

Teacher's Readiness in Implementing Higher Order Thinking Skills and its Challenges

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Abstract

The educational landscape in Malaysia is now undergoing a transformation with the aim of cultivating individuals who possess the ability to engage in creative and critical thinking, enabling them to effectively confront forthcoming issues. The subject at hand pertains to the incorporation of Higher-Order Thinking Skills (HOTS) throughout elementary and secondary schools in Malaysia. The establishment of HOTS represents an initial stride towards fostering a highly knowledgeable and skilled generation, equipping our nation to compete on par with other advanced countries. Next, it is important to devise an education system of better effectiveness with the aim of achieving competitive standing in global evaluations such as the Programme for International Student Assessment (PISA) and the Trends in International Mathematics and Science Study (TIMSS). The issue of teacher willingness is a significant concern in the successful implementation of HOTS, as it must align with established criteria while also considering the potential burden it may have on students, particularly given all the challenges they already experience. The review article will focus on the current implementation of the HOTS at schools, the readiness of teachers, the challenges that have been identified throughout the implementation process, and potential strategies for addressing these issues.

Keywords: Higher Order Thinking Skills, Schools, Readiness, Teachers, Students

Introduction

The implementation of Higher Order Thinking Skills (HOTS) in primary and secondary schools is one of the strategies employed by the Ministry of Education Malaysia (MoE) to align the education system with the Malaysian Education Development Plan (PPPM) 2013-2025 and the 21st Century Learning (PAK-21). The PPPM 2013-2025 and PAK-21 approaches aim to provide students with the necessary skills to compete at a global level by cultivating high-level thinking abilities (Mohamad & Mustapha, 2022). The concept of HOTS, as described by the Ministry of Education Malaysia (KPM, 2014), refers to an individual's capacity to effectively use their knowledge, skills, and values in the process of logical reasoning. This capacity

enables individuals to make informed decisions, solve complex issues, and engage in innovative practises aimed at generating novel ideas and creations.

Higher order thinking (HOT) is a cognitive concept derived from the 1956 Bloom taxonomy, which focuses on knowledge and intellectual skill development (Saido *et al.*, 2018). The concept used in HOTS involves the utilisation of Anderson's revised Bloom's taxonomy, which consists of a hierarchical structure of six levels of cognitive development, with the highest level representing the most complex thinking (Febrina *et al.*, 2019). The stages of thinking in the aforementioned hierarchy start with remembering, understanding, applying, analysing, evaluating, and creating (KPM, 2014). The stage of remembering and understanding falls under the category of Lower Order Thinking Skills (LOTS), whereas Higher Order Thinking Skills (HOTS) encompass the skills of applying, analysing, evaluating, and creating.

The HOTS application only requires the student to remember the facts learned, perform simple operations or answer questions based on the formula that is the lowest level of thinking. (Ahmad *et al.*, 2019). The HOTS application also requires students to think further and beyond the box when faced with problems and to practice them to always think and not rely solely on memorization. HOTS is also closely linked to Critical and Creative Thinking Skills (CCK) (On *et al.*, 2022) because HOTS consists of a critical and creative thinking component. According to KPM (2014), there are seven elements in the implementation of HOTS in schools that comprise of three main elements and four supporting elements. The main elements are curricula, pedagogy and measurement, while the supporting elements are cocurriculum, community and private support, effort building and also resources. Therefore, it is essential that we review the structure of the question so that it matches the level of students at school and does not overburden not only students, but teachers, parents and society.

Higher order thinking skills, such as critical, logical, reflective, metacognitive, and creative thinking, are demonstrated by students' ability to implement wise judgment and produce reasoned critiques (Fatmawati & Setyawan, 2018). HOTS has significant value for students, teachers, and the educational system as a whole. The acquisition of these skills contributes to the development of critical thinking abilities, problem-solving capabilities, creative thinking, innovative approaches, knowledge retention, and readiness for real-world applications (Papanastasiou *et al.*, 2019). Through the active use of higher-order cognitive processes, students cultivate a more profound comprehension of the content at hand, hence facilitating the capacity to transcend superficial analysis and provide innovative resolutions or interpretations.

HOTS also enhances communication abilities, facilitating students in successfully articulating their thoughts and ideas via both written and oral means (Alkhatib, 2019). It facilitates the cultivation of a lifelong learning mindset, stimulating curiosity and the active pursuit of information. Furthermore, it promotes flexibility, since the capacity to engage in critical thinking and adjust to novel circumstances is imperative in the contemporary dynamic environment (Gurubatham, 2023). HOTS activities have the potential to be enhanced in terms of inclusivity, by placing value on a range of opinions and fostering a mindset that promotes innovative thinking. This fosters a learning atmosphere that is characterised by inclusivity and open-mindedness.

The cultivation of HOTS equips students with the necessary abilities to succeed in both tertiary education and professional environments. This is due to the fact that institutions of higher

learning and employers highly regard persons who possess the capacity to engage in critical thinking and effectively address intricate challenges (Clarke, 2018). One significant advantage of HOTS is the promotion of personal empowerment, whereby students are equipped with the necessary skills to critically analyse, inquire, and make well-informed choices. In the context of an increasingly interconnected global society, the cultivation of higher-order cognitive abilities among students plays a pivotal role in facilitating their comprehension and resolution of complex global challenges (Tyas *et al.*, 2019). This, in turn, contributes to the development of a heightened awareness of global citizenship and a corresponding feeling of accountability towards global affairs. In general, the use of HOTS is a highly beneficial resource for both students and the educational system thus teachers need to be ready and aware of the challenges that comes with the effort to implement HOTS at school.

Teacher's readiness in the implementation of HOTS

It is imperative for teachers to possess adequate readiness in order to proficiently integrate Higher Order Thinking Skills (HOTS) into the educational setting. This pedagogical approach fosters the development of critical thinking, problem-solving abilities, and enhanced comprehension (Sasson *et al.*, 2018). Teachers' creativity is essential when applying HOTS questions in learning sessions. One of the approaches that teachers can take in preparation for the implementation of HOTS in the classroom is to master 21st-century skills that include innovation skills, information skills, media and technology skills, basic life skills, and career skills. (Bael *et al.*, 2021). In addition, Bael *et al* (2021) also stressed in his study that teachers should ensure that the HOTS implemented meets the critical 4C elements proposed in 21st Century Learning (PAK-21) namely critical thinking, creative thinking, collaborative skills and communication skills. Many studies have been carried out to identify the readiness of teachers to implement HOTS from a wide range of learning backgrounds and areas.

Teacher readiness encompasses several critical components that are essential for effective instruction. Professional development programmes, such as workshops, seminars, and online courses, may equip educators with the essential information and skills required for their professional growth (Adnan, 2018). The process of curriculum design include the careful selection of instructional materials, the creation of assessments that effectively measure higher-order thinking skills, and the alignment of curriculum with objectives that promote higher-order thinking (Saiyad *et al.*, 2020). It is important for educators to possess a comprehensive comprehension of explicit learning outcomes pertaining to HOTS, including critical thinking, problem-solving, creative thinking, and analytical abilities.

The adoption of HOTS necessitates the incorporation of differentiation strategies to effectively cater to the various learning styles and degrees of preparation among students (Walter-Williams, 2022). This entails customising activities and assessments accordingly. The utilisation of effective questioning tactics is crucial in fostering HOTS among students (Akatsuka, 2019). This may be achieved by the implementation of various strategies, such as the use of open-ended questions, which prompt students to critically analyse and evaluate material. Additionally, encouraging debates that delve into many perspectives can further enhance the development of these cognitive abilities (Yacoubian & Khishfe, 2018).

Classroom management include the facilitation of collaborative activities, group discussions, and projects that foster critical thinking skills, all while cultivating a classroom culture that is supportive and polite. Educators must offer valuable feedback and establish precise

evaluations in order to facilitate students' cultivation of HOTS (Ghanizadeh *et al.*, 2020). The integration of HOTS within the educational setting necessitates a steadfast commitment to continuous professional growth, a readiness to modify instructional approaches, and a resolute determination to cultivating an environment that nurtures critical thinking and problem-solving abilities.

The availability of suitable tools and materials is essential for the effective implementation of HOTS instruction (Zydney *et al.*, 2019). Educators must consistently evaluate their instructional approaches and adapt their tactics in accordance with the requirements and achievements of their students. Engaging in collaborative opportunities and exchanging best practises for the deployment of HOTS might provide advantageous outcomes (Hernández-de-Menéndez *et al.*, 2019). It is imperative for educational administrators and leaders to offer substantial assistance and foster an environment that places significant importance on the development of HOTS.

According to the findings of a qualitative study carried out by Bael *et al.* (2021) in Bintulu, Sarawak, it was observed that elementary school teachers continue to exhibit inadequate readiness in terms of incorporating HOTS in their schools. The reason for the situation can be attributed to the teacher's limited comprehension of HOTS and their familiarity with only the most commonly used HOTS. This phenomenon is seen in the findings of the research, whereby a majority of participants saw HOTS solely as a skill that must be cultivated to its highest level. Additionally, it is emphasised that students are required to employ creative and critical thinking in order to effectively address and resolve complex situations. In addition to this, a majority of participants express challenges in linking the concept of HOTS with the PAK-21 framework due to the ambiguous nature of the provided response. Furthermore, the proposed strategies for implementing HOTS predominantly lean towards conventional methods like quizzes and group activities. The inadequate recognition of student cognitive abilities by traditional approaches is a contributing factor to the unsatisfactory achievement of HOTS among students (Yusof *et al.*, 2022).

The integration of HOTS has been widely implemented in both elementary and secondary schools. Hence, it is expected that research indicates a positive correlation between teachers' enhanced understanding of HOTS and their preparedness to effectively incorporate HOTS into their teaching practises. Across the nation, a wide array of courses, seminars, and exercises known as HOTS are organised to facilitate the professional development of teachers in the field of science. These initiatives serve as a first measure for teachers to enhance their scientific knowledge and pedagogical skills. The favourable outcomes and advancements seen in a study conducted by Yusof *et al.* (2022) indicate the efficacy of their research. Specifically, their investigation focused on instructors of Islamic Education in Johor Bahru, revealing notable gains when compared to earlier studies. The study's findings indicated a high degree of mastery in HOTS across several dimensions, including knowledge, preparedness, attitude, and proficiency.

Yusof *et al.* (2022) propose that the readiness and attitude of teachers significantly influence their capacity to use HOTS during instructional sessions. In addition to this, several more studies have demonstrated favourable outcomes in relation to teachers' readiness for implementing HOTS. An example is provided by a quantitative study carried out by Kamaruddin and Ahmad (2022), which revealed that the respondents' readiness level for

history topics in a secondary school located in Segamat, Johor, was found to be very high. In addition to comprehending the use of HOTS in the classroom, it is imperative for teachers to possess a comprehensive awareness of how to facilitate and encourage students' utilisation of their cognitive abilities when engaging in problem-solving tasks. According to a recent study conducted by Kamaruddin and Ahmad (2022), it was found that a significant proportion of students, who were history teachers, possess the knowledge and ability to effectively utilise HOTS in problem-solving and history instruction. Specifically, out of the 192 respondents, 125 respondents (65.1%) expressed a level of agreement with the statement, while 37 respondents (19.3%) indicated a strong agreement.

In general, it may be suggested that it is of greatest importance for a teacher to have a comprehensive understanding of HOTS from several viewpoints, drawing upon the principles of 21st-century teaching.

Challenges on the Implementation of HOTS

The majority of teachers and students are now familiar with the integration of HOTS in learning sessions. However, there are still several problems they face that hinder them from utilising HOTS more optimally. This phenomenon not only has the potential to restrict the development of critical thinking skills among students, but it also has the capacity to undermine the motivation of parents and teachers together. This claim can be supported by the increasing number of parent concerns over the application of targeted HOTS within schools. According to Abu Bakar (2023), Numerous research have been conducted to ascertain the issues arising from the perspectives of students, teachers, as well as technology aspects.

From a student's point of view, one of the things that keeps them from mastering HOTS is that their basic skills are still weak and not strong (Bael et al., 2021). Basic skills are essential for students to understand the concepts of the things they learn and then apply them in problem solving. The intended basic skills include 3M skills (reading, listening, writing) that are still weak for some students. According to Andin and Rosmiza (2023) through her research, it was found that teachers thought HOTS was only suitable for high-performing students where they were more likely to give relevant answers and test their minds.

From the teacher's point of view, many of them are experiencing difficulty in terms of time and material to provide appropriate teaching materials as proposed in PAK-21. Moreover, we're aware that there are teachers who need to teach options other than their own.

Additionally, the students who are crowded in the classroom have different levels of cognitive and intelligence (Bael et al., 2021). This will enable teachers to spend more time and be more creative in developing teaching materials. Not only the time factor, the teaching resources that involve technology are also incomplete in schools, causing them to use their own stuff during learning sessions. (Andin & Rosmiza, 2023).

It can be concluded that there are still many challenges for teachers and students in the implementation of HOTS that not only delay the student's mastery of the HOTS, but can also reduce the motivation of teachers to make classroom preparations.

Conclusion

In summary, the preparedness of teachers in their implementation of HOTS encompasses their understanding and proficiency in HOTS-related knowledge and skills. Multiple studies

have demonstrated varying degrees of teacher preparedness, potentially attributable to limitations within the research itself, including inequalities in sample size and variations in study settings. This study enables us to identify the challenges encountered by students and teachers, which are crucial for effectively implementing HOTS in accordance with the PAK-21 framework.

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