

Approaches to classroom assessment among primary school teachers in Tanzania: A latent class analysis

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Abstract

This study examined the assessment approaches of primary school teachers in a middle-income setting characterized by limited resources, large class sizes, and traditional methods. The Approaches to Classroom Assessment Inventory (ACAI) was used to collect data from 1,815 teachers. The results revealed four distinct assessment profiles: eager assessors, teacher-centric assessors, contemporary assessors, and hesitant assessors. Teachers highly supported approaches to classroom assessment, particularly in design, communication, and measurement theory. However, variations existed across profiles. Multinomial logistic regression revealed that age, employment status, and teaching experience were significant predictors of class membership. This study provides a large-scale latent class analysis of assessment literacy in Tanzania, adding to existing international research on different types of assessors. The results suggest that initial teacher education and targeted professional development should strengthen assessment literacy and formative assessment practices to meet teachers' specific needs and should be embedded in daily teaching practices.

Keywords: assessment literacy, classroom assessment, formative assessment, student agency

In recent decades, a notable shift has been observed wherein classroom assessment has evolved from a primarily evaluative approach to one integrated into teaching and learning (Black & Wiliam, 2018; Shepard et al., 2018). This suggests that assessment is now acknowledged as fundamental to quality teaching and learning (Black & Wiliam, 2009, 2018). Scholars have consistently affirmed that effective assessments enhance learning and improve feedback practices (Black & Wiliam, 2018; Wiliam, 2011). This shift is reflected in educational policy and practices, with greater emphasis on assessment literacy (Brookhart, 2011; DeLuca et al., 2016b; Pastore, 2023). Assessment literacy encompasses a practical understanding and

appropriate application of assessment practices, alongside theoretical and philosophical knowledge of student learning measurement (DeLuca & Klinger, 2010; Stiggins, 2002). Increased research on assessment literacy indicated that the literature indicates substantial variations in teachers' assessment practices across countries that often diverge from policy expectations due to contextual, sociocultural, and institutional constraints (Coombs et al., 2018; Xu & Brown, 2016).

Theoretical foundations of assessment literacy and classroom assessment

Conceptualization of assessment literacy

Teacher assessment literacy is defined as teachers' ability to conduct valid, reliable, and goal-oriented classroom-based assessments to promote student learning (DeLuca & Bellara, 2013; Gan & Lam, 2024; Popham, 2009). Assessment literacy was initially perceived as teachers' technical knowledge and skills in the classroom, particularly in psychometric principles and test design (Plake et al., 1993; Stiggins, 1991). The 1990 Standards for Teacher Competency in Educational Assessment of Students are cited as early seminal work that established a knowledge base for assessment literacy (American Federation of Teachers, National Council on Measurement in Education, and National Education Association, 1990). The standards were the foundation of the initial investigation of teachers' knowledge and skills in assessment through quantitative measures. However, these standards were criticized for confining assessment literacy to a set of technical skills centered on the development, administration, and scoring of assessments (Brookhart, 2011; DeLuca et al., 2016b). The definition used in this study moves beyond psychometrics to encompass relational, ethical, and pedagogical aspects (Pastore & Andrade, 2019).

The conceptualization of assessment literacy was expanded in response to the contemporary shift in classroom assessment and learning theories (DeLuca et al., 2016b; Willis et al., 2013; Xu & Brown, 2016). This evolution has led to greater emphasis on formative assessment as a social and theoretical framework (Black & Wiliam, 2018; Shepard, 2000; Willis et al., 2013).

In establishing updated skills and competencies for teachers in educational assessment, Brookhart (2011) stated that the 1990 standards failed to fully consider formative assessment (assessment for and as learning). Evidence has demonstrated that the formative assessment approach has a positive effect on students' learning outcomes (Assessment Reform Group, 2002; Black & Wiliam, 1998, 2009; Sadler, 1989; Wiliam & Leahy, 2015). Furthermore, scholars in the field of educational assessment and evaluation suggest that assessment should be adapted to facilitate and improve continuous learning by emphasizing student agency as opposed to performance metrics (DeLuca et al., 2019; Klenowski, 2009; Sadler, 1989; Stiggins, 2017).

In 2015, the Joint Committee for Standards in Educational Evaluation (JCSEE) published 16 guidelines that reflect modern understandings of assessment literacy (Klinger et al., 2015). These guidelines addressed criticisms made by Brookhart (2011) regarding the 1990 standards, particularly in relation to contemporary conceptions of assessment literacy. As indicated by these guidelines, teachers are expected to base assessment decisions on a combination of technical knowledge and skills alongside social and contextual factors (Brookhart, 2011; Brown et al., 2024; Coombs & DeLuca, 2022; Pastore & Andrade, 2019). Since the initial conception of assessment literacy, our contemporary understanding of the concept has evolved to encompass a more comprehensive perspective, now integrated with pedagogical, subject matter, and learning context knowledge (Black & Wiliam, 2018; Brookhart, 2024; Heritage, 2007; Xu & Brown, 2016). The integration of assessment knowledge is fundamental to the professional identity of teachers (Pastore & Andrade, 2019; Willis et al., 2013). Teachers are required to apply their expertise to enhance all areas of teaching, ensuring that assessments are effective and improve both students' learning and teaching methods (Li & Yongqi Gu, 2023; Xu & Brown, 2016). Global assessment understanding, alongside JCSEE (2015) standards, increasingly incorporates Organization for Economic Co-operation and Development (OECD) frameworks. These frameworks conceptualize formative assessment as a method for developing

both responsive teaching and learner-centered environments. The OECD's (2018, 2025) research on responsive teaching and teacher assessment highlights evidence-informed feedback, student agency, and learning-oriented cultures across diverse education systems. Consequently, these frameworks offer an international benchmark that aligns with assessment literacy and situates classroom assessment within wider educational reforms.

Formative assessment and approaches to classroom assessment inventory

Assessment approaches can be understood as teachers' combined theoretical knowledge and practical understanding of assessment in teaching and learning (Asamoah et al., 2023; DeLuca et al., 2016a; Pastore, 2023). Coombs et al. (2021) argue that assessment approaches are multidimensional, reflecting teachers' beliefs about and understanding of assessment literacy across 12 dimensions, such as assessment purpose, process, fairness, and measurement (see Table 1). This study uses the Approaches to Classroom Assessment Inventory (ACAI) to understand teachers' assessment approaches. The ACAI offers a tested structure for investigating teachers' understanding and use of 12 key assessment literacy areas, allowing for thorough and consistent comparisons of assessment practices in the classroom (DeLuca et al., 2016a).

This study draws from formative assessment theory (Black & Wiliam, 1998, 2009, 2018), the learning-oriented assessment framework (Shepard, 2000), and the student-centered assessment model (Brookhart, 1997). These models suggest that assessment should be a key part of teaching to improve learning outcomes. Formative assessment highlights the importance of clear learning goals, useful feedback, and involving students in the learning process (Wiliam & Thompson, 2008). The learning-oriented assessment model builds on formative assessment theory by stressing the importance of including assessment in the broader learning environment (Shepard, 2000). The student-centered perspective highlights the active role students play in assessment, setting goals, and developing understanding of their own learning (Brookhart,

1997). These frameworks connect with the ACAI's focus on assessment approaches such as assessment for—and as—learning, communication, and design, which together show how teachers collect, interpret, and use assessment results to help students learn (Asamoah et al., 2023; Coombs et al., 2021). While the assessment of learning is not naturally formative, it is still an important part of the ACAI. It is crucial to understand teachers' approaches to assessment, especially in education systems that rely on summative examinations.

Table 1

Approaches to the Classroom Assessment Inventory dimensions

Dimension	Priority Approach	Description of Priority Approach
Assessment Purposes	Assessment of Learning	Teachers use evidence to summarize student learning and assign grades based on how well students have achieved the learning goals.
	Assessment for Learning	Teachers and students use evidence of learning to provide feedback on progress toward learning objectives, which informs next learning and teaching strategies. Involves both teacher-led and student-focused approaches to formative assessment.
	Assessment as Learning	Teachers and students focus on the students' learning processes by offering feedback or activities that develop metacognitive and learning skills (e.g., self-assessment and goal setting). This approach is student centered, although it also involves teachers.
Assessment Processes	Design	Teachers focus on developing and designing reliable assessments and test questions that accurately measure how well students have met the learning objectives.
	Scoring	Teachers adapt and use scoring protocols and grading schemes to respond to different assessment scenarios.

	Communication	Teachers prioritize explaining what assessment results and feedback mean by communicating with students and parents.
	Standard treatment	Teachers employ equal assessment protocols for all students.
	Equitable treatment	Teachers change how they assess students with special educational needs or who are learning English by making accommodations and/or modifications.
	Personalized approach	Teachers tailor learning and assessment to meet the specific needs and goals of each student.
Assessment Theory	Consistent	Teachers ensure reliable assessment results by maintaining consistent scoring methods, designing assessments carefully, and administering them uniformly.
	Contextual	Teachers ensure that assessments align with curriculum expectations and accurately reflect students' learning and experience in the classroom. When interpreting assessment results, teachers carefully consider the learner and the learning environment.
	Balanced	Teachers consider the reliability of assessments to ensure consistent measurement of student learning and the validity of assessments to ensure they align with the curriculum.

Note. Adapted from: DeLuca (2020)

Research suggests that these assessment approaches are not fixed characteristics of a teacher. Instead, they are dynamic constructs shaped by teachers' learning experiences, contexts, and individual attitudes (Coombs et al., 2018; Coombs et al., 2020). These influences include not only teacher background, experience, and training but also classroom environment, student behaviors and interactions, and the range of learning needs within the classroom (DeLuca & Klinger, 2010).

Empirical gaps in classroom assessment practices in East and southern Africa

Despite reforms in some East and Southern African education systems, there is little evidence of teachers' classroom assessment practices in this context. This lack of evidence limits the success of current educational changes, because it is unclear if assessment policies are being used in practice or if teachers are still facing obstacles using contemporary assessment. This is clear in education systems with high-stakes exams, limited resources, and structural barriers to contemporary assessment, such as in Tanzania, Uganda, Kenya, Zambia, and Zimbabwe (Kasuga & Kalolo, 2025; Mitana et al., 2022; Miyoba et al., 2023; Wawire et al., 2025).

Although research on formative assessment in sub-Saharan Africa has increased, its distribution remains uneven. For instance, studies have examined the gap between policy goals and classroom practice in South Africa, especially with competency-driven curricula (Lubisi & Murphy, 2002; Sayed & Kanjee, 2013). Other studies have revealed the growing prominence of assessment reform throughout East Africa (Fidelis et al., 2025; Kasuga & Kalolo, 2025). In Tanzania, the Education and Training Policy (2014, revised 2023) outlines the adoption of competence-based teaching and continuous assessment practices. The implementation of a competence-based curriculum is intended to strengthen learner-centered pedagogy and classroom-based assessment (Ministry of Education, Science and Technology, 2014). Similarly, the Tanzania Institute of Education's (TIE) curriculum for primary education outlines the integration of assessment practices related to formative assessment principles (Ministry of Education, Science and Technology, 2023). Despite these policy commitments, a considerable discrepancy remains between official expectations and actual classroom practices. Furthermore, there is limited empirical and classroom-based formative assessment research. Specifically in Tanzania, research reveals consistent tensions between formative assessment policies and classroom realities (Halai et al., 2023; Kahembe & Jackson, 2020; Kasuga & Kalolo, 2025; Wawire et al., 2025). Teachers often operate under accountability pressure and have limited assessment training (Halai et al., 2023). Furthermore, it remains unclear how Tanzanian primary

school teachers' assessment literacy manifests in practices across the multidimensional domains of assessment approaches. Similarly, emerging studies in the East African region, such as those from Kenya, Uganda, and Zambia, highlight the challenges teachers face in implementing formative assessment within competency-based curriculum reforms (Fidelis et al., 2025; Gasva et al., 2019; Mitana et al., 2022; Wawire et al., 2025). These challenges are not unique to East Africa. Reports from UNESCO (2021) and the World Bank (2018) highlight overcrowded classrooms, insufficient resources, and limited teacher support as systemic barriers to effective pedagogy in sub-Saharan Africa.

Although Tanzanian educational policy supports formative assessment, there is limited research on how teachers assess pupils in practice. Research suggests that systemic issues hinder teachers' assessment practices in Tanzania (Halai et al., 2023; Kahembe & Jackson, 2020; Kyaruzi et al., 2018). Previous studies in Tanzania have found inconsistencies between formative assessment policy and what happens in classrooms (Halai et al., 2023; Kahembe & Jackson, 2020; Lupeja & Komba, 2021; Ombay et al., 2024). Existing studies have mainly explored teachers' perceptions or challenges rather than their actual assessment profiles. However, it is still unclear how teachers approach their assessment methods and how assessment literacy is demonstrated in classrooms. This ambiguity around teachers' assessment approaches is a methodological weakness. Without examining teachers' approaches to assessment, it is impossible to know whether their understanding of assessment actually improves their teaching. Using a person-centered approach and a large sample, this study aimed to provide a detailed understanding of assessment literacy in a resource-constrained environment. This study addressed the following questions:

RQ1: What assessment profiles can be identified among primary school teachers in Tanzania based on multidimensional indicators of assessment literacy, and how do these profiles compare to assessment profiles identified in other countries as measured using similar indicators of assessment literacy?

RQ2: To what extent do teachers' demographic and professional characteristics predict membership in the assessment profile?

Methods

A cross-sectional survey was used to examine the distinct latent profiles of the approaches to classroom assessment among primary school teachers in Tanzania.

Participants and sampling procedure

A long string analysis was used to identify careless responses (Curran, 2016; Meade & Craig, 2012). Participants with over 70% identical responses were excluded from the analysis. This process resulted in the exclusion of 16% ($n = 348$), leaving 1815 participants included in the analysis. The participants comprised 1815 primary school teachers from selected regions in Tanzania. At their schools, teachers were invited to complete a paper-and-pencil questionnaire. Of the total sample, 40.4% were male ($n = 734$), while 59.6% were female ($n = 1081$). Regarding age, 38% of participants were between 30 and 39 years old, 27.3% were between 40 and 49, 21.7% were between 20 and 29, and 13.1% were over 50. The majority (87.4%) were full-time teachers, while 12.6% were part-time teachers. Educational qualifications varied: 40.2% held a certificate, 36.2% held a diploma, 22.4% held a bachelor's degree, and 1.2% held a master's degree. In Tanzania, a certificate in education is usually the basic qualification for primary school teachers, whereas a diploma indicates a higher level of training in teaching and subject knowledge designed to improve skills in basic education. In terms of teaching experience, 50.6% had more than 11 years, 25.4% had between 6 and 10 years, and 24% had between 1 and 5 years. Most participants (83.8%) had attended at least one assessment course, 6.3% had no formal preparation, and 9.9% did not recall any training.

This study included 121 public schools: 57 in Mwanza, 28 in the Coastal Region, and 36 in Morogoro, in Tanzania. These three regions were chosen to ensure that the sample was geographically and socioeconomically diverse. These regions were purposefully chosen to

represent a range of geographical locations and socio-educational backgrounds. The selection criteria were government ownership, accessibility, and consent. The Regional Education Office provided a list of primary schools. Stratified random sampling was then used to select schools from this list. Permission to collect data was obtained from the heads of schools through district education officers. All teachers present on the day of the visit were invited to participate in this study. Participation was voluntary and anonymous and took place during school hours. This sampling approach ensured a broad coverage of schools within the selected regions.

Instruments

The study adapted the ACAI version 3.0 (DeLuca et al., 2016a). The ACAI was developed from an analysis of 15 contemporary assessment standards from various regions, including Canada, the United States (US), the United Kingdom (UK), Europe, Australia, and New Zealand (DeLuca et al., 2016a). Version 3.0 of the ACAI instrument consists of three parts. Part A investigates teachers' demographic variables, teaching experience, and assessment education. Part B consists of four scenario-based questions designed to examine teachers' approaches to classroom assessment. An example of an assessment scenario presented in the ACAI 3.0 is scenario 4: *You are planning a unit for your class. As a teacher in this situation, how likely are you to do each of the following actions? If you have experienced this scenario in your teaching context, base your response on the actions you took* (Baidoo-Anu 2023; DeLuca et al., 2016a). Teachers' responses to this scenario determined whether their assessment practices prioritized assessment of, for, or as learning (assessment purposes); prioritized assessment design, scoring, or communication (assessment processes); were standard, equitable, or differentiation (assessment fairness); and were consistent, contextual, or balanced (measurement theory). Each of the scenario-based questions in the ACAI aligned with one of the 12 assessment literacy dimensions (Table 1). Finally, part C of the ACAI was designed to analyze teachers' fundamental beliefs about classroom assessment and their learning preferences regarding

professional development in classroom assessment. Teachers were asked to rate how likely they were to respond to each action on a six-point rating scale ranging from 1 (*not at all*) to 6 (*highly likely*). Teachers' preferences for a particular assessment literacy dimension were determined by averaging their support for the dimension across all four scenarios.

The ACAI was developed using scenario-based items addressing the 12 dimensions of assessment literacy, achieved through an expert panel alignment methodology (DeLuca et al., 2013; DeLuca et al., 2019). A panel of 10 North American educational assessment experts validated the ACAI (DeLuca et al., 2019). These experts examined the scenario-based items to ensure alignment with underlying assessment literacy dimensions. Furthermore, 10 classroom teachers—five from secondary schools and five from elementary schools—participated in the validation process (DeLuca et al., 2016). These teachers served as practitioner experts and reviewed the ACAI using the same protocol (Baidoo-Anu, 2023; DeLuca et al., 2019).

Translation and contextual adaptation

Given that the study was conducted in Tanzania, the ACAI was translated into Swahili to ensure its validity. A four-step forward and backward translation protocol was used to ensure semantic, conceptual, and normative equivalence between the original English instrument and the Swahili version (Behling & Law, 2000). The translated ACAI was further improved through a systematic validation process. Six educational assessment experts, all with significant experience in research and university teaching, evaluated the instrument. These experts assessed the relevance (1 = not relevant to 4 = highly relevant) and clarity (1 = not clear to 4 = very clear) of each of the 48 items across four different scenarios. In addition, experts provided qualitative feedback to refine the Swahili translation.

Reviewers suggested specific changes to Swahili terms to ensure accuracy in context; for instance, one expert recommended using “mwanafunzi” (individual student) instead of “wanafunzi,” (students), while another proposed using “matini” (written material) instead of

“nakala” (a copy of a document) to more accurately reflect the meaning in classroom assessment. These recommendations represent important conceptual clarifications that portray classroom assessment in Tanzania. The ratings showed strong agreement, with mean scores between $M = 3.2$ and $M = 4.0$, which suggests that the translated items were appropriate and understandable for use in Tanzania. This rigorous methodology was necessary to ensure that the instrument accurately reflected the intended construct while also adapting Western assessment standards to the specific context of the developing country.

Data analysis

The ACAI consists of 48 items grouped into four scenarios across 12 assessment literacy dimensions. Prior to latent class modeling, the four scenario-level responses for each dimension were averaged to generate a single composite score per dimension. This aligns with the ACAI scoring protocol, ensuring indicator stability by scenario-specific variance. The resulting 12 dimension-level indicators constituted the observed variables in the latent class analysis (LCA). LCA is frequently employed in educational research to delineate subgroups based on beliefs and instructional orientations (Canrinus et al., 2011; Lee, 2024; Marsh et al., 2009; Perera et al., 2018). Prior research has used LCA to model teacher belief profiles, instructional practice typologies, and self-efficacy belief clusters. The strength of this approach lies in its capacity to identify heterogeneous patterns within teaching populations. Consistent with prevailing trends in educational psychology research that uses LCA to capture heterogeneity in teacher beliefs, self-efficacy beliefs, and instructional practices, this study used LCA to identify distinct teacher profiles using multidimensional assessment literacy indicators (Nylund-Gibson & Choi, 2018).

According to Collins and Lanza (2010), Likert-type indicators with more than five categories can be collapsed to maintain a stable multinomial distribution and reduce errors associated with sparse responses. To facilitate meaningful latent classes and keep the model stable, indicators were trichotomized into three ordinal levels (Low: 1–2, Neutral: 3–4, and High: 5–6). Simplifying indicators reduces noise from too many response options, which helps to maintain

the statistical detectability of the causal relationship. This relationship is unidirectional, moving from the latent variable to the indicator (Collins & Lanza, 2010, p. 4). This approach aligns with the person-oriented nature of LCA, which focuses on identifying individuals based on their unique patterns of characteristics (Masyn, 2013; Nylund-Gibson & Choi, 2018). The indicators were appropriately categorized, which confirmed the conditional independence assumption, allowing for the estimation of conditional item probabilities (Rhemtulla et al., 2012).

LCA was performed using 4000 random starts and 800 iterations to generate the optimal replicable likelihood. To determine the number of classes, models with up to five classes were tested. The selection of the best-fitting latent class model was determined by examining the absolute Vuong–Lo–Mendell–Rubin (VLMR) likelihood ratio test, the Lo–Mendell–Rubin adjusted (LMRA) likelihood ratio test, and relative fit indices Akaike information criterion (AIC), Bayesian information criterion (BIC), Sample-size adjusted Bayesian information criterion (BIC) (Goller et al., 2022; Nylund et al., 2007; Weller et al., 2020). The four-class model was retained because both the p-values obtained from the VLMR and LMRA likelihood ratio tests (LRTs) were below the 0.05 threshold, and it had a lower BIC value than the three-class model. The five-class model had lower AIC, BIC, and SSA-BIC values than the four-class model; this difference was not statistically significant ($p = 0.057$), suggesting that it had no substantial improvement. Furthermore, the five-class model contained a very small class ($n = 30$) that offered little insight, further justifying the selection of the four-class model. Although the four-class model had lower entropy (0.851) than the other models, it was retained mainly due to the VLMR and LMRA LRT results. To explore whether demographic and professional factors predicted latent class membership, a three-step multinomial logistic regression (R3STEP) was performed using the maximum likelihood robust (MLR) estimator (Asparouhov & Muthén, 2014). In Mplus, listwise deletion was applied to auxiliary variables with missing data, reducing the effective sample size for the regression to $n = 1802$ participants. Therefore,

the analysis included six independent variables: gender, age, education, employment status, years of experience, and assessment education.

Results

Latent class analysis

A four-class model demonstrated an acceptable statistical fit for the data, with class sizes that allowed for a statistical interpretation of class membership. The statistical identification of the four-class model was supported by VLMR and LMRA LRT results and the assessment of information criteria and fit indices (see Table 2). The four latent profiles were labeled (i) eager assessors, (ii) teacher-centric assessors, (iii) contemporary assessors, and (iv) hesitant assessors (Fig. 1).

Table 2

Fit indices for latent class enumeration

Model	Class sizes	Free parameters	Entropy	VLMR LRT (p)	LMRA LRT (p)	AIC	BIC	SSA-BIC
2-Class	1271/544	49	0.887	0.0000	0.0000	18648	18918	18762
3-Class	1013/603/199	74	0.872	0.0000	0.0000	17739	18146	17911
4-Class	1027/260/363/165	99	0.851	0.0048	0.0049	17551	18096	17782
5-Class	366/30/1020/148/251	124	0.868	0.0570	0.0579	17405	18087	17693

Table 3

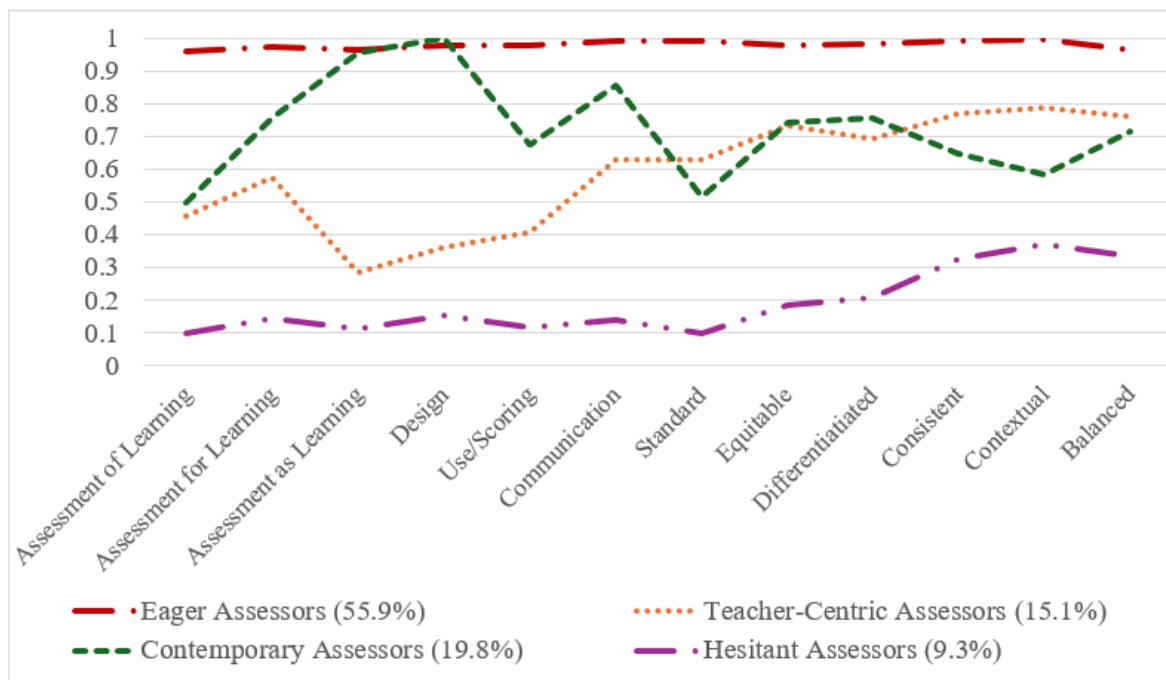
Demographic and professional composition of assessment profiles

Demographic	Within-profile frequency (%)
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		Eager	Teacher- centric	Contemporary	Hesitant
Gender	Male	41.5	38.2	37.0	44.0
	Female	58.5	61.8	63.0	56.0
Age	20–29	22.3	20.1	19.5	25.2
	30–39	39.6	36.1	35.0	37.4
	40–49	26.9	29.2	28.0	25.3
	50+	11.2	14.6	17.5	12.1
Educational qualification	Certificate	39.9	38.5	42.5	39.1
	Diploma	38.0	33.6	33.0	35.9
	Bachelor's degree	20.8	25.8	24.0	22.8
	Master's degree	1.3	2.1	0.5	2.2
Teaching experience	1–5 years	23.6	25.2	21.1	29.7
	6–10 years	28.3	25.2	19.6	20.8
	10+ years	48.1	49.6	59.3	49.5
Employment status	Full-time teacher	90.0	81.1	85.0	86.8
	Part-time teacher	10.0	18.9	15.0	13.2
Assessment education	Do not remember	8.9	9.0	8.2	14.1
	No formal preparation	7.2	4.1	4.5	8.7
	Module in assessment	11.8	14.5	14.8	10.8
	Short course	19.6	27.6	15.8	17.4
	1-semester course	21.6	19.3	28.6	20.7
	2+ full semesters	30.9	25.5	28.1	28.3

Figure 1

Conditional probabilities of the four-class model



Eager assessors

This profile constituted 55.9% of the sample ($n = 1014$) and represented the most prevalent and assessment-literate profile among the primary school teachers surveyed. This profile was marked by high professional stability; teachers in this group were predominantly female (58.5%). This profile had the highest proportion of full-time teachers in the study (90%). In terms of experience, 48.1% had taught for over 10 years (Table 3). Moreover, 30.9% of the group had completed two or more semesters of assessment-focused education. Teachers in this profile demonstrated consistently high-level practice across all assessment approaches, suggesting formative orientations. A strong endorsement of assessment for and as learning and related design practices indicates that this profile may possess a high level of assessment capability.

Furthermore, the high assessment as learning score suggests that these teachers may promote self-assessment and goal setting. Eager assessors also consistently scored highly on assessment

results and the communication of assessment results to parents and students. This profile appeared to demonstrate an educational approach centered on mastery, with assessment integrated as part of instruction. Teachers' adherence to measurement theory suggests that their evaluative judgments may be reliable and valid. Teachers in this profile maintained a standard approach while providing equitable and differentiated accommodations for identified learners. Consequently, these classrooms potentially provide a supportive and equitable assessment environment for students, intended to motivate them to achieve learning objectives and internalize success criteria.

Teacher-centric assessors

This profile represented 15.1% of the sample ($n = 274$), containing 61.8% females and having the highest percentage of part-time teachers (18.9%) across the sample. Teachers in this profile were characterized by high reliance on short courses for their assessment training (27.6%). Teachers in this profile tended to favor traditional teacher-led assessment practices and may place less emphasis on student agency. They appeared moderately likely to engage in assessment of learning to summate student learning and to use assessment for learning to provide feedback. However, they may be less likely to facilitate student-centered metacognitive experiences. In the assessment process, communication and scoring seemed to be emphasized more than the initial design, suggesting a focus on interpreting and communicating results rather than on developing reliable tools.

The findings indicate a relatively high endorsement of consistency and contextual and balanced indicators, which suggests a theoretical commitment to reliability and curriculum alignment despite the continued use of didactic teaching methods. While these teachers may promote equitable and differentiated assessment approaches, assessment remains teacher controlled. This profile seems to support traditional accountability and reporting through standard assessment practices. However, because teachers maintain authority over evaluative

judgements, students may not be given opportunities to develop metacognitive skills to monitor their own progress and internalize success criteria.

Contemporary assessors

This profile represented 19.8% of the total sampled population ($n = 358$). This profile (63.0%) possessed the highest level of professional experience in the study, with 59.3% having taught for 10 or more years. They demonstrated a high level of formal training, with over half (56.7%) having completed at least one full semester of assessment education. Teachers in this profile were characterized by a shift toward student-centered pedagogical approaches. This profile appeared to prioritize assessment as learning, indicating that students may be encouraged to engage in reflective and monitoring practices during classroom instruction. Although assessment for learning was endorsed, its implementation seemed targeted, suggesting a strategic rather than consistent use of feedback. However, these teachers were somewhat more likely to favor assessment of learning as the primary driver of classroom assessment.

Within the assessment process dimension, these teachers prioritized communication and scoring approaches, with an emphasis on communicating assessment results. The relatively high endorsement of differentiated and equitable approaches suggests a tendency to prioritize personalized instructional practices to accommodate the diverse learning needs of their students. They scored highly for evidence and consistency but less well for contextual alignment. Teachers in this profile appeared to strategically use communication to provide feedback to students and parents, but challenges may exist in maintaining consistent grading across different classes.

Hesitant assessors

This profile represented 9.3% of the sample ($n = 169$). This profile contained the highest proportion of early-career teachers (29.7%) with 1–5 years of experience. Notably, these

teachers were the most likely to report having no formal preparation (8.7%) or being unable to recall their assessment training (14.1%). This profile was characterized by consistently low scores across all assessment dimensions. These teachers seemed to use assessment mainly for grading, not to inform teaching and learning. They also showed little interest in assessment design, scoring, or communicating results to students and parents. Furthermore, they showed limited support for contextual and consistent approaches. Teachers in this profile may have struggled to meet all of their students' learning needs, potentially resulting in an unclear classroom environment in which students lacked the tools to learn and track progress. The classroom learning environment may have lacked clarity, possibly making it difficult for students to evaluate their own learning and monitor their progress.

Comparison of assessment profiles

Person-centered analysis, employing the ACAI as described by DeLuca et al. (2016a), indicates the consistent emergence of distinct assessment profiles internationally. These profiles encompass teacher-centric, student-centric, accountability-oriented, and hesitant assessors. Although the prevalence of these profiles is subject to variations in educational policy, the fundamental assessment approaches demonstrate comparability. Subsequently, the four classes identified in the present study were compared with findings from global studies conducted in the US, China, Canada, Ghana, and Brunei. These global investigations have delineated four overarching categories of assessors: student-centric, balanced or moderate, teacher-centric/accountability-driven, and hesitant assessors (Asamoah et al., 2023; Baidoo-Anu et al., 2025; DeLuca et al., 2021). Educational systems that foster learning-oriented environments exhibit a diversity of teacher assessment approaches that are reflective of both responsiveness and individual teaching styles (OECD, 2018, 2025).

Tanzanian teachers' assessment profiles exhibit similarities to international typologies. For instance, the eager assessor profile is comparable to the student-centric profile observed in

Canada and China, in which teachers frequently endorse assessment for learning, assessment as learning, and practices related to design, communication, and fairness (Coombs et al., 2020). However, Tanzanian assessors were characterized by consistently high conditionality probabilities across all 12 approaches. Furthermore, Tanzanian teacher-centric assessors share similarities with accountability-oriented profiles identified in the US and Ghana. In these contexts, teachers tend to prioritize the assessment of learning, communication, and scoring, with less emphasis on student-centered assessment practices (Baidoo-Anu et al., 2025; Coombs et al., 2020). In contrast, Tanzanian teacher-centric assessors demonstrated a notable commitment to consistency and contextual alignment, potentially reflecting national curriculum expectations and school accountability driven by examinations (Abdala & Vuzo, 2024; Kahembe & Jackson, 2020).

Table 4

Global comparison

Tanzania profiles	Other countries profiles	Similarities	Differences
Eager assessors	Student-centric in Canada and China	High endorsement of assessment for learning, assessment as learning, design, communication, and fairness	The Tanzanian profile shows even higher endorsement across 12 approaches.
Teacher-centric assessors	Teacher-centric/accountability-driven assessors in the US and Ghana	High endorsement of assessment of learning, communication and scoring. Low endorsement of assessment as learning	The Tanzanian profile shows high consistency and contextual alignment due to exam pressures

Contemporary assessors	Balanced or moderate assessors in Canada and Brunei	High emphasis on assessment as learning, assessment for learning and differentiated assessment	The Tanzanian profile has exceptionally high assessment as learning, but lower contextual alignment
Hesitant assessors	Hesitant/low-endorsement assessors in China, Ghana, and Canada	Low endorsement of all assessment literacy indicators	The Tanzanian profiles show even lower endorsement than China, Ghana and Canada

Contemporary assessors in Canada and Brunei appear to exhibit a balanced formative profile, with teachers emphasizing assessment as learning, differentiated assessment, and assessment for learning (Asamoah et al., 2023; Coombs et al., 2020). In contrast, Tanzanian contemporary assessors endorsed assessment as learning highly but demonstrated less contextual alignment. This contrasts with countries in which measurement theory is strongly emphasized in teacher training. Tanzanian hesitant assessors showed low endorsement across all 12 approaches, which aligns with hesitant profiles observed in China, Ghana, and Canada (Baidoo-Anu et al., 2025; Coombs et al., 2020). However, the lower probabilities demonstrated by Tanzania's hesitant assessors compared to global reports suggest a potential challenge in assessment training or structural barriers that may be more pronounced than those in higher-income nations.

Multinomial logistic regression

Class 1 was chosen as the main reference group due to its size and representativeness, accounting for 55.9% of the total sample. Using this profile as a benchmark facilitates the characterization of how demographic and professional attributes distinguish the three smaller profiles. R3STEP and multinomial logistic regression were used to examine how gender, age, education, employment, experience, and assessment-focused education predicted class

membership. Predictive analysis identified age, employment status, and experience as the primary factors distinguishing class membership (Table 5). Career maturity (age and professional experience) and employment status were the primary predictors of class membership when Class 1 was used as a reference. However, demographic factors and formal education showed no significant predictive power in differentiating class membership relative to the reference group.

Table 5

Multinomial logistic regression: Reference class 1

Predictor	Class Comparison	Estimate	SE	Odds Ratio (OR)	p-value
Gender	Class 2 vs. 1	0.16	0.17	1.17	.382
	Class 3 vs. 1	0.13	0.15	1.14	.433
	Class 4 vs. 1	-0.09	0.19	0.91	.593
Age	Class 2 vs. 1	0.26	0.09	1.30	.013
	Class 3 vs. 1	0.25	0.08	1.28	.009
	Class 4 vs. 1	-0.01	0.11	0.99	.935
Education	Class 2 vs. 1	0.13	0.10	1.13	.253
	Class 3 vs. 1	-0.03	0.09	0.97	.724
	Class 4 vs. 1	0.06	0.12	1.06	.613
Employment Status	Class 2 vs. 1	1.04	0.24	2.84	.006
	Class 3 vs. 1	0.80	0.23	2.22	.018
	Class 4 vs. 1	0.30	0.29	1.35	.376
Experience	Class 2 vs. 1	-0.01	0.10	0.99	.886
	Class 3 vs. 1	0.23	0.10	1.26	.043
	Class 4 vs. 1	-0.04	0.11	0.96	.705

Assessment-	Class 2 vs. 1	-0.03	0.05	0.97	.488
Focused Education	Class 3 vs. 1	0.04	0.05	1.04	.385
	Class 4 vs. 1	-0.08	0.06	0.92	.149

Age significantly distinguished teacher-centric assessors (class 2) and contemporary assessors (class 3) from eager assessors (class 1). Specifically, age significantly predicted membership in class 2 ($B = 0.26$, $SE = 0.09$, $p = .013$) and class 3 ($B = 0.25$, $SE = 0.08$, $p = .009$). However, age did not significantly differentiate class 4 from class 1 ($B = -0.01$, $p = .935$). The odds ratio indicated that a one-unit increase in age corresponded to a 1.30 times greater likelihood of belonging to class 2 compared to class 1 ($p = .007$).

Employment status strongly predicted class membership in several comparisons. Employment significantly predicted membership in classes 2 ($B = 1.04$, $SE = 0.24$, $p = .006$) and 3 ($B = 0.80$, $SE = 0.23$, $p = .018$). However, employment status did not significantly predict membership in class 4 ($B = 0.30$, $SE = 0.29$, $p = .376$) relative to class 1. Full-time teachers were more likely to belong to class 2 ($OR = 2.84$, $p = .006$) and class 3 ($OR = 2.22$, $p = .018$) than class 1. Years of experience significantly predicted class membership, particularly in class 3 ($B = 0.23$, $SE = 0.01$, $p = .043$). However, years of experience were not a significant predictor for classes 2 ($p = .886$) and 4 ($p = .705$). The odds ratio demonstrated that each year of experience increased the odds of belonging to class 3 by 26%. No statistically significant predictors of membership in class 4 (hesitant assessors) were identified at the $p < .05$ level when compared to class 1. Demographic variables such as gender ($OR = 0.910$, $p = .593$) and education ($OR = 1.064$, $p = .613$) did not predict class membership in reference to class 1.

The results indicate that specific demographics and professions predict teachers' assessment approaches. Older age and employment status largely predict membership in class 2, the teacher-centric assessors. Class 3, the contemporary assessors, were even more distinct, with membership uniquely predicted by years of teaching experience. Conversely, the results

revealed clear limitations to prediction. Teacher gender and educational qualifications were not significant predictors of membership in any class relative to the reference class. This suggests that, within this sample, maturity and professional stability are stronger drivers of assessment approach profiles than educational attainment or gender. The variables did not fully predict membership in class 4, the hesitant assessors, suggesting that unmeasured psychological or environmental factors may influence teachers with lower endorsement in assessment dimensions.

Discussion

This research investigated Tanzanian primary school teachers' classroom assessment approaches. The study identified four distinct assessment profiles: eager assessors (55.9%), teacher-centric assessors (15.1%), contemporary assessors (19.8%), and hesitant assessors (9.3%). These profiles were determined using 12 multidimensional assessment literacy indicators encompassing assessment purposes, processes, fairness, and measurement theory. Based on the VLMR and LMRA LRTs and information criteria, class enumeration favored a four-class model. The identified assessment profiles were compared with global studies employing the ACAI in the US, Canada, China, Ghana, and Brunei. Gender, educational qualifications, and assessment-focused education were not significant predictors when compared to the eager profile.

Interpretation of assessment profiles

The eager assessors demonstrated consistently high conditional probability across all 12 assessment approaches. Their strong endorsement of assessment for learning and assessment as learning suggests that these teachers elicit evidence of learning and foster collaborative student engagement with assessment (Black & Wiliam, 2018). However, focus on assessment as learning emphasizes metacognition, aligning with Brookhart's (1997) student-centered

assessment perspective. This endorsement across all 12 approaches supports Shepard's (2000) argument that assessment should be integrated into teaching to support learning rather than simply evaluate it.

Teacher-centric assessors support assessment for learning but seldom use assessment as learning, indicating that feedback practices are mainly teacher led, with little student participation. These practices reflect a limited use of formative assessment, as described by Black and Wiliam (1998). While feedback is provided, students are not involved in guiding instruction. The focus on communication and simple scoring rather than understanding concepts indicates a procedural view of formative assessment. Furthermore, this approach contrasts with Brookhart's (1997) student-centered assessment principles, which emphasize student participation in understanding learning and regulating their own learning progress.

Contemporary assessors prioritize the use of assessment as learning alongside differentiated and equitable assessment methods, reflecting commitment to student-centered teaching (Brookhart, 1997). The emphasis on communication, scoring, and strategic application of assessment for learning indicates a focus on feedback that informs instructional modification (Black & Wiliam, 2018; Hattie & Timperley, 2007). These teachers exemplify Shepard's (2000) learning-oriented assessment model, wherein instruction and assessment are mutually reinforcing. However, their alignment with measurement theory is somewhat weaker.

Hesitant assessors demonstrate low endorsement across all 12 assessment approaches, suggesting minimal use of formative assessment principles, learning, and student-centered assessment. According to Black and William's (1998) formative assessment framework, these teachers do not follow the formative assessment cycle: They rarely clarify learning intentions, seek little evidence of learning, give minimal feedback, and rarely involve students. A low level of support for student autonomy indicates a misalignment with Brookhart's (1997) student-centered assessment model, suggesting that assessments do not enable learners to take

ownership of their learning. This reflects classrooms in which teachers and students lack the prerequisites to implement assessment for or as learning.

Predictors of assessment approaches

Multinomial logistic regression analysis offers significant insights into the professional characteristics that differentiate teachers' assessment approaches. Age was identified as a notable predictor, distinguishing both teacher-centric and contemporary assessor groups from the eager assessor reference group. These profiles were more prevalent among older teachers, suggesting that assessment orientations develop over time with experience. This observation is consistent with the proposition that teachers' assessment expertise develops incrementally as they refine their judgment, feedback mechanisms, and instructional decision-making capabilities (Heritage 2007, 2010; Timperley 2008). Employment status also emerged as a key predictor; specifically, full-time teachers were more likely to belong to the teacher-centric or contemporary profiles. It is plausible that full-time employment exposes teachers more comprehensively to the exigencies of classroom assessment, institutional expectations, and accountability measures.

As anticipated, teaching experience predicted membership in the contemporary profile, with evidence indicating that the capacity for formative assessment is enhanced through iterative cycles of practice, reflection, and adaptation (Black & Wiliam, 2009; Wiliam & Leahy, 2015). Conversely, the predictors examined did not distinguish the hesitant assessors from the reference group. This implies that hesitant assessors are driven by factors other than structural characteristics, particularly self-efficacy with regard to assessment. Teachers exhibiting low confidence in their ability to design, interpret, or utilize assessment evidence often avoid contemporary assessment practices, resulting in consistently weak endorsement across all domains (Heritage, 2010).

Implications for policy, teacher education, and professional development

The study identified four distinct teacher assessment profiles: eager assessors, teacher-centric assessors, contemporary assessors, and hesitant assessors. These profiles provide empirical evidence that can inform differentiated assessment practices and evidence-based policies. Given the inconsistent adoption of these approaches, the education curriculum could prioritize coherent formative assessment systems that explicitly emphasize assessment for learning and assessment as learning practices. Furthermore, policies must strengthen structural conditions by, for example, maintaining manageable class sizes, enabling access to assessment resources, and providing support mechanisms at the school level. Although the TIE primary curriculum explicitly integrates assessment into teaching and learning, teachers' reported practices suggest that the policy has not been fully translated into classroom practice. These practices are particularly teacher-centric and demonstrate a reluctance to assess, aligning with persistent challenges in operating learner-centered and assessment-driven reforms in Tanzania (Kasuga & Kalolo, 2025). These constraints are well-known across Sub-Saharan Africa and have consistently been reported as limiting teachers' ability to implement formative assessment effectively. These findings reinforce the argument that strengthening formative assessment requires more than structural reform and also necessitates cultivating teachers' professional agency.

As Priestley et al. (2015) emphasized, teacher enactment depends on personal, cultural, and structural resources. Therefore, teachers in Tanzania should be supported in developing the skills needed to use formative assessment in challenging environments. Teacher education programs could integrate scaffolded practical placements that exemplify assessment design, interpretation of the assessment results, and the provision of student-centered feedback. The findings indicate that neither level of education nor formal assessment training was able to predict class membership, suggesting that current training models may lack sufficient practical application. Therefore, professional development should shift from episodic workshops to

sustained, school-embedded coaching, cultivating assessment mindsets and evidence-based practices (Christoforidou & Kyriakides, 2021; DeLuca et al., 2019; Xu & Brown, 2016).

Contributions to theory and practice

The four latent classes provide strong empirical support for sociocultural approaches to assessment literacy. These approaches suggest that classroom assessment practices are shaped by teachers' identities, contextual constraints, and interpretations of assessment purposes (Xu & Brown, 2016). These structural constraints are well-documented, as evidenced by previous research in Tanzania. These studies underscore the persistent disparities between policy and classroom realities. UNESCO (2021) and the World Bank (2018) have also highlighted this in their regional reports on large-class pedagogy across Sub-Saharan Africa. These reports highlight that class sizes limit teachers' use of learner-centered and feedback-rich methods. Consequently, teacher-centric approaches and hesitant assessors are not merely individual failings; they are more likely to be products of middle-income settings in which high student-to-teacher ratios hinder assessments that promote student agency.

Limitations and future research

Although the study provides robust empirical insights, it has several limitations. First, it relied on self-reported assessment practices using scenario-based structured items. Although the ACAI demonstrates robust construct validity, self-report data may be vulnerable to social desirability bias, particularly in systems in which accountability is predominantly outcome based. Second, the cross-sectional design limits causal interpretation. Longitudinal transition analysis (LTA) could examine how teachers move between profiles over time and identify professional factors that encourage more sophisticated approaches. LTA would improve our understanding of how assessment literacy develops and what helps teachers move from teacher-led approaches to more formative, empowering ones (Lanza et al., 2010). Third, demographic

variables were not predictive of membership in the hesitant profile group. This indicates that psychological attributes, such as assessment self-efficacy, epistemic beliefs, and professional identity, may be critical determinants.

Future research should therefore consider the psychological factors that underpin teachers' differing perspectives on assessment literacy. Bandura's (1997) social cognitive theory emphasizes self-efficacy, suggesting that teachers with low self-efficacy are less likely to design effective assessments or provide effective feedback. Similarly, Pajares (1992) argues that teachers' instructional beliefs influence classroom decision-making. These frameworks should be applied in future studies to examine how teachers' assessment literacy and perceived self-efficacy shape their positions within latent classes, particularly among hesitant assessors. Investigating these psychological factors would facilitate a more nuanced understanding of the variations in formative assessment practices.

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