A Conceptual Framework on the Effectiveness of the HOTS Approach in Enhancing the Understanding and Skills of Year 1 Pupils in Mathematics at Primary Schools

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ABSTRACT

This paper develops a conceptual framework to evaluate the effectiveness of the Higher Order Thinking Skills (HOTS) approach in enhancing understanding and skills in Mathematics among Year 1 pupils in primary schools. The framework draws upon Bloom's Revised Taxonomy, Constructivist Theory, and the 21st Century Competency Model to explain how teachers' readiness, pedagogical practices, and contextual factors influence the success of HOTS integration. By synthesizing insights from local and international literature, this paper highlights both the potential benefits of HOTS in fostering critical thinking, creativity, and problem-solving, as well as the challenges that may arise, such as limited resources, teacher preparedness, and contextual constraints in rural schools. The proposed framework contributes to the theoretical understanding of HOTS in early Mathematics instruction and provides practical implications for teacher training, curriculum design, and educational policy. It also offers a foundation for future empirical studies to test and refine the model in real classroom contexts.Keywords: effectiveness, HOTS approach, Mathematics understanding, Mathematics skills, Year 1, primary school

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INTRODUCTION

Malaysia has reformed its education system to address the challenges of globalization. The aim of 21st-century education is to produce students who are not only knowledgeable but also intelligent, innovative, creative, and capable of thinking critically. Therefore, the implementation of Higher Order Thinking Skills (HOTS) in teaching and learning (T&L) has become a key focus in the effort to develop human capital that can compete globally. The Malaysian Education Development Plan (PPPM) 2013–2025 emphasizes the importance of HOTS in the curriculum, particularly in the subject of Mathematics (Ministry of Education Malaysia, 2013).

Mathematics is a core subject that demands the implementation of HOTS because it involves not only computational skills but also logical thinking, reasoning, and problem-solving abilities. Thus, mastering basic mathematical concepts from an early stage is crucial to ensure that students are able to understand more complex concepts at later stages. According to Mohd Ali et al. (2021), the mastery of fundamental skills such as numbers, basic operations, and an introduction to geometric shapes in the first year of schooling serves as a vital foundation for cognitive development in Mathematics.

To ensure the successful implementation of HOTS in Mathematics T&L, teachers' teaching methods must be adapted. Rote memorization alone is no longer suitable. Instead, teachers must plan activities that stimulate critical thinking, problem-solving, and student creativity. A study by Abdullah and Mahmud (2017) found that the use of contextual approaches such as shopping simulations or measurement activities in daily life can enhance students' interest and understanding of mathematical concepts.

However, the success of HOTS implementation is highly dependent on the level of teacher readiness. Teachers with in-depth knowledge of HOTS and appropriate pedagogical skills are more successful in applying HOTS

elements in their T&L. A study by Hassan et al. (2020) found that teachers who had attended specific HOTS training were more confident and competent in planning HOTS-based activities. On the other hand, constraints such as lack of time, teaching aids, and insufficient training remain major challenges (Jamaludin et al. 2019). Furthermore, for Year 1 students who are in the early stages of cognitive development, HOTS approaches must be carefully planned to align with their maturity and abilities.

The assessment system and curriculum also play a significant role in supporting HOTS implementation. The Year 1 Mathematics Standard Curriculum and Assessment Document (DSKP) outlines learning objectives that incorporate elements of critical thinking and problem-solving. This is further supported by the use of formative assessments and project-based assessments that emphasize application, analysis, and creation (Ministry of Education Malaysia, 2018). A study by Che Musa and Nor Hashimah (2021) stated that authentic assessments better reflect students' actual abilities in applying mathematical knowledge to real-life situations.

Differences in socioeconomic background also affect the implementation of HOTS, particularly in basic Mathematics. This factor influences the level of students' exposure to the use of Mathematics in real-life contexts. In planning a more inclusive T&L process, teachers must consider students' backgrounds and connect learning with their daily experiences. According to a study by Mohamad Zain et al. (2022), students' perceptions of Mathematics are strongly influenced by how they understand and relate basic concepts to real-life situations.

Problem Statement

The implementation of Higher Order Thinking Skills (HOTS) in Year 1 Mathematics is widely acknowledged as essential in preparing pupils for the demands of 21st-century learning. By cultivating critical thinking, creativity, and problem-solving skills from an early age, HOTS provides the foundation for deeper conceptual understanding in Mathematics and across the curriculum. However, its successful application remains a challenge in the classroom. The extent to which teachers are ready in terms of knowledge, pedagogical skills, and attitudes—plays a decisive role in determining whether HOTS is effectively translated into practice.

Previous studies reveal that while teachers generally understand the importance of HOTS, their classroom strategies often remain teacher-centred and procedural in nature (Arumugam & Mahmud, 2022; Naing & Maat, 2021). Factors such as limited exposure to training, misconceptions about the suitability of HOTS for young learners, and the absence of concrete teaching aids further hinder its effective implementation. This gap between theoretical awareness and practical application suggests that more structured guidance is required for teachers at the primary level, particularly in Year 1, where students are still developing basic numeracy and cognitive maturity.

The situation is even more pressing in rural districts such as Kerian, where disparities in resources, socioeconomic backgrounds, and learning support systems intensify the challenges faced by both teachers and pupils. Studies highlight that teachers in rural schools often experience heavier workloads, larger class sizes, and limited administrative support, which reduce their ability to design and sustain HOTS-oriented lessons. Without targeted support, there is a risk that HOTS remains a policy aspiration rather than a classroom reality, leaving pupils without the opportunity to benefit from higher-level cognitive engagement at a crucial stage of their education.

Therefore, this paper argues for the development of a **conceptual framework** that synthesizes existing theories and empirical findings to guide the integration of HOTS in Year 1 Mathematics. By bringing together Bloom's Revised Taxonomy, Constructivist Theory, and the 21st Century Competency Model, the framework seeks to provide a structured reference for teachers, policymakers, and curriculum developers. It aims to bridge the gap between policy intentions and classroom realities, ensuring that HOTS implementation becomes more consistent, meaningful, and responsive to pupils' developmental needs.

Government Policies Supporting The Implementation Of Hots In The Malaysian Education System

In today's challenging era of globalization, the national education system must be capable of producing a young generation equipped with critical, creative, and innovative thinking skills. In line with this necessity,

various government policies have been formulated and implemented to ensure that Higher Order Thinking Skills (HOTS) become a key element in teaching and learning (T&L) at all levels of schooling. The implementation of HOTS not only enhances students' understanding of fundamental subject concepts, particularly in Mathematics, but also cultivates problem-solving abilities and rational decision-making from an early age in primary school.

One of the main policies supporting the implementation of HOTS is the Malaysia Education Blueprint (MEB) 2013–2025. According to the Ministry of Education Malaysia (2013*)*, this blueprint focuses on raising the quality of the education system to ensure students can compete at the international level. Among the student aspirations outlined in this blueprint is the need to produce learners with thinking skills, including the ability to think critically, creatively, and innovatively. In Shift 1 of the MEB, the government mandates that all students must master these skills to meet the demands of the 21st century, thereby making HOTS implementation a national curriculum priority.

In addition, the Primary School Standard Curriculum (KSSR) and the revised KSSR 2017 further strengthen the integration of HOTS in the classroom. HOTS elements have been holistically embedded in all subjects, including Mathematics. In this context, teachers are encouraged to employ teaching strategies that emphasize activities such as problem-solving, concept exploration, and inquiry-based learning, which stimulate students' cognitive development. These approaches not only enhance students' understanding of subject content but also build their confidence in expressing ideas and reflecting on their learning.

Aligned with these pedagogical shifts, the Classroom-Based Assessment (PBD) policy also plays a vital role in supporting HOTS implementation. This assessment approach focuses more on students' holistic development, including cognitive, affective, and psychomotor aspects. Teachers are given the flexibility to assess students' achievements through tasks that require analysis, evaluation, and creative problem-solving. This allows HOTS to be applied practically within real learning contexts.

Moreover, the Digital Education Master Plan (2021–2025) introduced by the Ministry of Education Malaysia also supports the integration of technology in T&L to reinforce HOTS implementation. Digital tools such as interactive quiz applications, simulation-based learning, and online collaborative platforms provide a conducive learning environment for developing higher-order thinking skills among students. This approach is highly appropriate for today's digital-native generation, which requires more engaging and intellectually stimulating learning methods.

All these policies demonstrate the Malaysian government's strong commitment to strengthening the national education system through the implementation of HOTS. A comprehensive and systematic application starting from primary education is essential to ensure that students are not merely memorizing facts but are capable of understanding, applying, and solving real-life problems. In the context of this study, the implementation of HOTS is seen as an effective approach to improving Year 1 students' understanding and skills in Mathematics, in line with the nation's educational aspirations.

The Effectiveness Of Hots In Mathematics For Teachers

From the teachers' perspective, the implementation of Higher Order Thinking Skills (HOTS) contributes to the enhancement of their pedagogical skills and professional competencies. According to the Ministry of Education Malaysia (MOE, 2022), effective HOTS implementation depends on the extent to which teachers are prepared to understand cognitive levels, design HOTS-oriented questions, and adapt suitable teaching methods. Teachers also become more attuned to their students' thinking levels and are better prepared to provide guidance based on individual needs, rather than solely focusing on the syllabus content.

In the context of primary schools, implementing HOTS from Year 1 has shown significant long-term benefits. Students who are exposed to higher-order thinking activities early on are more likely to adapt to challenging learning at later stages. According to Rahman and Noor (2021), students nurtured with a culture of critical thinking from Year 1 demonstrate greater ability in self-reflection, group collaboration, and articulating their own opinions with confidence by the time they reach Level 2. This suggests that early exposure to HOTS not

only affects academic performance but also helps develop 21st-century learner traits envisioned in the Malaysia Education Blueprint (MEB 2013–2025).

Overall, the implementation of HOTS in Mathematics transforms the role of the teacher from a mere knowledge transmitter to a facilitator who shapes a classroom environment that is active, stimulating, and supportive of the development of higher-order thinking from as early as Year 1.

The Effectiveness Of Hots In Mathematics For Students

The implementation of Higher Order Thinking Skills (HOTS) in the teaching of basic Mathematics in Year 1 has become increasingly critical to ensure that students not only master facts and procedures but are also able to think deeply, logically, and creatively. In today's educational context, relying solely on teacher-centred methods and rote memorisation is no longer sufficient. This is especially true for Mathematics, a subject that requires conceptual understanding, problem-solving skills, and real-life application. Thus, the implementation of HOTS is a key strategy in helping students build a strong foundation in thinking from the very beginning of their schooling.

According to Zakaria and Yunus (2021), the integration of HOTS in Mathematics instruction has proven effective in enhancing students' ability to solve non-routine problems, construct mathematical justifications, and make decisions using various strategies. In their study involving Year 1 and Year 2 students, they found that those exposed to HOTS-based questions and activities performed better in formative assessments and were able to explain their working steps. This indicates that HOTS is not only suitable for high-achieving students, but with appropriate scaffolding, even early-year learners can develop higher-order thinking skills.

Another significant benefit of implementing HOTS is the development of students' self-confidence and curiosity. A study by the Aminuddin Baki Institute (2020) also revealed that when students are able to see the relevance of Mathematics topics to real-life contexts—such as calculating pocket money, comparing prices, or estimating distances—they tend to be more engaged in class and no longer view Mathematics as a boring subject.

Challenges In Implementing Hots In Year 1 Mathematics Instruction

The implementation of Higher Order Thinking Skills (HOTS) in Year 1 Mathematics instruction presents a significant challenge, especially when dealing with students who are only just beginning to learn numbers, basic operations, and mathematical symbols. These challenges are not only technical in nature but also involve psychological, pedagogical, and professional readiness aspects of teachers themselves. One of the main challenges identified is the low readiness level of students to think analytically and critically. At the age of seven, most students are still at the concrete operational stage of cognitive development, according to Piaget's theory. This makes it difficult for them to engage in problem-solving activities that require justification or complex evaluation.

The second challenge lies in the teachers' readiness in terms of pedagogy and content knowledge. Many teachers report uncertainty when planning HOTS activities that are suitable for the ability level of Year 1 students. According to Nasir and Jamil (2021), the lack of specific training related to HOTS implementation at the primary level causes teachers to apply HOTS in a generic manner without understanding how to tailor it to their students' context. Furthermore, some teachers perceive that HOTS is only appropriate at the secondary school level and less relevant for Year 1 learners (Azman & Zainudin, 2020). This perception hinders teachers from integrating HOTS activities as a routine part of daily instruction.

Time constraints and workload burdens are also major obstacles for teachers. According to Rahimi et al. (2022), Year 1 teachers are often overwhelmed with non-instructional duties including documentation, continuous formative assessment, and student file management. This limits the time available for planning creative and effective HOTS-infused lessons. Moreover, HOTS activities generally require more time to implement compared to traditional teaching methods focused solely on rote exercises.

In addition, the lack of supporting materials and HOTS-based teaching modules makes it difficult for teachers to integrate this approach into foundational Mathematics instruction. Most available resources still focus on memorisation and procedural practice without emphasising higher-order thinking elements. Challenges related to classroom management also cannot be overlooked. Year 1 students typically still require close supervision and have short attention spans. Managing HOTS activities such as inquiry-based learning or small group discussions becomes difficult when students struggle to follow instructions or work independently. In a study by Tan and Mazlan (2021), teachers reported that HOTS activities often become unmanageable if students do not understand the tasks given or if the class size is too large.

Finally, support from school administrators and parents also plays a crucial role. A lack of encouragement or monitoring from school leadership means teachers' efforts in implementing HOTS often go unrecognised and unsupported. At the same time, parental involvement in assisting children with HOTS-related tasks at home is low. This widens the understanding gap among students, particularly those from lower socioeconomic backgrounds In conclusion, the implementation of HOTS in Year 1 Mathematics instruction should not be viewed as a straightforward endeavour. It demands deep understanding, continuous training, teacher creativity, and a supportive school ecosystem. Without adequate preparation and holistic support, this effort may remain only as a policy on paper, without making a real impact on the cognitive development of students.

Findings From Literature : Synthesis Of Benefits & Challenges

The synthesis of existing literature reveals several key benefits and challenges in implementing HOTS in Year 1 Mathematics. Research indicates that HOTS-based instruction improves students' ability to solve non-routine problems, enhances conceptual understanding, and fosters motivation and confidence in learning Mathematics. Students exposed to HOTS-oriented activities from early schooling demonstrate stronger problem-solving skills and greater self-confidence in expressing ideas.

However, challenges remain. Young learners' limited cognitive maturity often makes it difficult to engage with complex problem-solving tasks. Teachers also face obstacles such as insufficient training, misconceptions that HOTS is only suitable for higher levels, and a lack of teaching resources. Additionally, workload pressures and large class sizes reduce opportunities for meaningful HOTS integration (Rahimi et al., 2022; Tan & Mazlan, 2021). These findings underscore the need for a framework that not only emphasizes the pedagogical value of HOTS but also addresses contextual barriers to implementation.

METHODOLOGY / APPROACH

This paper adopts a conceptual analysis approach by reviewing and synthesizing relevant literature, policies, and theoretical models related to HOTS in Mathematics education. Rather than collecting primary data, the paper integrates insights from previous studies with established educational frameworks, namely Bloom's Revised Taxonomy (Anderson & Krathwohl, 2001), Constructivist Theory (Piaget, 1977; Vygotsky, 1978), and the 21st Century Competency Model. This synthesis enables the development of a conceptual framework that illustrates how HOTS can be effectively applied in Year 1 Mathematics to enhance both understanding and skills.

LITERATURE REVIEW

Studies on teachers' readiness to implement the Higher Order Thinking Skills (HOTS) approach in teaching have become a focus of both local and international researchers in recent years. According to Bhanu Leega and Sofwan Mahmud (2022), who conducted a quantitative study in Selangor, Mathematics teachers demonstrated a high level of readiness for HOTS implementation. However, the study also highlighted key challenges, such as confusion regarding the concept of HOTS itself and time constraints in managing teaching and learning sessions, which hinder optimal implementation.

In contrast, a qualitative study by Bernard, Suppiah and Maslinda (2021) in Bintulu revealed that teachers were not fully prepared to implement HOTS comprehensively. The main reasons identified were the lack of specific teaching aids and a learning environment that was not conducive. Nursafra et al. (2021) uncovered even more

complex challenges in HOTS implementation, including difficulties related to language proficiency, pedagogical skills, and the highly varied ability levels of students. A practical study conducted in Karak, Pahang by Shanmugavadivu and Afifi Bahurudin (2023) explored the use of tables in Mathematics teaching to stimulate HOTS in problem solving. Kaffah et al. (2024) demonstrated that the implementation of HOTS-based authentic assessment successfully enhanced students' literacy skills and supported 21st-century learning.

Ehsan Latif et al. (2024) examined the role of artificial intelligence (AI), such as tools developed by OpenAI, in the domain of HOTS. Their findings suggested that AI shows high potential in several HOTS aspects, but remains limited in creativity and abstract thinking. This indicates that although technology can assist in the implementation of HOTS, the human element remains crucial in stimulating creativity and critical thinking. Sabran (2013) assessed the level of HOTS among Form Five students in solving Mathematics problems. The findings revealed that students' HOTS levels remained low, primarily due to a lack of practice and exposure to HOTS-based questions.

Finally, a study by Zheng Zheng et al. (2025) within the context of Outcome-Based Education (OBE) in China confirmed that the skills of analysing and creating have a direct impact on students' critical thinking and problem-solving abilities. This finding strengthens the argument that HOTS is a key element in shaping students who not only memorise but also think critically and creatively. In conclusion, this literature review shows that while teachers' readiness for HOTS is gradually improving, various challenges and support needs still exist in terms of concept clarity, resources, training, and the learning environment. At the same time, the implementation of HOTS has shown positive impacts on students' skills and learning experiences, whether at the primary, secondary, or tertiary level. Therefore, continuous efforts in professional teacher development, provision of teaching aids, and pedagogical innovation are essential to ensure that HOTS can be implemented effectively and successfully.

Model And Theory

21st Century Competency Model

The 21st Century Competency Model emphasizes four core skills known as the 4Cs: critical thinking, creativity, communication, and collaboration. These skills are considered essential in shaping students who are prepared to face the challenges of the modern world and serve as a foundation in implementing Higher Order Thinking Skills (HOTS) in the classroom, particularly in the teaching of basic Mathematics. Year 1 teachers play a crucial role as facilitators capable of creating a student-centered learning environment by effectively integrating the 4C elements.

Critical thinking refers to the ability to analyze, evaluate, and make decisions based on evidence and logic. In the context of teaching basic Mathematics, critical thinking helps students understand concepts more deeply through questioning, analyzing, and making reasoned judgments. According to Thornhill-Miller et al. (2023), critical thinking is one of the most important components in delivering HOTS content, especially in subjects like Mathematics that require deep conceptual understanding and application across various contexts. Creativity, on the other hand, refers to the ability to generate new, innovative, and relevant ideas in problem-solving. In teaching basic Mathematics, teachers need to be creative in preparing teaching aids and designing activities that connect mathematical concepts to real-life situations. A study by Rizaldi and Fatimah (2024) found that creative teachers were more successful in encouraging active student engagement and enhancing student motivation to solve problems in innovative ways.

Effective communication is essential to ensure that the teaching and learning process runs smoothly. Teachers must be able to convey instructions and mathematical concepts clearly, while also providing opportunities for students to ask questions, share opinions, and participate in discussions. In this regard, Thornhill-Miller et al. (2023) noted that positive two-way communication between teachers and students contributes to better conceptual understanding and generates more meaningful learning experiences. Finally, collaboration refers to the ability to work together in groups to achieve common goals. In HOTS-based approaches, group activities such as discussions and projects allow students to share ideas, consider peers' perspectives, and build solutions collectively. Rizaldi and Fatimah (2024) emphasized that collaborative activities in Mathematics not only improve conceptual understanding but also foster important interpersonal skills needed in real-world settings.

Overall, the 4C skills within the 21st Century Competency Model are highly relevant and vital in the context of teaching basic Mathematics that integrates HOTS. Teachers who are ready to apply these skills not only strengthen their own readiness as educators but also have a positive impact on student development and learning achievement. Therefore, the integration of 4C skills into teacher training and lesson planning should be prioritized to align with the aspirations of 21st-century education.

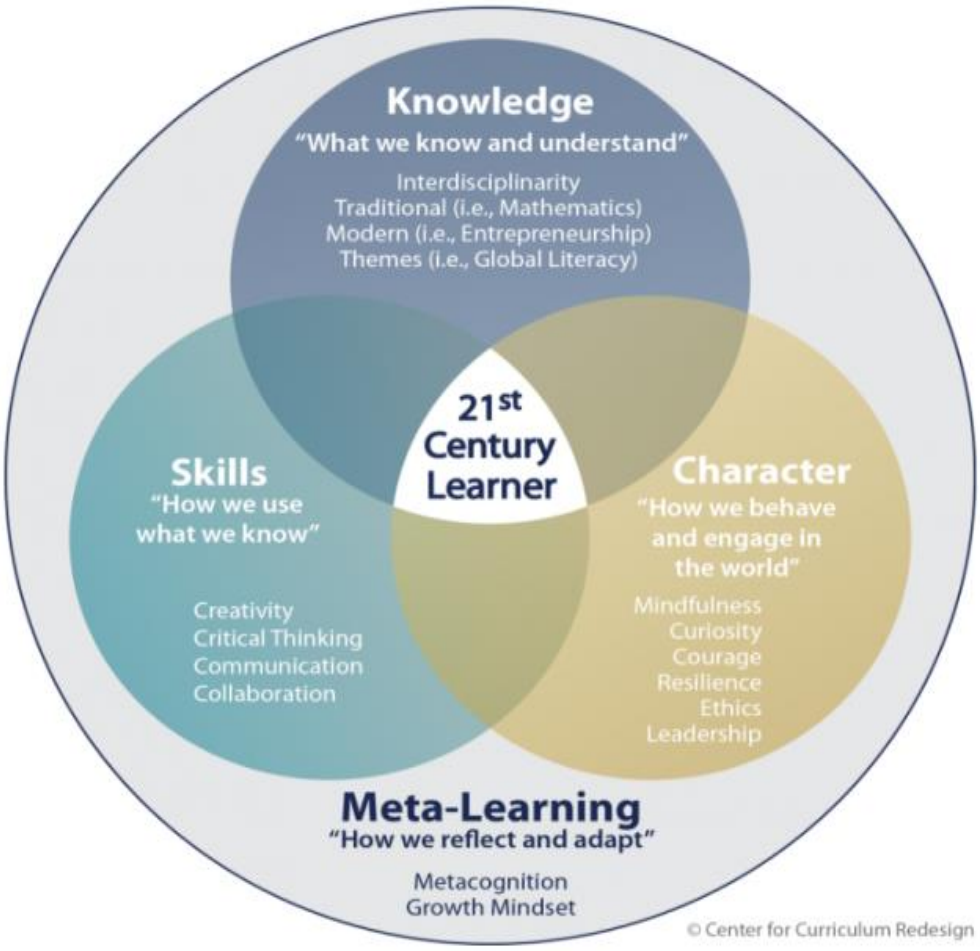

Figure 1: 21st Century Competency Model

Bloom's Taxonomy and Revised Bloom's Taxonomy

Bloom's Taxonomy, introduced in 1956 by Benjamin Bloom and his colleagues, is a structured framework used to classify learning objectives into three main domains: cognitive, affective, and psychomotor. The primary focus in education, especially in school teaching and learning, is on the cognitive domain, which comprises six levels of mental abilities: knowledge, comprehension, application, analysis, synthesis, and evaluation. At that time, the taxonomy helped educators construct appropriate teaching and assessment objectives according to students' skill levels; however, its categorization was still static and linear (Bloom et al. 1956).

With the development of education and 21st-century demands, Bloom's Taxonomy was revised and updated by Anderson and Krathwohl in 2001 to make it more dynamic and action-oriented. This revision, known as Anderson's Taxonomy, changed the original terms into verbs and rearranged the cognitive levels into remember, understand, apply, analyze, evaluate, and create. This new structure emphasized application and creation, thereby highlighting higher-order thinking skills (HOTS), which are crucial in today's education (Anderson & Krathwohl, 2001).

In the context of the Malaysian curriculum, the Ministry of Education Malaysia (2014) has adapted this revised Bloom's Taxonomy to be integrated into the school curriculum. HOTS is positioned as the core of the teaching and learning process in line with the aspirations of the Malaysian Education Development Plan 2013–2025.

HOTS encompasses students' ability to think analytically, critically, and creatively in solving real-world problems. Therefore, Anderson's Taxonomy serves as the main guide for teachers in planning teaching objectives that challenge students' thinking, especially in conceptual subjects such as Mathematics. Studies by Wan Zah et al. (2021) reveal that effective implementation of HOTS in Mathematics teaching helps students improve problem-solving skills, especially when teachers incorporate elements like analyzing and creating in their tasks.

In conclusion, the evolution from the original Bloom's Taxonomy to the revised Anderson's Taxonomy provides a new dimension in planning instruction that focuses more on higher-order thinking skills. In this study titled "The Readiness Level of Year 1 Teachers in Integrating HOTS Elements to Empower Understanding of Basic Mathematical Concepts in Primary Schools" understanding this framework is essential. It assists Year 1 teachers in planning and implementing teaching that fosters critical and creative thinking among students. Moreover, the integration of HOTS based on this taxonomy has the potential to strengthen the understanding of basic mathematical concepts, thereby contributing to the development of students who can face future challenges with greater confidence and competitiveness.

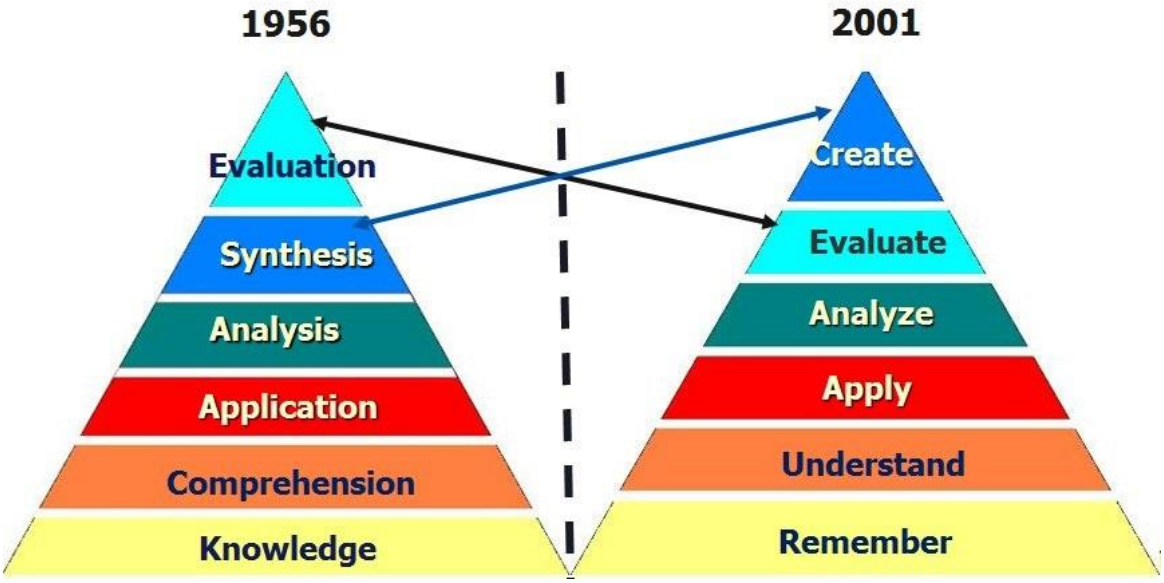

Figure 2: Differences between Original Bloom's Taxonomy and Anderson's Taxonomy (Ministry of Education Malaysia, 2014)

Constructivist Theory

Constructivist theory is a learning approach that emphasizes that knowledge is not passively transferred from teacher to student but is actively constructed by students through their experiences and interactions with the environment. Jean Piaget and Lev Vygotsky are among the main figures who founded this theory, with Piaget focusing on knowledge construction through individual cognitive development, while Vygotsky emphasized the role of social and cultural interaction in learning development. In the context of Mathematics education, constructivism advocates that students be given opportunities to actively explore mathematical concepts through problem-solving, group discussions, and challenging tasks.

Voon and Amran (2021) explained that Mathematics teaching based on constructivist theory can help students build deeper understanding because they are directly involved in meaningful learning activities. This aligns with findings by Shaimi et al. (2022), who found that this approach encourages higher-order thinking skills and helps students connect prior knowledge with new situations. Therefore, in the implementation of the Primary School Standard Curriculum (KSSR), which demands the integration of Higher-Order Thinking Skills (KBAT), teachers need to be proficient in designing constructivist activities so that Mathematics learning becomes more enjoyable, challenging, and relevant. Furthermore, international studies by Himmi, Armanto, and Amry (2025) show that the implementation of Project-Based Learning rooted in constructivism has increased student interest and mastery in Mathematics. Roubides and Roubides (2025) also found that students

exposed to constructivist approaches demonstrated better performance in skill-based courses compared to traditional approaches.

However, the implementation of constructivist theory in the classroom requires a high level of teacher readiness in terms of knowledge, pedagogical skills, and creativity. Teachers not only need to plan student-centered teaching and learning but must also be prepared to act as facilitators who guide students flexibly and reflectively. In the context of this study the readiness level of Year 1 teachers in integrating KBAT elements to empower understanding of basic Mathematics concept constructivist theory is highly relevant. Teachers who understand and apply the principles of constructivism can design learning activities that support the development of KBAT and subsequently help students grasp mathematical concepts more effectively. As emphasized by Pazin et al. (2022), students need problem-solving strategies based on real-life situations to strengthen their basic understanding, and this approach can only be achieved if teachers are holistically prepared in terms of knowledge, skills, and attitudes toward pedagogical change.

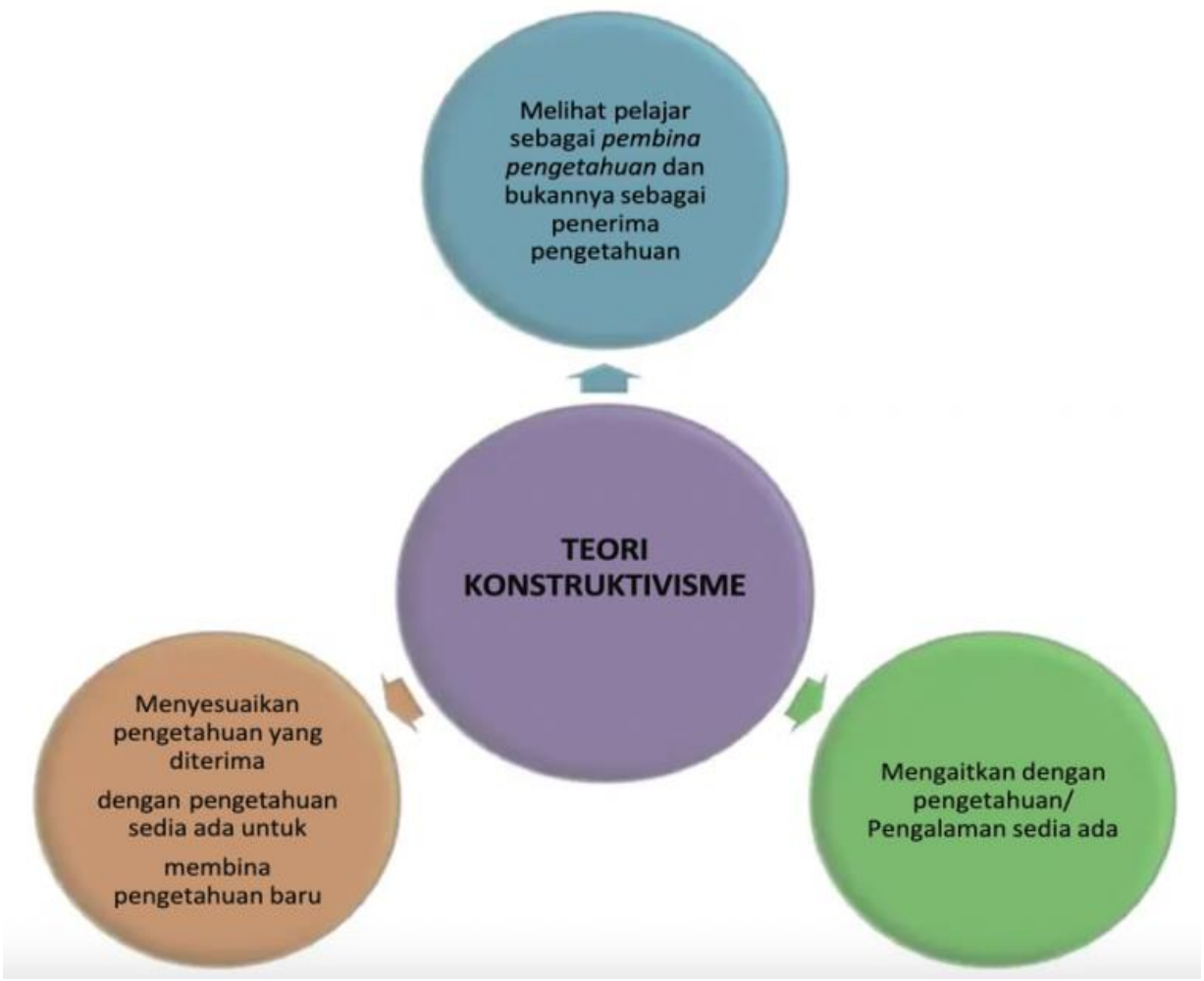

Figure 3: Constructivist Theory

Conceptual Framework Of The Study

This study proposes a conceptual framework that integrates Bloom's Revised Taxonomy, Constructivist Theory, and the 21st Century Competency Model to explain the effectiveness of Higher Order Thinking Skills (HOTS) in Year 1 Mathematics. Bloom's Taxonomy provides the cognitive structure for moving pupils from basic to higher-order thinking; Constructivist Theory highlights active, student-centred learning through problem-solving and interaction; while the 21st Century Competency Model emphasizes critical thinking, creativity, communication, and collaboration. Together, these models form a holistic framework in which teachers act as facilitators, designing Mathematics lessons that are cognitively challenging and meaningful. The framework also acknowledges the importance of contextual factors such as teacher readiness, resources, administrative support, and parental involvement, which influence the successful implementation of HOTS.

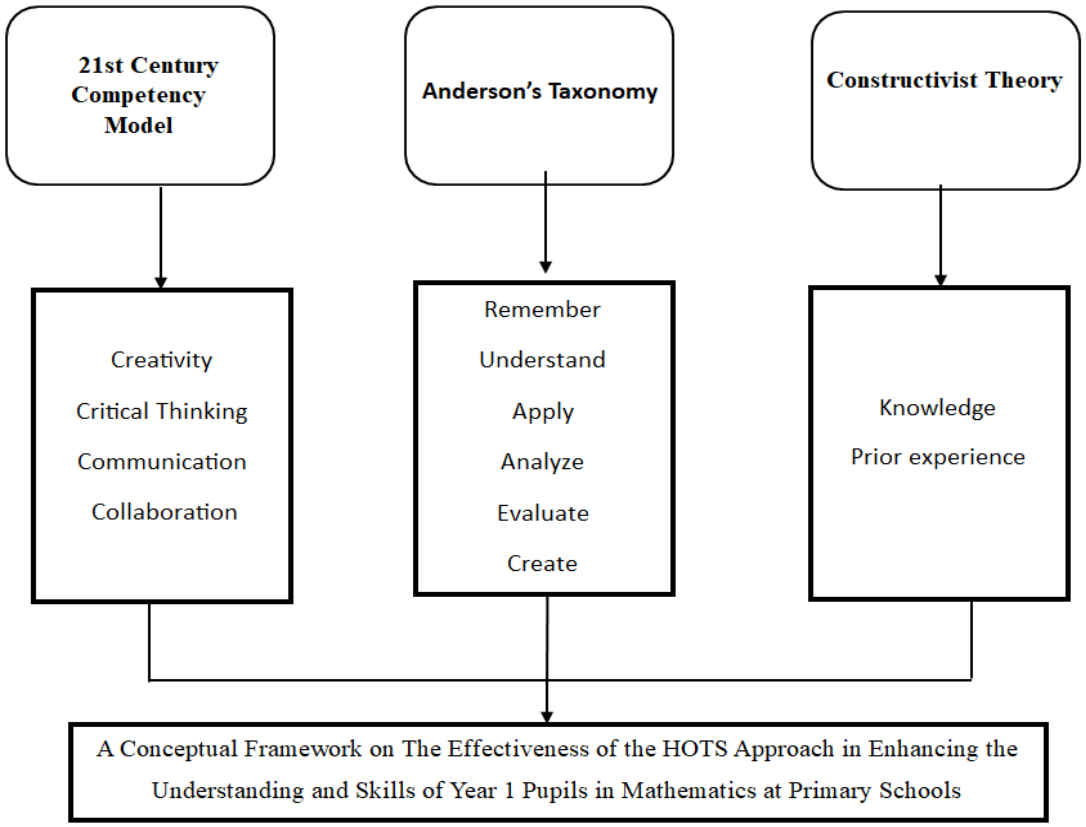

Figure 4: Conceptual Framework adapted from the 21st Century Competency Model (2001),

CONCLUSION

This paper presents a conceptual framework that highlights the effectiveness of Higher Order Thinking Skills (HOTS) in strengthening Year 1 pupils' understanding and skills in Mathematics. By integrating Bloom's Revised Taxonomy, Constructivist Theory, and the 21st Century Competency Model, the framework underscores the importance of designing student-centered, higher-order learning experiences that promote critical and creative thinking from the early years of schooling.

The contribution of this paper is primarily theoretical, offering a structured lens through which policymakers, educators, and researchers can understand the complex interplay between teacher readiness, pedagogical strategies, and contextual challenges in implementing HOTS. Practically, the framework provides insights for teacher training programs, curriculum developers, and school administrators to better support the integration of HOTS into early Mathematics education.

Future empirical research is recommended to validate and refine this framework through classroom-based studies, incorporating quantitative data and experimental designs to measure the impact of HOTS on pupils' achievement.

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