

# **A CONCEPTUAL STUDY ON THE USE OF HOTS-CBT MODUL TO INCREASE HIGHER ORDER THINKING SKILLS AMONG SECONDARY STUDENTS**

**AIDAHAPINI BINTI DERUM**

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## **ABSTRACT**

This experimental study aims to investigate the effects of HOTS-CBT module based on the Anderson taxonomy (the new taxonomy), focusing on form one Science syllabus in assessing the impact of the module on high order thinking skills (HOTS). A quantitative approach with a quasi-experimental design was used, sampling 72 form one students of one school. The respondents were consisted of 36 students in the treatment group while the other 36 students were in the control group. The questionnaire contains of the respondents' personal information, HOTS-SCIENCE Inventory and HOTS-SCIENCE Knowledge Inventory. The data was analysed using descriptive analysis, Manova which aims at explaining the students' HOTS achievement levels and also explaining the relationship between independent and dependent variables in the pre-test and post-test. The findings of this study are expected to improve the achievement of students' higher order thinking skills which include six subscales which are, remembering, understanding, applying, analyzing, evaluating and creating skills. The findings of this study conclude that the use of the HOTS-CBT module has the potential to increase the level of critical and creative thinking skills among students, as well as to foster positive perceptions and attitudes towards the teaching and learning of Science. With this module, it is hoped to contribute greatly to the education system and the field of counseling through the formulation of a group guidance module combining the HOTS-CBT and HOTS based on the cognitive behavioral therapy.

Keywords: Higher Order Thinking, Cognitive Behavioral Therapy, Conceptual, Modul, Secondary student

## **INTRODUCTION**

Higher Order Thinking Skills (HOTS) is the ability to apply knowledge, skills and values in reasoning and reflecting when solving problems, making decisions, making innovations and being creative. The purpose of the introduction of HOTS is to change the way learners learn from memorization to comprehension. In addition, it increases the level of knowledge awareness that requires students to analyze, evaluate and create more. Rapid advancement in science and technology has made the dissemination of information to be fast and beyond border. The situation indirectly causes some changes in life and positively affects the development of education. In line with the current rapid growth, the government has intensified efforts to improve the quality of education of the nation. The National Education System is transformed through the introduction of 11 key shifts in the Malaysian Education Development Plan 2015-2015 which is believed to reduce the achievement gap in Science and Mathematics when compared to other countries (Ministry of Education Malaysia, 2013).

Cognitive Behavioral Therapy (CBT) is defined as people who can observe the connection between their thoughts about an event, how they feel and what they do. According to the Cognitive Behavioral perspective, cognitive is at the core of behavioral change. Cognitive development therefore needs to be understood so that every input to cognitive change corresponds to the change that is to be achieved. Beck and Weishaar (1995, in Gilliland & James, 1998) explain that Cognitive Therapy is based on the formulation of how a person thinks and determines that would shape one's emotions and how one acts.

The Cognitive Behavioral approach is based on a structured model of psychoeducation and emphasizes the role of homework, assigning responsibility to clients by assuming their active participation in and out of sessions and adopting a variety of behavioral and cognitive strategies that bring change.

In brief, the Cognitive Behavioral approach is an appropriate approach to transform students' thinking into higher order thinking. In order to equip higher order thinking skills among students, there needs to be an approach or method that can change one's thinking. Therefore, the cognitive behavioral approach is a very appropriate approach. Based on this statement and studies, the HOTS-CBT Module is designed and integrated on the basis of HOTS formation using Bloom's Taxonomy and the Cognitive Behavioral Therapy approach. Students' Higher Order Thinking Skills (HOTS) will only be achieved by changing one's thinking. Behavioral Cognitive Therapy is the best treatment for changing one's thinking style.

For this purpose, this conceptual article is to discuss the conceptual framework of the effects of cognitive behavioral therapy on the levels of students' higher order thinking skills in science subject.

### **PURPOSE OF THE STUDY**

This study is in line with the Ministry of Education's intention to adopt a first-class mindset or, in other words, higher order thinking among high school students. Studies on the implementation of HOTS in T&L have yet to be carried out, especially the construction of modules to enhance HOTS among secondary school students. Therefore, the researcher took the initiative to produce the HOTS-CBT Module, which combines the methods of learning and teaching of Science with cognitive behavioral therapy

### **LITERATURE REVIEW**

Bloom's taxonomy was introduced by Benjamin Bloom in the 1950s and is a way of categorizing the level of thinking skills needed in classroom situations. There are six levels in the taxonomy, each requires a higher level of extraction from the students. Thus, in 1956, Bloom, Englehart, Furst, Hill and Krathwohl successfully introduced the Bloom's Taxonomy conceptualization concept called Bloom's Taxonomy. Bloom's taxonomy is a hierarchical structure that classifies thinking skills from low to high skills.

However, in 1990, a group of researchers updated Bloom's Taxonomy to address its weaknesses and took into account the educational and psychological developments that took place in the second half of the 20th century. A review by Anderson and Krathwohl (2001) adopted the process of analyzing, evaluating, and creating. The two most obvious changes are the name of the level of Bloom's Taxonomy or the revised taxonomy are now using the verb forms for each level and there are changes in the top two levels.

THIS DESCRIPTION IS ILLUSTRATED IN FIGURE 1.1

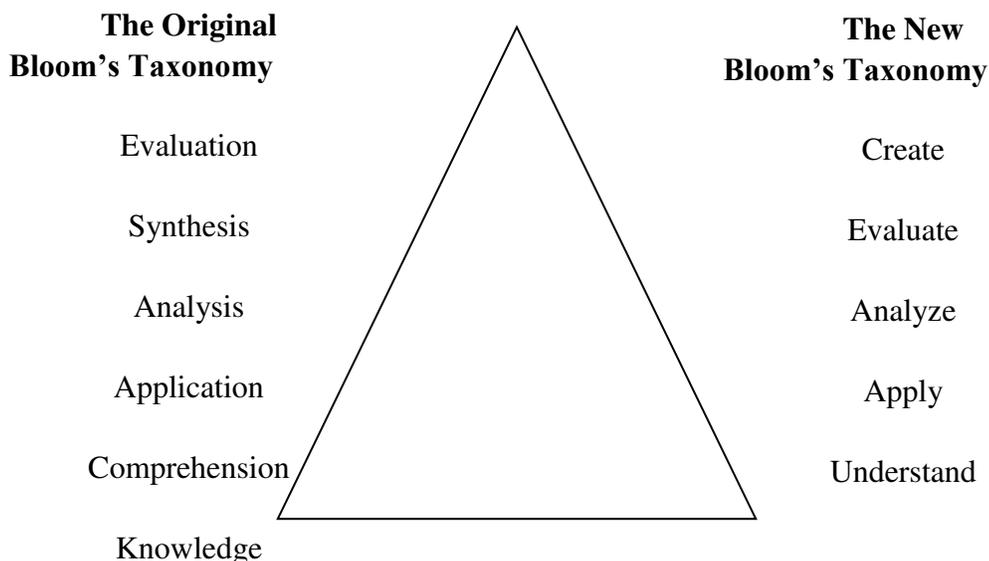


Diagram 11.: Comparison between the original terminology and the new terminology

In the context of this study, the cognitive behavioral (CB) approach was combined with Anderson’s taxonomy to see the effect it had on students’ higher order thinking skills. The group guidance approach is used as a compulsory treatment to improve students’ higher order thinking skills in science subject. It is then used to address problems in students’ thinking skills. This theory of CB is seen to be useful in both individual and group counseling, therapy and mentoring sessions, particularly to correct new ways of thinking and belief (Peterson & Nisenholz, 1999). Therefore, this study is expected to change the way students’ think. Cognitive behavioral therapy is a kind of psychotherapy developed by American psychiatrist, Aaron T. Beck in the 1960s. His approach is based on the theory that human internal communication is emotionally accessible. However, according to Dobson and Block (1998), behavioral cognitive therapy is a psychotherapy that focuses on the importance of thinking and how it affects our feelings and actions.

**PROBLEM STATEMENT**

Through the Malaysian Education Development Plan 2013-2025, critical and creative thinking skills and Higher order thinking skills (HOTS) are integrated into lessons aimed at giving students the skills to think critically and generate new ideas. However, the students’ thinking levels are still low. Some of the approaches taken by the Ministry of Education Malaysia, for example, have shown that this study contributes to the improvement of students’ thinking through the use of group guidance in which this module is treated in a more detail and systematic manner through the CBT approach.

The Ministry of Education Malaysia through the Center for Curriculum Development (2002) has developed a number of modules for teachers to emphasize on the teaching of scientific thinking skills to children. However, teaching scientific thinking skills is still a problem (Rosnani et al., 2003). The HOTS-CBT Group Guidance Module is built on the basis of Taxonomy Theory Module using the CBT treatment approach, guidance for students to think based on the ABC concepts through the CBT approach in this module helps to apply Positive Thinking to students.

**RESEARCH OBJECTIVES**

The purpose of this study is built based on the research gap found from literature review. The purpose of this study is to look at the impacts of the HOTS-CBT module in enhancing the students’ HOTS mastery. The objectives of this study are as follows:

1. to examine whether there are significant differences in the mean of pre and post-test variable mean test scores which is the increase of HOTS, critical thinking skills (KBKri), creative thinking skills (KBKre) and Positive Thinking (PPS).

2. to investigate whether there are significant differences in the mean of pre and post-test test size in concepts of remembering (KM<sub>i</sub>), understanding (KM<sub>m</sub>), analyzing (KM<sub>An</sub>), applying (KM<sub>Ap</sub>), creating (KM<sub>c</sub>) and evaluating (KM<sub>n</sub>) of experimental group when compared to control group.

**RESEARCH QUESTIONS**

Based on the above objectives of the study, the research questions were developed as follows:

1. Can the HOTS-CBT Module increase the dependent variables namely KBAT, KBK<sub>ri</sub>, KBK<sub>re</sub> and PPS?
2. Is there any significant difference in the mean of pre and post-test test size in concepts of remembering (KM<sub>i</sub>), understanding (KM<sub>m</sub>), analyzing (KM<sub>An</sub>), applying (KM<sub>Ap</sub>), creating (KM<sub>c</sub>) and evaluating (KM<sub>n</sub>) between experimental group and control group?

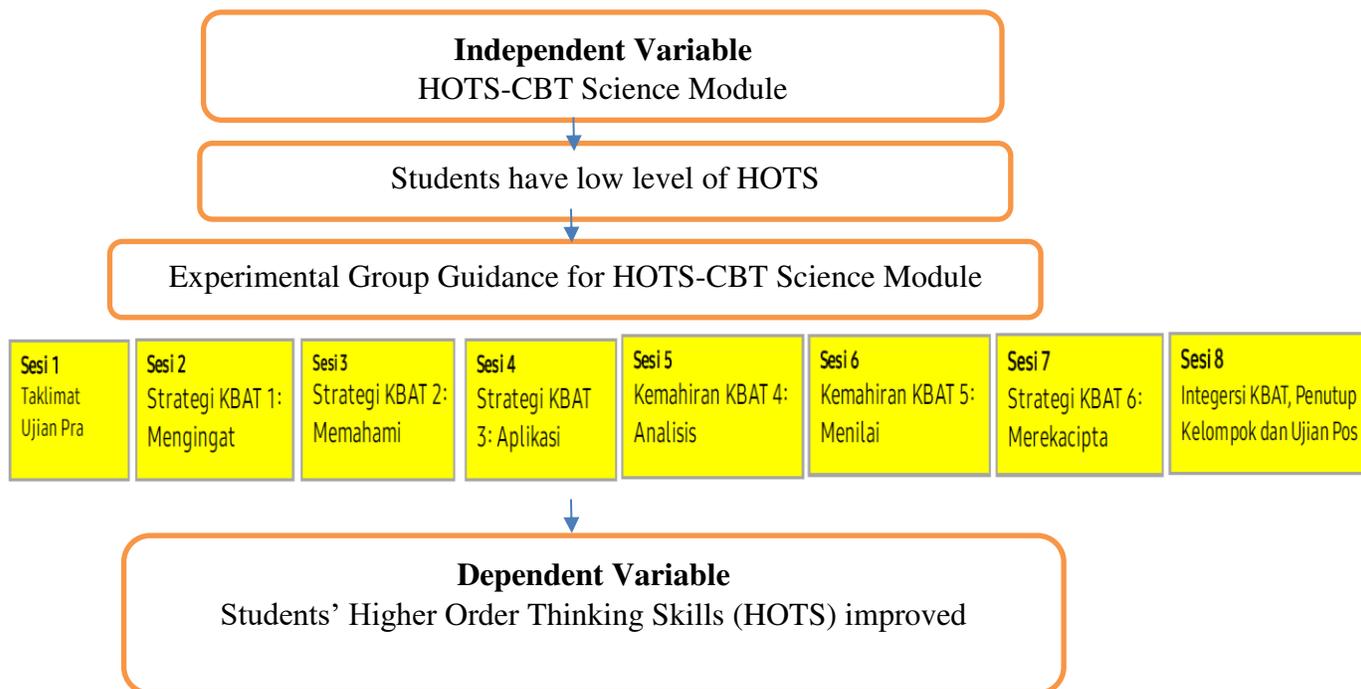
**HYPOTHESES**

The hypotheses of the study were designed to test the effectiveness of CBT Module on the improvement of HOTS. HOTS was the main dependent variable in this study with six levels of high level thinking skills.

H1 There is a significant difference in the mean size of pre-test and the dependent variable of the post-test which is HOTS of the experimental group when compared to the control group.

H2 There are significant differences in the mean of pre-test and post-test scores of subscale concept of remembering, understanding, analyzing, applying, creating and evaluating skills for the experimental group rather than the control group.

**CONCEPTUAL FRAMEWORK**



The following are quasi-experimental studies through the pre and post-test design of both treatment and control groups:

Table 1: Design of Experimental Studies

Type of Group	Pre-Test	Post-Test	Intervention
Group R1	01	02	X1
Group R2	01	02	X2
Group K1	01	02	

Petunjuk :

R1 = HOTS-CBT Module Treatment Group

K1 = Control Group

01 = Pre-Test

02 = Post-Test

X1 = HOTS-CBT Weekly Guidance Group Intervention

X2 = HOTS-CBT Marathon Guidance Group Intervention

Reference Source: Adapted from Hepper, Kivlighan and Wampold(1992).

**DATA ANALYSIS**

In this study, the data analysis involves quantitative data. Experiments were conducted for the treatment group using the HOTS-CBT Module and one control group without receiving any treatment. Basically these data was processed and analyzed using the Statistical Package for Social Science (SPSS) program. Descriptive analysis of the pre and post-test means were made for the main dependent variables according to the experimental and control groups. Meanwhile, the Multivariate test was used to test the effect of independent variable on the dependent variable (HOTS) with six subscales.

**CONCLUSION**

This study on Higher Order Thinking Skills needs to be continued to produce students who are in line with national development. Various approaches and opinions have been mentioned in the study regarding higher order thinking skills. Through the National Education System Transformation Plan, one of the issues that needs to be emphasized is not only the intellectual ability of the students, but also their ability to innovate in problem solving. Therefore, this study is dedicated for form one students who take Science subject to study on how the application of the Higher Order Thinking Skill-Cognitive Behavioral Therapy Module (HOTS-CBT) can improve their thinking ability. Selection of Science subject fits this perspective to see if HOTS can make the students to be more competitive. It is also believed that the HOTS-CBT module based on Cognitive Behavioral Therapy is a module that teachers or school counselors can use as one of the teaching methods that emphasizes on thinking skills strategies. This is because this module is a complete guidance.

**REFERENCES**

Bloom, B. S. (ed.). *Taxonomy of Educational Objectives. Vol. 1: Cognitive Domain.* New York: McKay, 1956.

Basri, M. (2010). *Proceedings of Regional Conference on Knowledge Integration in ICT 2010* 629. *Integration The Vlsi Journal.*

Krathwohl, D. R., & Anderson, L. W. (2009). *A Taxonomy for Learning, Teaching and Assessing: A Revision of Bloom’s Taxonomy of Education Objectives 2009 – Longman*

Nor Yuzie, Y., Rosini, A., & Aida Suraya, M. Y. (2014). *Tingkah laku, emosi dan kognitif murid sebagai faktor peramal pencapaian akademik.* *Journal of Human Capital Development.*

Padmowihardjo, S. (2014). *Psikologi Belajar Mengajar.* In *Pengertian Psikologi Belajar Mengajar dan Definisi Proses Belajar.*

Papazoglou, K. (2017). *Examining the Psychophysiological Efficacy of CBT Treatment for First Responders Diagnosed With PTSD: An Understudied Topic.* *SAGE Open.* <https://doi.org/10.1177/2158244017729407>

- Sholikhah, N. F., Haryanto, J., & Wahyudi, A. S. (2015). Permainan tradisional 3 jadi terhadap progresifitas demensia pada lansia di kabupaten Mojokerto. *Jurnal Kesehatan "Wiraraja Medika,"* 60–67.
- Sari, R. P., Rejeki, T., & Achmad, A. (1995). *Jurnal Psikologi Universitas Diponegoro* Vol.3 No. 2, Desember 2006. *Jurnal Psikology.*
- Tingkah laku, emosi dan kognitif murid sebagai faktor peramal pencapaian akademik. (2014). *Journal of Human Capital Development.*
- Kementerian Pelajaran Malaysia. (2003). Huraian kurikulum prasekolah kebangsaan. Pusat Perkembangan Kurikulum.
- Mohd Nazri Hassan, Ramlee Mustapha, Nik Azimah Nik Yusuff, R. M. (2017). *Sains Humanika H Mata Pembangunan Modul Kemahiran Berfikir Aras Tinggi di dalam Humanika. Sains Humanika.*