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## **Classroom Assessment: Juxtaposing Teachers' Beliefs with Classroom Practices**

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### **Abstract:**

This paper discusses the beliefs of two Malaysian mathematics teachers selected from a total of ten involved in a study that aims to gain insight into Malaysian post-secondary mathematics teachers' beliefs about classroom assessment. Teacher A and Teacher B were selected because of their contrasting beliefs about classroom assessment. The research was conducted within the interpretive paradigm and the design was a qualitative, multiple case study carried out at a single college site. The college was selected because the researcher could maximise relevant data collection due to the progressive and unique nature of the assessment practices encouraged by the management in the 100 percent examination-oriented environment in Malaysia. Data collection techniques included semi-structured interviews, non-participant classroom observation and document collection. The findings are presented from four perspectives: 1. purpose of assessment, 2. assessment techniques, 3. need for change, and 4. concerns about change. The findings show contrasting profiles of the mathematics teachers' beliefs about classroom assessment juxtaposed with their actual classroom practices.

### **Introduction:**

Assessment is an important component in the teaching and learning process as it provides teachers with information that is important for decision-making in the classroom. Stiggins and Conklin (1992) emphasized that about one-third to one-half of teachers' times in the classroom is spent on assessment related activities. Teachers constantly make decisions concerning students' learning and development, as well as the suitability and effectiveness of classroom instruction (Linn & Miller, 2005). Information generated from assessment provides teachers with an insight into the meanings constructed or assigned by students to ideas or concepts taught in the classroom. Webb (1994) explains that this aspect of assessment allows the teacher to gauge whether the idea or concept taught was conveyed successfully to the students.

Assessment is also important to students. Nitko and Brookhart (2007) state that students view assessment as a way of informing them of their progress and also to identify the learning areas that need improvement. Students who receive regular feedback through assessment are better motivated to learn as they feel more involved in their own learning. Therefore, feedback from assessment guides improvement of student learning as well as contributes to student motivation.

There are different techniques of assessment that can be employed in the classroom to collect information about students' achievement (Angelo & Cross, 1993; Nitko & Brookhart, 2007). Examples of assessment techniques considered to be more traditional include tests, exams, quizzes

and textbook exercises. Assessment techniques that are seen as alternatives to these traditional techniques include concept maps, group work, portfolios, journals and presentations. An assessment technique can be used for more than one purpose, for example, a portfolio can be used for formative and summative purposes (Bell, 2007).

The global educational assessment scenario has gradually moved from the dominant examination and testing culture to a more flexible assessment culture where a wider range of assessment techniques is being implemented in the classroom (Linn & Miller, 2005). Due to this reform, educational assessment in many Asian countries can be seen moving away from rigid, high-stakes testing to a flexible assessment culture that incorporates a range of assessment techniques. In order to keep up with this global trend, Malaysia started drafting a new national assessment system with the intent to meet the demands of an increasingly globalized world. The focus of the change was to move away from the highly-centralized examination system to a system that is a combination of centralized examination and school-based assessment (Tuah, 2007). This new national assessment system will be implemented in 2010.

This study is grounded in the perspective that teachers' beliefs influence their classroom practices. That is, teachers' beliefs influence the decisions they make in the classroom (Isenburg, 1990; Pajares, 1992; Hofer & Pintrich, 1997). According to Isenburg (1990), research on teachers' beliefs help educators understand why teachers do what they do in their respective classrooms. Studies conducted on mathematics teachers' beliefs have generated findings that indicate a positive relationship between mathematics teachers' beliefs and their instructional practices (Anderson, Sullivan & White, 2005; Barkatsas & Malone, 2005; Beswick, 2007; Yates, 2006).

A study by Adams and Hsu (1998) focused on mathematics teachers' conceptions about assessment and their assessment practices in the classroom. The findings indicated that the mathematics teachers' conceptions of assessment covered a wide range of assessment techniques, strategies, and tasks. Importantly it was found that these conceptions structure the assessment techniques that the teachers employed in the classroom. Delanshere and Jones (1999) conducted a study which investigated factors that defined high-school teachers' beliefs about assessment in mathematics. The findings of this study suggest three main factors shaped the teachers' beliefs; (a) the external definition of the purposes and functions of assessment, (b) teachers' views of the official curriculum and the teachers' position with regard to the subject matter, and (c) teachers' understanding of students and their learning. The study indicated that teachers tended to view the learning of mathematics as somewhat mysterious and limited their assessment practices to making judgements of the students' mastery of the subject matter. Hence, the classroom assessment practice was focused on evaluating what students could or could not do in mathematics. The findings of these two studies highlight the influence that teachers' beliefs have on their classroom practices.

The focus of the study discussed in this paper is on teachers who were required by the College administration to undergo change in their assessment practices from traditional paper-pencil tests to a mixture of traditional and alternative modes of assessment. This context is similar to the scenario that Malaysian teachers will experience when the new national assessment system is implemented in 2010. This study aims to develop understandings of Malaysian mathematics teachers' beliefs of classroom assessment, specifically teachers who had experienced change in their assessment practices, from traditional paper-pencil testing to a mixture of traditional and alternative techniques. The two teachers were selected for this discussion because of their contrasting beliefs even though they are both considered senior teachers in the college.

The study addressed the following questions:

1. What are the teachers' beliefs about the purpose of classroom assessment?
2. What are the assessment techniques employed by the teachers?
3. What are the teachers' beliefs about the need for change in assessment practices?
4. What are the teachers' beliefs about barriers to this change?

### **Methodology:**

The study was conducted within the interpretive paradigm. The design of the research was a qualitative, multiple case study. Case study design provides a rich and wholesome account of the teachers' beliefs about classroom assessment (Punch, 2005; Creswell, 2007; Yin, 2009; Merriam, 2009). Qualitative forms of data were best suited to the research because the emphasis was on the qualities of the entities being investigated and not on the quantified manner of these entities in terms of amount, intensity or frequency (Denzin & Lincoln, 2003).

The two teachers were purposefully selected from ten participants in a larger study in order to maximise the information being conveyed about the phenomenon being studied (Merriam, 2009). This method of sampling was used to provide two strongly contrasting case studies that would maximise information to understand the research problem (Punch, 2005; Creswell, 2007). The two teachers each had more than 15 years of teaching experience. However, Teacher A had considerable experience with alternative assessment techniques and Teacher B rigidly implemented traditional assessment techniques.

The qualitative data collection approaches employed in the study were semi-structured, in-depth interviews with teachers, non-participant observation of classroom assessment techniques and documentation collection. An interview is a good way of probing perceptions, beliefs, definitions and meanings constructed by an individual (Beswick, 2007; Luft & Roehrig, 2007; Punch, 2005). Non-participant observation and document collection was employed to allow a process of triangulation. This provided the researcher with more credible, consistent and complete data from which to develop findings for the study (Creswell, 2005; Maxwell, 2005; Merriam, 2009). Hence, the triangulation process enhanced the rigour of the study.

Both teachers were interviewed twice and two rounds of classroom observation were completed for each of them. Documents such as assessment handouts, students' work and marking schemes were collected from the teachers. The teachers also provided reflective accounts of their thoughts and feelings related to assessment.

The analysis of the qualitative data was guided by the framework suggested by Miles and Huberman (1994) which involves data reduction, data display, and drawing conclusions and verification. Data reduction refers to the processes of selecting, simplifying, abstracting and transforming data into themes by coding (Creswell, 2007; Miles & Huberman, 1994). These coded data were then organised and assembled into representations including mind maps and case summaries. This process is known as data display. The final stage in the data analysis was drawing conclusions and verification from the data. The findings discussed in this paper were obtained by performing single-case analysis for each of the two teachers.

## Findings and analysis:

This section provides a brief description of the two teachers' background, a summary of the findings and a brief discussion of these findings. The findings from the single-case analysis for each teacher are summarised in the form of tables. The tables allow easy comparison between the teachers' beliefs. The teachers' beliefs are categorised into four aspects: purpose of assessment, assessment techniques, need to change and concerns about change.

### 1. Background of the teachers

#### a) *Teacher A*

Teacher A is a mathematics teacher in her mid-forties and a graduate with a degree in mathematics. She is not a trained teacher but has about 20 years of teaching experience. She was teaching in a secondary school before moving to her current position as a post-secondary mathematics teacher. Teacher A has vast experience in continuous assessment due to her experience teaching in various educational programmes.

#### b) *Teacher B*

Teacher B is a mathematics teacher in her late fifties and a graduate with a degree in mathematics. She is a trained teacher and holds a Diploma in Education with a major in mathematics and a minor in physics. Teacher B has 30 years of experience in teaching mathematics. According to Teacher B, her past teaching experiences mostly involved examination-oriented programmes. Therefore, she has very little experience with alternative assessment.

### 2. Findings

a) Purpose of assessment: An overview of Teacher A and Teacher B's beliefs about the purpose of assessment as outlined in Table 1.

<b>Teacher A</b>	<b>Teacher B</b>
Gives feedback about the quality of teaching	Identifies how much of the lessons students have retained
Useful for reporting and forecasting	Useful for reporting the students' progress to parents
Immediate identification of students' understanding	Identify students' understanding
Directs the pace and pathway of teaching	Directs the path and pace of teaching
Helps to understand students better personally	Identifies the standard of the class
Informs students of their ranking among peers	Informs students of their ranking among peers
Identifies students' areas of strengths and weakness	Identifies students' areas of strengths and weakness
Makes students study	To prepare students for exams
Identifies low-achieving and high-achieving students	Identifies low-achieving and high-achieving students
	Informs students of the effectiveness of their learning methods

Table 1: Teacher A and Teacher B's beliefs about the purpose of assessment

Teacher A and Teacher B have similar beliefs about the purpose of classroom assessment. They both hold beliefs that assessment is to inform the students where they stand compared to their peers as well as to identify their strengths and weaknesses. For both teachers, assessment serves to provide information for reporting and forecasting purposes, to identify low-achieving and high-achieving students, and to direct the pace and pathway of their teaching. Teacher A uses assessment to “force” her students to study whereas Teacher B uses assessment as a platform to prepare her students for examinations.

b) Assessment techniques employed: An overview of Teacher A and Teacher B’s beliefs about assessment techniques as outlined in Table 2.

<b>Teacher A</b>	<b>Teacher B</b>
Written tests	Written tests
Oral questions	Oral questions
Reflective logs	Mind maps
Quizzes	
Portfolios	
Projects	
Feedback forms	
Journal	
Multiple-choice questions	
Mathematics games	
Directed investigation	
Peer assessment	

Table 2: Teacher A and Teacher B’s beliefs about assessment techniques

Table 2 provides evidence of a strong difference between Teacher A and Teacher B with respect to the types of assessment techniques employed in their respective classrooms. The techniques used by Teacher A range from traditional paper-pencil tests to alternative techniques such as directed investigation and mathematics games. During the classroom observations, Teacher A actively questioned the students to challenge their thinking and acted mostly as a facilitator. On the other hand, Teacher B had a very limited range of techniques confined to the more traditional techniques. From the classroom observations, it was evident that she had a predominantly teacher-centered approach to teaching, always providing the answers to the students to most of the questions she asked in class.

c) Need for change: An overview of Teacher A and Teacher B’s beliefs about the need for change as outlined in Table 3.

<b>Teacher A</b>	<b>Teacher B</b>
Current system assessing memory	Not keen on change. Still feels paper-pencil tests are still the fairest way of assessing students
One exam not a fair measure of ability	
Students need to be continuously assessed	
Need to enhance students’ communication skills	
Maths is not about correct answers	
Analytical and interpretive skills important	
Need to enhance ability to think	

Table 3: Teacher A and Teacher B’s beliefs about the need for change

Teacher A feels that there is a need for change in the way students are assessed and the focus of this change should be on preparing students with better analytical, thinking and interpretive skills, the ability to communicate mathematically and to ensure a fair measure of their mathematical abilities. However, Teacher B is a strong believer in the traditional paper-pencil tests as a “fair” way of assessing students. She mentioned in her interview that if she had to change her assessment practices, it would only be because it was a trend.

d) Concerns about change: An overview of Teacher A and Teacher B’s concerns about change as outlined in Table 4.

<b>Teacher A</b>	<b>Teacher B</b>
Extra preparation time and workload	Fairness of the assessment process, specifically marking and setting of class tests
Fear of change	Students getting help with their projects
More marking for teachers	Advantages of urban students over rural students
Some assessment techniques are difficult	Plagiarism from the internet
Reliability of students’ work	
Students lack analytical skills	
Students have no previous exposure	

Table 4: Teacher A and Teacher B’s concerns about change

Teacher A’s concerns about change were focused around the fear of change itself among teachers, an increase in workload and dealing with the students’ inexperience or under exposure to different assessment techniques, as well as the reliability of their work. She felt that these issues will be potential problems and barriers to the introduction of alternative assessment techniques. Teacher B’s concerns were related to the issue of fairness and reliability in alternative assessment techniques. She was of the opinion that alternative assessments are subjective in nature and lack reliability.

**Conclusions:**

Teacher A and Teacher B are just two examples of teachers who have strongly contrasting beliefs

about classroom assessment, having experienced a subtle change in the assessment policy in the post-secondary programme that they are involved in. It is important to understand their beliefs about assessment due to the change in assessment policy enforced by their college. This information will guide further steps that can be taken to improve the implementation of this policy by the college administration. One of the steps that can be taken is to address their needs in preparing them to adopt the new approaches to assessment. Also, teachers' apprehension about change can be identified by looking at their beliefs.

The data showed that the teachers expressed similar views about the purpose of assessment, but the interviews and observations showed they used very different techniques. Teacher A, who used a range of progressive assessment techniques, expressed strong beliefs about the need for change. Teacher B, who does not utilise innovative assessment techniques, expressed concerns about the need for change. Both teachers identified barriers to change.

Any reform of assessment of learning in mathematics education will only be successful if teachers' beliefs about this reform are taken into consideration (Handal & Herrington, 2003). If the mathematics teachers' beliefs match the principles that underpin the mathematics assessment reform, then it is more likely they will implement the change with confidence and the degree of success of implementation is likely to be promoted.

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