

**THE ACCEPTANCE AND PROBLEMS FACED BY TEACHERS  
IN CONDUCTING HIGHER ORDER THINKING SKILLS**

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*Dedicated to:*

*My Beloved husband,  
Parthiban*

*My parents,  
Krishnan & Anjalai*

*My Parents in Law  
Vinayagam & Saroja*

*My sisters  
Sivaamalar & Dhurgamalar*

*My family in laws  
&  
Nieces and Nephews*

*For their constant love and  
being understanding as well as supportive*

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## ABSTRACT

The main aim of this study is to investigate teachers' responses towards the idea of teaching Higher Order Thinking Skills (HOTS) questions in School Based Assessment (SBA). This research aims to investigate teacher's problems in implementing HOTS questions in one of the schools in Johor Bahru. The research design for this study uses structured interview questions. A total of five teachers who are involved in Lower Secondary especially, Form One and Form Two were identified as the respondents. The interviews were carried out face to face, in order to get reliable and valid information. These teachers have experiences in both exam oriented assessment and School Based Assessment as well. Moreover, they are capable of differentiating between the approach in teaching Lower Order thinking Skills (LOTS) and Higher Order Thinking Skills (HOTS) clearly. Qualitative methodology has been used as the primary data collection. The interview questions were built very carefully to cater the aim of the research. The interviews were video-recorded, transcribed and analysed by categorising the raw data accordingly to the research questions. Findings were coded to make identification task easier in assisting and categorizing teachers' responses. The transcriptions were done in two ways, the first one is by respondents, and the next one is, by classification according to the research questions. The research revealed that teachers are willing and realize the role of HOTS in producing thinking society. However, the structure should be developed and well organised, in order to, to motivate them in implementing new ideas as the HOTS approach.

## ABSTRAK

Matlamat utama kajian ini adalah untuk mengkaji tanggapan dan maklumbalas guru mengenai Kemahiran Berfikir Aras Tinggi (KBAT) yang dijalankan dalam Pentaksiran Berasaskan Sekolah (PBS). Kajian ini juga menyelidik kekangan yang dihadapi oleh para guru di salah sebuah sekolah di daerah Johor Bahru. Rekabentuk kajian ini menggunakan kaedah temubual berstruktur. Seramai lima orang guru menengah rendah, khasnya yang mengajar Tingkatan Satu dan Dua dikenalpasti sebagai responden. Temubual ini dijalankan secara bersemuka, untuk mendapatkan maklumat yang tepat dan sah. Guru-guru ini berpengalaman dalam kedua-dua sistem, iaitu pentaksiran berorientasikan peperiksaan dan Pentaksiran Berasaskan sekolah. Tambahan pula, mereka berkemampuan untuk membezakan kemahiran berfikir aras rendah dengan kemahiran berfikir aras tinggi dengan jelas. Kaedah kualitatif digunakan dalam pengumpulan data. Soalan-soalan temubual direka dengan teliti agar menepati persoalan kajian. Temubual tersebut direkod menggunakan rakaman video, dan hasil temubual ditranskrip dan dianalisis mengikut persoalan kajian. Dapatan dikodkan untuk mempermudah proses penganalisan. Transkrip tersebut ditulis dalam dua bentuk iaitu, mengikut individu dan mengikut persoalan kajian. Dapatan kajian menunjukkan bahawa guru-guru bersedia dan menyedari kepentingan Kemahiran Berfikir Aras Tinggi dalam mewujudkan masyarakat yang mempunyai daya pemikiran yang tinggi. Walau bagaimanapun, strukturnya perlu dirangka dan diurus dengan sempurna, agar guru-guru bermotivasi untuk menjayakan idea baru seperti Kemahiran Berfikir Aras Tinggi ini.

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## LIST OF ABBREVIATIONS

<b>HOTS</b>	- Higher Order Thinking Skills
<b>LOTS</b>	Lower Arder Thinking Skills
<b>SBA</b>	School Based Assessment
<b>PBS</b>	Pentaksiran Berasaskan Sekolah
<b>KBAT</b>	Kemahiran Berfikir Aras Tinggi
<b>TIMSS</b>	Trends in International Mathematics and Science Study
<b>PISA</b>	Programme for International Student Assessment
<b>UNESCO</b>	United Nations Educational, Scientific and Cultural Organization
<b>OECD</b>	Organisation of Economy Co-operation and Development
<b>UPSR</b>	Ujian Penilaian Sekolah Rendah
<b>PMR</b>	Penilaian Menengah Rendah
<b>SPM</b>	Sijil Pelajaran Malaysia
<b>KSSR</b>	Kurikulum Standard Sekolah Rendah
<b>KBSR</b>	Kurikulum Bersepadu Sekolah Rendah
<b>KBSM</b>	Kurikulum Bersepadu Sekolah Menengah
<b>UTM</b>	University Teknologi Malaysia
<b>SMK</b>	Sekolah Menengah Kebangsaan
<b>STS</b>	Science, Technology and Society
<b>R1</b>	Respondent 1
<b>R2</b>	Respondent 2
<b>R3</b>	Respondent 3
<b>R4</b>	Respondent 4
<b>R5</b>	Respondent 5

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## **CHAPTER 1**

### **PREFACE**

This chapter gives an overall idea about the research carried out where the major aim of this study is to investigate teacher's response towards the idea of approach on Higher Order Thinking Skills (HOTS) questions in school base assessment and to investigate teacher's problems in implementing HOTS questions as school base assessment in one of the school in Johor Bahru. The background of the problem states the importance of this research as it is the latest issue of 2013 where Higher Order Thinking Skills (HOTS) for Science and Mathematics in Malaysia is been focused. There are two main objectives to be achieved with three research questions which are designed to serve as a guide in performing this study. The findings of this study is hoped to be beneficial to all the parties involved such as teachers, students, administrators, policymakers and those who are involved in education line. The scope and limitation are also indicated clearly. A conceptual framework is constructed to make a clear picture on what is being researched. At the end of chapter, the specific definition of few main terms related to the research topic is given to enhance clarity.

## 1.1 Introduction

To meet the needs of all Malaysians and prepare the country to compete in the global level, Malaysian education system has been transformed many times for better achievement. Hence, the noble aim of the reformation for the future is very much creditable where the students will be taxed to perform and achieve well to the certain level of their own capability rather than the expectation of the educators. The latest development in Malaysian curriculum was focused on the changes of assessment from examination oriented system to school based approach. Thus, the implementation of '*Penilaian Berasaskan Sekolah* (PBS) or School-Based Assessment (SBA) in the year 2011 is a right move in the right direction towards the nation's future. Hence, KSSR (Kurikulum Bersepadu Sekolah Rendah) has been initiated in Year One and Two, while in secondary school, the Form One and Form Two students are undergoing the school base assessment system. It is less exam-orientated and the emphasis is mainly on continuous assessment. This makes sure that each and every student is capable of achieving given tasks at his or her own pace of learning.

As SBA requires the students' academic progress to be monitored constantly, the teaching and learning process and the subsequent school-based evaluations should be strictly gauged to reflect the true achievements of the students' ability. Theoretically, the students learn on their own efforts with the guidance of teachers and parents to achieve the tasks given.

Tony Wagner (2012) from Harvard University has identified the top seven survival skills needed for the 21st century through his recent research, where the two main skills that had been acknowledged are critical thinking and problem solving as well as curiosity and imagination.

After a lot of researches, the paradigm of education is being changing towards higher order thinking skills (HOTS). As many countries have embedded it in their curriculum, Malaysia also made positive move to implement it in current curriculum. Therefore, Higher Order Thinking Skills (HOTS) has been highly highlighted recently as part of government's effort to meet the need of future nation. As an immediate action to develop these skills, 2013 has become the year in conducting HOT skills in the subject of mathematics and science. So, this transformation has generated many questions about the implementation and the success of HOTS. Furthermore, there is question regarding how well is HOTS accepted; as well as the readiness amongst teachers and students.

The implementation of HOT skills in our education system means, among other things, to educate our children to become wise decision makers and efficient problem solvers. In order to achieve these goals, we need to train teachers on aspects of critical thinking in real life as well as in their respective subject matters. If we want to teach our students to be skillful in critical and creative thinking through instructional materials, the need of teachers who can infuse these thinking skills into is essential. In simple words, teachers should be able to relate thinking skills to correspond to the knowledge content that they are trying to impart. That way, students could be trained to be skillful in doing observation, analysis and generalization.

Teachers should -encourage students to do more than just memorising. This kind of environment should be - foster on students to prepare them for more advance level of performance and thinking. Rusnani Mahmud (1991), assured that it is important for teachers to find the best way to teach mathematics. This statement implies that the brunt of the burden falls on the shoulder of teacher to implement this policy. Therefore, teachers must take the responsibility and initiative as the aim of this, is to generate thinking society.



Overall, School Based Assessment (SBA) assesses both academic and non-academic fields. It has to be conducted in a well planned manner and in accordance with procedures prescribed by the Examination Board. This assessment is carried out by all schools and assessed by subject teachers as a continuous process besides working on HOTS skills as well.

In this research, the main issues are the acceptance of teachers in adopting HOT skills and the problems faced in fostering the critical way of thinking in students.

## **1.2 Background of the problem**

The status of Malaysia's ranking in Trends in International Mathematics and Science Study (TIMSS) and Programme for International Student Assessment (PISA) has instrumental for the Malaysia Education Board to reform teaching and learning. As a developing country with various cultures, Malaysia is at a crossroads between national education standards and international education standards.

The outcomes of the results of TIMSS and PISA have lead to many implications. In Malaysia, the education system relies solely on examinations. Therefore, our students are not trained to answer TIMSS and PISA questions which focus more on analysis, synthesis and evaluation levels.

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At the same time, a comprehensive review on the education system in Malaysia was launched to assist the development of National Education Blueprint. This decision was made in the context of raising international education standards; the Government's aspiration of better preparing Malaysia's children for the needs of the 21st century; and the increased public and parental expectations of education policy. Over the course of eleven months, the Ministry drew on many sources of input, from education experts at UNESCO, World Bank, OECD, and six local universities, to principals, teachers, parents, and students from every state (Malaysia Education Blueprint 2013 – 2025 , 2012)

Therefore, the changes in examination design leads to where teachers will focus less on predicting which topic and questions will come out and drilling for content recall. Instead, students will be trained to think critically and to apply their knowledge in different settings (Malaysia Education Blueprint 2013 – 2025 , 2012). In other word, the new assessment will test for higher order thinking skills too.

The aim is mainly to make every child to learn how to continue acquiring knowledge, be able to derive the connection between different pieces of knowledge and learn to create new knowledge as a support for knowledge-based economy in the future. Students will acquire the skill of thinking critically outside the familiar academic contexts which is the result of mastering a range of important cognitive skills, including problem solving, reasoning, creative thinking and innovation.

Therefore, the main purpose of this research is about how far Higher Order Thinking Skills (HOTS) which has been given attention and priority are being taught and the complication faced by teachers as teachers are given the responsibility to ensure the students are well equipped with these skills.

### **1.3 Purpose of Study / Research Objectives**

1. To investigate teacher's response and acceptance towards the idea of approach on HOTS questions in school base assessment.
2. To investigate the problems faced by teacher's in conducting HOTS questions as school base assessment.

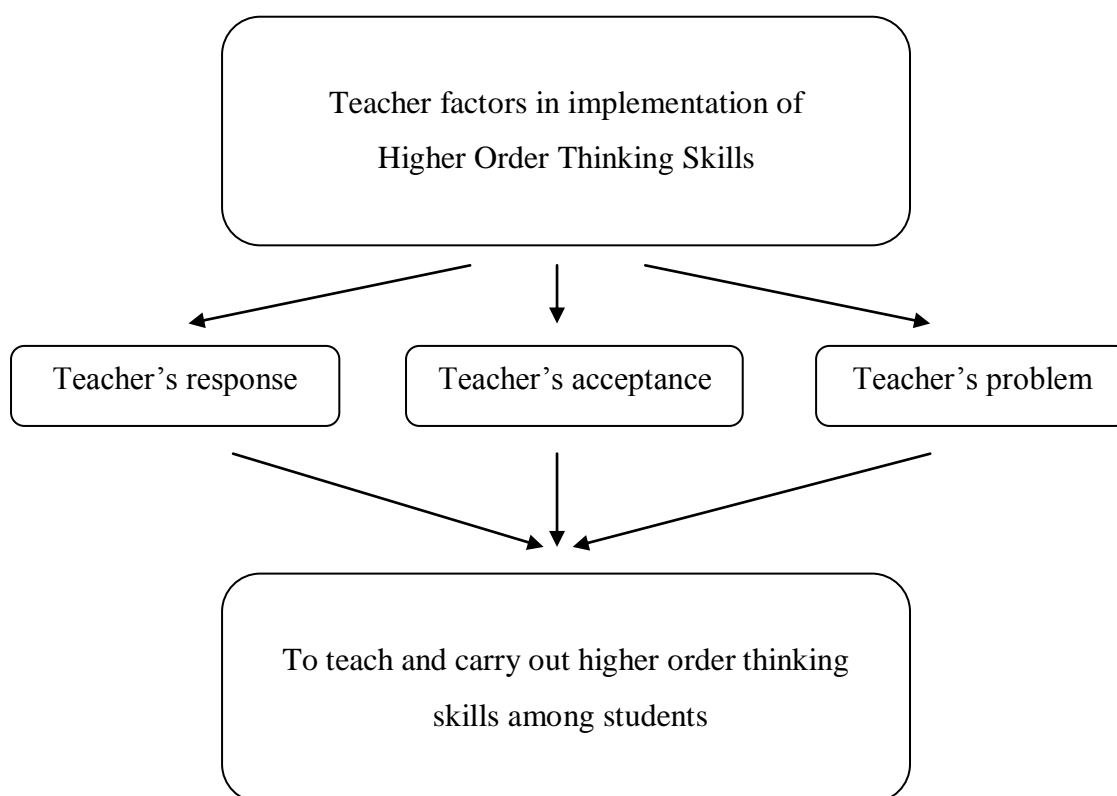
### **1.4 Research Questions**

1. What is the response of teachers towards HOTS question patterns in school base assessment content?
2. How is the acceptance of teachers towards HOTS question patterns in school base assessment content?
3. What are the problems do teachers' face in implementing HOTS question pattern in school?

## 1.5 Research Framework

There are many factors that should be considered in the implementation of Higher Order Thinking Skills in Form One and Form Two students. Teachers, students, administrators, education department, material, parents, publishers are all involved in imparting this thinking skills. The acceptance, responses and problems faced are the main factors that effects the implementation.

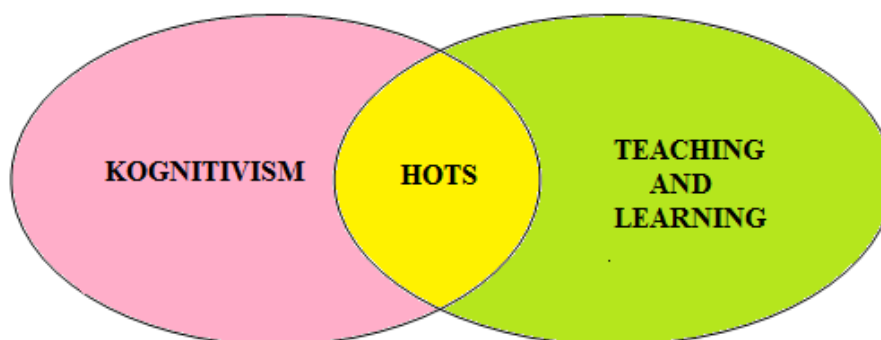
In this research, the main focus is on the teacher's perspective where three issues were identified to be verified. The framework in figure 1.1 shows clearly the issues that being discussed about HOTS.



**Figure 1.1** Research framework

## 1.6 Conceptual / Theoretical Framework

There are many theories related to thinking which has been implemented in class to develop living skills. Few theories which are relevant shall be discussed in this study. The Figure 1.2 below shows various thinking skills theories adapted in teaching and learning that will definitely cultivate Higher Order Thinking Skills among students. The intersection between well planned teaching, learning and application of thinking skills, increases meta- cognition that instills higher level thinking. As practice makes perfect, higher level thinking can be taught continuously and efficiently by highly motivated teachers and suitable learning environment.



**Figure 1.2** The Theoretical Framework

## 1.7 Research Rational

1. Why is it that, when teachers are introduced to new approaches in teaching, they are not often readily accepted or they are rejected ?
2. The attitude of teachers, instead of readily embracing the new question pattern, initially struggled and tended not to sustain interest in it.
3. What are the reasons for this scenario? What are the drawbacks for this mindset?

## **1.8 Significance of the study**

This research discusses mainly the factors that influence the teaching of Higher Order Thinking Skills from the teacher's perspective. Not only do teachers need to learn how to teach thinking skills, but they have to train themselves to think as well, so that they can choose the appropriate material according to the level of students.

Goodlad, Sirotnik, and Overman (1979) concluded that in a typical high school class period of 57 minutes, “barely 5 % of the instructional time is spent on direct questioning such with specific responses like yes or no... Not even 1 % of the time is devoted to open questions, calling for students skills beyond the first or second levels of the cognitive or affective taxonomy.....”. Therefore, more higher level thinking should be fostered in students and the responsibility lies on teachers.

Even though there are many research on the implementation of thinking skills, the aspects which have been studied varies. Studies on thinking skills are very important because of its impact towards the future of the knowledge economy.

The study is expected to improve the implementation of HOT skills in our education system. Year 2013 has become a challenging year for teachers in Form One and Two who not only have to teach the skills, but also to assess them as well. Consequently, the authority may take appropriate actions to resolve problems faced by teachers in teaching HOT skills. By this study, it is hoped that teacher's burdens and problems can be reduced with the support of higher authority.

## **1.9 Scope of research**

This is a qualitative study where the aim is to study the responses among Form One and Form Two teachers. These teachers are the focused respondents because they are the direct implementers of government policy in cultivating thinking skills among students who will be assessed under the School Based Assessment System.

## **1.10 Limitation**

This study only covers some of Form One and Form Two Mathematics teachers in one of the secondary school in Johor Bahru who are experiencing the School Based Assessment System.

## **1.11 Definition of terms**

### **1.11.1 Acceptance**

Acceptance refers to approval of something, policies, thoughts or ideas. It can also be the action of consenting to receive or undertake something offered. Acceptance in human psychology denotes a person's assent to the reality of a situation Recognising a process or condition without attempting to change it, protest or exit. In this context, teacher's approval and acceptance towards HOTS questions is being studied.

### **1.11.2 Higher Order Thinking Skills (HOTS)**

HOTS refers to Higher Order Thinking Skills which is the idea that some types of learning require more cognitive processing than others, but also have more generalized benefits. In Bloom's taxonomy, for example, skills involving analysis, evaluation and synthesis (creation of new knowledge) are considered to be higher order thinking, requiring different teaching and learning methods, than the learning of facts and concepts. Higher order thinking involves the learning of complex judgmental skills such as critical thinking and problem solving.

Higher Order Thinking Skills (HOTS) are mainly related to analysis, synthesis, evaluation and problem based learning whereas, worksheet, chalk and talk, memorizing and recalling are considered lower level. Some researchers and scholars think that “critical thinking” and “higher order thinking” are interchangeable, while others define “critical thinking” as a form of higher order thinking. Some use the terms “critical thinking” and “problem solving” interchangeably; yet for others, critical thinking is a form of problem solving. Still others define “critical thinking” as a part of the process of evaluating the evidence collected in problem solving or the results produced by thinking creatively (Crowl et al., 1997; Lewis & Smith, 1993).

To summarize the meaning and description of Higher Order thinking Skills, the terms such as cognition, comprehension, creative thinking, critical thinking, graphic frame, higher order thinking, inquiry, insight, meta cognition, problem solving, rational thinking, scaffolding, schemata and transfer data do serve the purpose. “Content and Context” provides the individual with something to think about, but serves primarily as “the vehicle that carries” the thinking skills (Fogarty & Mc Tighe, 1993). In this study, the Higher Order Thinking Skills (HOTS) refers to analysis, synthesis and evaluation where teachers are responsible to teach students the way to think logically.



### **1.11.3 Problems**

The problems here refer to the issues that occur when a certain activity takes place. It can arise before, during and after depending on the situation. Sometimes, the kind of problems which happen can be solved by. When there is a difference between human will and reality, the resolution of the gap becomes the solution of the problem.

In this study, the challenges in implementing, teaching and making students understand and applying Higher Order Thinking Skills (HOTS) will be identified.

### **1.11.4 Teacher / Educator**

A 'teacher' is a person who delivers an educational program, assesses student participation in an educational program, and / or administers, provides consistent and substantial leadership to an educational program. Teacher quality has been said to be the number one school-related influence on student achievement. Although research on what constitutes a quality teacher is often the subject of debate, there are some findings on teacher quality that are rarely contested. These suggest that it is what teachers do in classrooms that matters. Research has shown that teachers can improve student achievement when they communicate high expectations, avoid criticism, reward truly praiseworthy behavior, and provide abundant opportunities for success in academic learning time on material over which students are tested.

A teacher instructs specific skills and content according to a curriculum and developmental level while an educator coaches individuals to become what is essential. An educator stands shoulder to shoulder with the learner and shares a

vision of what can be or how to make the past better. Exploration of facts can lead to deep questioning that instills marvel and astonishment creation. This can assist the learner to the journey through the joys and frustrations of trying out something new.

Therefore, the definitions above is hoped to be considerably sufficient enough in giving a clear picture about this research on teacher's acceptance, and problem faced by teachers in implementing Higher Order Thinking Skills in school.

### **1.12 Summary**

It is hoped that the above information explains the general idea of the research, and the importance of this research. The main focus is totally related to teachers, as they are the strength of the character in any approaches.

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