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Recognize Teachers' Perception of the School-Based Assessment (SBA) Effectiveness in Increasing Students' Achievement in Mathematics

ABSTRACT: In the assessment of Mathematics, the policy makers have noticed that many students were quite able to learn the necessary formula and apply them to the limited range of textbook and test situation; but when faced with novel problem, they fell short and showed that they were far from having understood the relevant concepts and conceptual relations. Therefore, an effective assessment is needed to promote students' mastery of Mathematical thinking through SBA (School-Based Assessment). SBA is a formative assessment which provide the students' progress from one level to another level. Teachers can create a diagnostic measure to detect the students' progress from time to time. This provides an opportunity for teachers to correct any mistakes and improve students' weaknesses immediately, so that these weaknesses are not accumulated. This study sought to recognize the teachers' perception of the SBA effectiveness in increasing students' achievement in Mathematics. A total of 50 Mathematics teachers from Secondary Schools in Kedah, Malaysia participated in the survey. A 19-items questionnaire was employed to measure teacher's perception on the SBA effectiveness and students' scores in Mathematics. The data were analysed quantitatively using descriptive statistics and logistic regression. The result showed that the teachers' perception on the SBA effectiveness in school had no statistically significant relationship with the students' achievement in Mathematics. This finding implied that the teachers' perception on the effectiveness of SBA practiced in school didn't affect the students' achievement in Mathematics.

KEY WORDS: Teachers' Perception; School-Based Assessment; Mathematics; Effective Assessment; Students' Achievement.

INTRODUCTION

The SBA (School-Based Assessment) was introduced by the MES (Malaysian Examinations Syndicate) through a transformation process in education system in Malaysia. This transformation process poses new and interesting questions for policy makers and teachers, who are searching for

strategies to positively influence student's achievement and who are seeking to ensure that the current educational system adequately prepares the students for the 21st century and tomorrow's challenges (Talib *et al.*, 2014).

SBA is a new transformation process, because Malaysia had been practicing exam-oriented educational system, such as monthly

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test and year-end examination for more than 50 years (Salmiah, 2013). Therefore, with this policy, it has potential in changing the pattern of teaching and learning, and enabling students to be more creative and critical thinking.

H.O. Esther Sui-Chu (2012) stated that SBA is a formative assessment, which provides the students' progress from one level to another level. Teachers can create a diagnostic measure to detect the students' progress from time to time. This provides an opportunity for teachers to correct any mistakes and improve students' weaknesses immediately, so that these weaknesses are not accumulated (Sui-Chu, 2012).

In addition, the teacher can identify weaknesses and develop the strength and potential in students (Barley, 2013). Through an effective follow-up activities, teachers can help students improve learning progress and earn outstanding achievements in the evaluation at the central level.

Under the SBA, teachers are given big responsibility to design quality assessments that align with the learning outcomes as they are the most suitable people to assess their students and they have a better understanding of the context of the subject area (Salmiah, 2013). This provides opportunities for teachers to continuously monitor their students and to give constructive feedback to improve students' learning abilities (Mansor *et al.*, 2013).

Teachers play an important role in detecting the development, abilities, progress, and attainment of students. Teachers determine the learning outcomes to be assessed, design and build instruments of evaluation, analyse assessment information, reporting, and conduct follow-up. Through SBA, it is hoped that the development of individual potential and integration in terms of intellectual, spiritual, emotional, and physical accordance with the NEP (National Education Philosophy) will be ensured (Hassan & Yew, 2013).

Statement of Problem. Teachers play an important role in ensuring the effectiveness of evaluation system in Malaysia. Since SBA (School-Based Assessment) was introduced in schools, there were a variety of reactions among teachers. According to a study by Z. Gan (2013) and Gizem Mutlu (2014), many

teachers felt that the change of education assessment had increased their workload. Besides teaching, teachers felt they need to do extra administrative works for which teachers are also given other responsibilities at school, such as handle the school projects and being the advisor for students' co-curricular activities (Gan, 2013; and Mutlu, 2014).

Teachers need to assess and teach at the same time. This is because in the SBA system, evaluation and teaching will take place at the same time throughout the year. Similarly, A.M. Tan (2010), in his study, noted that SBA had doubly increased teachers' existing workload, including time consuming in assessment preparation. This resulted in teachers implementing assessment as a product rather than as a process (Tan, 2010).

In addition, there are teachers who do not fully understand of the policies and the basic concepts of the assessment. This is because they were never asked to attend any SBA courses but were instructed by the school to implement SBA. In addition, many teachers are not teaching their specialization as an option. This situation had indirectly led to the questionable competency of teachers to become the advisors and facilitators for the assessment in the classroom.

Another academic finding from Matt Larson (2002), some of the curriculums are not covered in SBA, misleading the teachers assuming that those parts of curriculum are not important and not necessarily be taught in class (Larson, 2002). Another worrying trend is that some of the teachers were teaching based on the examples of performance standard provided by the Ministry of Education, which defeated the purpose of SBA (Choi, 1999). SBA requires the teachers to not only act as an educator, but also as the examiner. Therefore, many teachers felt unprepared to play the double role.

Another problem with SBA identified concerns the large classes (Raman & Yamat, 2014). Generally, Malaysian public schools are packed with students; whereby each classroom needs to accommodate about thirty to forty students or more. The atmosphere in the crowded classes' environment made SBA implementation difficult. Large numbers of

students posed significant teaching challenges, and so does the assessment of students. The most troubling reason is that large classes can limit the feedback amount given by the students. Consequently, it will affect the students' achievement in their study and assessment.

In the SBA of academic aspect, the students' results are assessed and graded into 6 bands in SBA. However, the levels of the bands are not consistent with the standard of the curriculum, making it difficult for the teachers to set the assessment. Moderation of the marks awarded by teachers for SBA is often cited as a means of addressing issues of equity and fairness by making adjustments, where necessary, to bring marks or grades back in line with the standards of the public examination board.

According to T.Y. Hwa & C.S. Lim (2008), the usage of bands (band 1-6) instead of the exam grade (A-F) is actually creating a very large difference in the assessment. This is because the evaluations of students are not using the examination standard benchmark. For instance, the students from weaker classes able to get band 5, although their assessment methods were different from the smart students who got band 5 (Hwa & Lim, 2008).

In the assessment of Mathematics, the policy makers have noticed that many students were quite able to learn the necessary formula and apply them to the limited range of textbook and test situation, but when faced with novel problem, they fell short and showed that they were far from having understood the relevant concepts and conceptual relations (Lane, 1993; and Lange, 1999).

Therefore, an effective assessment is needed to promote students' mastery of Mathematical thinking through SBA. Without appropriate assessment and grading system in assessing students, we cannot know how effective and efficient such assessment for students. All these are real issues currently present in Malaysian schools, as teachers play an important role in assessing their students. This study sought to recognize the teachers' perception of the SBA effectiveness in increasing students' achievement in Mathematics.

LITERATURE REVIEW

School-Based Assessment. Malaysia's education system used to be labelled as too exam-oriented and focused mostly on academic excellence. Consequently, the Ministry of Education (MoE) Malaysia had shifted existing education system into the SBA (School-Based Assessment) system and executed a variety of innovations in curriculum, so that our education system is in line with the rapid changes that occur within the community locally or globally (Majid, 2011).

SBA is in line with the government's inspiration to make Malaysia become more competitive in the world (MoE Malaysia, 2012). In this context, educators and policy makers in Malaysia viewed SBA as one of the driving force that will be able to solve the problems in traditional education system (Chan & Gurnam, 2011).

As we are aware, SBA is actually not a new assessment method in Malaysia, as it had been indirectly practiced by teachers in the classroom, since the late nineties and early 2000 (Chan & Gurnam, 2011). Individual learning assessment has improved, from the restraint of time-limited writing examinations to a more extensive involvement, and engagement of teachers and students in the assessment process itself (Gipps, 1999).

Having realized that, Tan Sri Musa Mohamed, the former Malaysian Minister of Education, on 7 May 2003, as cited in Y.F. Chan & K.S. Gurnam (2011), said that Malaysia needs a new philosophy and approach in the examination system to make the education system less exam-oriented (Chan & Gurnam, 2011). Again, as cited by Y.F. Chan & K.S. Gurnam (2011), Tan Sri Musa Mohamed also believed that SBA is a better assessment system in increasing students' abilities and capabilities. With that, SBA was officially materialized into the Malaysian education system beginning 1 January 2011, after a meticulous planning and long deliberation since 2005 (Chan & Gurnam, 2011).

The study on "School-Based Assessment in Malaysian Schools: The Concerns of the English Teachers" was done by Faizah A. Majid in 2011, where she had identified a

number of teachers' concerns regarding to the concerns that was raised by G.E. Hall, A.A. George & W.L. Rutherford (1977). A total of 40 English teachers from Malaysian public schools participated in the study. The questionnaire's items elicited the information about the concerns of the respondents regarding the usage or implementation of any educational innovation which related to the SBA (Majid, 2011).

The results showed that the respondents were very concerned with the SBA innovation process. The teachers' concerns on the SBA were also acknowledged by the professional development trainers, not only the English teachers. Thus, decisions can be made during the planning of for-service teacher training on SBA. Some implications for the in-service training were provided to ensure that SBA ran smoothly (Hall, George & Rutherford, 1977; and Majid, 2011).

SBA in Malaysia was performed to evaluate each student holistically and overall will reckon their overall well-being, including the aspects of intellectual, emotional, spiritual, and physical; and these aspects will be impossible to assess through the written examination only (MoE Malaysia, 2014; and Md Ali, Veloo & Krishnasamy, 2015). Our current education system is good enough, but Malaysia needs to keep abreast with the current assessment trend, so that we will not be left behind.

Y.F. Chan, K.S. Gurnam & Md Rizal Md Yunus (2006) focused on how the newly introduced assessment approach had benefited the teaching and learning process in evaluating the Year 1 academic progress in three urban Chinese Primary Schools. In their qualitative case study, data was collected from interviews involving three Year 1 Chinese language teachers. They found out that teachers have a very positive attitude towards SBA and overall, both teachers and students, have benefited from SBA (Chan, Gurnam & Yunus, 2006).

However, there were also weaknesses that need to be acknowledged and improvements need to be made. The findings implicate that for SBA to be successful, teachers need to be creative, using varying strategies in their teaching, and exploiting repertoire of methods in assessing their students.

Based on T.Y. Hwa & C.S. Lim (2008), in their study, practicing SBA is not an easy task. The schools may differ in the way they grade their students, as it is impractical to completely eliminate teacher biases when multiple individuals are involved (Hwa & Lim, 2008). The variation of evaluation standards between teachers themselves may also be questioned in the future (Levinsson, Hallstrom & Claesson, 2013). It is hard for them to break off with the previous assessment grading.

Most of the teachers thought that the students can be assessed via examination only. As stated in HR (Hanover Research), in 2011, the previous mark-based grading assessment has encouraged students to score higher and higher in order to improve their achievement in a subject.¹

Furthermore, P.J. Black & D. Wiliam (1998), as also cited in D. Marva (2008), pointed out that the formative assessment in SBA does improve learning. However, among the key findings are that this kind of assessment is not well understood by teachers (Black & Wiliam, 1998; and Marva, 2008). In addition, they state that SBA is not effective in practice and that its implementation calls for deep changes, both in teacher perceptions of their role in relation to their students and classroom practices. They further stated that many other recent studies on the practice of assessment clearly demonstrate that there can be no effective change at the level of the classroom without schools and teachers being provided with the necessary training and resources (Black & Wiliam, 1998; and Marva, 2008).

The effectiveness of the implementation is closely binded to the students' achievement. According to H.H. Ronald (2009), the effectiveness of the transformation process itself is a central effort to improve student achievement. A teacher can be seen as an individual resource that varies across classrooms within schools (Ronald, 2009).

Therefore, a teacher's perception on SBA is essential and binded to students' learning as well as their achievement. The researchers

¹See, for example, an article entitled "Effective Grading Practices in the Middle School and High School Environments" in *HR: Hanover Research*, February 2011, pp.1-37. Available online also at: <https://njectl-media.s3.amazonaws.com> [accessed in Kuala Lumpur, Malaysia: April 7, 2015].

found out that the effectiveness of successive organization was related to students' achievement in Reading and Mathematics, and was positively associated with their achievement levels (Ronald, 2009; and Marzano & Michael, 2011).

Similarly, T.A. Myers *et al.* (2013) believed that the change is a highly personal experience (Myers *et al.*, 2013). As teachers that are engaged in change, many feelings and perceptions are expressed, and many more are only whispered or left unspoken (Hall & Hord, 2011). No matter how promising and wonderful the transformation process is, no matter how strong the support is, teachers will still have moments of self-doubt about whether they can be successful with these new ways, and whether they even want to change.

Changes are brought about by people; therefore, their feelings, concerns, perceptions, and frustrations, all play a critical role in determining the success or failure of the transformation process (Marva, 2008). Thus, teacher's perception plays an important role in determining the effectiveness of the SBA practiced in school.

By reviewing such literature, the present study sought to understand the teacher's perception on the SBA practices. Finally, it is accepted that the perceptions of the respondents' experiences are of utmost importance, as the researcher seeks to understand and describe the respondents' experiences, and how these experiences are seen by the respondents themselves.

METHODS

A total of 50 Mathematics teachers from Secondary Schools in Kedah, Malaysia participated in the survey. A 19-items questionnaire was employed to measure teacher's perception on the SBA (School-Based Assessment) effectiveness and students' scores in Mathematics. The data were analysed quantitatively using descriptive statistics and logistic regression (Glewwe & Levin, 2000; and Peng, Lee & Ingersoll, 2002).

This study used purposive sampling in order to include most of the variables of interest (gender, race, age, years of teaching, marital status, highest qualification, area of

specialization, and school location). According to E. Babbie (2001), a purposive sample, commonly called a judgmental sample, is one that is selected based on the knowledge of a population and the purpose of the study (Babbie, 2001). The subjects are selected, because of some characteristics. Since this study was a purposive study, 10 schools had been selected to participate in this study.

Data Analysis. The descriptive statistics, logistic regression analysis, and Pearson correlation were used to answer all respective research questions in this quantitative study (Peng, Lee & Ingersoll, 2002). Firstly, descriptive statistics were used to analyse the percentage and frequency of the respondents' demographic data. Then, the researchers utilized a logistic regression analysis to explore the teachers' perception on the SBA (School-Based Assessment) effectiveness in school and to determine whether it was related to students' achievements in Mathematics.

The dependent variable in this study was a binary outcome: "yes" or "no", for the teachers' perception on the SBA effectiveness in school. The teachers' perception on the SBA effectiveness in school was coded "0" for the response "SBA is not effective".

FINDINGS

Demographic Variables. The background information of the respondents was analysed and presented. Descriptive statistics were used to analyse the data as well to provide the percentage and frequency of the respondents for the demographic data (Glewwe & Levin, 2000). The purpose is to provide a better understanding and an overview of the respondents in this research. The total number of respondents who participated in this study was 50, all of them taught Mathematics to Lower Secondary Schools in Kedah, Malaysia.

Firstly, the results showed that 66% (n = 33) of the teachers in the sample were female, whereas 34% (n = 17) of the teachers were male. The ages of these respondents fell in the ranges of 25 years to 58 years. The raw data then was divided into several groups with a class size of 10 and put together into a table. From the table 1, 38% or 19 of the respondents were in the age group of 30 – 39 years old

Table 1:
 Breakdown of Teachers' Demographic Details

Demographics		N	%
Gender	Male	17	34
	Female	33	66
Race	Malay	43	86
	Chinese	6	12
	Indian	1	2
Age	20 – 29	5	10
	30 – 39	19	38
	40 – 49	15	30
	50 – 59	11	22
Year of Teaching	1 – 10	18	36
	11 – 20	21	42
	21 – 30	6	12
	31 – 40	5	10
Marital Status	Single	7	14
	Married	43	86
Highest Qualification	Certificate	1	2
	Diploma	1	2
	Bachelor's Degree	45	90
	Master's Degree	3	6
Area of Specialization	Mathematics	45	90
	Others	5	10

Table 2:
 Logistic Regression Analysis on Students' Achievement in Mathematics

		B	S.E.	Wald	Df	Sig.	Exp(B)
Step 1 ^a	Average_ach	.050	.038	1.729	1	.048	1.051
	Constant	-2.392	2.533	.892	1	.034	.091

making them the majority. The respondents' teaching experience was categorized into four groups. The respondents' years of teaching range is between 1 year and 35 years.

Moreover, 86% of the teachers were Malay, whereas 12% were Chinese and 2% were Indian. The finding also revealed that 14% of the teachers in the sample were single and 86% were married. The highest academic qualification of the respondents was divided into 4 categories: Certificate (MCE = Malaysian Certificate of Education), Diploma, Bachelor's Degree, and Master's Degree. In this study, 90% of the teachers in the sample were highly qualified Bachelor's Degree holder and mostly specialized in Mathematics. Further demographic details are given in table 1.

Table 2 shows the result of logistic regression analysis on students' achievement in Mathematics. The probability of the Wald statistic for this variable was 0.048,

less or equal to the significance level of 0.05. The odds ratio of the teachers who agreed that SBA (School-Based Assessment) was effective in increasing students' achievement in Mathematics was observed to have a probability of 1.051.

In other words, the teachers who responded "SBA is effective" in increasing students' achievement in Mathematics were 1.051 times higher than the teachers who responded with "SBA is not effective" in increasing students' achievement in Mathematics. It was merely about 5% improvement in students' achievement in Mathematics via SBA practice in school.

The Relationship between Teachers' Perception and Students' Achievement in Mathematics. In terms of the relationship between teachers' perception on the SBA (School-Based Assessment) practiced in school and students' achievement in Mathematics, a correlation

test was conducted. The result showed that the teachers' perception on the SBA effectiveness in school had no statistically significant relationship with the students' achievement in Mathematics.

This finding implied that the teachers' perception on the effectiveness of SBA practiced in school didn't affect the students' achievement in Mathematics. This result did not concur with the result of the study conducted by Ewnetu Hailu & Firdisa Jabesa (2010) that reported teachers' belief and perception often had positive influence on the students' academic achievement. They further elaborated that a better understanding of the teachers' belief or conceptual base will significantly contribute to enhancing educational effectiveness as well as increasing students' achievement (Hailu & Jabesa, 2010). It emphasized the teachers' thinking process as the base on how teachers act in practical situation.

CONCLUSION

As conclusion, SBA (School-Based Assessment) is the form of future education that has been inviting criticism upon another criticism. This paradigm shift is happening in line with orders from Saiyyidina Umar al-Khatib, who pointed out that the form of children's education was required based on the needs of the future. The practices of SBA in Malaysia allowed the educational system and assessment to always moving forward, while all the wisdom and previous experiences still can be used in the current environment.

The challenges of the SBA practice indeed will always come from time to time. Deficiencies and errors that still persist should not be the reason for the implementation of the SBA to become ineffective again. Students, teachers, and the community have the right to give the best for the future of the nation and country.

Given this set of circumstances, it is clear that more researches still needed to be done on the SBA effectiveness practice in school. Seeking out and compensating teachers' perception based on the SBA practice in Mathematics are likely to yield significant improvement in the students' achievement in Mathematics, though currently this is common

practice.

These recommendations do not affect the findings of this present study, but they can serve as a starting point for future researches by providing factors that others should consider before conducting similar study.²

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²**Statement:** Herewith, we have declared that this paper is our original work; so, it is not product of plagiarism and not yet be reviewed as well as be published by other scholarly journals.

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