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A CRITICAL REVIEW OF THE SCHOOL-BASED ASSESSMENT IN BRUNEI DARUSSALAM

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ABSTRACT

School-Based Assessment for Learning (SBAfL) was developed by the Ministry of Education in Brunei Darussalam to assess how well the students have achieved the objectives and learning outcomes as mentioned in the mathematics syllabus. Under the SBAfL, the Brunei Common Assessment Tasks (BCATs) was introduced where teachers develop and adapt standard-based criteria and rubrics to help students assess their developing knowledge and skills. In this study, random samples of the fourth assigned BCAT (BCAT 4) for Year 7 were collected as research artefacts. A semi-structured interview was conducted with Ms. Ella, who assessed the Year 7 students. Learning outcomes and marks awarded in BCAT 4 are discussed in this paper. The Year 7 students were expected to carry out the task based on the learning outcomes, which are categorised into three dimensions: Knowledge and Understanding (K&U), Thinking skills, Problem Solving and Investigation (PSI), and Communication Skills (CS). It was found that these learning outcomes were confusing. The learning outcomes and the dimensions indicated should be clear and consistent. The marks awarded in the assessment task were not fair and contradict the aims of designing a quality assessment task. A proper marking scheme should be discussed and designed by teachers in order to give a fair and systematic approach in the process of working out the solution for the assessment tasks. Teachers must not depend on BCATs only as a source of feedback for students. Continuous formative assessment should be administered to ensure the students' mastery of knowledge.

Keywords: School-based assessment, Learning outcomes, Secondary, Mathematics, Brunei darussalam.

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Contribution/ Originality

This study is one of very few studies, which have investigated the school-based assessment for learning outcomes, in the learning of mathematics in Brunei Darussalam. The paper's primary contribution is finding whether the standard and quality of the assessment tasks have met the newly reformed national education system requirements.

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1. INTRODUCTION

The general education structure in Brunei Darussalam recently underwent a major transformation known as the National Education System for the 21st Century or *Sistem Pendidikan Negara Abad ke-21* in the Malay Language, and it is also better known as the SPN21 (Ministry of Education, 2013). The interim stage of the SPN21 implementation started in 2008 initially with the Year 7 level. However, the official full implementation of SPN21 started for Years 1 and 4 in 2009, and for Year 7 in 2012.

In the interim stage of SPN21, School-Based Assessment (SBA) was implemented. SBA is an assessment administered in schools in Brunei as part of the learning and teaching process where the subject teachers assessed their own students. The main rationale of SBA is to enhance the validity of public assessment of the Year 8, and extend it to include a variety of outcomes that cannot be assessed easily through the public examinations (Hong Kong Examinations and Assessment Authority, 2013). Under the new SPN21 curriculum, Assessment for learning (AfL) is integrated and evaluated in the form of formative assessment. Some of the key characteristics of AfL as a formative assessment are: it involves sharing learning outcomes with learners, provides feedback that leads learners to recognise their next steps to achieve the learning outcomes, and involves both teacher and learners in reviewing and reflecting assessment data (Curriculum Development Department, 2010; Rashid and Jaidin, 2014).

Subsequently in 2010, the School-Based Assessment and the Assessment for Learning were fused to become School-Based Assessment for Learning (SBAfL). The SBAfL was developed by the Ministry of Education in Brunei Darussalam to assess how well students had achieved the objectives and learning outcomes mentioned in the syllabus. An important feature of SBAfL is stated below by Rashid and Jaidin (2014).

> …assessment is integrated with teaching and learning, providing opportunities for students to evaluate their own learning and identify ways in which they could improve by obtaining feedback from teachers and peers. It is a form of formative assessment that focuses on individual student's development and performance through constructive feedback. (Rashid and Jaidin, 2014).

Under the SBAfL, the Brunei Common Assessment Tasks (BCATs) was introduced. In BCATs, teachers develop and adapt standard-based criteria and rubrics to help students assess their developing knowledge and skills. Learners are engaged in self and peer assessment and incorporate critical but constructive feedback during the assessment cycle (Curriculum Development Department, 2010). According to Buhagiar and Murphy (2008), feedback in assessment informs the students how they performed in a test and not how they are doing as learners. Meanwhile, the summative assessment part of BCATs was intended specifically for the purpose of assigning a grade where 30% of the grades will contribute to the Student Progress Assessment (SPA).

1.1. Brunei Education Research Related to SPN21 and SBAfL

Implementation of both the inclusive education policy and SPN21 curriculum in Brunei require teachers to be sensitive to the learning and assessment needs of all categories of students – disabled, nondisabled, and gifted, particularly those with high support needs (Mundia, 2009; Mundia, 2010a). Recent research suggests that Brunei trainee teachers were only favorable to the inclusion of learners with mild to moderate disabilities in regular schools and tend to have negative attitudes to those with severe or profound specific disabilities and high support needs (Bradshaw and Mundia, 2005; Bradshaw and Mundia, 2006; Haq and Mundia, 2012). In addition, research has also found out that students with Special Educational Needs (SEN) and High Support Needs (HSN) who are included in regular schools do not perform well or achieve high in these settings (Wong, 2005). Altogether these findings and later research further suggest that inclusivity and SPN21 could be improved or served better by reforming the teacher education system in the country (Mundia, 2012; Tait and Mundia, 2012). Moreover, there is also evidence from research that indicates that the teacher education programs need to facilitate and foster the development of high self-efficacy in special education among trainee teachers (Tait and Mundia, 2014). It seems that inclusivity, SPN21, and the reformed teacher education may not succeed sufficiently unless they are accompanied with and supported by the assessment reforms. This is largely because teaching tends to emphasize mainly those knowledge contents and skills that are covered by or included in the school assessments and examinations (Mundia, 2010a).

There are several other factors (most of psychological) that need to be considered when assessing students particularly those with SEN and HNS. One of them is the proper use of verbal and written questioning strategies which recent research on Brunei education system suggested should be improved (Shahrill, 2009; Shahrill, 2013; Salam and Shahrill, 2014; Shahrill and Clarke, 2014; Shahrill and Mundia, 2014a). Another important assessment factor to be considered carefully is addressing barriers to achievement in specific challenging subjects such as mathematics since failure to do this merely perpetuates the poor performance in the Brunei context (Hamid *et al.*, 2013).

An analysis of the students' internalizing and externalizing behaviors would also be relevant when assessing all categories of students. Research has shown that students in the Brunei education system use mostly extrinsic sources of motivation as well as external attributions for describing their successes and failure at school (Matzin *et al.*, 2013). For difficult subjects such as mathematics, struggling students (both active-failing and passive-failing) need to be taught the skills of persistence or resilience when faced with adversity and failure (Mundia, 2010b). Students also need to be taught skills regarding the use of appropriate learning styles and study strategies (Shahrill *et al.*, 2013), effective modes of coping with stress resulting from being assessed (Shahrill and Mundia, 2014b), and perhaps, introduce an alternative assessment strategy different from the norms (Nor and Shahrill, 2014).

1.2. Objectives of the Study

In the present study, the SPN21 assessment strategies were qualitatively reviewed to determine how well the students have achieved the objectives and learning outcomes as mentioned in the mathematics syllabus under the SBAfL.

2. METHODOLOGY

The main reason for choosing the BCATs in this study was to investigate whether the standard and quality of the assessment tasks have met the SPN21 requirements in helping students' learning, provide valid and reliable data, have credibility with all stakeholders and be accessible and transparent especially to students (Curriculum Development Department, 2010).

2.1. Design

This study adopted a qualitative field case study approach. The rationale and justification for using the case study strategy was to obtain rich or in-depth interview data. The main disadvantage of using this procedure in the present study was that the results could not be generalized to other students and teachers.

2.2. Participants

Three students and three teachers were involved in the study. They were all selected randomly. Because of the small number of participants, their personal demographic information such as age, gender, school and district cannot be revealed and discussed for ethical reasons to prevent them from being identified.

2.3. Data Collection

Random work samples of three students on the fourth assigned mathematics BCAT, known as BCAT 4, for the Year 7 that was administered in the year 2013 were collected as the research artefacts or documents. It was necessary to collect the previous BCATs as sample since the subsequent BCATs have not been administered yet this year in 2014 (at the time of study). There were three teachers in the participating school who were involved with the mathematics BCAT 4 in 2013 and among them; one teacher (known as Ms. Ella, pseudonym only) was willing to be interviewed. She was only willing to contribute 20 minutes of her time for the interview. In addition, due to time constraints, only one question from the BCAT 4, assessed in 2013, was the main focus of the present study.

2.4. Data Analysis

Both the interview data and students' work sample documents were content analyzed. The students' work samples on the assessment items were also error-analyzed. All the analyses were approached qualitatively.

2.5. Procedure

In this study, the learning outcomes and the marks awarded in BCAT 4 were discussed anonymously at a group level. Only the teacher who voluntarily consented to be interviewed provided the interview data.

3. LEARNING OUTCOMES

According to Ebert and Culyer (2011), teachers who use formative assessment can monitor the progress of their students and adjust the instructions accordingly. Ongoing assessment can provide the teacher with valuable feedback about the group and individual understanding of the lesson being taught. Since BCATs are considered as both formative and summative assessment, the formative part is used to provide feedback for the students regarding their performance. The performance of students in the BCATs is based on the learning outcomes and will be reported to their parents at the end of each term (Curriculum Development Department, 2011). Figure 1 below is an extract taken from BCAT 4 that shows the students' expected learning outcomes.

Students Learning Outcomes

	The students should be able to:
Knowledge and Understanding	• Carry out conversion between currencies. • Solve problems involving rate. • Collect data, tabulate data and present data.
Thinking skills, problem solving and investigation	• Apply mathematical strategies in solving problems on everyday mathematics.
Communication skills	• Present information in a graphical form and communicate findings in writing. • Justify and explain decisions and results.

Figure-1. Students learning outcomes

Students are expected to carry out the task based on the learning outcomes that are categorised into the three dimensions: Knowledge and Understanding (K&U), Thinking skills, Problem Solving and Investigation (PSI), and Communication Skills (CS). The K&U means students are expected to write down the necessary facts, calculations and answers. While, the PSI means the students are expected to write down all steps and calculations in a logical manner in solving the problem. And the CS means students are expected to write down statements of their thinking process, calculation steps, strategies and reasoning in solving the problem (Curriculum Development Department, 2011). In the BCAT 4, the three dimensions were indicated at the end of each part of a question.

Focusing on Question 2 from BCAT 4 that focused on the Mathematics topic of the Foreign Exchange, the students were expected to accomplish the learning outcome in carrying out conversion of currencies. Question 2(a) was labeled under the dimension K&U. The question asked students to calculate how much was the conversion in Ringgit Malaysia after changing the money from Brunei Dollars and US Dollars. Based on the interview with Ms. Ella, the teacher said that this question actually assessed the dimension on PSI and not K&U. The procedure was not straightforward and did not measure their understanding skills. This question also assessed students learning outcomes on the ability of applying mathematical strategies in solving problems on everyday mathematics.

Meanwhile, Question 2(b) measures the dimension on PSI. Students were to decide whether it was better to change back to Brunei Dollars or not, by comparing the new exchange rate and the previous exchange rate. From the interview with Ms. Ella, the first author asked whether PSI was appropriate for this question and she at first said that this part assessed students' application skills. Ms. Ella then changed her mind and said that PSI was appropriate for the question. The reason given was that PSI should come after K&U. In summary, part (a) assessed K&U hence part (b) assessed PSI.

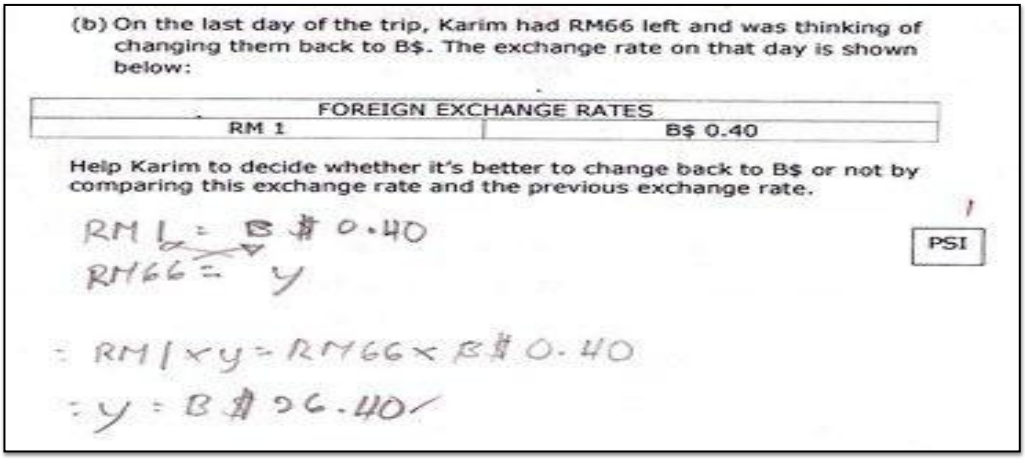
From the interview, it seemed that Ms. Ella was confused with the learning outcomes of the assessment tasks. In order for teachers to give constructive feedback for the students and their parents, the learning outcomes and the dimensions indicated should be clear and consistent. The K&U, PSI and CS are insufficient to put as the learning outcomes dimensions in BCATs. Choosing suitable verbs for every learning outcomes are also necessary. According to Carroll (2001), all learning outcomes must have a verb to describe the students' behaviour that demonstrates the students' learning and information about the context for the demonstration. The teachers and the people responsible with BCATs should discuss to improve the learning outcomes of any future BCATs. The learning outcomes in the assessment should also be aligned with the intended learning outcomes from the curriculum. According to Daugherty and colleagues, the alignment of assessment with the content standards that are intended to measure is critical if the assessment is to strengthen rather than undermine the standards (Daugherty *et al.*, 2011).

4. INVESTIGATION INTO THE MARKS BEING AWARDED

According to Ezinwanyi (2014), marking guides are important in the process of arriving at an answer by allocating marks to the steps taken to arrive at the final answer. Sufficient marks should be awarded to methods and steps at solving problems. There are three categories of marks awarded while marking, Method Marks (M), Bonus Marks (B) and Accuracy dependent on method (A). The M marks are given for the use of a correct method that leads to correct or sometimes incorrect answers. The B marks combines both M and A marks together. If the problem can be solved mentally or by using calculators, B mark is awarded. The A marks are

earned when the answer is correct depending on the M marks. If the essential steps are correct but the answer is incorrect, only M marks are awarded and A mark is zero.

Figure 2 shows how a student attempted Question 2(a) in BCAT 4. The student managed to convert B$ 210 and US$ 50 to RM but did not add them together. Here, the method is correct and should be given 1 mark. According to Ms. Ella, the reason the student got a zero is because the question only assessed the right or wrong answer. Even though the steps were correct, the student did not answer the question. Hence it was considered incorrect and marks were not awarded.


(b) On the last day of the trip, Karim had RM66 left and was thinking of changing them back to B$. The exchange rate on that day is shown below:

FOREIGN EXCHANGE RATES	
RM 1	B$ 0.40

Help Karim to decide whether it's better to change back to B$ or not by comparing this exchange rate and the previous exchange rate.

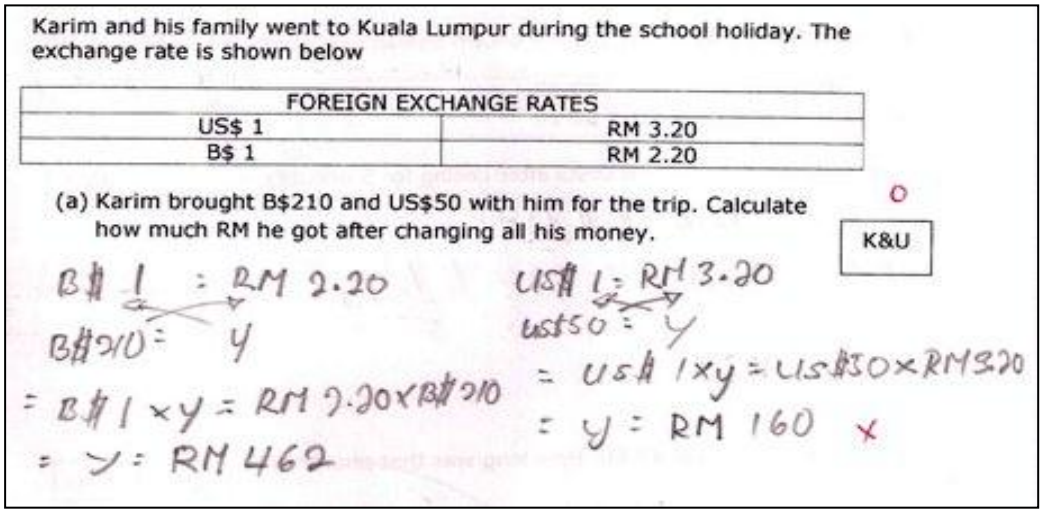
1

PSI

RM 1 = B$ 0.40
RM66 = y

: RM 1 × y = RM66 × B$ 0.40
: y = B$ 26.40

Figure-2. A student's attempt to Question 2(a) from BCAT 4


Karim and his family went to Kuala Lumpur during the school holiday. The exchange rate is shown below

FOREIGN EXCHANGE RATES	
US$ 1	RM 3.20
B$ 1	RM 2.20

(a) Karim brought B$210 and US$50 with him for the trip. Calculate how much RM he got after changing all his money.

0

K&U

B$ 1 : RM 2.20
B$210 = y
: B$ 1 × y = RM 2.20 × B$ 210
: y = RM 462

US$ 1 : RM 3.20
US$50 = y
: US$ 1 × y = US$50 × RM3.20
: y = RM 160 ×

Figure-3. A student's attempt to Question 2(b) from BCAT 4

Figure 3 shows the student's attempt to Question 2(b). Here, one mark was awarded for the converting to B$ using the new exchange rate. Based on the marking scheme, this question

carries 3 marks, with the breakdown of one mark for conversion using previous exchange rate, one mark using the new exchange rate and one mark for the decision made.

It is obvious that the marks allocated are not sufficiently fair in each of Question 2(a) and Question 2(b), and thus contradicts the aims in designing quality assessment tasks. In the available guidebook for SBAfL (Curriculum Development Department, 2010), the key to quality assessment is to make sure that the assessment tasks are fair and useful in developing students' thinking and practical skills, as well as knowledge and understanding. A proper marking scheme should be discussed and designed by teachers in order to give a fair and systematic approach in the process of working out the solution for the assessment tasks.

5. CONCLUSION

The BCATs are designed by teachers and are standardised only within the assigned cluster of secondary schools in Brunei. Different secondary school clusters will have different assessment tasks given to the students. Even so, the designing of assessment tasks or questions should be monitored in terms of its quality and validity. Other criteria should also be considered for quality and valid assessment tasks. The assessment task designers should design low relatedness assessment tasks to which there are no tasks that are related to the tasks done before in the textbook or tasks that have been dealt with in the classroom (Boesen *et al*., 2010). This will help teachers in determining students' conceptual understanding of the content and methods.

The government of Brunei, especially the Ministry of Education has been making sure that the SPN21 curriculum is constantly monitored and improved over time. However, there is still a lack of research in the outcomes from BCATs implementations. Little is still known on the quality and standards of the mathematics BCATs questions and the effective outcomes. In fact, (Yatab and Shahrill, 2014) investigated the effectiveness of Science BCATs in the lower secondary school level in Brunei, and their findings revealed differing views from the perspectives of the students and teachers involved in the study. During an informal discussion with one of the school inspectorates, during the first three years BCATs were introduced by the Curriculum Development Department at the Ministry of Education, only the students' achievement were reported. Since BCATs were originally standardised and produced by the Curriculum Development Department, not much is known publicly on how the questions were derived and the quality assured when the assigned schools within each cluster took over the responsibility in producing the BCATs. With this critical review of the mathematics BCATs, it has the potential to be expanded for further research studies especially with the quality and standards of the questions or tasks that will be administered to the students.

The relevant authorities at the ministry should constantly monitor the quality of the BCATs to ensure that students will progress according to the requirements of SPN21. The formative side of BCATs is important for students and their parents in giving positive feedback based on the outcomes of the assessment tasks. To provide formative assessment and timely feedback requires that assessment and grading be criterion-based and that each student's performance is interpreted

relative to established instructional goals and standards independent of other students' performances (Lalley and Gentile, 2009). In addition, Rashid and Jaidin (2014) suggested that teachers need to implement formative assessment consistently as part of their teaching and learning processes instead of applying it sparingly because the purpose of assessment for learning is to guide the students in their learning process and help them to identify the gaps in learning. Teachers must not depend on the BCATs only as a source of feedback for students. Continuous formative assessment should be administered to ensure student mastery of knowledge. The feedback should be based on the formative assessment during instruction rather than a summative grade or test score at the end of a course. At the same time, students should compare and contrast both correct and incorrect concepts and follow correction procedures to understand subject components more thoroughly and maximise their learning (Pham, 2011).

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