Research Article:

Implementation of Classroom Assessment in Malaysia

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ABSTRACT

Classroom assessment, initially known as "pentaksiran sekolah", has been implemented in Malaysia for almost ten years. Several studies have sought to examine the views and practices of primary and secondary teachers in Malaysia regarding the implementation of classroom assessment. Therefore, it is crucial to conduct a thorough examination of these studies in order to provide essential information to all stakeholders involved in the implementation of classroom assessment over the past decade. This paper aims to examine the four big keys that contribute to the quality of classroom assessment and analyse recent studies that are relevant to these components. The majority of the studies indicated that school teachers encounter difficulties in the initial stage of classroom assessment quality, specifically in comprehending the concept and purpose of classroom assessment and formative assessment. The study demonstrated that the process of implementing classroom assessment is demanding. Additional efforts and enhancements are required to enhance it further. It is expected that all the issues mentioned in this article will be thoroughly examined to improve the implementation of classroom assessment in the future.

Keywords: Classroom assessment, formative assessment, summative assessment, learning standards

INTRODUCTION

Classroom assessment is a process in which assessment data is collected, interpreted, and used for numerous purposes, namely formative, summative, and diagnostic purposes (Andrade & Brookhart, 2020). An effective classroom assessment can be used by teachers and students to articulate the learning standards, provide feedback ,and upgrade the learning and teaching process. Therefore, the recent education policy development throughout Asia, Canada, Europe, the United States, and Middle-East countries has focused on implementing classroom assessment. It has become a cornerstone in most of these countries' educational assessment systems (DeLuca et al., 2018). In addition, various research has demonstrated the advantages of implementing this approach, including the development of students' metacognitive abilities, academic performance, motivation, self-perception, and the improvement of teaching strategies (Birenbaum et al., 2015; DeLuca et al., 2018; Popham, 2013; Willis, 2010).

Malaysian Ministry of Education (2020) believes that implementing classroom assessment is an ongoing assessment in students' learning process for all subjects across all grades, namely Year 1 to Year 6 at the primary school level and Form 1 to Form 5 at the secondary school level. Thus, it should continuously provide useful information on students' development, progress, and abilities. Classroom assessment can be implemented in a formative and summative manner, namely assessment for learning and assessment of learning. The classroom assessment started in 2011 and was formerly known as the school assessment (*pentaksiran sekolah*). In 2016, it was known as classroom assessment (*pentaksiran bilik darjah*).

The main purpose of implementing classroom assessment is not to compare the level of mastery between students but to assist teachers in:

1. tracking the student learning progress as a whole,

2. identifying the strengths and weaknesses of students in their learning process,

3. investigating the effectiveness of teaching plan,

4. planning and improving teaching method, and

5. taking appropriate follow-up action immediately.

Under this system, teachers are given greater responsibility to design, develop, analyse, and communicate the results of assessments. What has been the progress in implementing classroom assessment over the past decade? Are Malaysians on the correct trajectory? It is critical to thoroughly examine the implementation's progress to identify and address any weaknesses encountered. This article examines the four big key factors

contributing to the quality of classroom assessment. It will also analyse recent studies that have explored these factors and provide recommendations for improvement.

FOUR BIG KEYS FOR THE SUCCESSFUL IMPLEMENTATION OF HIGH-QUALITY CLASSROOM ASSESSMENT

The implementation of any type of assessment focuses on the accuracy of the acquired information. The decision based on inaccurate information has the potential to detrimentally impact the teaching and learning process, as well as the educational system. There are four big keys to the classroom assessment that teachers need to adapt to ensure the implementation of classroom assessment is accurate, valid, and effective. These four big keys are drawn from the educational assessment domain (Brookhart & Nitko, 2019; Chappuis & Stiggins, 2020). According to Chappuis and Stiggins (2020), understanding the uses of classroom assessment is particularly important to ensure accuracy and quality: no accuracy, no gain. Thus, teachers' understanding of how to evaluate the quality of assessment is as important as their understanding of how to use the assessment result effectively. Hence, the big four keys are proposed. It is adapted and analysed from various sources to highlight the need for quality in implementing classroom assessment.

The first three big keys define the concern related to the accuracy and validity of assessment. The last big key defines the concern related to the positive consequences and effectiveness of assessment. The detailed descriptions of each big key are as follows.

Big Key 1: Clear Concept and Purpose

Classroom assessment is central in providing information for making decisions about teachers, students, schools, policymakers, programmes, and curriculum. Distinct types of decisions may be made for different purposes, such as instruction decisions, selection decisions, placement decisions, classification decisions, and guidance decisions (Brookhart & Nitko, 2019). Different types of assessment will serve different functions and thus provide different information. As such, teachers have to understand the function of different types of assessment methods to make sure they are appropriate for achieving the main purpose of the assessment that they plan.

In any assessment context, the teacher must start by understanding the types of information needed. Those elements will determine the method of assessment to be implemented. To provide teachers with a clearer understanding of the purpose of assessment, it can be divided into three primary categories: formative, summative, and diagnostic.

Formative assessment emphasises the involvement of teachers and students in generating and using the assessment information. In the first phase, teachers share the learning standard with the students. Next, teachers and students focus on achieving the learning standards. After the instructional process, teachers collect the assessment information to monitor the students' learning progress and improve their teaching strategies to achieve the learning standards. Similarly, students use the assessment information like teachers' feedback and self-reflection to improve their learning. It is a repeating cycle of using the assessment information to improve further learning (Chappuis & Stiggins, 2020). In simple words, formative assessment is a systematic way of collecting evidence about the product and process of learning and using the evidence to improve learning.

Summative assessment emphasises collecting information about students' achievement to make judgments about their competency level. Thus, it is used after the learning process has taken place. It is more formal, and the most often used instruments are paper and pencil tests, term projects, and reports. It helps teachers to determine the students' performance grade and report it to students, parents, and school officials. This assessment information is usually recorded in a home report or school report card.

Diagnostics assessment is used to identify the learning standards that the students have not mastered. It may be used to identify the possible reason the students have not mastered the subject and their strengths if they have mastered it successfully. More specifically, diagnostics assessment can provide more detail and different levels of information through different approaches (Brookhart & Nitko, 2019). There are six approaches to categorising diagnostics assessment that provide a variety of information:

1. Content strengths and weakness: identify the students' low standing, compared to their classmates, in broad learning standards of the subject topics.

2. Prerequisite deficits: identify the students' failure in mastering certain vital concepts, facts, or skills before they start learning new topics. This information is useful for teachers to tailor their teaching strategies to meet the students' needs.

3. Objectives not mastered: identify students' failure in mastering certain learning standards after the instructional process.

4. Errors: identify the students' errors rather than evaluate the students' level of mastery. Teachers can investigate the causes and problems students face that result in poor performance.

5. Inappropriate knowledge structure: identify students' inappropriate mental structure of the concept or fact they learnt. It focuses on analysing how the students process information and knowledge when solving a problem.

6. Inability to solve word problems: identify the inability to solve word problems in various subjects. This problem is a critical situation that prevents students from performing to the best of their ability.

Teachers face challenges in maintaining a harmonious integration of formative and summative assessments, as well as formative and diagnostic assessments (Vlachou, 2018). In order to achieve an optimal balance in enhancing the teaching and learning process, it is crucial for teachers to possess a comprehensive comprehension of the concept and function of its purposes.

Big Key 2: Define the Learning Standard

The learning standard will guide the teachers to plan and conduct the assessment. The learning standard refers to what the teachers expect students to perform after learning the skills and knowledge (Violante, Moos, & Vezzett, 2020). A clearly defined learning standard is important because the breadth and depth of the learning standard will affect the scope and content coverage that needs to be assessed (Obro & Gift, 2022). The learning standard can be assessed as either the 'process' of achieving the learning standard or the invention or creation of 'products'. Thus, the clearly understood learning standard will help the teachers reach the 'destination' they targeted. Teachers need to classify the learning standards according to three domains: cognitive, affective, and psychomotor. Cognitive focuses on knowledge and abilities requiring a thinking process, affective focuses on the feelings, attitudes, and emotional states, and psychomotor focuses on physical movement skills. The classification of learning standards within the domains will be sorted into the taxonomy models, which will help the teachers bring to mind the wide range of learning standards across the levels in a hierarchical manner. Sharing learning standards with the students is one of the important practices in formative assessment. Teachers need to explain clearly the scope of learning standards to the students. Both parties then have to work closer and focus on achieving the learning standards.

Big Key 3: Sound Design of the Assessment

The Big Keys 1 and 2 lay the foundation for designing the quality assessment by informing the teachers what needs to be assessed and what kind of assessment results are needed. In other words, to ensure accurate assessment findings, the main criterion for selecting the assessment method is the consideration of the types of learning standards to be assessed. Some assessment methods are more appropriate for assessing learning standards than others. There is no one assessment method that can fit all

learning standards. Each assessment method brings its own unique strengths and weaknesses. Thus, classroom assessment practices should use various evidence collected from different methods, from paper-and-pencil tests, observations, demonstrations, interviews, presentations, peers and self-assessments (Andrade & Brookhart, 2020).

Various assessment methods can be categorised into three types:

1. Paper and pencil tests consist of selected-response tests and constructed-response tests. The selected-response test refers to the item format in which students select the options provided to give a response. The constructed-response test refers to the item format in which the students must construct their answers, either a word, a phrase, a sentence, a paragraph, or more, to give the response.

2. Performance assessment refers to the types of assessment in which teachers gather information through observation and judgment about their students' demonstration of a skill or knowledge in creating a product, constructing a response, or making a presentation.

3. A portfolio assessment is a systematic collection of students' work. The collection of students' work can be used to represent the students' best work collection or their educational growth over a time period.

After the teachers decide on the assessment method, they have to develop a good quality assessment task that reflects the learning standard accurately in the form of an essay, multiple-choice item, or scenario-based task, accompanied by clear instruction and a scoring rubric or marking scheme.

Big Key 4: Assessment Result Usefulness

The vital part of implementing classroom assessment is to keep the students in touch with their learning progress. Formative assessment is informational, not for grading and making judgments (Brookhart & Nitko, 2019). The assessment results enable the students to improve their learning progress. It also allows the teachers to adjust their teaching methods. It plays the role of informing and guiding the teachers and students to achieve the targeted learning standards. Meanwhile, summative assessment results enable the students to gather information about the overall achievement level attained in the grade form. It also assists the teachers in informing the effectiveness of their teaching plans and activities.

The result information, either from formative or summative assessment, must be communicated to the students in an understandable manner. Typically, communication of formative assessment results provides descriptive feedback, whereas communication

of summative assessment results focuses more on the overall performance and achievement in the grade form at a point in time.

Feedback is one of the most influential and useful practices teachers can use to guide students' learning. Feedback provides information to improve students' task performance by commenting on their misconceptions and errors and suggesting better solutions (Patra et al., 2022). In classroom assessment, feedback may come from teachers or peers. Effective feedback should be descriptive and contain clear information for learning improvement ((Brookhart & Nitko, 2019). By giving feedback, teachers and peers also learn what and how their students and peers think. It is helpful in guiding teachers to adjust and improve their teaching strategies for the next lesson.

HOW WAS THE IMPLEMENTATION OF CLASSROOM ASSESSMENT IN MALAYSIA?

Recently, numerous studies have attempted to investigate the primary and secondary teachers' views and practices on implementing classroom assessment in Malaysia. (Chong & Lai, 2018; Halimah & Rozita, 2018; Hasim et al., 2018; Kalai Selvan, 2020; Mazidah & Mohd Sallehhudin, 2018; Rohaya et al., 2014; Sathasivam et al., 2019). The researchers have applied different frameworks to identify various factors and problems faced by the teachers. In order to provide a more precise picture of all the issues detected, a mechanism to make a comprehensive analysis is crucial.

Evidence from the previous studies has established that the obstacles to achieving the Big Keys 1, 3, and 4 that impeded the implementation of quality classroom assessment are as follows:

1. Big Key 1: Lack of understanding of the concept and purpose of classroom assessment and formative assessment

2. Big Key 3: Lack of knowledge and skill in the scoring rubric preparation and the score interpretation

3. Big Key 4: Lack of skill in the assessment results in communication

Problem of Achieving Big Key 1: Lack of Understanding the Concept and Purpose of Classroom Assessment and Formative Assessment

Kalai Selvan (2020) investigated how Malaysian primary school teachers implemented classroom assessments. Ten school teachers were involved in the interview and observation of the data collection for the study. The findings revealed that the teachers focused more on attaining higher achievement levels (*tahap pencapaian*), represented

by Band 1 to Band 6, as stated in DSPK (Curriculum and Assessment Standard Documents), rather than the students' learning development. One of the factors is that the academic assessment culture in this country is still too examination-oriented. However, this practice has deviated from the fundamental concept of classroom assessment, as stated in the four big keys above.

Meanwhile, Rohaya et al. (2014) found that more than 68% of 400 school teachers in Johor Bahru were still at the moderate level regarding the concept of school-based assessment. These teachers were implementing school-based assessment insufficiently, although 70.3% of them had attended professional development training related to school-based assessment. The mean score of the school-based assessment knowledge for the teachers who already attended the training was only 49.94. The results reflected that the Malaysian Ministry of Education should look into the content, timeframe, delivery method, and instructors provided for the training course. It is impossible to implement classroom assessment successfully if the teachers are still vague about the first stage, namely unclear about the concept and expectation to be achieved.

On the other hand, Sathasivam et al. (2019) studied the relationship between Malaysian teachers' espoused and enacted assessment for learning practices. There were 121 secondary school teachers involved in the survey and video recording design of the study. The findings revealed no relationship between espoused and enacted assessment for learning practices for three out of four dimensions investigated: sharing learning targets, descriptive feedback, and peer assessment. It showed that the teachers may commit to the formative assessment or assessment for learning but may not have the competency and skill to practice it.

Hasim et al. (2018) studied the practice of formative assessment by school teachers in English language classrooms. Ten English Language primary school teachers from five primary schools in a mainly middle-class suburban area were interviewed. The teachers demonstrated a general lack of understanding of the difference between formative and summative assessments. In such a situation, the teachers had ineffectively implemented the formative assessment and even declined the formative assessment practice in the classroom. They preferred to continue with the summative assessment, which they were more familiar with. It is understandable that most school teachers face challenges and trials to shift the paradigm from summative assessment to classroom assessment, as the traditional assessment system in this country is mainly monopolised by summative assessment for an extended period.

Further, Mazidah and Mohd Sallehhudin (2018) conducted a comparative study of the primary school assessment concepts and practices in Singapore and Malaysia. They claimed that the level of formative assessment practice in Malaysia is still low due to the considerable number of students in a class, teachers' beliefs and workload problems. It is

a big challenge to implement formative assessment because the summative assessment was deemed by parents and teachers as more important than the formative assessment. Thus, it is hard to change the school teachers' paradigm from teaching-to-the test to the combination of formative and summative assessments.

Fakhri and Mohd Isha (2016), Sidhu et al. (2018), and Abdullah et al. (2016) found that school teachers lack knowledge about the concept of classroom assessment. They are not aware of the concept of formative assessment, which can be implemented during teaching and learning. Meanwhile, Rohaya et al. (2014) found that among 400 school teachers involved in their study, the majority of them rarely practised formative assessment in their classrooms. Teachers might have limited knowledge and skills to utilise formative assessment to guide their teaching process and improve students' learning progress. Similarly, the study done by Singh et al. (2017) revealed that in a total of 260 primary mathematics teachers participated in the survey and interview design of the study, the majority of them responded that they were not ready and confident to implement school-based assessment in the mathematics classroom. More than two-thirds of them voiced that they had not enjoyed teaching since the implementation of the school-based assessment. This might indicate that the teachers do not have the ability and competency to implement school-based assessments.

Azlin et al. (2018) studied ten experienced language primary school teachers' perceptions of the practices, challenges, and weaknesses of school-based assessment. The findings revealed that parents and students had misconceptions about the concept of school-based assessment. Students were not serious about their learning because the implementation of formative assessment was informal. No score or grade was shown for their performance. They did not complete the tasks given seriously. Parents had little confidence in the band ranking system. They found that it was too difficult to monitor and guide their children.

According to the analysis of the previous studies, it is evident that Malaysian teachers not only struggle to comprehend the concept of classroom assessment, but they are also influenced by their beliefs regarding classroom assessment (Shahazwan et al., 2023). Most students, parents, and educators have doubts regarding the validity and reliability of classroom assessment results. They prefer to implement the summative assessment, which is said to be fairer and more standard. They are more comfortable with the summative assessment which has been implemented for generations (Alla, et al, 2023). This situation is similar to Vlachou's (2018) research findings regarding the middle school science teachers' conception of classroom assessment. Almost all the Greek science teachers involved in the study preferred to collect the quantitative data of assessment through the classroom assessment practice (in a summative way) and used the data for the formative assessment purposes such as adjusting the teaching strategies and improving the students' learning. They lacked the confidence to collect and present qualitative data to parents and teachers. On the other hand, Rahman (2017) revealed

that the majority of Bangladesh teachers in his study perceived classroom assessment as a test and grades are used to indicate their performance. It shows that if the teachers use the classroom assessment practice to fulfil the summative assessment purpose, they fail to understand their students' learning progress during the teaching and learning process.

Problem of Achieving Big Key 3: Lack of Knowledge and Skill in the Scoring Rubric Preparation and the Score Interpretation

Arsaythamby et al. (2015) studied 210 teachers from 15 secondary schools' knowledge and readiness for the implementation of school-based assessments. They discovered that most of the school teachers were not confident in implementing the Big Key 3 of the classroom assessment, especially interpreting and using the assessment result to provide a better lesson for helping and guiding students who lacked mastery of the lessons. Halimah and Rozita (2018) explored how the teachers conduct the Malay Language oral assessment scoring rubric. The case study research findings demonstrated that the skill of scoring rubric application is still low among teachers. The main factor is that there is considerable confusion and uncertainty regarding the criteria in the DSPK. The description of mastery level is too general and unclear, and the teachers were driven to use their own perceptions to implement it. The study conducted by Zemel et al. (2021) found that Israeli Chemistry teachers consistently encounter difficulties in accurately interpreting scores when the rubric dimensions assess students' abilities in analysis, forming conclusions, and justification, which involve subjective interpretation. The scoring guide consistently elicits divergent perspectives among educators. Consequently, the scoring exhibits significant variation.

Scoring and score interpretation are fundamental processes in determining the degree of validity of an assessment. Thus, teachers need to be given proper guidance, training, and monitored by stakeholders to ensure these processes are carried out accurately. With that, the classroom assessment can be implemented along the guidelines and be on the right track.

The Problem of Achieving Big Key 4: Lack of Skill in the Assessment Results Communication

Chong and Lai (2018) investigated 242 secondary school teachers who taught Integrated Living Skills subject in Sarawak. The findings showed that the teachers lacked skills to communicate the assessment result to their students and use it to improve students' weaknesses. Mazidah and Mohd Sallehhudin (2018) also claimed that Malaysian Primary English teachers prefer to give quantitative feedback in the form of examination slips rather than a detailed description of qualitative feedback as practised in Singapore. Similarly, Sidhu et al. (2018) studied the application of the Common European

Framework of Reference (CEFR)-aligned school-based assessment in primary English classrooms and claimed that the majority of the ten teachers involved in their case study were not aware of the usefulness of formative assessment to give constructive feedback. Students were not encouraged to reflect on their mistakes in the assignment. Besides, all the teachers interviewed placed a strong emphasis on worksheets (paper and pencil tests) and quizzes as the main assessment methods. They seldom practised other assessment methods in their classroom. The teachers seldom apply peer and portfolio assessments in their English teaching and learning.

The implementation of the classroom assessment is considered an innovative and action-oriented assessment system. It has witnessed corresponding improvements in education quality in many countries. However, it calls for a fundamental shift from the traditional-based assessment to the assessment for learning. This indicates that it places greater emphasis on offering diverse feedback and guidance to students following the assessment. Scdult (2019) asserted that teachers' feedback is an influential factor in classroom teaching and learning, although its impact is complex. While it can have a positive effect on students' learning, at other times, it may have a minimal impact. In certain instances, it can hinder the motivation of students to learn. In addition, feedback can be conveyed through various mediums, including verbal, written, or a combination of both. Therefore, it is essential to provide teachers with professional support to ensure they are equipped with this literacy. It is important to monitor the development of feedback practices over time. Assisting them in maximising the effectiveness of feedback practices is crucial for supporting the development of their students' learning.

The overview of the literature review stated is shown in Table 1 (Appendix A). The table shows that most of the issues encountered in the studies involve Big Key 1, namely understanding the concept and purpose of classroom and formative assessments. Out of the 13 studies reviewed, 10 of them identified these emerging issues. Four studies have identified a challenge faced by schoolteachers in effectively communicating and utilising assessment results to enhance students' learning. This challenge specifically pertains to a significant aspect referred to as Big Key 4. Only one study claimed that teachers face a challenge when it comes to creating a scoring rubric, specifically in relation to a significant issue known as "Big Key 3."

SUGGESTIONS FOR THE IMPROVEMENT

Classroom assessment has been widely implemented in numerous countries for a considerable period of time. Nevertheless, the parties involved have encountered numerous challenges. According to the literature review, the barriers can be attributed to three primary factors: the accountability system of the country, the centralised high-stakes assessment that holds significant influence, and the level of assessment literacy

among teachers (Viachou, 2018). The lack of teachers' assessment literacy consistently hinders effective classroom assessment practices. Therefore, several studies have suggested various measures to enhance teachers' assessment literacy. These measures include providing ongoing professional development tailored to teachers' specific needs, revising the educational assessment course in the education degree programme, and promoting informal collaboration among teachers (Acar-Erdol & Yıldızlı, 2018; Narathakoon et al., 2020; Viachou, 2018).

In the Malaysian context, the reform of classroom assessment involves teachers undergoing a paradigm shift. In addition to grading students' achievements and learning standards, they are also responsible for consistently assessing students' progress in learning. According to the analysis of prior research, Malaysia is still facing significant difficulties. Most studies have asserted that school teachers encounter difficulties with the initial crucial aspect of classroom assessment quality, which involves comprehending the concept and purpose of classroom and formative assessments. The government should prioritise this matter as teachers' effective implementation of classroom assessment hinges on their clear understanding of the concept and purpose. It is evident that they have a lack of confidence and do not appreciate these noble changes.

The meaningful classroom assessment can only be realised if the school teachers equip themselves with the assessment skills and knowledge related to:

1. Concept and purpose of classroom assessment. Without a clear understanding of classroom assessment's direction, expectation, and objective, it is impossible to implement it effectively and fruitfully.

2. Validity of formative assessment. It is crucial to convince the parents and students about the significance of formative assessment in the learning process. As discussed earlier, Malaysia has practised solely summative assessment for a long time in the education system. Thus, the formative assessment is deemed less valid and reliable than the summative assessment, in which the grade and score are applied to show the students' achievement. Teachers should become professional assessors who need to master and apply the three big keys accurately, which start from the explicit purpose of different types of assessments, definition of the learning standards, design, and prepare the sound and appropriate assessment design. Teachers can only confidently generalise the assessment result if the assessment is reliable and valid. Teachers can obtain evidence to support the interpretation of the assessment result and remain consistent with the positive value of consequence, namely motivating the students in their learning process.

3. Providing and using feedback. The vital component of assessment quality is missing if the assessment results do not benefit the students or bring no significance to the teaching and learning process. Feedback is one of the most powerful formative assessment results that teachers can provide for monitoring and improving students' learning. Besides, teachers should help the students use feedback to achieve the targeted learning standard. Communication of formative and summative assessment results with students and parents is needed to engage the students in tracking their learning progress.

From one perspective, it is necessary for school teachers to adopt a proactive approach to learning in order to discover the most effective methods of assessing their students in the classroom.

The policymakers and implementers are vital to providing ongoing support services to the teachers. They should provide accurate and up-to-date sources about classroom assessment in online or offline form. This resource is essential in becoming the main guideline and reference for teachers from time to time. A lack of sources, such as information about the concept and purpose of classroom assessment, will hamper the policy's implementation.

Apart from that, high-quality, professional, and sustainable training should be provided to the teachers. This requires the Ministry of Education, the State Education Department and the District Education Office to provide continuous training to the teachers. A one- or two-day workshop is insufficient to get the result. It should involve a prolonged period of investment, including training, postmortem, feedback analysis, reflection, and monitoring. The greater the investment in high-quality training, the more successful the outcome will be.

CONCLUSION

The four big keys have been widely used in various settings to ensure the quality of the implementation of the classroom assessment (Chappuis & Stiggins, 2020; Shepard et al., 2020; Veldhuis & van den Heuvel-Panhuizen, 2020). Shepard et al. (2020) applied the idea of primary big keys to present a set of classroom assessment principles intended as a leading resource for practitioners, especially school teachers. Meanwhile, Veldhuis and van den Heuvel-Panhuizen (2020) adapted the idea of these four main keys to design four classroom assessment technique workshops for mathematics teachers. The study results revealed that the teachers who participated in the workshops were able to practise the assessment knowledge and skills in the classroom. Consequently, their students showed a significant increase in mathematics achievement scores.

Therefore, this article applied the four big keys model to systematically analyse Malaysian school teachers' central problems of assessment literacy. To date, previous studies have focused more on the investigation of assessment literacy among certain subject teachers and different dimensions of assessment literacy. The application of these four big keys provides a clear and comprehensive picture of identifying the teacher's assessment literacy problems in terms of the key stages. With that in mind, the authorities can carry out more effective improvements and follow-up actions. The analysis revealed that most of the school teachers are still struggling to achieve Big Key 1, namely, the understanding of the concept and purpose of classroom assessment, as well as the formative assessment. Therefore, the professional development training and reference sources should focus more on the mastery of the Big Key 1. If teachers become fixated on Big Key 1, they will undoubtedly encounter significant difficulties in mastering and implementing the subsequent big keys.

As a recommendation for further study, these four main key models can be adapted to identify the assessment literacy problem of various subject teachers in detail and in depth through a qualitative method of research design.

The problem regarding the implementation of classroom assessment is not only caused by the teacher's assessment literacy but also by other parties involved, such as school leaders, students, parents and community culture. Therefore, a comprehensive study investigating the barriers to classroom assessment should be carried out as soon as possible to ensure that the main objectives of the classroom assessment system can be achieved.

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APPENDIX

Table 1: Overview of literature review

No	Title of study	Year	Author	Issue highlighted	The big key involved
1	Eliciting teachers' understanding and their reported practices on school-based formative assessment: Methodological challenges	2018	Hasim et al.	Teachers lack of understanding of the difference between formative and summative assessment.	Big key 1

No	Title of study	Year	Author	Issue highlighted	The big key involved
2	Juxtaposing the primary school assessment concepts and practices in Singapore and Malaysia	2018	Mazidah et al.	The level of the teachers-formative assessment and assessment for Learning practices is still low. The practice is still too examination oriented. Teachers prefer to give quantitative feedback in the form of examination slip, rather than the detail description of qualitative feedback as practiced in Singapore.	Big key 1 and 4
3	Teacher readiness issues in the practice of implementing school-based assessment	2016	Fakhri and Mohd Isha	Teachers lack of knowledge about the concept of classroom assessment. Lack of understanding about the purpose, technique, recording and interpretation of the assessment result.	Big key 1
4	Assessment for learning: Espoused and enacted practices of Malaysian teachers	2019	Sathasivam et al.	There is no relationship between espoused and enacted assessment for learning practices for three out of four dimensions investigated, namely sharing learning target, descriptive feedback and peer assessment.	Big key 1

No	Title of study	Year	Author	Issue highlighted	The big key involved
5	Curriculum, teaching and assessment in the perspective of classroom assessment	2020	Kalai Selvan	Teachers focus more on the attainment of higher achievement level (tahap pencapaian) which is represented by band system as stated in DSPK rather than learning development.	Big key 1
6	CEFR-aligned school-based assessment in the Malaysian primary ESL classroom	2018	Sidhu et al.	Although the school teachers responded positively about the concept and rationale of school-based assessment. However, the implementation stage is still far from the expectation. They lack of understanding about formative assessment, especially providing and applying feedback in their teaching. Teachers are not aware of the usefulness of formative assessment by giving constructive feedback.	Big key 1 and 4
7	School-based assessment: A study on teacher's knowledge and practices	2014	Rohaya et al.	Teachers rarely practice formative assessment in their classroom. Teachers are still in the moderated level about the concept of school-based assessment. They seldom implement classroom assessment in classroom although they had attended the related training.	Big key 1

No	Title of study	Year	Author	Issue highlighted	The big key involved
8	The evaluation and effectiveness of school-based assessment among science teachers in Malaysia using CIPP Model	2016	Abdullah et al.	The main downsides of school based assessment is the teachers do not understand clearly the implementation of it as a whole.	Big key 1
9	Re-assess or risk the slow death of school based assessment	2017	Singh et al.	Primary mathematics teachers are not ready and confident to implement school-based assessment in mathematics classroom. More than two third of them voiced they are not enjoy in teaching since the implementation of school based assessment.	Big key 1
10	Managing school-based assessment: Challenges and solutions for educational practice	2018	Azlin et al.	Parents and students have the misconceptions about the concept of school-based assessment. Students do not serious about the assessment process because the implementation of formative assessment is informal, no score shown for their performance. Parents are not confident with the band ranking system.	Big key 1

No	Title of study	Year	Author	Issue highlighted	The big key involved
11	The Implementation of the scoring for Malay Language oral assessment	2019	Halimah and Rozita	Teachers face the problems regarding the low knowledge of preparing scoring assessment, that resulted the assessment was bias and not transparent. The scoring rubric application skill is still low among the teachers. They are unclear and did not fully understand the description of the performance standard that stated in the curriculum.	Big key 3
12	Level of teachers' satisfaction with school-based assessment (PBS) for Kemahiran Hidup subjects in secondary schools in Sarawak	2018	Chong and Lai	The teachers lack of skill to communicate the assessment result with students and use it to improve students' weakness.	Big key 4
13	Teachers' knowledge and readiness towards implementation of school based assessment in secondary schools	2015	Arsaythamby et al.	Teachers are not confident in interpreting and using the assessment result to provide the better lesson for helping and guiding the non-master students.	Big key 4