

Activities of Student Centralization, Questionnaire, Modelling and KBAT among Science and Non-Science Students

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To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v9-i7/6787> DOI:10.6007/IJARBSS/v9-i7/6787

Published Date: 01 July 2019

Abstract

The purpose of this study was to identify whether or not there was a significant difference in the variables of student centralization, teacher questioning, teacher modelling and high-level thinking skills of students based on class stream for low-performing school students in Kudat, Sabah, Malaysia. This quantitative study used a survey method involving 250 respondents from the stated population. This study referred to the Absorption Learning Model (Swartz, Fischer and Parks, 1998) as the basis model for the study. The data were analyzed using the T-test with Statistical Packages for Social Science (SPSS) version 22. Based on the class stream in Kudat district, the findings showed that there was a significant difference in the involvement of student centralization between Science and non-Science students; there was no significant difference in teachers' questioning between Science and non-Science students; there was no significant difference in teacher modelling between Science and non-Science students; there was a significant difference in thinking skills level between Science and non-Science students. It is hoped that this study can provide useful inputs for improving the practice of teaching infusion of teachers to students from every class stream in Kudat region in particular and throughout Malaysia in general.

Keywords: High Level Thinking Skills, Islamic Education, Low-Performing Schools.

Introduction

The Islamic Education Philosophy (FPI) was founded with the primary goal of forming primary and secondary schools' Muslim students through the learning environment at school. As a student's preparation to a more realistic world, FPI emphasises the importance of soft skills so that students can become skilled or semi-skilled contributors, which are in line with the

claims of the Quran and Sunnah (Abd Rahim, 2001). The current globalization demands individuals to equip themselves with emotional capabilities as well as thinking skills that include self-management, problem solving and creativity (Rajendran, 2013). The education system in Malaysia has always become the focus of the government and non-government associations, contributing to its continuous improvement. Recognizing the importance of thinking skills, the Ministry of Education (in the 1990s) began to absorb thinking learning across the curriculum through the compilation approach formula with the Primary / Secondary School Integrated Curriculum (KBSR / M), which implements Creative and Critical Thinking Skills (KBKK). Given the current modernization cycle, the Secondary School Standard Curriculum (KSSM) was introduced as KBSM emphasising the High Level Thinking Skills (KBAT) and introduced continuous student assessments in the classroom. The integrity and ingenuity of the teacher as a murabbi is the key element in assessing student progression, thus reducing the exam-oriented sentiment (Curriculum Development Section, 2016).

The combination of expertise to design the teaching method in the compilation curriculum for each subject is actively done since the introduction of the KBSR / M initiation. The curricula and teaching specialists from inside and outside of the country have gradually rolled out teachers on the best approaches, strategies, methods and techniques (Rajendran, 2013). In practice, teachers often face the challenge of diversifying the best approaches in designing lessons that can meet the needs of current educational aspirations and touch on the aspects of student's cognitive, affective and psychomotor needs (Audrey, 2010). Therefore, Mel (2010) suggests activities that promote cooperation, leadership and speech to be implemented in classroom teaching. While the student centering strategy is better to encourage thinking skills, conventional teaching strategies are more frequently used by teachers (Rajendran, 2013; Kamarul, & Halim, 2007) as they are better in terms of time and class control. The method is still basically relevant and is very necessary in teaching most of the Islamic Education syllabus. The only debate is the extent to which teachers make the teaching in a way that is meaningful and effective especially with the practice of deep discussion including deep learning (Marton & Saljo, 2005).

In depth lectures and explanations on teachers demand reinforcement activities as an interesting step of focus and to test the understanding of students on what have been taught. In order to achieve these goals, questionnaires and simple activities should be carried out so that the classroom atmosphere is in the form of two-way and affects the students by referring to the correct rules (Ab. Halim et al., 2004). Two-way communication in learning opens up opportunities for students to express their opinions and argue contextually (Fisher, 2009) whether formal or informal as well as giving a philosophical exposition (Rosnani, 2012). Brookfield (2005) further emphasized the importance of 'neglected pedagogy' - teacher modelling - in the teaching of curriculum infusion and thinking skills to ensure that the conventional strategies remain relevant for a more challenging new century than ever before. Through the perspective of educational practice, basic elements such as simple activities, questioning and modelling are properly implemented to enable a learning to be active or at least partially active. It is an early step for a large number of student groups with high dependency on teachers before continuing with full active learning such as presentation, debate, planning and organizing events. The effectiveness of transformational empowerment is able to gradually shape the students to be more constructive.

Generally, for upper secondary students, every public school in Malaysia offers class trends aimed at students' appropriateness and skills by making their interests, talents and academic decisions from the lower secondary level as a basic consideration. The streams offered are

divided into two; science flow and non-science flow. Being preoccupied with the school places students with the best results in the lower secondary level assessment as a priority to be enrolled in the science stream classes unless there is a demand from the students as a factor of interest, talent and tendency in the flow other than science such as painting, accounting and business. To help teachers in evaluation, findings from psychometric tests have been also used to enable students to be in the right place to assist them in pursuing future goals and qualifications (Curriculum Development Section, 2016). Using the same judgment, students who receive good, moderate and poor results are given the opportunity to explore more appropriate humanitarian sciences such as accounting, business, craftsmanship, cuisine and so on. Teachers are particularly committed in providing the best education for the students to make them useful to the family, thus serving the religion as a da'i at least in small groups.

Statement of Problem

Nur Arfah (2016) found that Malaysian students showed a passive attitude in discussing matters related to Islam. They took the easy way to answer "do not know" for any Islamic-related discussions and other related aspects. This scenario illustrates the cultures of voicing their unambiguous views at an unpredictable level while at the adolescent age, students have been provided with basic knowledge of belief and rationality in every religious practice. The reassessment on the implementation of Islamic Education learning at schools is certainly the main focus subject to resolve this issue so that an in depth discussion on the culture through various approaches can be effectively done. Every innovation in teaching is meaningless if important principles are not well preserved and improved. Conventional approaches are still relevant, but student activities and teacher lectures need to be reinvigorated with structured questioning and modelling exercises so that they are in line with the learning needs of the 21st century.

In the context of education and future education of the country, rural students should be given due attention. On average, most of them are from the socioeconomic system of low and middle-income families, which possibly cause them to rely on guidance and teaching of teachers compared to urban students with the access to education despite the geographical and financial positions (Suhaimi, 2014). This situation clearly marks the need for further strengthening the activities of student concentration among rural students despite time constraints, control and student engagement. Collectively, students need to be encouraged to enhance the more active learning style so as not to be comfortable with the current learning culture that is less constructive. To make classroom atmosphere more functional to hone in mind, teacher questioning is needed. In this case, Rajendran (2013) found that teachers are still conducting questionnaires that do not generate students' thinking skills. This finding was in line with that of Seman (2005) and Waheedawati (2003) stating that most teachers are still bound to provide questions in the form of low or moderate cognitive forms with the two-way interaction that does not work well while questioning is the most important element for sharpening the mind of the students. Only with effective questionnaire (dialogue) that in-depth learning can be implemented and further enhance the thinking skills of Islamic students. Additionally, Brookfields (2015) found that teachers dismissed the modelling while implementing the curriculum and thinking skills in the classroom. Teachers often expose their students with a variety of techniques to answer high-level questions that occur not through 'exemplary'. Thinking tools are used in the classroom with teachers that rarely demonstrate a high level of argument as expert thinkers (Rajendran, 2013).

To create a balanced learning environment in terms of attractiveness and effectiveness, Ellen (2014) identified some constraints on students to be faced by teachers such as the ability of IQ, confidence, acceptance, time and class control as well as constraints in terms of the burden of so many teacher-related tasks in administration that they have less time thinking of any innovation in the classroom. At the same time, low and medium achievement students showed less interest and participation in learning activities in the form of fully constructive (Howard & Nancy, 2006). As a result, teachers returned to conventional methods that include speaking, giving notes and training without appropriate transformation. In order to familiarize the building of own knowledge of the less 'friendly-constructive' students, the teacher has to at least make partial-operated learning and maximize the available space for inquiry and dialogue with students even in small groups. In other words, teachers should be active with students as facilitators and moderators. Generally, the active momentum of teachers will raise students' expectations with gradual guidance.

Although majority of the people are more comfortable, happy and smarter than the minority (Kanazawa, 2010), in the context of Ainon and Abdullah's (2005) thinking skills, it is clear that there is no connection between intelligence and student thinking skills. Therefore, every student regardless race and socio-economic background is likely to equally have a high-level thinking skill generally and appreciate, practice and convey the teachings of Islam in particular. Based on the needs of the current teaching phenomenon with the needs of the 21st century learning, the study on the element of teaching and learning through student-centered activities, teacher inquiry and teacher modelling among rural students should be examined so that any improvement can be discussed based on the differences between the students and help to raise the level students' thinking skills to the best level.

Literature Highlights

Since the early 90's, the education system in Malaysia started step by step to work on thinking skills among its primary and secondary students (Rajendran, 2013). Initially, the curriculum for each subject is absorbed alongside creative and critical thinking skills (Rajendran, 2013) through the Secondary School Integrated Curriculum (KBSM) and subsequently improved to high-level thinking skills (KBAT) through the Secondary School Standard Curriculum (KSSM) with minor differences that led to significant implementation changes. At the early stage of the transformation of thinking skills in teaching and learning by formulation, the education ministry deployed experts from within and outside the country to devise and introduce the best teaching strategies and thinking tools to teachers across Malaysia (Rajendran, 2013). During this time, the consolidation effort continues with the implementation of KBAT as an important element in the assessment of primary and secondary school level with the re-rating of KBSM to KSSM. Many improvements in teaching and assessment have been revamped to suit the desire of empowering students' thinking in line with lifestyle and challenging needs of the 21st century (Curriculum Development Section, 2016). In line with global education, dependency on exam-oriented was reduced with teacher profession appointed as a student appraiser at all times when students are in school and formulated in Form Three assessments as a measure on the achievement of knowledge, practical, practice, appreciation and consistency (istiqamah). To celebrate the package to reduce the exam and to override KSSM's assessment, the teacher's teaching method remained a question.

From the pedagogical point of view in the classroom, two strategies are used either as teacher-centered or student-centered. Teacher centralization is the sole source of knowledge transfer while student-centered learning is a self-controlled learning process (Csete and

Gentry in Noor, 2011). However, the extent to which the centralization of students can be implemented among weak students is dependent on teachers. As most teachers face difficulty in carrying out activities in the classroom, there are some efforts done to highlight activity modules of students' centralization (Jonathan, 2011; Mel, 2010) that are fascinating and full of discipline, speed and timing but encourage students to argue, stretch, interact, solve problems, evaluate, criticize, act and exchange opinions. Trained Islamic Teaching teachers can refer and implement the proposed modules according to the Islamic Education syllabus to achieve the main objectives of the subject including the appreciation that affects the lifestyle of the students beyond the schooling period. Excessively, active learning activities are difficult to implement in some groups of student, but individual learning alone simply does not help the students to achieve the goals of their psychomotor ability. Hence, the best way is to train teachers towards active or partial learning with appropriate approaches.

Problem answer is a common method used by teachers in the classroom (Robert, 2009) with the aim of attracting students' focus, testing comprehension and sharpening students' sharpness in thinking. The discussions are the extent to which teachers' quizzes are effective in achieving the syllabus's objectives and whether or not the students are brought to the front for in depth discussion dialogically. Trained teachers have been exposed to various questions and questions levels that can be used when interacting with students (Rosnaini et al., 2011). The Bloom's taxonomic questions level (in Krathwohl & Anderson, 2009) is synonymous with questionnaire practice in oral learning and written test starting from the level of student knowledge to the level of student's ability to assess and synthesize. Teachers need to balance their divergent and convergent questions with their levels and other thinking tools. Socrates (in Braun et al., 2015) makes questioning as the primary element of his teaching. However, the Socratic questions are not focusing on a certain level unless systematically, organized and critical (Braun et al., 2015; Richard & Linda, 2006). Even in the world of advanced education with sophisticated teaching-learning technology, the success of a lesson depends on the ability of questioning of the teachers.

Behind the lecture practice as the main medium of instruction during the implementation of the compilation, the modeling is often marginalised (Brookfield, 2015). In this century, the teaching of conventional styles including lectures and descriptions make the learning sessions become empty and less meaningful. The modernisation stream that emphasises on thinking skills across knowledge and exemplary guidance of teaching becomes a must among teachers. Modelling is a challenge for teachers since they are not just teaching, but also arguing as thinkers by following the basic protocols that must be mastered before starting each teaching session such as thinking and culture teaching techniques to analyses every day's personal daily teacher experience (Brookfield, 2015; Bryan, 2009; Bob & Peter, 2009). In order to achieve this capability, Islamic Education teachers in particular should embrace the practice of environmental and spiritual thinking to expose them as expert thinkers in the student's view during modelling. This is because the modelling of thinking in a high level is not just a play and script reading but rather natural and dynamic to planned and unplanned discussion. If the basic modelling is not mastered in the teacher's argument, the students will be left with unanswered questions, making education of thinking as a rigid and non-original learning. As a student centering activity and teacher questioning, modelling also needs to be incorporated with any thinking tools proposed in learning so that it becomes diverse and learning becomes a very interesting focus of the students to continue to engage and become individuals who engage in thinking activities even beyond the schooling period.

Research Objective

The objective of this study is to identify whether or not there is a significant difference in mean score for the variables of student centralization, teacher questioning, teacher modelling and high level thinking skills based on the aspect of class stream.

Study Hypotheses

H_01: There is no significant difference in the mean score of student activity variable based on class stream.

H_02: There is no significant difference in the mean score of teachers' questioning variable based on class stream.

H_03: There is no significant difference in the mean score of teacher modelling variable based on class stream.

H_04: There is no significant difference in the mean score of KBAT variable based on class stream.

Operational Definitions

Student Centering Activity

The student centering activity is a group activity organized by teachers to be conducted by students in the learning process to achieve learning objectives. It opens up space for students to determine objectives, assignments and learning resources (Hisham, 2011). Other terms used for this purpose is self-learning, group-based learning, peer-to-peer teaching and student-based learning. The same definition is used for this study by making constructive cognitive theory as a special reference. Many studies are focusing on collaborative cognitive partially active since previous studies (Suhaimi, 2014; Halim et al., 2004; Rosnani, 2003) found that dependency of inland students is still high on teachers and not group learning. Whether the teacher applies it thoroughly or not, this study examines the differences in activity of student centralisation based on the flow of student class through questionnaire adapted from the previous questionnaires and experts' views.

Teacher Questionnaire

Questioning is the activity of the teacher to get the response from the students whether or not they understand the topic delivered (Kamarul & Halim, 2007). Various questions and levels of questionnaire have been highlighted by various parties to create a teaching and learning environment that develops student minds as well as strengthening their knowledge on the lesson. Investigation by Bloom's taxonomy (in Krathwohl & Anderson, 2009) is a commonly used questionnaire and practiced in classroom and training. For this study, the similar definition was applied. In the thinking skills in Islamic Education, not only the questioning level is considered, but also the teacher's creativity in asking a good and challenging question in accordance with Bloom's taxonomy and criteria of lateral thinking proposed by Edward (2000), resulting in a dialogue interaction that leads to appreciation and practice.

Teacher Modelling

Modelling is a learning through examples such as demonstration and demonstration. Demonstration or demonstration is done to show students how to perform specific tasks accompanied by oral descriptions (Tegin et al., 2009). Usually, a student or teacher shows an understandable method to do some movements, procedures or means of using an object. If

it is worthwhile to find discovery and deprivation, it is called an experiment. In the study of high-level thinking skills, modelling is how the teacher as a role model describes the teaching content using structured and critical thinking techniques. Bandura (in Rosnani et al., 2011) pioneered social cognitive theories in which he suggests that learning takes place through a modelling process of observation and impersonation involving cognitive processes. Students will not think well with the instruction of the teacher solely, but accustomed to the proper atmosphere by continuously observing the argument of teacher as an expert thinker (Edward, 2015; Rajendran 2013; Stephen, 2013; Brookfields, 2012).

High Level Thinking Skills (KBAT)

KBAT is the ability of students to apply knowledge, skills and values in making reasoning and reflection to solve problems, make innovative decisions and to create something (Curriculum Development Section, 2016). KBAT's goal is to produce students who are no longer relying on mere memorization (Rosnani et al, 2014) in understanding the subject matter and expanding their thinking to a better level in line with the current modernization trend. KBAT in Islamic Education is a quest for searching the value behind something (Rosnani, 2014) by linking and discussion to understand Islamic teachings better. Rosnani (2014) emphasised that philosophy is necessary in educating students to be more critical. Thus, the skill of questioning and explanation and activity formation is very important to be examined with the existing teacher's expertise.

Low-Performance Schools

Every school in Malaysia is in the appeals system implemented by the Ministry of Education. The positions of the schools are determined by the band starting from band 1 as best to band 7 as the weakest. Following the banding system through the Malaysian Education Development Plan 2013-2025, the ministry introduced two new posts, which are School Improvement Specialist Coach Plus (SISC+) and School Improvement Partner (SIP), to guide and collaborate with teachers and administrators of band 5 to 7 schools in certain academic and administrative aspects. By making the need for SISC+ and SIP monitoring requirements in band 5 to 7 schools as an indicator, this study assumes the schools within the bands as the poorest performing schools to require eye-to-eye monitoring with pedagogical practice and school administration experts. For the purposes of this study, nine out of the eleven schools in the low band were identified within the population.

Research Methodology

This study used survey method to collect data using questionnaire. All items have been tested for their validity and reliability. High-level thinking skills instruments were adapted from the Rosnani (2014) and Rajendran's research instruments (2008); Rajendran's student centring activity (2008), teacher questioning of Rajendran (2008), Mayer et al. (2009), Braun et al. (2015) and Fisher (2007). Meanwhile, teacher modelling instruments were developed by researchers through the process of strictness and reliability. Respondents are the students of Islamic Education of low-performing secondary schools in the rural areas of Sabah (Kudat) and 256 people were selected from a total population of 692 people using purposive random sampling technique. This study used the Statistical Packages for Social Studies (SPSS) version 22 to test its hypotheses.

Findings

The Difference of Student Centering Activity Based on Class stream

Based on the T-test analysis, it was found that mean score of the science stream students (min = 4.103) was higher than non-Science students (mean = 3.853) with $t(246.02) = 4.775$. The P-value was 0.000, which is smaller than 0.05 ($p < 0.05$). Therefore, the null hypothesis (H_01) states that 'there is no significant difference in student centering activity variable based on class stream' is rejected. There was a significant difference in involvement of student centering activities between Science and non-Science students. This means that the involvement of Science and non-Science stream students in student centering activities performed by teachers is not equal. The following table shows the T test records that have been performed.

Table 1:

T Test Analysis on Differences of Student Centring Activity based on Class stream

Variables	Class stream	N	Min	SP	T value	P (sig)
Student Centring Activities	Science Stream	101	4.1033	.36554	4.533	.000
	Non Science Stream	155	3.8530	.46975	4.775	

*significant level at .05.

The Difference of Teacher Questioning based on Class stream

Based on the result of T-test analysis, the mean score for Science stream students (min = 3.993) was greater than non-Science students (min = 3.911) with $t(252.26) = 1.488$. The p-value was 0.138, which was greater than 0.05 ($p > 0.05$). Therefore, the null hypothesis (H_02) stating that 'no significant difference in teacher questioning variable based on class stream' was not rejected. Thus, there was no significant difference between teacher questioning between Science and non-Science streams students. This means that the tendency towards questioning of teachers in high-grade thinking skills in the classroom for Science stream students and non-Science students was the same. The following table shows the results of the T test analysis that have been implemented.

Table 2:

T-Test Analysis on Differences of Teacher Questioning based on Class Stream

Variables	Class Stream	N	M	S	T value	P (sig)
Teacher Questioning	Scien	1	3	.	1	.
	ce Stream	01	.9934	36547	.386	138
	Non	1	3	.	1	
	Science Stream	55	.9113	51674	.488	

*significant level at .05

Differences in Teachers Modelling based on Class Stream

Based on the T-test analysis, it was found that the mean score for Science stream students (min = 4.105) was greater than the mean score for non-Science stream students (min = 4.060) with $t(235.73) = .825$. The p-value was 0.410, which was greater than 0.05 ($p > 0.05$).

Therefore, the null hypothesis (Ho3) that states 'no significant differences in teacher modelling variable based on class stream' failed to be rejected. Thus, there was no significant difference in teacher modelling between Science and non-Science students. This means that teacher modelling in high-thinking thinking skills is accepted by Science stream students and non Science stream with the same acceptance. The following table shows the results of the T test analysis that have been implemented.

Table 3:

T-test Analysis of Differences in Teacher Modelling Based on Class Stream

Variables	Class Stream	N	Min	SP	<i>T value</i>	P (sig)
KBAT	Science Stream	101	4.1046	.39450	.799	.410
	Non Science Stream	155	4.0601	.46049	.825	

*significant level at .05

The Differences of High Level Thinking based on Class Stream

Based on the T-test analysis, the mean score for Science stream students (mean = 4.071) was higher than mean score for non-Science students (min = 3.844) with $t(209.76) = 5.327$. P-value was 0.000, which was smaller than 0.05 ($p < 0.05$). Therefore, the null hypothesis (Ho4) stating that 'no significant difference in KBAT variable based on class stream' was rejected. Thus, there was a significant difference in High Level Thinking Skills between Science stream students and non-Science stream students. This means that the level of thinking skills of high school Science students and non-Science students is not the same. The following table shows the results of the T test that have been carried out.

Table 4:

T test analysis of Differences in Thinking Skills based on Class Stream

Variables	Class Stream	N	Min	SP	<i>t value</i>	P (sig)
KBAT	Science Stream	130	3.8692	.35300	-3.059	.000
	Non Science Stream	126	4.0005	.33301	-3.062	

*significant level at .05

Discussion

Science stream students showed differences in non-Science stream in the aspect of student centring activities and high-level thinking. This clearly demonstrates that students from the science stream are more active in performing the tasks given by teachers especially in the subjects of Islamic Education. Indirectly, this finding also presents that students from non-Science streams have a high dependency on teachers and need to refer their teachers in many instances while Science stream students can complete assignments given without frequently

relying on teachers. Teachers should therefore provide alternative steps to increase the participation of non-Science students with appropriate approaches to strengthen and diversify the existing methods of Science stream students.

Students of Science stream were also seen to have a higher level of thinking skills than non-Science students, thus showing inconsistencies with the findings of Ainon and Abdullah (2005) stating that students with lower IQ still have the opportunity to master high-level thinking skills. This study illustrates the relationship between intelligence and skills. However, there is likelihood that there are still non-Science stream students who have higher thinking capabilities but in a very small number, causing the findings of the data analysis to not show the meaning. The incentives and tests of thinking skills can be gradually alleviated for non-Science stream students while Science stream students are better prepared to accept higher and complex thinking skills challenges to be systematically solved in line with the Islamic teaching.

The findings showed that in terms of questionnaire and modelling, both streams do not show significant differences. This means that Science and non-Science students demonstrated similar tendencies and interests in questionnaires with teachers. However, this study does not compare the form of questions and the level of questionnaires given by the students to their teacher. Students from both class streams were also aware of the modelling exercises exhibited by teachers during lectures and explanations. In terms of questionnaire and modelling, teachers can provide equal improvement without differentiating both groups of student. However, the answer should however apply the appropriate level of questioning while the teacher modelling should provide the thinking tools presented by previous academics including Bono (2000).

Conclusion

Overall, this study demonstrated the need to diversify and differentiate appropriate learning activities between Science and non-Science students and understand the differences in thinking ability for both groups of student. It should be noted that Science stream students dominated these two capabilities in learning Islamic Education at school. This thus indicates that teachers have to focus more on non-Science stream students with more engaging activities to enhance their thinking ability. While questionnaire and modelling do not show significant differences, teachers need to continuously strive to enhance their strengths in questionnaire and modelling that generate two-way thinking between teachers and students.

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