study sought to determine the understanding and perceptions of K-12 pre-service teachers in Assessment literacy. Therefore, it addressed the question; how do K-12 pre-service teachers perceive the knowledge of assessment literacy in education? The study focused on enhancing the productivity of K-12 pre-service teachers in the classroom and students' success. The ability of teachers to exhibit high levels of assessment literacy in turn affects their professionalism and their students' learning outcome.

ASSESSMENT LITERACY

According to Erwin (1991, as referenced by NCF (Government of Pakistan, 2018b), assessment encompasses the processes of identifying, selecting, developing, gathering, evaluating, analyzing, and utilizing information to perpetually enhance students' learning and development. It is the systematic collection, review, and use of information about educational programs to improve student learning; therefore, the ability for preservice teachers to understand assessment principles and practices and to use assessment data effectively to support students learning is known as assessment literacy. This parameter is a crucial aspect that teacher educators must address in the training of student teachers during their preparation, since it will influence their productivity. Preservice teachers' assessment literacy will significantly impact their knowledge in assessments, ability to interpret and use assessment data, their teaching confidence, and enhance the integration of technology in assessment.

PRESERVICE TEACHERS' KNOWLEDGE AND PERCEPTIONS

Preservice teachers' knowledge is the understanding and skills that preservice teachers possess on assessment practices and how to apply them to meet students learning in the classroom. These skills include the types of assessments, the principles underlying each type, and the purpose of

the types of assessments. Hence, perceiving the knowledge of preservice teachers on assessment literacy will enable stakeholders to know preservice teachers' needs in assessment principles underlying the types of assessments and then cater it into their training.

Preservice teachers' ability to understand the process of implementing assessment, collecting data from the assessment, and using the data to support student learning will be one of the parameters that will be enhanced with assessment literacy. Knowing this ability of the preservice teachers and how they will apply the data from assessment to support students learning outcomes will provide stakeholders with the need to ensure high assessment literacy in pre-service teachers.

METHODOLOGY

This study included a systematic review and synthesis of peer-reviewed empirical journal articles. The primary objective of this design was to mitigate bias and enhance transparency throughout the review process by employing explicit, systematic methods to minimize bias in the selection and inclusion of studies, evaluate the quality of the included studies, and summarize them objectively (Liberati et al., 2009). Also, the purpose was to identify existing literature on assessment literacy among preservice teachers, their understanding and perceptions toward assessments. The outcome of the search yielded twenty-one peer-reviewed journal articles. The methodology described by Khan et al. (2003) for the selection of journal articles was employed. According to Khan et al. (2003), to arrive at a quality results and synthesis of articles, these stages should be employed for the review; selection of relevant research using databases and search keywords, assessment of study quality, synthesis of evidence, and interpretation of findings. After the review stages, 17 articles were considered out of the 21 articles. The procedures for the selection of these articles have being explained further below.

SELECTION OF RELEVANT WORK

The researcher initiated the search for journal articles via EBSCO and Advanced Google Search. Journal papers were selected because, as noted by Reeves and Crippen (2021), they typically offer a more comprehensive description and analysis of data compared to conference proceedings, which may only present initial phases or preliminary versions. The search strategy utilized the following keywords: assessment literacy, pre-service teachers, and years of teaching experience.

INCLUSION- EXCLUSION CRITERIA

The inclusion criteria used in the selection of the articles were firstly, articles from the year 2014 to 2024. Secondly, articles on pre-service teachers and their perception on knowledge of assessment literacy. However, the exclusion criteria were articles beyond the specified years and articles on only one type of assessment. Also, articles on assessment literacy applied in non-education disciplines were excluded.

ASSESSING THE QUALITY OF STUDIES

The articles were subsequently evaluated by analyzing the titles and abstracts. The constructs, literature review, methodology, findings, comments, and conclusions of the numerous journal papers were also examined.

SUMMARIZING THE EVIDENCE

Krippendorff (2012) contends that the preliminary stage of content analysis involved a coding procedure for study attributes based on research questions, wherein certain narrative or representational components of each manuscript were identified as evidence. The elements of the manuscripts that pertained to the research issue were identified and designated a term (construct) that signifies a characteristic.

INTERPRETING THE FINDINGS

17 out of the 21 identified journal articles were on assessment literacy among pre-service teachers whilst the remaining 4 were on assessment types. For the excluded articles, one was on formative assessment, two were on summative assessment and the remaining one was on diagnostic assessment and these were excluded from the review. The findings of the 17 journal articles were presented in table 1.

Table 1. Articles selected and their overview

<i>Authors</i>	<i>Constructs</i>	<i>Findings</i>
1. Sheikh and Manap (2024)	classroom assessment, Secondary education	Many teachers employed quiz methodologies, interrogatives, instructional strategies, open-ended inquiries, and closed questions. Certain educators were implementing the incentive system and cultivating a sense of accountability among students.
2. Wolde, Agago, and Zinabu (2024)	assessment skills and assessment practices, Predictors of teachers	The academic qualifications of teachers, their teaching experience, and the assessment training they have undergone predict their perceived assessment competencies and practices.
3. Zou, Yuan, Mo, and Mustakim (2024)	assessment Strategies	Enhancements in curriculum assessment methodologies by the adoption of practical, strategy-oriented evaluations can significantly improve teaching quality and student learning results.
4. Yang, Huang, Wu and Xiong (2024)	assessment of preservice physics teachers' knowledge	The preservice teachers' knowledge, skills, and understanding of force and motion were only moderately advanced, and their topic knowledge showed no correlation with their KSU. A four-tier progression system for KSU was also established.
5. Stăncescu and Drăghicescu (2016)	importance of assessment, science teachers' perspective	Science teachers believe they should prioritize the assessment process and incorporate contemporary assessment strategies, such as formative assessment, and alternative methods, like portfolios, alongside traditional strategies and techniques.
6. Beziat and Coleman (2015)	classroom assessment literacy, pre-service teachers'	Pre-service teachers exhibit a deficiency in assessment literacy, notwithstanding their completion of training in classroom assessment.
7. Zin Oo, Alonzo and Asih (2022)	teacher assessment literacy, pre-service teachers	Four fundamental content designs in assessment programs were identified from the twelve articles: audience-oriented, theory-driven, policy-driven, and classroom practice-driven.
8. Atjonen, Pöntinen, Kontkanen and Ruotsalainen (2022)	Assessment Literacy of Preservice Teachers: Emphasis on Knowledge Base, Assessment Conceptions, and Teacher Development	The students' understanding of assessment knowledge and concepts was notably diverse and demonstrated a profound awareness of the comprehensive nature of assessment. Furthermore, assessment is a challenging subject for student instructors to engage in discussions with their classmates.
9. Zin Oo, Alonzo and Davison (2020).	Pre-service teachers' Decision-Making and Classroom Evaluation Methods	The decision-making of preservice teachers (PSTs) in the classroom was significantly shaped by their ideas and values regarding assessment procedures, however it was notably restricted by their supervising teachers. The PSTs who comprehended the ideas of assessment for learning (AfL) and sought to apply continuous evaluation encountered conflict with supervising professors who want to maintain stringent control over the practicum. Consequently, most PSTs were unable to employ assessment methodologies effectively to guide their judgments regarding learning and teaching activities.
10. Mellati and Khademi (2018)	Teachers' Assessment Literacy, Students' Writing Proficiencies, and Consequences for teacher Development	The assessment literacy of teachers significantly influences students' writing performance, while teachers' understanding of assessment fosters effective and motivated assessment design in educational settings.

11. Ogan-Bekiroglu and Suzuk (2014)	The assessment literacy of pre-service teachers and its practical application	The research uncovered discrepancies between theoretical and practical evaluation literacy. This study advocates for teacher education programs to emphasize assessment theories and evaluation types, underscore the validity and reliability of assessments, facilitate student engagement in both traditional and performance-based assessment methods, and offer opportunities for reflection, practice, and revision of these methods.
12. Lian and Yew (2016)	A Framework for Analyzing the Assessment Literacy of Preservice teachers	Researchers posited that preservice teachers might demonstrate three tiers of assessment literacy according to the cognitive development model. The three tiers consist of unistructural, multi-structural, and relational.
13. Kitty, Liesbeth, Marjan and Elly de Bruijn (2023)	Teachers' perceptions of assessment literacy	Seven interconnected dimensions of assessment literacy were identified: 'ongoing enhancement of assessment literacy', 'meticulous decision-making', 'alignment', 'collaboration', 'discussion', 'advancement and innovation', and 'managing conflicts.' This depiction of assessment literacy, grounded in teachers' perceptions, may inform the enhancement of their assessment literacy in practice.
14. Güngör and Güngör (2023)	Enhancing Pre-service Teachers' Assessment Literacy during the Practicum	Pre-service teachers recognized the disparity between the EFL curriculum and actual classroom assessment procedures, enhanced their self-confidence through participation with action research for assessment preparation, and cultivated a tacit grasp of assessment literacy through experiential learning in real contexts.
15. Delosa, Pagara and Manla (2021)	Assessment Literacy of Madrasah Teachers	The assessment literacy of Madrasah teachers need improvement, indicating that the majority lack the knowledge and abilities in employing efficient assessment tools. Enhanced learning can be attained through the implementation of efficient classroom assessment methods and strategies.
16. Larsari (2021)	Teacher Assessment Literacy (TAL) regarding Learners' Writing Progressions	The influence of teacher assessment literacy (TAL) significantly impacts writing development. Teacher assessment literacy (TAL) significantly influences the improvement of learners' writing skills.
17. Nayagi and Rajendran (2019)	Approaches to Classroom Assessment by Pre-Service Teachers	Pre-service teachers demonstrated a superior comprehension of three out of five topics, namely assessment purpose, measurement theory, and confidence in evaluating the assessment. Nonetheless, the study revealed that individuals possess a deficient comprehension of assessment design and techniques.

Table 1 shows the studies done on pre-service teachers' perceptions and understandings in assessment literacy from 2014 to 2024. It was revealed that majority of preservice teachers lack the knowledge and abilities in employing efficient assessment tools. Also, individuals preservice teachers possess a deficient comprehension of assessment design and techniques. It was further revealed that most preservice teachers (PSTs) were unable to employ assessment methodologies effectively to guide their judgments regarding learning and teaching activities. Assessment plays a major role in promoting learners performance. As revealed by the table, the influence of teacher assessment literacy (TAL) significantly impacts writing development. Teacher assessment literacy (TAL) significantly influences the improvement of learners' writing skills. Also, The assessment literacy of teachers significantly influences students' writing performance, while teachers' understanding of assessment fosters effective and motivated assessment design in educational settings.

Also, preservice teachers' ability to make vital decisions on students' performance depends on their skills of using the appropriate assessment strategies in the classroom, and their ability to cultivate a sense of accountability among students. The preservice teachers' understanding of assessment knowledge and concepts was notably diverse and demonstrated a profound awareness of the comprehensive nature of assessment. In addition, it was seen that their decision-making in the classroom was significantly shaped by their ideas and values regarding assessment procedures, however it was restricted by their supervising teachers. Therefore, it was revealed that teacher

education programs should emphasize on assessment theories and evaluation types to underscore the validity and reliability of assessments, facilitate student engagement in both traditional and performance-based assessment methods, and offer opportunities for reflection, practice, and revision of these methods.

UNDERSTANDING AND PERCEPTIONS OF PRE-SERVICE TEACHERS ON ASSESSMENT LITERACY

The review indicated that pre-service teachers exhibit a deficiency in assessment literacy, notwithstanding their completion of training in classroom assessment (Beziat & Coleman, 2015). Consequently, students must attain greater proficiency in assessment literacy. Furthermore, pre-service instructors demonstrated a superior comprehension of three out of five topics, namely assessment goal, measurement theory, and confidence in evaluating the assessment. Nonetheless, they possess a deficient comprehension of assessment design and assessment methodologies (Nayagi & Rajendran, 2019). Consequently, Ogan-Bekiroglu and Suzuk (2014) assert that teacher education programs must emphasize assessment theories and evaluation kinds. This suggests that emphasizing these curriculum features will augment the comprehension and implementation of effective assessment procedures in the classroom, hence enhancing students' academic achievement.

Wolde, Agago, and Zinabu (2024) assert that the educational qualifications of instructors, their teaching experience, and the assessment training they have had are predictors of their perceived assessment competencies and practices. According to Zin Oo, Alonzo, and Davison (2020), preservice teachers' (PSTs) decision-making in the classroom is significantly shaped by their views and values regarding assessment strategies, although it is notably restricted by their supervising teachers. The PSTs who comprehended the ideas of assessment for learning (AfL) and sought to apply continuous evaluation encountered conflict with supervising instructors who want to maintain stringent control over the practicum. Consequently, most PSTs were unable to employ assessment methodologies effectively to guide their judgments regarding learning and teaching activities (Zin Oo, Alonzo & Davison 2020). This indicates that pre-service teachers' perceptions of assessment literacy are contingent upon their attitudes, values, educational attainment, and assessment training.

DISCUSSION

The concept of assessment literacy is crucial for teacher programs in training of preservice teachers. The knowledge in assessment is needed by these teachers to ensure learning among students. For instance, in the US, the recent revision of the InTASC Model Core Teaching Standards and Learning Progressions for Teachers 1.0 (CCSSO, 2017) introduces the notion of assessment literacy, acknowledging that teachers must possess enhanced knowledge and skills in developing diverse assessments, appropriately balancing formative and summative assessments, and utilizing assessment data to comprehend each learner's progress, plan and modify instruction as necessary, provide feedback to learners, and document learner advancement relative to standards. From a socio-cultural standpoint, assessment literacy is regarded as socially distributed, contextually reliant, and intertwined with cultural artifacts, objects, and individuals (e.g., professional standards, school organization, students, and colleagues), as observed by Pastore (2023). Recent research has consistently emphasized the assessment illiteracy of both pre-service and in-service teachers, arguing for improvements in teacher preparation about assessment techniques. The recent redefinition of assessment literacy, instead of following a basic checklist aligned with professional standards, highlights the dynamic interaction between the vertical and horizontal aspects of assessment literacy and investigates how to analyze these elements and their impact on improving teacher assessment proficiency (Pastore, 2023).

The results of the present study revealed that preservice teachers understanding in assessments is deficient and thus their perceptions toward assessments need to be improved. These findings corroborate numerous investigations regarding the efficacy of the assessment course, indicating that pre-service teachers' understanding of assessment practices has not sufficiently

advanced to fulfill the current demands of assessment in standard teaching (Abbott, 2016; Beziat & Coleman, 2015; Deneen & Brown, 2016; Izci & Caliskan, 2017). This was corroborated by Alkharusi et al. (2011); Davidheiser (2013); Gotch & French (2013); King (2010); Mertler (2003). These authors indicate that multiple studies have investigated teachers' understanding of assessment and their perceptions of assessment competence. The findings suggest that teachers may not be adequately prepared to evaluate student learning and possess limited knowledge necessary for implementing high-quality assessments. Specifically, pre-service teachers exhibited constrained assessment competencies (Coombs, 2018; Cowan, 2009; DeLuca & Klinger, 2010; MacLellan, 2004; Volante & Fazio, 2007).

CONCLUSION

The study assessed the understanding and perceptions of pre-service teachers' assessment literacy. The findings indicated that preservice teachers' understanding of assessment is deficient and their perceptions toward assessment need to be improved. Knowledge in assessment is very crucial for teachers in general to enhance their teaching practices in the classroom, which in turn improves upon students' learning outcomes. In view of this, stakeholders of teacher training institutions should factor more assessment literacy, both theory and practice, into the curriculum to equip their pre-service teachers with more skills in assessment.

LIMITATION OF THE STUDY

Due to time constraint, secondary data were gathered from specific number of peer reviewed journal articles on preservice teachers and thus the findings cannot be generalized. Also, articles published within the time frame of 2014 to 2024 were considered in the review.

SIGNIFICANCE OF THE RESEARCH

Firstly, the research will help to improve K-12 pre-service teachers' perceptions toward assessment, and improve their classroom efficiency and student achievement, as they will be more professional, and their learners will be more capable of learning because of increased assessment literacy. Moreover, most of the literature focused on assessment literacy of in-service teachers and not so much on pre-service teachers, so this study seeks to address the assessment literacy of pre-service teachers. The study will give stakeholders and teacher educators knowledge on the assessment literacy of their preservice teachers and suggest remediation before their practical teaching experience.

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