

Examining Assessment Literacy: A Study Of Technical Teacher

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ABSTRACT: *Teacher assessment literacy is essential to the success of teaching the quality of student learning and student performance. Therefore as teachers, they must acquire an understanding of assessment literacy for utilizing data to make sound data-driven decisions. The purpose of this descriptive study was to examining the levels of assessment literacy among technical teachers of Universiti Tun Hussein Onn Malaysia. Thus, the objectives of this study to identify differences in assessment literacy based on technical teachers' gender and experience practicing competency-based assessment. The instrument used for this research study was the Classroom Assessment Literacy Inventory (CALI). The inventory consists of two sections. The first section of the survey consists of demographic questions regarding gender and experience of assessment training. The second section uses the CALI to examining the level of assessment literacy of technical teachers. A total of 55 technical teachers completed the survey and the data was analyzed using Statistical Package for the Social Sciences (SPSS) version 20. The data from the survey showed that technical teachers averaged 22 out of 35 questions correct (63%). The findings reflected that UTHM technical teachers had an average level of assessment literacy. The study discusses the implications of research findings and offers suggestions for technical teacher preparation programs, teaching institutions, and future research.*

Key words : *Assessment Literacy; Technical Teachers; Assessment Knowledge*

1. INTRODUCTION

Assessment has gained increasing attention in education in recent decades. Educational researchers now recognize that teachers' classroom assessment beliefs and knowledge of assessment practice act as instruments from which both students and teachers can benefit

enormously. By then, the issue of teacher training in classroom assessment has long been considered important in general education circles. In addition, assessment at higher institutions has resulted in vigorous discussions in many countries and Malaysia is no exception. Classroom assessment practices are a fundamental component of the standards-based, accountability system of education evident across Malaysia [15]. Due to the pivotal role of assessment practices within this system, there have been increasing demands to further develop teachers' assessment literacy [40],[9] and [34]. Assessment literacy is regarded as the sound knowledge and skills in the educational assessment required by teachers in assessing students' learning outcomes. Assessment literacy can be conceptualized as teachers' understandings of foundational assessment concepts (i.e., assessment purposes, assessment processes, communication of assessment results, assessment fairness, assessment ethics, measurement theory, assessment for learning, education support for teachers) and how these concepts are implemented during educational decisions [41], [8] and [39] further argued that assessment literacy is a sociocultural construct in which teachers must negotiate their approach to assessment in relation to their teaching context. [39] state: assessment literacy is a dynamic context-dependent social practice that involves teachers articulating and negotiating classroom and cultural knowledge with one another and with learners, in the initiation, development, and practice of assessment to achieve learning goals of students. (2013, p. 2).

Currently, in order to reform the Malaysian education system, there have been a number of education policy initiatives launched by the Malaysian Ministry of Education (MOE). All these initiatives have encouraged and inculcated teaching and learning for creativity, critical, innovative and higher-order thinking skills rather than conceptual knowledge, procedural knowledge, and rote memorization. The reform in teaching and learning approaches in Malaysian teacher education should also be reflected in the method of assessment as assessment is seen as a vital part of instruction in the culture of learning. In view of the need for changing higher education institution's assessment culture, teachers' assessment literacy becomes one of the main concerns. The role of teachers in assessment is not without importance and technical teachers no exception. Universiti Tun Hussein Onn Malaysia (UTHM) is known as a leading as Technical and Vocational Education and Training (TVET) center for offering technical programs in line with national development needs. However, radical changes in assessment lead to high proficiency in assessment literacy to ensure the quality of education in TVET.

The motivation behind this study is to seek whether teachers at higher education institutions are equipped with the necessary skills knowledge in the fundamentals of literacy assessment to be able to evaluate students fairly and effectively especially in a technical and vocational field. In addition, this study seeks to investigate the levels of assessment literacy among technical teachers of Universiti Tun Hussein Onn Malaysia (UTHM) using Classroom Assessment Literacy Inventory (CALI) approach. [32] emphasized that educational reform has called for the implementation of multiple sources of assessment information from the classroom instead of just relying on one type of assessment. The Ministry of Education (MOE) in Malaysia has taken this assessment reform into account seriously and came up with a new national assessment system for all higher education institutions and schools. The goal was to reduce dependence on the highly centralized assessment system and shift to a system that integrates assessment practices and beliefs. In anticipation of the reformation of the assessment system, the current assessment literacy and practices of the Malaysian teachers need to be known so that appropriate action can be taken to improve the assessment skills of teachers.

2. LITERATURE REVIEW

2.1 *The Importance of Assessment Literacy*

Proper assessment procedure in the classroom plays a vital role in ensuring the fact that learners are meeting instructional goals. Educators today are expected to make important professional decisions based on the results of educational assessments. It can be stated that despite the important role of classroom assessments in influencing their teaching and their students' learning, teachers generally leave assessment issues to be considered at a later time of the academic year. Yet, in many instances, the educators making those assessment-dependent decisions are doing so without a genuine understanding of educational assessment [28]. According to [7] the term 'educative assessment' used to describe assessment literacy includes techniques and issues that educators should know about when they design and use assessments. They stated that the nature of assessment influences what is learned and the degree of meaningful engagement by students in the learning process. It is also believed that effective teaching is characterized by assessments that motivate and engage students in ways that are consistent with philosophies of teaching and learning and with theories of learning and motivation. Furthermore, [36] justified that effective teaching and learning rests on meaningful assessment and professional judgment which is the foundation for assessment. Educators need to clearly understand and use all aspects of assessment. Whether that professional judgment occurs for constructing test questions, scoring essays, creating rubrics, grading participation, combining scores, or interpreting standardized test scores, the essence of the process is making professional judgment and interpretation. However, the degree of competence rests on a high level of making professional judgment and interpretation which is determined by the level of assessment literacy [12]. Assessment literacy is based on professional assumptions and values and is cultivated in the context of institutional needs and goals. Thus, assessment literacy has a high premium in describing the success of providing education.

Over the years, there has been strong agreement amongst some researchers [15],[22] and [24] that it is important to vary assessment methods so that the same students are not discriminated against repeatedly because they are not proficient in certain methods of assessment that had been over-used by teacher, especially paper and pencil tests. Furthermore, the affective and psychomotor domain of learning normally should be assessed by using performance-based assessment methods, not just where students are writing about such skills and knowledge in examination halls. For instance, when attempting to assess manipulative skills, the assessment should not be fully dependent on the quality and ability to produce written responses, but also on the quality of the performance such as hands-on activities and demonstrations. After deciding the assessment method to be used, teachers need to follow certain fundamental principles and standard guidelines suggested by assessment experts in creating more quality and effective assessment tasks. However, this process has always been ignored and sidelined by school teachers. As a result, many assessment tasks are poorly designed and ineffectively used [10]. Researchers have revealed that many teachers are ill-prepared to develop various methods of assessment and to create assessment tasks, especially authentic assessment [19] and [16]. Teachers who are less skilled and less prepared in constructing assessment tasks, perceive these to be more challenging and difficult than constructing traditional paper-and-pencil tests. Many teachers were found not to be good judges of their own assessment tasks in terms of quality and effectiveness [3]. Therefore, teachers need to become more knowledgeable regarding the selection of assessment methods and the development of assessment tasks so they can arrive at justifiable inferences about students' covert skills and knowledge. The justifiable inferences and evidence then play a prominent role in the making of arguments to support the accuracy of interpretations and conclusions about students' achievement. As [28] states teachers who are

genuinely assessment literate will not only efficiently develop more appropriate assessments but also will become familiar with the various potential assessment methods. The more accurate the assessment information that teachers gather, the more appropriate of the interpretation and inference of the assessment results that bring to a better degree of validity.

2.2 Assessment Literacy Knowledge in Malaysian Higher Education

Education has been a key factor in Malaysia's rapid economic growth since independence in 1957, and the national government has been continuously striving and successfully providing growth and expansion of the nation's education system. Being driven by both industry needs and human development needs, there is a clear recognition that in the 21st Century, at the center of all the educational resources and programs, quality teachers and their education are a primary factor in improved student outcomes and achievement. The government has put in efforts to change the assessment culture in the form of school-based assessment to avoid viewing students' scoring A's as a way to measure success. The higher education institutions in Malaysia should also adopt such a view and move away from the rote learning approach to teaching. Teachers must possess effective classroom assessment implementation practices so that their students can exhibit their strengths and weaknesses appropriately.

The National Higher Education Strategic Plan 2020 and Malaysia Education Blueprint 2013-2025 have emphasized the use of assessment to promote greater active student learning to enhance their potentials. As a result, it is compulsory for all the higher education institutions in Malaysia to emphasize two key components in the structure of academic programs which are: clear and measurable program learning outcomes and quality assessment well-aligned with the intended outcomes. The relationship between these two components is inseparable because learning outcomes are used as a source of guidance and practice of assessment among higher institution teachers [36]. The requirement to integrate measurable outcomes and well-aligned quality assessment into higher education academic programs is governed by two sources: (a) the Malaysian Ministry of Higher Education through its Quality Assurance Division, and (b) the Malaysia Education Blueprint 2015-2025. Since its implementation, the requirement has enthused most of the public universities to design a policy to guide their academic staff classroom assessment practices and hold workshops on classroom assessment practices for their academic staff in order to expose teachers with literacy assessment knowledge.

Many studies regarding teacher's assessment literacy revealed that teachers lack knowledge in assessment as identified in the literature. Adequate knowledge of assessment may compromise a teacher's opinion of the practicality and cost involved with adopting a new assessment. In the Malaysia context, teachers were exposed to only one assessment course with three credits throughout their teaching training program. A study conducted by [37] on assessment for learning in Malaysia revealed that teachers were unprepared for the change and found the new system challenging. They were required to learn new skills. Most of the time, they had to learn through experience and more of "on-the-job" training. Teachers need to view assessment as a vehicle for classroom practices and crucial for helping students learn. Teachers should also regard assessment for learning as a key to professional skills [37]. Referring [31], they found that lecturers were aware of the importance of formative assessment and feedback on student learning in Malaysian universities. Furthermore, [38] focused on university lecturers' conceptions about their assessment competencies in the classroom. The findings revealed that university lecturers' conceptions include practices of communicating results and feedback to students and using diverse assessment for learning methods. More importantly, it was found that Malaysian university lecturers utilized assessment for learning but their practices were limited to four underlying dimensions: communicating assessment results and feedback, using diverse assessment for learning methods, recognizing unethical, illegal, and inappropriate

assessment methods, and employing grading practices that integrated students' effort.

2.3 Classroom Literacy Inventory (CALI)

Many researchers show that assessment training in teacher education is important to improve teachers' assessment literacy [27], [30] and [33]. As [34] p.762 put it, "Few teachers are prepared to face the challenges of classroom assessment because they have not been given the opportunity to learn to do so." To address the problem of inadequate assessment training for teachers, the American Federation of Teachers (AFT), National Council on Measurement in Education (NCME), and National Education Association (NEA) collaborated to develop the "Standards for Teacher Competence in Education Assessment of Students" or STCEAS to guide pre-service teachers' and educators' learning and course assessment. This standard remains an important authority in the field of teacher assessment literacy. The Standards define assessment as "the process of obtaining information that is used to make educational decisions about students, to give feedback to the student about his or her progress, strengths, and weaknesses, to judge instructional effectiveness and curricular adequacy, and to inform policy" [1]. The first study related to assessment literacy was undertaken by [36] was referred to Standard for Teacher Competence in Educational Assessment of Students [1] for the development survey instrument called Classroom Literacy Inventory (CALI). This instrument consists of a total of 35 items where each standard is represented by 5 items. These standards are used to guide what teachers should know and be able to do with respect to classroom assessment [22]. The standards consist of the following seven principles. Teachers should be skilled in:

Standard 1 (S1) :	Choosing appropriate assessment methods for instructional decisions.
Standard 2 (S2) :	Developing appropriate assessment methods for instructional decisions.
Standard 3 (S3):	Administering, scoring and interpreting the result both externally produced and teacher produced assessment methods.
Standard 4 (S4):	Using assessment results when making decisions about individual students, planning to teach, developing curriculum and school improvement.
Standard 5 (S5):	Developing valid students grading procedures that used student assessment.
Standard 6 (S6):	Communicating assessment results to students, parents, other lay audience and other educators.
Standard 7 (S7):	Recognizing unethical, illegal and otherwise inappropriate assessment methods and uses of assessment information.

All these 7 standards apply to teachers' development and examining technical teacher literacy knowledge using CALI approach. Besides, standards 3, 4, 6, 7 also apply to large scale assessment, including administering, interpreting, and communicating assessment results, using the information for decision making, and recognizing unethical practices [5].

3. METHODOLOGY/MATERIALS

The purpose of this study was to investigate the levels of assessment literacy among technical teachers and determine the difference in the assessment literacy between teachers with gender and experience in practicing competency-based assessment. The sample consisted of N = 55

technical teachers at Universiti Tun Hussein Onn Malaysia (UTHM) and the instrument used for this research study was a survey adapted from the CALI [21]. The Classroom Assessment Literacy Inventory or CALI, modified by [21] from a similar instrument called the Teacher Assessment Literacy Questionnaire [27] and based on Standards for Teacher Competence in Educational Assessment of Students' [1]. The researcher developed items that are relevant to the teachers' assessment practices in the Malaysian technical education system. The instrument consists of 35 multiple choice items with four optional answers and one correct answer. The reliability index for Classroom Teacher Assessment Literacy is (KR20) =0.63. Table 1 provides information regarding the number of items for each standard:

Table 1: Standard and number of items of Teacher Assessment Literacy

No	Standard	No.of Item
S1	Choosing appropriate assessment methods for instructional decisions	5
S2	Developing appropriate assessment methods for instructional decisions.	9
S 3	Administering, scoring and interpreting the result both externally produced and teacher produced assessment methods.	5
S 4	Using assessment results when making decisions about individual students, planning to teach, developing curriculum and school improvement.	3
S 5	Developing valid pupil grading procedures that used pupil assessment.	4
S 6	Communicating assessment results to students, parents, other lay audience and other educators.	3
S 7	Recognizing unethical, illegal and otherwise inappropriate assessment methods and uses of assessment information.	6
	Grand Total	35

4. RESULTS AND FINDINGS

Overall assessment literacy was conducted using descriptive analyses and the seven composite scores that reflected standard including frequencies, percentages, mean and standard deviation. Inferential analyses included a One-Way ANOVA of the groups of teachers' gender, and experience practicing competency-based assessment to teachers' mean score for assessment literacy. All analyses were conducted using Statistical Package for the Social Sciences (SPSS) version 20.

4.1 UTHM Technical Teacher's Level of Assessment Literacy

The data resulting from the 55 respondents demonstrate the reliability of KR₂₀ .63. On average respondents answered 22 (63%) out of 35 items correctly. The data revealed that about 40.0% of the respondents score on a medium level of assessment literacy score and 27.0% of respondents score on the low level of assessment literacy. Based on the Z-score of each standard, out of the seven standards the highest performance was found for S2-skilled in developing assessment methods appropriate for instructional decisions (58% of the respondent

scored high level). The lowest performance was found for S4- skilled in decision making about individual students, planning to teach, developing curriculum and school improvement (47.0% respondent scored low level). The result for the level of overall assessment literacy and each standard are presented in Table 2.

Table 2: Classroom Teacher Assessment Literacy level of UTHM technical teachers.

Variable	Level	Frequency (f)	Percentage (%)
Overall Score of Classroom Teacher Assessment Literacy	Low	18	33
	Medium	22	40
	High	15	27
S1	Low	20	36
	Medium	17	31
	High	18	33
S2	Low	10	18
	Medium	13	24
	High	32	58
S3	Low	18	33
	Medium	22	40
	High	15	27
S4	Low	26	47
	Medium	21	38
	High	8	15
S5	Low	11	20
	Medium	21	55
	High	23	42
S6	Low	20	36
	Medium	13	24
	High	22	40
S7	Low	18	33
	Medium	19	35
	High	18	33

4.2 The Significant Differences In Classroom Teacher Assessment Literacy-Based On UTHM Technical Teacher's Gender, and Experience Practising Competency-Based Assessment.

The differences in assessment literacy of UTHM Technical Teacher's based on gender in experience practicing competency-based assessment were investigated using One-Way ANOVA. The examination of the result revealed that there is no significant differences existed between groups for the total score of assessment literacy ($t=22.48$, $p> .05$). The descriptive analyses show that UTHM female technical teachers' experience in practicing competency-based assessment ranges score highest than UTHM male technical teachers'. The results of all One-Way ANOVA are presented in Table 3.

Table 3: Mean and Standard Deviation of assessment literacy for groups of UTHM technical teachers' based on gender.

Gender	Assessment Literacy			Sig.
	Frequency (f)	Mean (M)	Standard Deviation (SD)	
Male	26	0.511	0.127	0.577

Female	29	0.532	0.143	
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Besides, based on Table 4, the descriptive analyses show that UTHM technical teachers' experience in practicing competency-based assessment ranges from one year to above 30 years. The examination of the result revealed that significant differences existed between groups for the total score of assessment literacy ($t=13.69$, $p<.05$). The group of UTHM technical with experience 26 - 30 years practicing competency-based assessment, scored the highest level of assessment literacy compared to the other group ($M=0.695$, $SD=5.230.918$). Meanwhile, the group of UTHM technical with experience 1-5 years practicing competency-based assessment, scored the lowest level of assessment literacy.

Table 4: Mean and Standard Deviation of assessment literacy for groups of UTHM technical teachers' experience in practicing Competency-Based Assessment.

Experience Practicing Competency-Based Assessment	Assessment Literacy			Sig.
	Frequency (<i>f</i>)	Mean (<i>M</i>)	Standard Deviation (<i>SD</i>)	
1 - 5 years	6	0.357	0.969	0.001
6 - 10 years	20	0.499	0.127	
11 - 15 years	11	0.512	0.110	
16 - 20 years	7	0.571	0.123	
21 - 25 years	4	0.636	0.360	
26 - 30 years	3	0.695	0.918	
Above 30 years	4	0.571	0.130	

5. RESULTS AND DISCUSSIONS

Apparently, assessment literacy is a commodity needed by technical teachers for their own long-term well-being, and for the educational well-being of their students. However, the result of this study indicated that the majority of UTHM technical teachers have moderate to the low level of assessment literacy. In this study, even though the instrument used was developed by the researcher, the findings are similar to the previous research investigating in-service teachers' assessment literacy using the original version of the instrument and focusing on the assessment literacy of in-service teacher [23], [20] and [26]. The overall performance on the 35 items resulted in an average score of 63%. This is slightly lower than the average score of 66% obtained by [26] and [20]. The findings on lowest performance are S4 (skilled in using assessment results when making decisions about individual students, planning to teach, developing curriculum and school improvement) definitely not similar to previous studies done by [26] and [20].

The findings imply that UTHM technical teachers' literacy on educational assessment is inadequate especially on making a decision and communicating assessment results to others. Therefore, continuous in-service training programs on educational assessment should be taken into consideration to cater to problems of the low level of assessment literacy. Although the teachers in this study had taken pre-service educational assessment courses, one course in assessment and measurement is not sufficient to cover everything that secondary school teachers need to know. According to [23], he stated that the trend of educational assessment is changing towards a higher education institutions assessment. The traditional focus of

preservice assessment courses has been more on standardized tests. Since technical teachers deal with competency-based assessment, therefore, the content of the pre-service training program on educational assessment should focus more on alternative assessment.

This study also investigated the differences in assessment literacy between groups of teachers' experience practicing competency-based assessment and also based on gender. The findings of this study are similar to the previous study done by [19]. The finding showed that the assessment literacy of technical teachers with experience of more than ten years practicing competency-based assessment has the highest score compared to the score of teachers with less of teaching. The finding shows that teachers with less than ten years practicing competency-based assessments are the majority also novice teachers. This means that the assessment courses during the teacher training program and short courses provided by the Malaysian Examination Syndicate (MES) could have a positive impact on assessment literacy.

Assessment is the bridge that links the curriculum and drives the instruction [13], as curriculum changes to reflect many and varied goals, the form of assessment must also change. This research explored the level of UTHM technical teachers' assessment literacy. The findings showed that majority UTHM technical teachers' have moderate to low level of assessment literacy especially in developing assessment methods appropriate for instructional decisions. This research also showed that assessment literacy of UTHM technical teachers with experience of 26 – 30 years practicing competency-based assessment has the highest score compared to teachers with minimum years of teaching. Therefore, there is an urgent need for continuous professional development courses involving assessment in the classroom for teachers to improve their practices in classroom assessment.

6. CONCLUSIONS

In this regard, some suggestions that had been discussed critically by [3] towards improving teachers' assessment literacy have been found to be a good reference in developing and advancing educational assessment in our country. Professional development of assessment literacy should be part of the daily practice of teachers. It should no longer be seen as an ad hoc event that happens only on a few days of the workshop or briefing. Therefore, before changing the old practice of assessment culture in a school or higher institutions, teachers should make a first move. They should change their old beliefs and update their assessment practices from time-to-time. They need to collaborate actively through school professional development communities. This will change the assessment culture in the long term. Besides, Teachers need to be encouraged and guided to take the lead in redesigning assessment process based on the fundamental principle of assessment. It is vital to produce more quality, reliable and valid assessment results. In the long run, the reform of their assessment practices will be beneficial to both teacher development and student learning. In addition, researchers also suggest to design more quality assessment tasks to assess student's knowledge and various thinking skill, teachers also should be capable in using the assessment result to improve a student's learning, for instance giving more effective and timely feedback which is tailored to the student's strengths, weaknesses, and understandings. It is the best way in telling a student about what s/he is doing well and what needs to be improved.

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7. REFERENCES

- [1] American Federation of Teachers, National Council on Measurement in Education, National Education Association. (1990). Standards for teacher competence in educational assessment of students, *Educational Measurement: Issues and Practice*, 9(4), 30-32.
- [2] Bakar, B. A. (2003). Asas pengukuran bilik darjah [Basic Classroom Assessment]. *Tanjong Malim: Quantum*.
- [3] Boud, D., & Soler, R. (2016). Sustainable assessment revisited. *Assessment & Evaluation in Higher Education*, 41(3), 400-413.
- [4] Brindley, G. (2001). Outcomes-based assessment in practice: Some examples and emerging insights. *Language Testing*, 18(4), 393-408.
- [5] Brookhart, S. M. (2001) The standards and classroom assessment research. Paper presented at the annual meeting of the American Association of Colleges for Teacher Education, Dallas, TX, March (ERIC Document Reproduction Service No. 451189).
- [6] Creswell, J. W. (2013). *Educational research: Planning, conducting, and evaluating*. W. Ross MacDonald School Resource Services Library.
- [7] Crusan, D., Plakans, L., & Gebiril, A. (2016). Writing assessment literacy: Surveying second language teachers' knowledge, beliefs, and practices. *Assessing writing*, 28, 43-56.
- [8] DeLuca, C., LaPointe-McEwan, D., & Luhanga, U. (2015). Teacher assessment literacy: A review of international standards and measures. *Educational Assessment, Evaluation, and Accountability*, 1-22.
- [9] DeLuca, C., & Volante, L. (2016). Assessment for learning in teacher education programs: Navigating the juxtaposition of theory and praxis. *Journal of the International Society for Teacher Education*, 20(1), 19.
- [10] Frontier, T., & Mielke, P. (2016). Making teachers better, not bitter: Balancing evaluation, supervision, and reflection for professional growth. ASCD.
- [11] Gronlund, N. E. (1998). *Assessment of student achievement (6th ed.)*. Boston: Allyn and Bacon.
- [12] Kalajahi, S. A. R., & Abdullah, A. N. (2016). Assessing assessment literacy and practices among lecturers. *Pedagogika*, 124(4).
- [13] Huang, J., & He, Z. (2016). Exploring assessment literacy. *Higher Education of Social Science*, 11(2), 18-27.
- [14] Kubiszyn, T., & Borich, G. (1996) *Educational testing and measurement: Classroom application and practice 5th ed.* Harper Collins College Publishers, United States
- [15] Lian, L. H., Yew, W. T., & Meng, C. C. (2014). Enhancing Malaysian Teachers' Assessment Literacy. *International Education Studies*, 7(10), 74-81.
- [16] Mahbib, U. K., Esa, A., Mohamad, N. H., & Mohd Salleh, B. (2017). Cooperative Learning (CL) as 21st Century's Teaching Method in Improving English Proficiency among Primary School Student: Teachers' Perception. *PERTANIKA*, 25 (S) APR. 2017, 39.
- [17] Marwiani, M., Junpeng, P., & Nakorn, N. N. (2014). The development of a model for mathematics classroom assessment: Collaborative assessment pyramid. *Procedia-Social and Behavioral Sciences*, 143, 764-768.

- [18] McMillan, J. H., & Workman, D. (1999). Teachers' Classroom Assessment and Grading Practices: Phase I and II.
- [19] Mellati, M., & Khademi, M. (2018). Exploring Teachers' Assessment Literacy: Impact on Learners' Writing Achievements and Implications for Teacher Development. *Australian Journal of Teacher Education*, 43(6), 1.
- [20] Mertler, C. A. (2003). Preservice versus inservice teachers' assessment literacy: Does classroom experience make a difference?. Paper presented at the annual meeting of the Mid-Western Educational Research Association, Columbus, OH, October. Retrieved from <http://wps.ablongman.com/wps/media/objects/1530/1567095/tchassesslit.pdf>
- [21] Mertler, C. A. (2003). Classroom Assessment Literacy Inventory. Retrieved from <http://pareonline.net/htm/v8n22/cali.htm>
- [22] Mertler, C. A. (2009). Teachers' assessment knowledge and their perceptions of the impact of classroom professional development. *Improving School*, 12(2), 101-113.
- [23] Mertler, C. A., & Campbell, C. (2005). Measuring teachers' knowledge and application of classroom assessment concepts: Development of the Assessment Literacy Inventory. Paper presented at the annual meeting of the American Educational Research Association, Montreal, Quebec, Canada.
- [24] Pereira, D., Flores, M. A., & Niklasson, L. (2016). Assessment revisited: a review of research in Assessment and Evaluation in Higher Education. *Assessment & Evaluation in Higher Education*, 41(7), 1008-1032.
- [25] Piaw, C. Y. (2006). Basic research statistics (Book 2). McGraw-Hill, Kuala.
- [26] Plake, B. S. (1993). Teacher assessment literacy: Teachers' competencies in the educational assessment of students. *Mid-Western Educational Researcher*, 6(1), 21-27.
- [27] Plake, B., Impara, J., & Fager, J. (1993). Assessment competencies of teachers: A national survey. *Educational Measurement: Issues and Practice*, 12(4), 10-12.
- [28] Popham, W. J. (2018). Assessment literacy for educators in a hurry. ASCD.
- [29] Purzer, S., Fila, N., & Nataraja, K. (2016). Evaluation of Current Assessment Methods in Engineering Entrepreneurship Education. *Advances in Engineering Education*, 5(1), n1.
- [30] Schafer, W. D. (1991). Essential assessment skills in professional education of teachers. *Educational Measurement: Issues and Practice*, 10(1), 3-6.
- [31] Singh, C. K. S., Lebar, O., Kepol, N., Rahman, R. A., & Mukhtar, K. A. M. (2017). An Observation of Classroom Assessment Practices among Lecturers in Selected Malaysian Higher Learning Institutions. *Malaysian Journal of Learning and Instruction*, 14(1), 23-61.
- [32] Shepard, L. A., Penuel, W. R., & Pellegrino, J. W. (2018). Using learning and motivation theories to coherently link formative assessment, grading practices, and large-scale assessment. *Educational Measurement: Issues and Practice*, 37(1), 21-34.
- [33] Stiggins, R. J. (1991). Relevant classroom assessment training for teachers. *Educational Measurement: Issues and Practice*, 10(1), 20-32
- [34] Stiggins, R. J. (2002). Assessment Crisis. the Absence of Assessment for Learning. *Phi Delta Kappan*, 83(10), 758-765
- [35] Suah, S. L. (2012). Analisis model literasi dan amalan pentaksiran guru sekolah serta kajian tentang jurang antara keduanya [Analysis of assessment literacy and practice school teacher and study of the gap between them] (Unpublished doctoral thesis). Universiti Sains Malaysia, Penang.
- [36] Suskie, L. (2018). *Assessing student learning: A common sense guide*. John Wiley & Sons.

- [37] Talib, R., Mohd Zaki Kamsah, M. Z., Abu Naim, H. & Abdul Latif, A. (2014). From principle to practice: Assessment for learning in Malaysian school-based assessment classroom. *International Journal of Social Sciences and Education*, 4(4), 2014, 850-857.
- [38] Tunku Ahmad, T. B., Ain Zubairi, A. M., Ibrahim, M. B., Othman, J., Abd Rahman, N. S., Abd Rahman, Z., Nordin, M. S., & Mohd Nor. Z. (2014). Assessment for learning practices and competency among Malaysian university lecturers: a national study. *Practitioner Research in Higher Education*, 8(1), 14-31
- [39] Willis, J., Adie, L., & Klenowski, V. (2013). Conceptualizing teachers' assessment literacies in an era of curriculum and assessment reform. *The Australian Educational Researcher*, 40(2), 241-256
- [40] Xu, Y., & Brown, G. T. (2016). Teacher assessment literacy in practice: A reconceptualization. *Teaching and Teacher Education*, 58, 149-162.
- [41] Yu, H., Abrizah, A., & Sani, M. K. J. A. (2016). Information literacy through resource-based learning: Malaysian teachers' conception and instructional practices. *Malaysian Journal of Library & Information Science*, 21(1), 53-67.

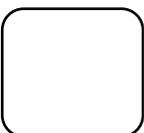
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