

The Assessment Literacy for Secondary School Teachers in Tanzania

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ABSTRACT

In this quantitative study, the assessment of literacy for secondary school teachers in Tanzania was examined using the Assessment Literacy Inventory (ALI), originally developed by Mertler and Campbell in 2005. Data were collected from 100 randomly selected secondary school teachers using the modified inventory which matched the local context. The purpose of employing ALI was to evaluate the levels of competence within the seven assessment standards and determine significant differences among the variables. The findings revealed that teachers had different levels of skills across these standards. Higher performance was observed in the area of "Choosing Assessment Methods that are Appropriate for Instructional Decisions," which scored an average of 1.52. In contrast, "Developing assessment methods that are appropriate for instructional decisions" had the lowest average score of 0.98. The Findings also revealed that significant differences were found in the mean competence of teachers with varying professional qualifications (p-value = 0.013). Teachers with master's degree qualifications had a mean score =10.20, which was higher assessment literacy compared to teachers with Diploma qualifications which had the mean score =7.7. However, the amount of time teachers spent in teaching (teaching experiences) had no significant impact on their assessment literacy (p-value = 0.429). Generally, the study revealed a worrying trend and indicated that Tanzania secondary school teachers have limited levels of assessment literacy. To address this, the Ministry of Education, Science and Technology should prioritise the enhancement of assessment literacy amongst secondary school teachers through comprehensive professional development programmes in collaboration with educational institutions.

Keywords: Assessment literacy, teachers, educational assessment, assessment literacy inventory; assessment standards

INTRODUCTION

Assessment is an important part of teaching and learning because it guides many educational decisions. This is why educators, including secondary school teachers, need to have the right skills in educational assessment to evaluate their students effectively. Besides, a growing board of knowledge asserts that assessment of students' achievement is a cornerstone of all levels within the system of education (Almossa & Alzahrani, 2022; Akayuure, 2021; Agu et al., 2013). Dutta (2020) added that assessment is an important tool for ensuring quality in the teaching and learning processes. The process of assessment provides information that facilitates most of the decisions in the educational process (Szarka, et al., 2022). Therefore, assessment offers formative and summative evidence upon which educational decisions are made (Akayuure, 2021).

On the other hand, assessment may take different forms and can be used for different purposes. It remains to be the daily business for educators across all levels of education and with the power to shape the curriculum and the teaching and learning processes. Teachers are responsible for designing and implementing different assessment methods in the classroom environment in order to collect information that can facilitate informed decision making. Cagasan (2020) holds that teachers need to demonstrate high level of assessment literacy in order to plan, design, implement and evaluate assessment schemes effectively. According to DeLuca et al. (2015), assessment literacy is referred to ability for a teacher to construct, administer and score assessment while maintaining reliability and validity. Popham (2011) viewed assessment literacy as teachers' demonstration of knowledge and understanding of assessment and its practices. For a teacher to be

literate in the field of assessment, s/he should know the skills, knowledge, or competencies to be assessed, reasons for the assessment to be conducted and the effective assessment methods to be used (Almossa & Alzahrani, 2022). Generally, assessment literacy is seen as the ability of a teacher to appropriately use the principles and assessment methods to obtain information that can lead into meaningful decision concerning the teaching and learning process (Delosa, et al. 2021). Most of the definitions of assessment literacy are largely rooted in the seven standards for Teacher Competence in Educational Assessment of Students developed jointly by several organizations. These organizations include the American Federation of Teachers (AFT), the National Council on Measurement in Education (NCME), and the National Education Association (NEA) (1990). These standards reflect seven broad competences a teacher needs to have to be considered literate in educational assessment.

These seven standards include: (a) choosing assessment methods that are appropriate for instructional decisions; (b) developing assessment methods that are appropriate for instructional decisions; and (c) administering, scoring, and interpreting the results of both externally-produced and teacher produced assessment methods. Others are (d) using assessment results when making decisions about individual students, planning teaching, developing curriculum and school improvement; (e) developing valid pupil grading procedures which use pupil assessments. Finally, (f) communicating assessment results to students, parents, other lay audiences, and other educators and (g) recognizing unethical illegal and otherwise inappropriate assessment methods and uses of assessment information (AFT, NCME, NEA, 1990). Scholars are guided by several standards for teacher competence in education assessment to design and use a number of instruments for measuring assessment literacy of teachers. The mostly recognized tool was the Assessment Literacy Inventory (ALI) developed and used by

Mertler and Campbell (2005). ALI has been extensively used to measure and evaluate teachers' assessment literacy across all levels of education since its development. Muhammad et al (2019) conducted a survey of 101 teachers in Iraq using classroom assessment inventory (CALI) with a modification of ALI and found that most of the teachers even if responded to be adequately trained for assessment, they still had low levels of assessment literacy. Frad and Tabatabaei (2018) have also used ALI to investigate the assessment literacy of teachers in Iran and found that most of them were at low level of assessment literacy. Hailaya (2014) used the same instrument in Phillipines to survey the assessment literacy of 582 teachers and found that elementary and secondary school teachers in the country possessed relatively low assessment literacy. Furthermore, a study by Yamtim and Wongwanich (2014) used ALI to investigate classroom assessment literacy of 19 primary school teachers at Wat Phai Rong Wua School and found that, most of the participants had poor level of assessment literacy.

The study suggested the need for improving teachers' level through continuous professional development. In a similar vein, Larsari (2021) employed ALI to examine teacher assessment literacy (TAL) of learners' writing developments. This study basically focused on learners' writing achievements and explored the implications for teacher development. The findings underscored that instructors' assessment literacy significantly influences learners' writing ability. The study recommends strengthening of teacher education programmes by providing assessments that are practical and oriented towards enhancement of effective teaching practices. Notably, assessment literacy is one of the four core skills required in the teaching profession. In view of its significance, Tanzania has always striving to incorporate courses related to educational assessment for teacher preparation programmes at its all levels of education. Studies

conducted outside Tanzania (See, Muhammad et al, 2019; Frad & Tabatabaei, 2018; Hailaya, 2014) have indicated gaps of knowledge and skills in the field of assessment by most of the teachers. However, in Tanzanian context, there is inadequate literatures on the assessment literacy of secondary school teachers. Therefore, the purpose of this study was to measure the assessment literacy of secondary school teachers in Tanzania in relation to assessment standards and propose measures on how to improve their assessment literacy.

Research Question

- i. What is the level of assessment literacy for secondary school teachers in Tanzania?

Hypothesis

- i. There is no significant difference in the assessment literacy level of secondary school teachers when measured by their professional qualifications.
- ii. There is no significant difference in the assessment literacy level of secondary school teachers when measured by their teaching experience.

Methodology

This study was guided by quantitative research approach, whereby correlational survey design was employed to establish the significant difference between variables. The study employed probability sampling technique to enable each respondent an equal chance to participate in the study. The sample size of 100 secondary school teachers was obtained through stratified proportional and simple random techniques. Assessment literacy inventory (ALI) was used as the tool for data collection. This tool was adopted and developed from the original ALI developed by Mertler and Campbell (2005). The current study consisted of two sections of ALI. Section A had three items on demographic information of the teachers' gender, professional

qualifications, and teaching experience. Section B consisted of 35 multiple choice questions arranged in five scenarios with each scenario having seven questions. The seven questions corresponded to the standards for teacher competence in assessment of students (AFT, NCME, NEA, 1990). Therefore, there were five questions in each standard (one from each scenario). Each multiple-choice item had the stem (in form of a question or statement) and four alternatives (choices). The alternatives also consisted of one correct answer (key) and three distractors. Validity and reliability of the instrument were assured through expert review and Cronbach alpha (0.78) for internal consistency which is higher for maintaining the data for further analysis. Both descriptive (Mean and Standard deviation) and inferential statistics (Analysis of Variance-One way ANOVA) were performed whereby the Statistical Package for Social Sciences (version 23) software assisted in running the data. The confidence interval was taken under 95% with significance level of 0.05. Ethical issues such as confidentiality, anonymity and respondents' privacy were all maintained and ensured.

Findings and Discussion

The findings of the study focused on the stated objective and research questions as revealed in the subsequent sections.

Table 1: The Level of Assessment Literacy for Secondary School Teachers in Relation to Assessment Standards

Standards and Corresponding Items	Min	Max	Mean	Std. Deviation
Standard one: choosing assessment methods that are appropriate for instructional decisions (items; 1, 8, 15, 22, 29)	0	4	1.52	1.147
Standard two: developing assessment methods that are appropriate for instructional decisions (items; 2, 9, 16, 23, 30)	0	3	.98	.869
Standard three: administering, scoring and interpreting the results of both externally-produced and teacher produced assessment methods (item; 3, 10, 17, 24, 31)	0	4	1.10	.909
Standard four: using assessment results when making decisions about individual students, planning teaching, developing curriculum and school improvement (Items; 4, 11, 18, 25, 32)	0	4	1.50	.886
Standard five: developing valid pupil grading procedures which use pupil assessments (Items; 5, 12, 19, 26, 33)	0	3	1.14	.904
Standard six: communicating assessment results to students, parents, other lay audiences and other educators (Items; 6, 13, 20, 27, 34)	0	4	1.10	.995
Standard seven: recognizing unethical illegal and otherwise inappropriate assessment methods and uses of assessment information (Items; 7, 14, 21, 28, 35)	0	3	1.40	.756

Choosing Assessment Methods Appropriate for Instructional Decisions

Had a minimum score of zero and a maximum score of four. The mean score for this standard was 1.52, indicating that, on average, teachers scored below the midpoint. The standard deviation was 1.147, suggesting a considerable variation in the scores. This indicates that teachers have some level of familiarity with appropriate assessment methods for instructional decisions, but there is a room for improvement. One possible explanation for the prevalence of traditional assessment methods, which primarily focus on recalling information rather than measuring mastery of intended skills, could be teachers' lack of appropriate skills in selecting the best assessment methods (Le et al., 2023). This finding suggests that teachers may be relying on familiar assessment techniques, even if they are not ideal for evaluating students' learning outcomes accurately. Arguably, the use of assessment methods that do not align with their intended purposes can hinder the improvement of the teaching and learning process (Agu et al., 2013). This implies that some teachers might be assessing students merely for the sake of assessment, without utilizing the assessment results to enhance instruction and learning. The findings underscore the importance of ensuring that assessment methods are appropriately aligned with instructional goals, as they play a crucial role in informing teaching practices and facilitating students' progress.

Developing Assessment Methods Appropriate for Instructional Decisions

Had a minimum score of zero and a maximum score of three. The mean score for this standard was 0.98, which is below the midpoint. The standard deviation was 0.869, indicating a moderate level of variation in the scores. This suggests that teachers have a relatively lower level of competence in developing appropriate assessment methods for instructional decisions. The mean score value indicates

that teachers struggle more significantly in the aspect of developing appropriate methods of assessment. The study conducted by Morris (2017) further supports the notion that teachers face challenges in developing appropriate assessment methods. It specifically highlights that teachers scored the lowest in items related to this particular standard. This reinforces the need for intervention and support to enhance teachers' understanding and application of assessment techniques. One possible explanation for inadequate literacy of teachers in this domain is the lack of training on assessment methods. As Khan et al. (2022) suggest, teachers may heavily rely on traditional paper and pencil tests as the sole method of assessment due to a lack of exposure to alternative approaches. This narrow focus on a single assessment format limits the opportunities for teachers to develop a comprehensive understanding of various assessment methods available to them.

Administering, Scoring, and Interpreting the Results of both Externally-Produced and Teacher-Produced Assessment Methods

Had a minimum score of zero and a maximum score of four. The mean score for this standard was 1.10, which is below the midpoint. The standard deviation was 0.909, suggesting a moderate level of variation in the scores. This indicates that teachers have some familiarity with administering, scoring, and interpreting assessment results, but there is a room for improvement. This is aligned with Larenas et al (2022), who found that teachers generally possess lower proficiency levels in administering, scoring, and interpreting assessment results. This suggests that the issue under discussion is not isolated to a particular context or region, but may be a more widespread concern among educators. In Zimbabwe, Chada (2022) underscores the challenges faced by teachers in the administration of assessments. Many teachers reported a lack of awareness regarding their exact responsibilities in this regard. This lack of clarity can hinder their ability to choose

appropriate assessments and effective interpretation of the results. Interestingly, the study mentioned by Nurdiana (2022) suggests that despite the involvement of teachers in administering and scoring assessments, a significant portion of teacher programmes do not adequately incorporate assessment skills. This indicates a potential gap in teacher education programmes, where there may be insufficient emphasis on equipping teachers with the necessary skills and knowledge in assessment practices.

Using Assessment Results when Making Decisions about Individual Students, Planning Teaching, Developing Curriculum, and School Improvement

The data shows that the mean score for using assessment results when making decisions about individual students, planning teaching, developing curriculum, and school improvement was 1.50, indicating that teachers have a low level of proficiency in this area. The minimum score was 0, indicating that some teachers missed all the items on this standard, while the maximum score was 4 (out of 5), meaning that no teacher scored all the items correctly on the same standard. The standard deviation was 0.886, indicating moderate variability in teachers' abilities. These findings generally show that teachers are less skilled in using assessment results for decision-making.

This is aligned with Weng and Shen (2022), who reported that teachers' insufficient skills may lead to irrational educational decisions. In the same line, Fitriyah et al. (2022) reported that teachers face challenges in using assessment results for improving student learning. This deficit in the ability to utilize assessment results for informed decision-making could have detrimental consequences in education. As highlighted by Almosa and Alzahrani (2022), Dutta (2020), and Szarka et al. (2022), assessments play a fundamental role in shaping educational decisions and ensuring teaching and learning quality. However, teachers'

inadequacy in this area, as supported by Weng and Shen (2022) and Fitriyah et al. (2022), may lead to irrational decisions, hamper student learning improvements, and hinder effective curriculum development. The support document and the broader context provided by Chen et al. (2021) and Huber and Skedsmo (2016) underscore that assessments serve as the cornerstone for educational decisions. Thus, it is crucial for teachers to possess the necessary assessment literacy to maximize positive impact of assessments on individual students, teaching strategies, curriculum enhancements, and overall school improvement efforts.

Developing valid Pupil Grading Procedures which use Pupil Assessments

On this aspect, the findings indicate several key points. Firstly, the mean score of 1.14 suggests that, on average, teachers scored below the midpoint of the grading procedure assessment, implying that there is a room for improvement in their understanding and application of these procedures. Additionally, the minimum score of 0 reveals that some teachers did not answer any questions correctly, suggesting the need for fundamental support in this area. Conversely, the maximum score of 3 out of 5 implies that no teacher scored correctly all the items. This suggests that there is still a room for improvement even amongst those with better performance.

The moderate standard deviation of 0.904 indicates a notable level of variation in the scores, suggesting that while some teachers may have a decent grasp of grading procedures, others might struggle more. These findings are in line with prior research such as Hung and Wu (2023), who emphasized the challenges teachers face in grading practices. Furthermore, Athuman's (2023) study whose focus is on biology teachers in Tanzania, reinforces the idea that grading can be particularly challenging, especially in competence-based assessments.

Therefore, the findings of the current study underscore the importance of providing ongoing professional development and support to help teachers enhance their skills in developing valid grading procedures, thereby ensuring fair and accurate assessment practices in education.

Communicating Assessment Results to Students, Parents, other Lay Audiences, and other Educators

The data show that the mean score for communicating assessment results to students, parents, other lay audiences, and fellow educators was 1.10. This indicates that teachers have a low level of proficiency in this area. The minimum score of 0 indicates that there are teachers who missed all the items on this standard, while the maximum score of 4 (out of 5) indicates that no teacher scored all the items correctly on the same standard. The standard deviation was 0.995; this indicates significant variability in teachers' abilities in this domain. These findings generally show that teachers are less skilled in communicating assessment results effectively. This is in line with Marzaini et al. (2023), who also reported moderately low competence among teachers in this aspect. While Larenas et al. (2022) reported that teachers had difficulty with this skill, Shapovalovy and Evans (2022) indicated the importance of enhancing educators' assessment literacy to address these challenges. It is argued here that if teachers are not skilled in communicating the results of assessments, it can lead to misunderstandings, hinder student progress, and limit parental involvement in the education process. Therefore, improving teachers' proficiency in communicating assessment results is essential for effective education practices.

Recognizing Unethical, Illegal, and Otherwise Inappropriate Assessment Methods and Uses of Assessment Information

The data show that the mean score for recognizing unethical, illegal, and inappropriate assessment methods and uses was 1.40. This indicates that teachers are less competent on this aspect. On one hand, the minimum score of 0 indicates that there are some teachers who missed all the items in this standard. On the other hand, the maximum score of 3 (out of 5) indicates that no teacher scored all five items in this standard. The standard deviation of 0.756 shows that there is variation in teachers' competence levels in this area. Teachers being less competent in recognizing inappropriate assessment practices has also been reported by Jaber (2023) who noted a low ability to recognize unethical assessment procedures. Jaber noted that low ability to recognize unethical assessment procedures can lead to misinformed assessment practices with adverse consequences. These consequences may include unfair treatment of students, misallocation of resources, and a lack of trust in the education system. To ensure integrity of assessment practices and protect the rights of students, it is imperative to enhance teachers' understanding and recognition of unethical and inappropriate assessment methods, and their potential negative impacts. Therefore, there is a clear need for improvement in teachers' understanding and recognition of unethical and inappropriate assessment methods and their potential negative consequences.

Table 2: Means, Standard Deviations, and One-Way Analyses of Variance in Determining the Significant differences between Assessment Literacy and Professional Qualifications

Measure	Diploma		Bachelor Degree		Postgraduate Diploma		Master		F (3, P-96)	Value
	M	SD	M	SD	M	SD	M	SD		
Literacy	7.67	2.75	9.03	1.97	8.00	1.55	10.20	2.78	3.786	0.013

The findings in Table 2 show that teachers with master's degree qualification had higher mean scores (10.20) of assessment literacy

compared to teachers with diploma qualification (7.67). Furthermore, when the hypothesis was tested to establish the significant differences in the assessment literacy level of secondary school teachers when measured by their professional qualifications. The findings revealed that there is significant differences amongst the professional qualifications ($p=0.013$). The findings of the current study postulate that the higher the teacher's education qualification the better the assessment literacy and vice versa. These findings are in agreement with the study of Odiemo and Kinyua (2018) who found that the level of education is significant towards validity and reliability of teacher made test. Therefore, the current study suggests further research to explore more on the reasons for higher qualifications to have higher assessment literacy while all respondents were qualified to teach in secondary schools and assessing teaching and learning activities. Researchers, however, thought of two reasons for their differences. Firstly, some secondary school teachers with master's degree qualifications went through diploma teacher education prior to joining the university's bachelor degree of education, whereby the course of educational measurement, assessment, and evaluation is offered. Thus, these teachers had an opportunity to learn educational measurement twice (at diploma and first-degree levels).

Thus, it is expected that these teachers have higher expertise compared to those with diploma qualifications who studied once in their diploma teacher education. Secondly, from the experiences in teaching at secondary schools prior to joining higher learning institutions, teachers with bachelor's and master's degree qualifications are assigned higher classes (forms) to teach. It is expected that these teachers would teach effectively and complete the syllabus in due time and provide more assessment tasks to students, and in turn, students may perform better in their final examinations. Thus, through performing several assessment tasks, they gain knowledge and skills on assessment unlike

their counterparts with a diploma level of education. The mean competencies in the field of educational assessment amongst teachers of different teaching experiences were compared to determine if teaching competence influences teachers' assessment literacy. The results of the comparison have been presented in Table 3.

Table 3: Teacher's Assessment Competence according to their Teaching Experience

Experience	N	Mean Competence	Std. Deviation	Minim um	Maxim um
1-5 Years	30	8.66	1.76	6.00	12.00
6-10 Years	40	9.20	2.91	4.00	13.00
11-15 Years	16	8.25	2.35	5.00	12.00
16 Years and Above	14	8.28	1.32	7.00	10.00
Total	100	8.76	2.34	4.00	13.00

Source: Field data (2023)

Teachers with 6-10 years of experience demonstrate the highest mean competence, with a score of 9.20. Meanwhile, teachers with 1-5 years of experience exhibit a slightly lower mean competence of 8.67. Educators with 11-15 years of experience show a mean competence of 8.25 and those with 16 years and above of experience display a similar mean competence of 8.29. To test whether the observed differences were significant, an analysis of variance (ANOVA) was run at a 95% confidence level and the results of analysis are presented in Table 4.

Table 4: ANOVA Table for Determining Significant differences between Assessment Competence and Teaching Experience

Assessment
competence

	Sum Squares	of df	Mean Square	F	Sig.
Between Groups	15.316	3	5.105	.930	.429
Within Groups	526.924	96	5.489		
Total	542.240	99			

Source: Field data (2023)

The results of the one-way ANOVA indicate that there are no statistically significant differences in the assessment competence mean scores of teachers based on their teaching experiences. This conclusion is based on the F-statistic of 0.930 and the associated p-value of 0.429. This suggests that, despite having many years of teaching experience, teachers still lack most of the essential skills needed to be competent in the field of educational assessment. The findings from this study diverge from other studies that observed significant differences among the variables (Agu et al., 2013; West, 2000). For example, the study by West (2000) indicates a strong positive relationship between teachers' years of teaching experience and teacher ability to assess teaching and learning activities. Arguably, the findings of the current study act as a wakeup call for the Tanzania Institute of Education – a key player in supporting teachers' professional growth – to continue with capacity building for all teachers in areas of educational assessment, regardless of their teaching experience. It is expected that the knowledge and skills acquired will improve teachers' capacity to assess teaching and learning activities and help avoid common pitfalls that will occur along the way.

Conclusion and Recommendations

In the context of secondary education in Tanzania, a concerning trend emerges as teachers consistently display low levels of assessment literacy across the seven examined standards. With mean scores often falling below the midpoint, it is evident that there is substantial room

for improvement in their competence, especially in the areas where teachers struggle the most. Such areas include developing appropriate assessment methods, using assessment data effectively for decision-making, and creating valid grading procedures. These shortcomings may lead to persistence of outdated assessment practices, hindering accurate evaluation of students' true learning outcomes and potentially impeding overall educational process. While some studies indicate similar challenges in assessment literacy worldwide, addressing these issues through targeted professional development and support is imperative so as to enhance educational practices and ensure quality in Tanzanian secondary education system. Based on the findings and discussion above, this study recommends the following. One, the Ministry of Education, Science and Technology should prioritize the enhancement of assessment literacy among Tanzanian secondary school teachers through comprehensive professional development programmes in collaboration with educational institutions.

These programmes should equip teachers with the skills to select suitable assessment methods, administer assessments effectively, interpret results, and utilize assessment data for informed decision-making. Two, teacher training institutions should revise their curricula to include thorough training on assessment practices, emphasizing the selection of appropriate assessment methods, the development of valid grading procedures, and ethical considerations. Three, educational officers should provide ongoing support and mentorship to teachers, encouraging the application of assessment knowledge in the classroom. Lastly, teachers themselves should engage actively in professional development opportunities, workshops, and peer collaboration to continuously improve their assessment literacy and contribute to better educational outcomes.

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