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High Order Thinking Skills of Level Two Orang Asli Students in Rompin District, Pahang

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Abstract

Higher order thinking skills is an important aspect in teaching and learning. Students with higher order thinking skills are able to learn, improve their performance and reduce their weaknesses. In recent years the most serious issue in Orang Asli schools is the achievement of Aboriginal students in their academic subjects as compared to the mainstream students. The purpose of this research was to identify the level of Higher Order Thinking Skills among Orang Asli students in Rompın Dıstrıct, Pahang, Malaysia. The research sample consists of (150) Orang Asli students of grades 4-6 were randomly selected. A valid and reliable scale was used as a data collection tool.The findings indicated that Orang Asli students have below average level of HOTS on all four areas. Results show that students have average HOTS level on analysis, below average level on applying, while more than half of average level on evaluating, and the lowest level was on creating. Besides that, the findings also showed that there is statistically significant difference in gender on the level of Higher Order Thinking Skills in general and in the analysis skills; female students have higher level more than males do.

Keywords: Higher order thinking skills, Science education, Science Achievement.

Introduction

In recent years, the Malaysian education system has come under increased public scrutiny and debate, as parents' expectations rise and employers voice their concern regarding the system's ability to adequately prepare young Malaysians for the challenges of the 21st century. Reform effort for the further improve in education system are ongoing efforts in Malaysia. In 1987, concerted efforts were undertaken to define the National Philosophy of Education (NPE).

Such an effort is design to produce Malaysian citizens who are knowledgeable and competent, who possess high moral standards, and who are responsible and capable of achieving a high level of personal well-being as well as being able to contribute to the betterment of the society and the nation at large (Educational Planning and Research Division, 1994, p.vii). However, in the 1990s, in order to demand the goal of the Vision 2020 reform efforts were focus to teaching thinking skills in schools (Nagappan, 2001).

Looking ahead, The Malaysia Preliminary Blueprint state the educators, parents, students, and other members of the public were united in a vision of education as a vehicle for the holistic development of children intellectually, spiritually, emotionally, and physically. The Ministry of Education have a specific aim of teaching thinking skills in schools. One of the six key attributes needed by every student to be globally competitive are thinking skills. Every child will master a range of important cognitive skills, including problem-solving, reasoning, creative thinking, and .innovation (Malaysia, Ministry of Education, 2013)

Malaysia will need 493,830 scientists and engineers by 2020, this estimates state by The National Council for Scientific Research and Development. To support this, one of the main objectives of the Malaysian science curriculum is to enhance the reasoning abilities of students which is hoped to be achieved by emphasising science process skills, manipulative skills, critical and creative thinking skills that have been consciously introduced into the new Malaysian Science Curriculum (Malaysia, Curriculum Development Centre, 2001).

These outcomes are in line with the aspirations articulated by participants during the National Dialogue, and are comparable to outcomes set by other high-performing education systems. Only Science and Mathematics were two important subject that will be evaluate in TIMSS.

It will assessing students in Grades 4 (the Malaysian equivalent is Year 4) and 8 (the Malaysian equivalent is Form 2) along two aspects: content such as algebra and geometry, and cognitive skills, namely the thinking processes of knowing, applying, and reasoning (Malaysia, Curriculum Development Centre, 2001).

Increasing the higher order thinking skills to all student need all efforts and not easy task to complete. The teacher have to know and understand the Bloom's taxonomy

(1956) before teach their students. Based on Bloom's taxonomy, memorization and recall of information are classified as lower order thinking whereas analyzing, synthesizing, and evaluating are classified as higher order. The higher order thinking skills can be the best idea to help students solve the real problem and making decision in their life.

However, nowadays, a drop in interest in Science subject may stunt efforts to improve technological innovations to make Malaysia a high-income nation. Based on U. Narmada research in 2013, to avoid that to become worst teachers should try to make learning of science an enjoyable experience, the one that the children will remember for a lifetime as Science is an on-going process and it will continue even when these children have stepped out of primary school (U. Narmadha, 2013).

Instead, students need to be able to reason, to extrapolate, and to creatively apply their knowledge in novel, unfamiliar settings. They also need attributes such as leadership to be globally competitive. As the TIMSS and PISA international assessments have demonstrated, our students struggle with higher-order thinking skills (Malaysia, Ministry of Education, 2013).

In recent years, the most serious issue in Orang Asli schools is the achievement of Aboriginal students in their academic subjects as compared to the mainstream students (Norwaliza A. Wahab, 2016). Without education, Aboriginal people may retain in poverty and may lag behind the other communities. Due to their poor academic achievement, they remain one of the poorest in the country (Nadchatram, 2007).

Theoretical Background

It is important to note that everyone is capable of thinking, but almost everyone has to be encouraged. Taught, and assisted in the higher-order thinking processes (Rajendran N.S, 2008).

Although different theoreticians and researchers use different frameworks to describe higher order skills and how they are acquired, all frameworks are in general agreement concerning the conditions under which they prosper.

In Malaysian science curriculum, student was hoped to be achieved by emphasising science process skills, manipulative skills, critical and creative thinking skills. All these skills have been consciously introduced into the new Malaysian Science Curriculum (Malaysia, Curriculum Development Centre, 2001).

These skills are carefully and systematically planned using the various teaching approaches such as inquiry and problem solving via a Thinking Skill Thinking Strategy (TSTS) framework (Maria Salih, 2010). See Figure 1.

To further emphasize the importance of teaching thinking skills, the curriculum states, "The contents of the curriculum promote the development of thinking abilities

to enable students to analyze, synthesize, explain, draw conclusions, and produce ideas that are both constructive and useful" (Salih, 2010).

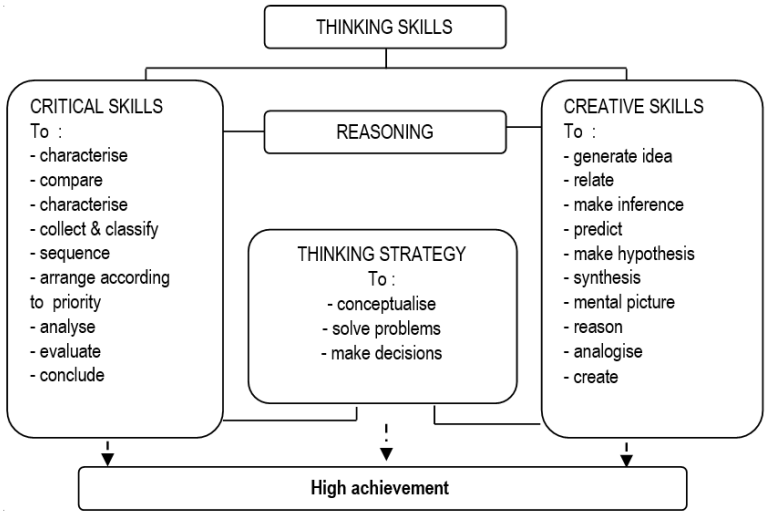

Figure 1. Conceptual framework of Thinking Skill Thinking Strategy (TSTS).

One of the key indicators of educational performance as a product is students' achievement level in various subject matter areas. Among them, science achievement is given a special emphasis by education policy-makers, since it deals with the concepts and principles that are required for a technologically equipped and developed society.

By 2016, higher-order thinking question will comprise at least 40% of questions in UPSR and 50% in SPM. This changes means student will be trained to think critically and to apply their knowledge in different settings (Ministry of Education Malaysia, 2013).

Nevertheless, the difficulty to interact due to the poor mastery of Malaysia language among the Orang Asli students can causes poor understanding of the less on and it leads to failure in the academic subjects. (Norwaliza A. Wahab, 2015). The HOTS implementation can be a new transformation among Orang Asli student to become very motivated and can achieve the same level of performance as other ethnic group in Malaysia. Nowadays assessment in Malaysia based on revised taxonomy Bloom by Larin Anderson, refer in figure 2.

Increase of higher order thinking skills in students is not an easy task. Teachers should refer to the instructional objectives Bloom Taxonomy (1956) for assistance. Bloom's Taxonomy divides thinking skills to the knowledge of low-level and high-level starting with knowledge, understanding and application. While higher-order thinking skills is analytical, synthesis and evaluation. Lorin Anderson has improved taxonomy Bloom in 2001 that changed the use of the noun to verb and the highest

levels of cognitive thinking is created. Higher-order thinking skills is seen as a benefit to solve problems and make decisions (Radzi, 2010)

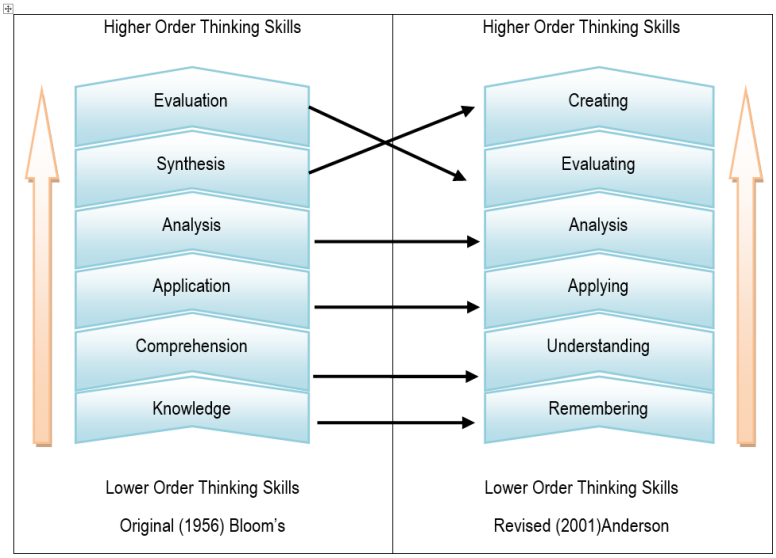

Figure 2

Statement of the problem

The Orang Asli of Peninsular Malaysia comprises of 18 ethnic subgroups classified under the three major groups: Negrito, Senoi and Proto Malay. They make up only 0.6% of the total Malaysian population. Senoi is the largest ethnic group constituting about 55% of the total population of Orang Asli, followed by the Proto Malays and the Negritos at 42% and 3%, respectively. Meanwhile, the level of achievement in education of Orang Asli students is among the lowest as compared to the other ethnic groups in Malaysia, (Nicholas.C, 2005).

Thinking skills can improve the capability of learning. By using thinking skills, students will be able to control, guide and measure their learning (Yee Mei Heong, 2010). In addition, students are also able to measure the knowledge acquired in a more productive as well. Then, directly control the knowledge and learned can be improved. Students, who are proficient to perform mental operations such as compare, analyze and make inferences seeks to increase understanding and learning. Hopefully the implementation of higher order thinking skill in learning progress help Orang Asli student to understand and learnt more.

Among the most obvious reason is the recognition of some teachers that they do not know how to enhance their students' thinking. Teachers always used to teach students to face the examination. Student must pass the examination. The other

problem are some teacher thought that teach students to master information for the examination and thinking are two different and conflicting goals. (Sivamugam, 2006)

According to Danny Weil , the higher order thinking skills are not so about content. They are about what students learn and think, but rather, they are about how they learn and think. It will requires changing both of our habits and the habits of our students, too (Danny Weil, 2004). Even the world of rapid progress now, require students seeking knowledge, be mastered various skills, and be able to use the knowledge learned to solve problems and make decisions.

In this context also, Sivamugam (2006) argues that the teaching in schools is still low member in emphasis and attention to the development of the power of thought. Most all the researcher agree that if student change their thinking, their performance will increasing. The Orang Asli student were selected because their performance in UPSR Data have shown only 61% of Orang Asli student pass the core subjects compare to the national average of 87% in the UPSR national examinations (Malaysia, Ministry of Education, 2013). The challenging was to overcome and in the same time to increase their performance.

It's true Orang Asli student can achieve the same level of the other main races if they can use and adapted higher order thinking skills in their learning process (Norwaliza, 2015). But there are also some reason why the teaching of thinking is not emphasized. This is because there are among the teachers felt that students must first master all the term and concepts of a subject before they are encouraged to think. Gaps in it, there is also a teacher who prefers the memorization of facts and not encouraging students to think about the fact that they have learned while ignoring how to use their own or seek information that is 'know how'.

This causes very dependent students and teachers from impulsive behavior, dogmatic, and lazy opinion. Even some of the teachers who believes teaching thinking skills will take many time and burden teachers. Therefore, it is sufficient if teaching thinking skills focused on gifted students only (Sivamugam, 2006).

The new KSSR offers an increased focus on higher-order thinking and is a clear step in the right direction of curriculum reform. However, if the new curriculum is to be delivered in the way envisioned, it requires complex lesson delivery skills from teachers such as tailoring lesson plans and materials to the needs of students at different levels of performance—even within the same classroom (Malaysia, Ministry of Education, 2013). The new curriculum hopefully can be a new beginning and transformation to Aboriginal school to increase their student performance.

Malaysia participated in the PISA assessment for the first time in its 2009+ exercise. Out of 74 countries, Malaysia performed in the bottom third for Reading, Mathematics and Science, well below both the international and OECD average in all three areas (OECD, 2007) (Ministry of Education Malaysia, 2013). Rather than assessing 'school' knowledge, PISA aims to measure how well students perform beyond the school

curriculum (Margaret Forster 2004). While in PISA 2009+ have shown the minimum proficiency as defined by PISA that science students in Malaysia have very limited scientific knowledge that can only be applied to a few familiar situations. They can present scientific explanations that follow explicitly from the given evidence, but will struggle to draw conclusions or make interpretations from simple investigations. It is recommended will affect the quality and actual student achievement in science. Based on the last published cycle of TIMSS results 2011, thirty-five and 38 per cent of Malaysian students failed to meet the minimum proficiency level in Science and Mathematics, which is two to four fold up from seven per cent and 13 per cent, respectively, in 1999 (Malaysia, Ministry of Education, 2013)

Maria Salih stressed the importance of teaching thinking skills to all students, science teaching and learning in the Malaysian school context has progressed significantly over the years (Salih, 2010). The school curriculum at both primary and secondary levels will be revised to embed a balanced set of knowledge and skills such as creative thinking, innovation, problem solving, and leadership (Malaysia, Ministry of Education, 2013)

Zohar & Dori also indicate higher achieving students, having mastered the basic skills, were viewed as prepared to handle more complex learning task. However, international and national examinations show that the perception of students and teachers are quite contrary to their performance. The result also based on different country have different syllabus in their curricula. They strongly suggest that teachers should encourage students of all academic levels to engage in tasks that involve higher order thinking skills (Zohar & Dori, 2003). That's mean Orang Asli student have an equal opportunity to seek the challenge.

Research questions

This study sought to find out the contributory effect of higher-order thinking skills in achievement in Science of level two Orang Asli students in Rompin, Pahang. For more specification, the study aims at answer the following questions:

1. What ıs the level of higher order thinking skills among orang asli students in rompın dıstrıct, pahang, malaysia?

2. Are there any statistical significant difference on the level of Higher Order Thinking Skills among orang asli students according to their gender?

Method

Research Design

This research is a descriptive in nature; its key purpose is a description of the state of affairs, as it exists at present. In descriptive studies, data information is usually collected through a questionnaire, survey, interviews, or observation. Surveys are concerned with describing, recording, analyzing and interpreting conditions that

either exist or existed (Kothari, 2004). Therefore, qualitative data were obtained through a survey conducted with Level Two Orang Aslı Students, the gathered data were analyzed using both descriptive and inferential statistics.

Participants

The research sample consist of 150 Level Two Orang Aslı Students In Rompın Dıstrıct, Pahang (Malaysia) who studying at year 4, 5 and 6 in the academic year of 2014-2015 , they were selected to participate in the survey randomly. The male students (n = 65) form 43% of the sample while the female students (n = 85) form 150% of the sample. The mean age was 10 years.

Materials

In order to investigate the level of higher order thinking skills, two research instruments have been used. The first instrument includes 15 items about Self-Developed Academic Satisfaction Questionnaire. It consists of two sections. The first section ask about the sample demographic information that included gender, science marks and grade level. The second section asked participants to answer SDASQ question. Self-Developed Academic Satisfaction Questionnaire was adapted to measure the level of Orang Asli students Academic Satisfaction. The SDASQ is a quantitative measure of HOTS, and this measure included 15 items using a three-point Likert type scale (1=strongly agree to 3= disagree). Finally, Omniscient Authority indicates whether knowledge is transmitted by authorities or obtained through personal experience (Welcha & Roy, 2012). Part 2 was a set of HOTS question. It includes 15 multiple-choice of the higher-order thinking skills (HOTS) scale contained items at the analytical, synthesis, evaluation and creating levels of learning. (M. Craig Edwards, 2000). The achievement tests were appropriate for determining “the degree to which the student has attained criterion performance” , Items used in the examination were constructed based on the criteria for the higher-order thinking skills is analytical, synthesis, evaluation and creating revised by Lorin Anderson (Radzi, 2010).

Data Collection Procedures

Quantitative data for this study was randomly collected. The students were explained by teacher the purpose of the study and requested participation. Students answer the questionaire and do the HOTS test individualy.

Results

The main aim of this study is to measure what ıs the level of higher order thinking skills among orang asli students in rompın dıstrıct, Pahang, Malaysia. Finally, it examines whether their usage and perceptions differentiated in terms of gender.

Findings of descriptive Analyses

The second section of the survey asked students to answer 15 HOTS items. Students were able to respond to all of the questions that they believed were true answer. Table (1) includes the means and standard deviations about HOTS level in every item.

The results in table 1 show that SUM of HOTS listed in this section of the survey (the percent of the mean for all the items less than 50%). The results also show that only 44.8 % of Orang Asli student can answer correctly in HOTS item level Applying (M = 2.240, SD = 1.464). The top performed tasks (HOTS item level analysis) gained a mean percent of 50.5%. The lowest tasks with a mean percent of 18% are (HOTS item level creating). These results indicate that Orang Asli student have low achievement in HOTS Item questions.

Table 1 the level of higher order thinking skills among orang asli students

	Mean	%	Std.Dev.
SUM Hots	6.080	40.5%	1.449
APPLYING	2.240	44.8%	1.464
ANALYSIS	2.020	50.5%	0.790
EVALUATING	2.360	36.5%	1.392
CREATING	0.360	18.0%	0.495

Table 2 the results of independent sample t-test according to students' gender

	Mean girls	Mean boy	Std.Dev. girls	Std.Dev. boy	t-value	df	p
SUM Hots	6.329	5.754	1.409	1.447	2.450	148	0.015
APPLYING-S	2.494	1.908	1.563	1.259	2.472	148	0.015
ANALYSIS-S	2.012	2.031	0.764	0.829	-0.146	148	0.884
EVALUATING-S	2.435	2.262	1.384	1.406	0.757	148	0.450
CREATING-S	0.376	0.338	0.511	0.477	0.464	148	0.643

Findings of inferential Analysis

The results in table (2) show that female student perceptions toward HOTS item (M = 6.329, SD = 2.450) higher than males' perceptions (M = 5.754, SD = 1.409), this difference was significant, t(148) = 2.45, p = 0.015.

Regarding the student perceptions towards the HOTS item level Applying, the results show that female student- perceptions (M = 2.494, SD = 1.908) higher than males' perceptions (M = 2.472, SD = 1.563),only this level the difference was

significant, t(148) = 2.472, p = 0.015. Meanwhile according to this table, the student perceptions towards the HOTS item level analysis, evaluating and creating between males and females did not differ significantly.

Discussion

The purpose of this study was to measure what ıs the level of higher order thinking skills among orang asli students in rompın dıstrıct, Pahang, Malaysia. It explored how the formal use of higher order thinking skills could impact student learning process, engagement, and participation. The study also examines whether higher order thinking skills usage and perceptions among students differentiated in terms of gender.

The survey results indicate that Orang Asli student have low achievement in HOTS Item questions. Higher order thinking skills were the good approach that can facilitate systematic change and can promote improved student achievement (Bill Thornton, 2004). However, the use of the higher order thinking skills among Orang Asli students facing a big challenge because of the level of achievement in education of Orang Asli students is among the lowest as compared to the other ethnic groups in Malaysia, (Nicholas.C, 2005)

The results also reveal that, the gender gap is both significant and increasing, with girls consistently outperforming boys at every level.

Based on the results of this study, the researcher offers the following suggestions to support the effective use of higher order thinking skills in among Orang Asli school

1. Increased a course training regarding the capabilities of Higher order thinking skills and the potential use in the classroom for teacher and student
2. Encourging the student and their to parents the benefit of Higher order thinking skills that could be used for general education.
3. Increasing the effectiveness of teaching and learning in formal education in school.

Future research may want to investigate the attitudes and perceptions of large sample and to examine differences based on region, field of study and age. Additional research could also be done to include all student not only focus to Orang Asli student as a sample and compare their perceptions. In addition, researchers may want to investigate if a difference exists among other ethnic in Malaysia.

Experimental research would also be beneficial to analyze how the use of higher order thinking skills could be used in a classroom or could be used to promote formal and informal learning.

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