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ASSESSMENT LITERACY FOR TEACHERS AND TEACHING PRACTICE: A META-ANALYSIS

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ABSTRACT

This study aims to present a synthesis of research on assessment literacy, identifying its contributions to teacher training and the improvement of the quality of teaching through pedagogical work with assessment. Zotero and Jamovi software were used for data management and statistical analyses, respectively, in the development of the meta-analysis. The findings indicate the need for assessment literacy programs for teachers, so that educators acquire fundamental skills in this field and, in doing so, strengthen their identity as an evaluator, improve both summative and formative assessment practices, as well as their perceptions of assessment, and use different instruments and techniques appropriately and consciously.

KEYWORDS ASSESSMENT LITERACY • TEACHING • BASIC EDUCATION • STATISTICAL ANALYSIS.

LETRAMENTO EM AVALIAÇÃO PARA PROFESSORES E A PRÁTICA DOCENTE: UMA METANÁLISE

RESUMO

Esta investigação tem como objetivo apresentar uma síntese de estudos que abordam o letramento em avaliação, identificando suas contribuições para a formação dos professores e a melhoria da qualidade do ensino a partir do trabalho pedagógico com a avaliação. Utilizaram-se os *softwares* Zotero e Jamovi para gerenciamento e análises estatísticas, respectivamente, no desenvolvimento da metanálise. Os resultados apontam a necessidade de programas de letramento em avaliação para professores, a fim de que docentes adquiram habilidades básicas nesse campo e, com isso, fortaleçam a identidade do professor como avaliador, aperfeiçoem as práticas de avaliação somativa e formativa, bem como as percepções acerca da avaliação, e utilizem de forma adequada e consciente os diferentes instrumentos e técnicas avaliativas.

PALAVRAS-CHAVE LETRAMENTO EM AVALIAÇÃO • ENSINO • EDUCAÇÃO BÁSICA • ANÁLISE ESTATÍSTICA.

LITERACIDAD EN EVALUACIÓN PARA PROFESORES Y LA PRÁCTICA DOCENTE: UN METAANÁLISIS

RESUMEN

Esta investigación tiene como objetivo presentar una síntesis de estudios que abordan la literacidad en evaluación, identificando sus contribuciones para la formación de los profesores y la mejora de la calidad de la enseñanza a partir del trabajo pedagógico evaluativo. Para el desarrollo del metaanálisis, se utilizaron los *softwares* Zotero y Jamovi para la gestión y los análisis estadísticos, respectivamente. Los resultados señalan la necesidad de programas de literacidad en evaluación para docentes, con el fin de que estos adquieran habilidades básicas en este campo y, con ello, fortalezcan su identidad como evaluadores, perfeccionen las prácticas de evaluación sumativa, formativa y las percepciones acerca del proceso evaluativo, así como el uso adecuado y consciente de diferentes instrumentos y técnicas de evaluación.

PALABRAS CLAVE LITERACIDAD EN EVALUACIÓN • ENSEÑANZA • EDUCACIÓN BÁSICA • ANÁLISIS ESTADÍSTICO.

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INTRODUCTION

Given the many variables that shape the world of contemporary classroom teaching, understanding and knowing how to use assessment processes and tools correctly and critically is essential to the knowledge of teachers in initial or continuing education, in order to improve the quality of teaching and its relationship to student learning, which depends on the effective implementation of these processes. What must be kept in mind, and requires the utmost care, is how, and for what purpose assessment is used.

Historically and culturally, assessments stem from a traditional paradigmatic framework, in which they are often used by teachers as value judgments, aimed simply at identifying who passes or fails, or which students were merely able to reproduce the teacher's thinking on standardized tests. This approach is considered highly misguided, as the social and educational function of assessment requires awareness and reflection, as Hoffmann (2014) emphasizes, highlighting the need to understand and redefine the concepts of assessment in teacher training and in teachers' professional practice.

This knowledge, referred to in this study as assessment literacy for teachers, is the set of epistemological knowledge and skills required for the critical use of assessment in its various contexts. This knowledge enables teachers to make assertive decisions regarding the reorientation of teaching based on data about student performance, and to maximize learning by addressing underdeveloped skills, with pedagogical work involving assessment serving as a foundation for teaching practice.

Discussions and studies on assessment literacy for teachers originated in the United States and other English-speaking countries, such as Canada, New Zealand, Australia, and the United Kingdom, in the early 1990s, with the coining of the term *teacher assessment literacy* to describe teaching practices and established ideas regarding assessment processes, particularly formative assessments, as well as the development of standards of excellence for classroom assessment (DeLuca et al., 2016). The term *teacher assessment literacy* was originally used by Richard J. Stiggins, in 1991.

To better understand what assessment literacy is, Stiggins (1991) explains that, first and foremost, one must understand what it means to lack this literacy. In other words, according to the author, someone who is illiterate in assessment does not grasp the necessary aspects for a student to achieve high-quality performance and, as a result, is unable to critically evaluate that performance. This critical perspective allows teachers to assess learning, which should directly impact the quality of classroom instruction.

However, a dichotomy is evident in the assessment process within the classroom, since, in principle, every teacher should possess the assessment techniques, knowledge, and principles that guide students toward learning through the assessment process. However, at times, the act of assessment is limited to measuring

what students have not learned or what the teacher expected them to learn through summative testing instruments.

In this regard, one might ask: Are teachers guided and supported in their assessment practices through a critical awareness of the various types, techniques, and tools of assessment? Is there training in assessment for teachers that would allow them to consider themselves, at the very least, literate in assessment within the context of teacher training in Brazil?

In light of these questions and the apparent gaps in teacher training within the Brazilian context, a serious concern emerges, as highlighted by Bayat and Rezaei (2015), who assert that a lack of assessment literacy jeopardizes both teaching practice and students' cognitive development and learning. That is, the absence of assessment literacy compromises educators' ability to plan, use, and interpret assessments and their data in promoting the quality of teaching and learning processes through pedagogical work with assessments.

In general, it is evident that the Brazilian literature lacks studies on this topic, which is highly relevant to teaching practice, even though it has been studied in English-speaking countries for over three decades. Thus, there is a clear need for research on assessment literacy for teachers¹ in the Brazilian context.

According to Bayat and Rezaei (2015), a teacher literate in assessment can enhance teaching and promote student learning through three aspects inherent to assessment: (i) the knowledge, skills, and abilities to design, develop, and maintain summative and/or formative assessments in a systematic, thoughtful, and critical manner; (ii) the teacher's familiarity with and awareness of assessment principles, concepts, and processes; and (iii) the ability to consolidate knowledge, skills, processes, principles, and concepts in a methodical manner, from a historical, cultural, social, political, and philosophical perspective, assessing the impacts on society, educational institutions, and the individual learner (Bayat & Rezaei, 2015).

In light of the above, the research question is: How can assessment literacy contribute to teacher training, improve classroom teaching practices, and enhance the quality of teaching processes through effective assessments?

To address this question, the aim is to present a synthesis of studies on assessment literacy, identifying their contributions to teacher education and the improvement of teaching quality through pedagogical work with assessment, using a meta-analysis.

The study was conducted in accordance with the guidelines of Page et al. (2022) and Moher et al. (2015), following the Preferred Reporting Items for Systematic

1 Assessment literacy for teachers can also be referred to by equivalent terms, such as "literacy in assessment", "instruction in assessment", or "teachers' assessment literacy".

Reviews and Meta-Analyses 2020 (PRISMA 2020)² protocol. This protocol outlines a set of checklists for the preparation of systematic literature reviews and meta-analyses, aiming to minimize the risk of bias in the research.

From this perspective, the process is organized around the formulation of guiding questions, the definition of inclusion and exclusion criteria, the selection of databases, and the use of specific search strings to identify relevant publications on the research topic.

This study begins with this introduction and then presents the main ideas and concepts found in the literature regarding assessment literacy for teachers. The article also includes a detailed description of the methodology used and key features of the methodological approach, such as the stages of the meta-analysis, as well as the processing and analysis of the articles that make up the *corpus* of this research.

In addition, the results and discussion address the research's guiding question. The study also highlights the research's contributions to the field of education, providing a cohesive and integrated overview of the study's development, the research's impact, and future prospects for work that contributes to science, research, and teaching practice.

ASSESSMENT LITERACY FOR TEACHERS

Assessment, which is essential to both teaching and learning processes, is a strategy used to evaluate performance and enables pedagogical monitoring, allowing teachers to reflect on student learning and their own professional practice (Moraes & Batista, 2020).

According to Richardson (2022), when separated from teaching, assessment affects the potential quality of student learning. Therefore, having knowledge and skills regarding the various forms of assessment, as well as the tools and resources involved, provides the assessor (teacher) with strategies for achieving previously established instructional and pedagogical goals.

Understanding different ways to implement assessment practices is an essential skill for those who teach and assess students on a daily basis in a school setting. In this context, being literate in assessment enables one to critically analyze the data (evidence) collected through assessments and, based on that analysis, develop strategies that strengthen classroom instruction within the framework of pedagogical work involving assessment.

According to Richardson (2022, p. 103), "being literate in assessment has the potential to challenge key concerns about the reliability of assessment outcomes". In this regard, assessment literacy is essential for improving teaching practice, as well as

2 The number 2020 refers to the year the PRISMA protocol was updated.

for fostering autonomy, freedom, and empowerment, and for transforming teaching practice through paradigm shifts in the culture of assessment (Moraes & Batista, 2020).

Based on Stiggins (1991), assessment literacy enables the identification of characteristics related to the measurement of student performance, characteristics that are identified through various assessment methods. In this sense, assessment literacy facilitates coherent and insightful analyses that contribute to the enrichment of teaching practice through assessment.

According to DeLuca et al. (2016), assessment literacy for teachers is a professional competency required worldwide in the field of public education. Thus, it is inconceivable, in the current educational context, that there are still teachers who are not adequately literate in assessment or who lack the minimum skills required for it, given the global consensus that recognizes assessment as a learning opportunity for students and a professional development tool for education professionals.

Assessment literacy provides teachers with "a deep and informed understanding of *why* assessments are conducted, *what* should be assessed, and *how* this will be assessed, so that they are able to make informed and conscious decisions regarding student outcomes" (Moraes & Batista, 2020, p. 19, own translation, emphasis added).

In fact, it is clear that mastering the competencies and skills specific to assessment literacy frees teachers from the notion that assessment is limited to a set of multiple-choice or essay questions organized into a test in which the teacher must assign a quantitative score based on the student's errors. In other words, the teacher literate in assessment possesses the critical awareness to interpret and utilize assessment data (Stiggins, 1991) in support of student learning and the improvement of their teaching practice.

Recent studies, such as that by DeLuca et al. (2019), reveal that teachers' assessment literacy has undergone changes in recent years. Epistemological and pedagogical issues regarding the critical use of assessment, as well as its social and cultural context, have been incorporated into teachers' skills through a humanized approach to assessment, that is, one that considers formative assessment, social justice, and equity beyond summative assessment and its homogeneous criteria for application and data.

In terms of a rough chronological framework, assessment literacy for teachers can be understood according to the milestones outlined in Table 1.

TABLE 1
Timeframes of assessment literacy for teachers and their characteristics

PERIOD	CHARACTERISTICS
From 1990 to 1999	During this period, studies on assessment literacy for teachers focused on understanding the purpose, processes, and communication of results, as well as the fair application of assessments in teaching; the emphasis was primarily on the use of summative assessments and psychometrics.
From 2000 to 2009	In addition to the perspectives that emerged in the previous decade, this period has seen the emergence of concepts of social justice in assessment and the assessment-for-learning approach. This unfolds in two strands: (i) formative, diagnostic, and self-assessment practices, as well as peer assessment and teacher feedback; (ii) integration between assessment, teacher training, and support, through greater awareness of the connection between assessment practices and teaching practice.
From 2010 to the present	A period marked by the strengthening of assessment-for-learning and by evidence-based educational decision-making regarding students' learning progress, as well as by an emphasis on the sociocultural dimension of assessment, taking into account the social and cultural relationships and conditions in which students are embedded as they experience assessment processes throughout their educational journey.

Source: Authors' elaboration based on DeLuca et al. (2016).

It is generally accepted that there are three dimensions of assessment literacy for teachers today. These are: (i) the conceptual dimension, which refers to the definitions and concepts of different types of assessment; (ii) the praxeological dimension, from which the actions of assessment practice emerge; and (iii) the sociocultural dimension, on which the conception of assessment as a social practice is based (Girgla et al., 2021).

In line with the concept of assessment literacy for teachers, Moraes and Batista (2020) argue that, in order to (re)orient or reframe teachers' pedagogical practices regarding assessment, one can adopt assessment tasks and criteria aligned with students' learning objectives, use different assessment instruments to accommodate diverse learning profiles, employ summative, formative, and diagnostic assessment in a complementary manner, and share criteria and results through effective feedback.

In light of the above, the relevance of assessment literacy for teachers is evident, as is the social responsibility that educators bear in their professional practice regarding the assessment processes embedded in teaching, so that students' effective and individualized learning reflects evidence-based best assessment practices, opening new horizons and promoting the consolidation of learning, in line with the objectives of teaching, learning, and school assessment.

METHODOLOGY

Methodologically, this study is designed as a quantitative investigation, employing statistical and mathematical procedures to analyze the evidence. Regarding the nature and objective of the research, it is classified as basic, as it involves a literature review based on previously published works, and is descriptive in nature, aiming to describe

the characteristics of a specific phenomenon. Regarding technical procedures and the time frame, this is a bibliographic study, limited to the data collection period (April to July 2025), and is characterized as a cross-sectional study (Ferreira, 2024).

Specifically, this article was based on a literature review employing statistical techniques, that is, a meta-analysis, which, in other words, "combines the findings of various individual studies to draw more robust conclusions on a specific topic" (Medeiros et al., 2024, p. 2, own translation), whereas a systematic review, for example, focuses more on the qualitative synthesis of results. Specifically, a search was conducted for publications that address the contributions of assessment literacy to teacher education and the improvement of teaching practices.

The article selection process was structured in accordance with the PRISMA 2020 guidelines (Page et al., 2021). These guidelines provide guidance on the preparation of systematic review and meta-analysis reports.

To select the studies, we used national and international databases that contain high-impact articles relevant to the topic, employing the automated search strings described in Table 2.

TABLE 2
Search strings for the investigation

DATABASES	SEARCH STRINGS
Capes and SciELO journals (national databases)	(letramento em avaliação) AND (formação de professores) AND (ensino)
Scopus, Eric and Web of Science (international databases)	(assessment literacy) AND (teacher training) AND (teaching)

Source: Authors' elaboration.

It should be noted that the same search terms and Boolean operators were used in both automated electronic searches, differing only in terms of language: Portuguese was used in the national databases, and English in the international databases.

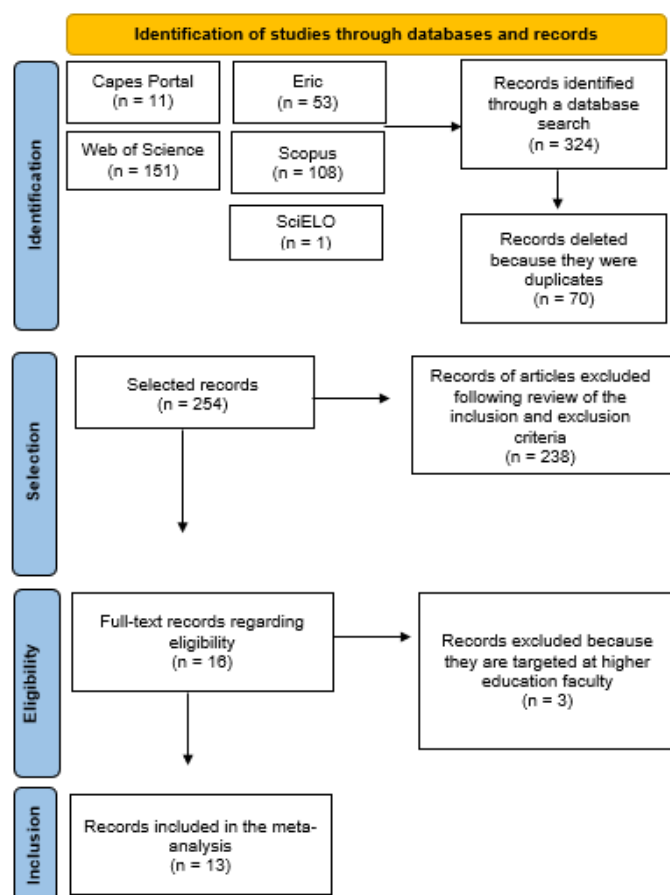
Regarding the inclusion criteria, the following items were defined for the literature review: articles published between 2016 and 2025; peer-reviewed, open-access journal articles in digital format and full available. Regarding the exclusion criteria, duplicate records, articles that did not fit within the scope of the research, review articles, theses, and dissertations were excluded.

A search in the selected national databases identified 11 articles in the Capes Journal Portal and 1 article in the Scientific Electronic Library Online (SciELO). In international platforms, 108 articles were found in Scopus, 151 in Web of Science, and 53 in the Education Resources Information Center (Eric), totaling 324 publications for the screening process (Figure 1).

Of the total number of articles identified in the initial screening phase, 70 duplicate records were excluded, leaving 254 articles. After applying the inclusion and exclusion criteria (selection phase), initially conducted by screening based on the title and abstract, 238 articles were excluded for not fitting the research context, resulting in 16 articles in the eligibility phase for the meta-analysis.

After thoroughly reviewing these sixteen articles, three were removed from the analytical *corpus* because they were aimed at higher education faculty or teachers in initial training, since the research focuses on the context of basic education. Thus, thirteen articles remained for statistical processing and quantitative data analysis.

FIGURE 1
Flowchart of the articles selection process



Source: Authors' elaboration using data from the study.

For data management, we used Zotero software, version 7.0.22 (Zotero, n.d.), a free tool that allows users to collect, organize, annotate, cite, and share research. The tool was essential for organizing the articles selected from search platforms, facilitating the initial screening of titles and abstracts according to the inclusion and exclusion criteria. Finally, the articles were read in full, resulting in a final list of publications that were then forwarded to the data extraction and systematization phases.

For the quantitative analysis of this study, we used the statistical software Jamovi, version 2.6.17 (Jamovi, n.d.), which enabled data exploration as well as the analysis and interpretation of the meta-analysis results.

RESULTS

Based on the screening process conducted according to the inclusion and exclusion criteria of the literature review, the articles listed in Table 3 (which includes the article title, authors, year of publication, and country where the study was conducted) were analyzed. From here on, they will be identified as A1, A2, ..., A13.

TABLE 3
Articles included in the meta-analysis

ID	ARTICLE TITLE	AUTHORS	YEAR	COUNTRY
A1	Mathematics teachers' abilities in developing formative assessment after the introduction of lesson study and open approach innovations	Thinwiangthong, S., Eddy, C. M., & Inprasitha, M.	2020	Thailand
A2	EFL teachers' assessment literacy of young learners: Findings from a small-scale study	Yeşilçinar, S., & Kartal, G.	2020	Turkey
A3	Exploring junior high school EFL teachers' training needs of assessment literacy	Zulaiha, S., & Mulyono, H.	2020	Indonesia
A4	Saberes necessários ao professor para avaliar a aprendizagem de crianças na sala de aula de línguas estrangeiras	Tonelli, J. R. A., & Quevedo-Camargo, G.	2019	Brazil
A5	HOTS-based language assessment literacy: Challenges and prospects in English language teaching	Sumardi, S., & Guci, R. I.	2023	Indonesia
A6	Letramento em avaliação para professores de inglês e a perspectiva glocal: Um microestudo	Quevedo-Camargo, G., & Sousa, A. A. C. de P.	2022	Brazil
A7	EFL teachers' assessment literacy	Isnawati, I.	2023	Indonesia
A8	A toolkit for the investigation of Greek EFL teachers' assessment literacy	Gkogkou, E., & Kofou, I.	2021	Greece
A9	Exploring language assessment literacy and needs of English teachers at senior high school level	Chang, D. Y.-S., Lin, M. H., & Lee, J.-Y.	2024	Taiwan
A10	Contribuições de um curso EaD para o letramento em avaliação de professores de línguas adicionais para crianças	Quevedo-Camargo, G., & Tonelli, J. R. A.	2021	Brazil
A11	Exploring secondary school EFL teachers' assessment literacy in practice: A case study in China	Chen, Y.	2021	China
A12	Understanding K-12 in-service EFL teachers' online assessment practices and assessor identity: A Chinese study	Shao, S.	2023	China
A13	Autoethnography of a novice teacher's assessment literacy in elementary physical education	Kim, Y., & Lee, O.	2021	South Korea

Source: Authors' elaboration using data from the study.

The descriptive data from the study show that most recent studies on assessment literacy for teachers were conducted during the 2020-2021 period, with 2021 being the most common year. In 2021, there was a little variation around the annual mean, as evidenced by the standard deviation shown in Table 4.

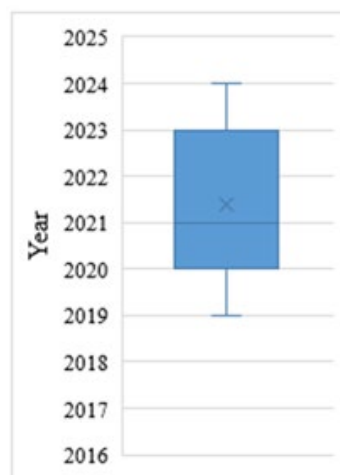
TABLE 4
Sample characteristics for the "year of study" variable

N	OMITTED	MEAN	MEDIAN	MODE	STANDARD DEVIATION
13	0	2021	2021	2021	1.50

Source: Authors' elaboration using data from the study.

Furthermore, this result reveals that, although studies from the 2016-2025 period were sought for the systematic review, research on this topic was concentrated in the six-year period of the research *corpus* (2019-2024), as shown in the boxplot below (Figure 2), with the highest concentration in the 2021-2023 period.

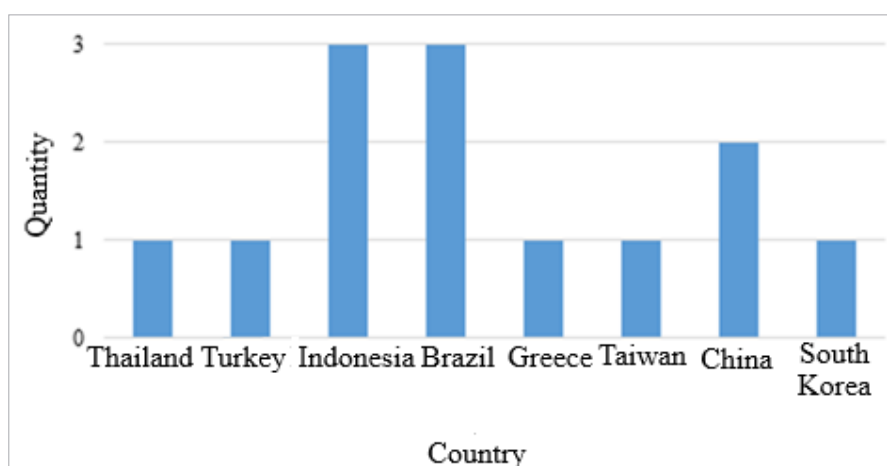
FIGURE 2
Distribution of articles by year



Source: Authors' elaboration using data from the study.

With regard to the countries where studies involving elementary and secondary school teachers were conducted, focusing on the relationship between teaching practice and training in assessment literacy, Figure 3 shows that Indonesia and Brazil account for the largest proportion of studies, each representing approximately 23% of the total studies in this research sample.

FIGURE 3
Countries of analyzed articles



Source: Authors' elaboration using data from the study.

The fact that these two countries are in the spotlight can be explained by their rankings in the Programme for International Student Assessment (Pisa) and their efforts to improve their performance in international assessments, which can be understood as a result of teachers' assessment literacy and their teaching practices, in light of the epistemology and pedagogy of knowledge in assessment. Of the 81 countries and economies worldwide participating in Pisa, Indonesia ranked 70th in mathematics, 71st in reading, and 67th in science, while Brazil ranked 65th in mathematics, 52nd in reading, and 62nd in science (Organisation for Economic Co-operation and Development [OECD], 2023).

Table 5 presents data collected from each study included in the meta-analysis, such as the number of teachers (research participants), age (calculated based on the age range reported in each study), teaching experience (determined by the range of the duration of experience described), the duration of training in assessment literacy for teachers (expressed in days, to ensure the appropriateness of the statistical analyses in this study), and the amount of evidence (both positive and negative) regarding assessment literacy contained in each study.

TABLE 5
Characterization by variable

ID	NUMBER OF TEACHERS	AGE	TEACHING EXPERIENCE	DURATION OF TRAINING IN ASSESSMENT LITERACY FOR TEACHERS	AMOUNT OF EVIDENCE OF ASSESSMENT LITERACY
A1	2	omitted	omitted	105	2
A2	3	15	13	omitted	3
A3	147	31	omitted	2	3

(to be continue)

(continuation)

ID	NUMBER OF TEACHERS	AGE	TEACHING EXPERIENCE	DURATION OF TRAINING IN ASSESSMENT LITERACY FOR TEACHERS	AMOUNT OF EVIDENCE OF ASSESSMENT LITERACY
A4	151	32	30	omitted	4
A5	43	omitted	25	7	1
A6	5	25	30	0	1
A7	30	omitted	omitted	omitted	1
A8	120	29	omitted	omitted	5
A9	57	omitted	15	21	1
A10	43	20	omitted	60	3
A11	2	omitted	14	180	3
A12	6	omitted	11	omitted	2
A13	1	omitted	4	1,140	4

Source: Authors' elaboration using data from the study.

In Table 6 it is observed that, based on the standard deviation, significant variability in the number of teachers across the studies and even greater variability in the duration of training in assessment literacy. However, when looking at the mean of this variable (189.38 days), it is noted that the average training duration corresponds to approximately six months, a period that can be considered sufficient for teachers to acquire basic and essential knowledge transferable to their teaching practice.

TABLE 6
Descriptive statistics of the study

					SHAPIRO-WILK	
	N	OMITTED	MEAN	STANDARD DEVIATION	W	P
Number of teachers	13	0	46.92	56.36	0.780	0.004
Age	6	7	25.33	6.71	0.917	0.481
Teaching experience	8	5	17.75	9.50	0.904	0.317
Duration of training in assessment literacy for teachers	8	5	189.38	389.18	0.553	< 0.001
Evidence of assessment literacy for teachers	13	0	2.54	1.33	0.899	0.131

Source: Authors' elaboration using data from the study.

The Shapiro-Wilk normality test assesses whether the data are consistent with the null hypothesis of normality; specifically, for $p > 0.05$ and W close to 1, this indicates that the null hypothesis of normality (normal distribution) is not rejected at the adopted level of statistical significance (Lima et al., 2025). However, it should be noted that for $p < 0.05$, there is evidence of non-normality.

Thus, as shown in Table 6, it can be observed that, regarding the duration of training in assessment literacy, the indices $W = 0.553$ and $p < 0.001$, as determined by the Shapiro-Wilk normality test, are appropriate but indicate a non-normal distribution; that is, they are not symmetrical around the mean.

Similarly, with regard to the variable number of teachers, it is evident that the number of teachers examined in each study is statistically significant, given the $W = 0.780$; however, with $p = 0.004$ (Table 6), most of the data are not concentrated around the mean.

One point worth noting is the presentation of the values $W = 0.899$ and $p = 0.131$ (Table 6), which indicate that the distribution of the data related to evidence of assessment literacy for teachers is normal, supporting the discussion regarding this variable in the context of teacher education, teaching practice, and assessment literacy.

Still regarding the data in Table 6, it can be observed that there is low variability in the evidence on assessment literacy for teachers, with an average of 2.54, that is, two to three pieces of evidence. Based on the analysis of the selected articles, what stands out regarding this evidence is that, in short, educators focus their considerations on the fact that (i) assessment literacy for teachers is a necessity, both in initial and continuing education; (ii) the conscious use of various assessment tools and techniques, as well as the improvement of formative assessment, not limited to tests and summative assessment, enhances teaching practice through pedagogical work with assessments; and (iii) assessment literacy for teachers develops the teacher's identity as an assessor.

By assessing the reliability of the meta-analysis through the correlation between the duration of training in assessment literacy for teachers and the evidence on assessment literacy from the analyzed studies, McDonald's omega yields a value of $\omega = 0.800$ (Table 7).

TABLE 7
Data reliability test

	MCDONALD'S ω
Scale	0.800

Source: Authors' elaboration using data from the study.

According to Flora (2020), the closer the reliability test result is to 1, the higher the degree of reliability or internal consistency of the study. In this case, the value obtained reveals that training duration and evidence on assessment literacy are reliably correlated, given that McDonald's omega is used to determine the highest reliability value that can be obtained (Silva et al., 2011).

Based on Miot (2018), Spearman's correlation coefficient (ρ) is appropriate for use when the correlation between variables does not follow a normal distribution and is not restricted to linear correlations, with values ranging from -1 to 1. According to the author, a coefficient of 0 indicates no correlation between the variables; coefficients between 0 and 0.3 are considered negligible; coefficients between 0.3 and 0.5 are considered weak; between 0.5 and 0.7 are moderate; between 0.7 and 0.9 are strong correlation coefficients; and above 0.9 are understood as a very strong correlation. As for the sign, the relationship is directly proportional when the sign is positive and inversely proportional when the sign is negative.

TABLE 8

Correlation matrix between variables using Spearman's correlation

	DURATION OF TRAINING IN ASSESSMENT LITERACY FOR TEACHERS	EVIDENCE ON ASSESSMENT LITERACY FOR TEACHERS	AGE	TEACHING EXPERIENCE	NUMBER OF TEACHERS
Duration of training in assessment literacy for teachers	-				
Evidence on assessment literacy for teachers	0.651	-			
Age	-0.500	0.455	-		
Teaching experience	-1.000	-0.367	0.866	-	
Number of teachers	-0.711	0.111	0.943	0.647	-

Source: Authors' elaboration using data from the study.

Looking at Table 8, with a 95% confidence interval based on the survey data, a strong direct correlation can be observed between teaching experience and the subjects' age ($\rho = 0.866$), indicating that teachers with more years of professional experience in the classroom are generally older.

The data in Table 8 also reveal that the correlation between teaching experience and the duration of training in assessment literacy for teachers ($\rho = -1.000$) is extremely strong and, in this case, inverse; that is, this coefficient indicates that teachers with extensive teaching experience have less training in assessment literacy. In fact, it was expected that, to enhance teaching, this relationship would be direct, such that the more classroom experiences a teacher had, the more training they should have in assessment literacy, reinforcing the urgency of assessment literacy for teachers, as well as the benefits for teaching processes and its relevance to students' cognitive development and the teacher's identity as an assessor.

However, it is essential to recognize the need for assessment literacy among teachers in their professional practice, given the moderate inverse correlation between

teachers' age and the duration of their training ($\rho = -0.500$), that is, older teachers have less training in assessment literacy, which may justify the urgent need for assessment literacy training for all teachers, whether through initial or continuing education, so that classroom assessment processes are of higher quality and pedagogical work with assessment is a central focus of teaching practice.

With a moderate correlation coefficient, the direct relationship between evidence on assessment literacy and the duration of training in assessment literacy for teachers ($\rho = 0.651$) can be explained by teachers' acquisition of assessment skills, the development of the teacher's identity as an assessor, the improvement of formative assessment practices, the conscious pedagogical use of various assessment tools and techniques to personalize instruction based on students' needs, and the pedagogical and emotional support needed to operate in an assessment environment, among other potential benefits that assessment literacy for teachers can bring to teaching practice.

DISCUSSIONS

The theoretical framework and findings of this study highlight the importance of assessment literacy for teacher education, for improving classroom teaching practices, and for the quality of basic education. From this perspective, assessment literacy is essential to the success of assessment processes and teaching practice today (Bayat & Rezaei, 2015).

In fact, by gathering information from assessments, teachers are able to communicate students' results to them and contextualize them within the relevant body of knowledge, thereby opening up a new pathway for consolidating the learning objectives of the subject matter under development. Based on this, it is possible to set both immediate and long-term goals, as well as to refine the knowledge developed in the classroom.

In the meantime, the need for training, whether in initial or continuing education, in assessment literacy has also been identified, as noted by Yeşilçinar and Kartal (2020), Sumardi and Guci (2023), Quevedo-Camargo and Sousa (2022), Isnawati (2023), and Gkogkou and Kofou (2021).

In particular, Sumardi and Guci (2023) highlight the need for more time dedicated to activities in assessment literacy training, considering cases where such training already exists, though currently limited in scope given the number of teacher training programs, and noting that it takes an average of six months to acquire basic assessment literacy skills.

This fact leads us to realize that a short-term (less than six months) teacher training program on assessment literacy is not sufficient to change teachers' critical awareness, much less their assessment practices in the classroom.

Another issue worth highlighting is addressed by Yeşilçinar and Kartal (2020) and Isnawati (2023), who suggest that assessment training also requires greater participation and engagement from teachers, given the small number of participants in the training process.

In fact, the low demand for these training courses exacerbates the difficulties associated with classroom assessment processes, which results, in part, in the low quality of assessments conducted in the classroom, since epistemological, theoretical, and pedagogical knowledge is necessary for a potential shift in teachers' attitudes toward assessment practices.

It should be emphasized that the creation and expansion of courses on assessment literacy for teachers (Yeşilçinar & Kartal, 2020) are urgent and essential in the context of teacher education in Brazil. As corroborated by Isnawati (2023, p. 767), this stimulus must come from the government, which should provide "more training, short courses, workshops, or other ongoing and sustained teacher professional development, especially those related to assessment".

That said, it is clear that these two factors (time/duration and courses/training) could have a significant impact on the advancement of public policies for education, teacher training, and the assessment of/in basic education, whether summative or formative, at the global level.

Therefore, assessment training for teachers should be integrated throughout their entire teaching career, helping teachers employ more effective methods that can empower students in assessment processes (Gkogkou & Kofou, 2021), thereby transforming assessment into a process that can potentially enhance teaching and learning in basic education.

In practical terms, assessment literacy for teachers can enable them to broaden their perspective on assessment as a means of learning and as a skill for teaching practice, based on evidence observed in a reflective and critical manner (Hoffmann, 2014). Furthermore, through this training, professionals will come to understand assessment as a process of constructing pedagogical practice guided by the development of teaching identity throughout their professional careers (Quevedo-Camargo & Sousa, 2022), strengthening their commitment to processes of equity and inclusion, which can directly contribute to a qualitative shift in assessment practices in basic education.

FINAL CONSIDERATIONS

The methodological approach was based on the aim of identifying patterns, concepts, and inconsistencies in the literature regarding assessment literacy for teachers, in order to provide an objective and specific overview of assessment knowledge and its

current state. This was achieved through a systematic and analytical synthesis of the articles included in the research *corpus*.

The core of this meta-analysis stemmed from a synthesis of national and international studies that could contribute to the discussion of assessment literacy for teachers, with a focus on enriching teaching practice through classroom assessment processes in basic education and improving the quality of teaching through pedagogical work with assessment.

The studies analyzed in this paper highlight the centrality and relevance of assessment literacy for teachers as an undeniably indispensable element of teacher training and professional practice, noting the constant need to master various types of assessment, as well as assessment techniques and tools, in the teaching process and, consequently, in reflecting on student learning.

In this context, developing assessment skills for basic education enables teachers to view assessment processes as an integral part of their pedagogical practice, rather than merely as a technical tool for assigning grades and determining summative results that lead solely to the ranking of students, with an emphasis on outcomes at the expense of the process.

The findings of this study offer significant contributions to classroom teaching practice, based on robust evidence regarding assessment literacy that directly impacts the relationship between teaching and assessment, such as: the improvement of formative assessment practices; the appropriate and informed use of different assessment tools, as well as various assessment techniques; the development of the teacher's identity as an assessor of/for learning; and, notably, emotional support for teachers in their pedagogical work with assessment.

All of these characteristics and skills are developed through training in assessment literacy for teachers, whether during initial or continuing education, with a typical training period of six months to acquire basic knowledge and skills in assessment.

In fact, the practical approach of a teacher with literacy skills in assessment can change, for example, the attitude toward the assessment process, where assessment is strongly viewed as a measure that relates solely and exclusively to a grade to determine how much the student has learned, that is, reducing learning to a metric scale to determine whether or not the student has acquired certain skills related to the subject matter under study.

Added to this is the possibility that teachers may become more attuned to certain aspects related to students' different learning profiles and propose personalized instructional sessions based on different contexts, objectives, methods, and assessment tools, thereby making the assessment process inherently inclusive and equitable for both teachers and students.

With regard to teacher training and public policy, this study could serve as the starting point for a detailed discussion that offers opportunities to expand and reexamine the Brazilian curricula that shape teacher training in Brazil, a matter that represents an urgent call, within the globalized landscape of basic education assessment, to enhance the quality of both assessment and national education.

Although the time frame of this study was the decade from 2016 to 2025, the number of studies eligible for meta-analysis (thirteen articles) highlights a limitation of this research, namely the small number of articles available for quantitative analysis; in addition to this fact, there is the omission of essential data in some articles, which is indispensable for maximizing statistical significance, analysis, and discussion.

This finding emerges as a significant factor highlighting the need for further studies on the subject of this research, underscoring that the voices of educators and researchers in the fields of education and assessment can broaden the discourse in support of an education system that fosters critical thinking and nurtures critical minds within their spaces for reflective development. Furthermore, the scarcity of robust data, such as the omission of key variables, reinforces the importance of this research and the inevitable need for similar studies to strengthen research on assessment literacy for teachers, especially in Brazil.

The didactic and pedagogical implications of this research's findings point to the need to propose a shift in thinking regarding assessment and its practical applications in elementary and secondary school classrooms; this involves not only the context of teaching practices but also a rethinking and redefining of curriculum frameworks, as these are directly intertwined with teaching and assessment.

Given this scenario, opportunities arise for future studies with promising prospects for improving assessment literacy, whether due to characteristics currently overlooked in this study's analysis or to deliberate limitations of the research – for example, investigating assessment literacy among university professors presents a viable avenue for future studies.

Thus, in the future, an action research project could be developed based on continuing education for teachers on assessment literacy, with a view to addressing the issues identified in this study and exploring viable solutions. It should be noted that this is a complementary perspective to the ongoing research, but that other avenues may emerge and expand research on assessment literacy for teachers, in order to enhance and strengthen teaching practice, professional identity, and to keep up with assessment trends in education.

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