Exploring Factors Influencing Habits of Mind: A Narrative Literature Review

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Abstract. Habits of Mind (HoM) are a set of intellectual dispositions that play a crucial role in fostering critical, creative, and reflective thinking, as well as sound decision-making in both educational contexts and everyday life. In the face of the demands of the 21st century, developing HoM has become increasingly relevant for addressing complex problems that require Higher Order Thinking Skills (HOTS), cognitive flexibility, and self-regulation. This study aims to explore the key factors that influence the development of HoM through a narrative literature review. Relevant scholarly works were critically examined to identify and categorize the factors shaping HoM. The review highlights five major factors: (1) cognitive factors related to HOTS and metacognition, (2) affective factors such as motivation, attitudes, and emotional dispositions, (3) social-environmental factors including support from family, peers, and academic communities, (4) pedagogical factors involving teaching strategies, approaches, and instructional design, and (5) contextual and cultural factors that reflect values, norms, and educational practices. The findings emphasize that HoM emerge through the multidimensional interaction of individual, social, pedagogical, and cultural aspects. This article concludes by recommending an integrated educational approach to nurture HoM in learners more effectively.

Keywords: educational factors; habits of mind; higher order thinking skills

INTRODUCTION

The rapid progress of digital technologies, globalization, and the rise of social complexity demand human resources who can not only have technical skills but also Higher Order Thinking Skills (HOTS). These skills include critical and creative thinking, problem-solving, and decision-making in uncertain situations (Brookhart, 2010; Fatahillah et al., 2021; Marzano, 2010; Retnawati et al., 2018). In the context of 21st-century education, numerous studies have highlighted Hatos' ideas as essential competencies that enable learners to compete globally and adapt to

rapid changes (Albarracín Vanoy, 2023; Al-Zoubi & Suleiman, 2021; Shahroom & Hussin, 2018; Šimunović & Vekić-Kljaić, 2024). To develop these skills regularly, a comprehensive framework involving cognitive, affective, and social dimensions is essential. One relevant approach is Habits of Mind (HoM), defined as a set of intellectual dispositions that enable individuals to think reflectively, persistently, flexibly, and from different viewpoints (Costa, A. L., & Kallick, 2009; Dweck, 2016). HoM incorporates affective, social, and cultural dimensions, in contrast to frameworks that focus primarily on cognitive dimensions. This provides a crucial foundation for lifelong learning and adaptive problem-solving in the face of complex global challenges (Al Abbasi et al., 2023; Yandari et al., 2019).

Recent research has demonstrated that HoM integration in education enhances learning quality, reinforces metacognitive skills and capabilities, and facilitates collaborative learning within the educational environment. Indicatively, Susanti (2020) has developed the latest evidence demonstrating how the introduction of thinking dispositions into instructional practice can encourage students to become more resilient in problem-solving. Equally, Alhamlan et al. (2017) and Altan et al. (2019) have discovered that HoM has the potential to enhance socio-emotional skills aligned with the requirements of 21st-century education. Furthermore, a body of evidence based on publications indexed in Scopus suggests that the overall trends in global education are evolving into a method of responding to technological disruption and the uncertainties of future trends, which are shifting towards the cultivation of critical dispositions and lifelong learning skills (Sumartini, 2022). All of these findings support the conclusion that HoM can not just apply to cognitive development, but also can be considered among the components of the broader pre-programmatic agenda of equipping learners to be educated in complex and rapidly changing settings.

However, even with the increased focus on HoM, a significant portion of existing research remains incomplete and dispersed. Many studies have been restricted to specific dimensions, such as critical or creative thinking, overlooking connections between other essential dimensions that together form an overall framework of student thinking (Brookhart, 2010; Costa, A. L., & Kallick, 2009; Marzano, 2010). For instance, Shahroom & Hussin (2018) underscored the importance of critical thinking for navigating the challenges of the Fourth Industrial Revolution, but did not link it with metacognition and self-regulation. Likewise, Yandari et al. (2019) concentrated primarily on problem-solving skills associated with HOTS, while giving limited attention to HoM as the foundation for long-term intellectual dispositions. This gap highlights the need for a more holistic perspective that situates HoM as a multidimensional construct, bridging the cognitive, affective, and socio-cultural aspects of learning.

In addition, research examining the factors that influence the strengthening of HoM remains limited. Several studies have primarily focused on cognitive aspects, while socio-emotional factors, learning motivation, and classroom environments have not been comprehensively mapped (Al-Zoubi & Suleiman, 2021; Alhamlan et al., 2017; Sumartini, 2022; Yandari et al., 2019). Yet in the context of 21st-century learning, the successful development of HoM cannot be separated from external factors such as instructional models, supportive classroom climates, and the integration of socio-emotional competencies (Alexander & Vermette, 2019; Dweck, 2016).

Methodologically, prior studies on HoM also show limitations. Most existing research has been empirical, often relying on quantitative measurements of specific skills or small-scale case studies. Few narrative literature reviews have attempted to synthesize these findings into a more integrated analytical framework. As a result, the understanding of how HoM can be developed in conjunction with HOTS remains fragmented and lacks a clear conceptual map.

Building on this gap, the novelty of the present study lies in offering a narrative literature review that comprehensively connects the factors influencing HoM with higher-order thinking skills (HOTS). While earlier research tended to focus on a single aspect of HoM, such as critical thinking (Khotimah et al., 2019; Siti Rahmatina et al., 2022) or its application in specific fields (Al-Zoubi & Suleiman, 2021; Susanti, 2020), this study examines HoM in relation to multiple dimensions: critical, creative, metacognitive, and self-regulatory within a more holistic framework. This review provides a conceptual framework to align HoM with 21st-century learning strategies that emphasise cognitive flexibility and lifelong learning, in addition to describing empirical practices (Costa, A. L., & Kallick, 2009; Dweck, 2016). This contribution is essential in a time of rapid change, where students must develop flexible and sustainable thought patterns in addition to mastering academic skills.

This research is expected to make both theoretical and practical contributions. Theoretically, it contributes to the body of literature on Habits of Mind (HoM) by employing a more detailed narrative review method. Unlike other past research projects that are frequently partial or fragmented, concentrating on individual facets of HoM like critical or creative thinking, the proposed review aims to combine several dimensions of HoM, that is, critical, creative, reflective, metacognitive, and self-regulatory dispositions into a single framework (Brookhart, 2010; Costa, A. L., &

Kallick, 2009; Marzano, 2010). This way, the research not only summarizes what is already known but also demonstrates how these dimensions interact and combine to generate higher-order thinking skills (HOTS) among students. This combined approach has a superior conceptual basis for understanding how HoM can be viewed as a multidimensional construct.

Considering its practical aspect, one may say that the research offers new perspectives on developing effective teaching and learning strategies within the higher education institutions' teaching and learning environments. A syntactic act of opportunity that compiles results from previous studies, it provides more practical suggestions on classroom activities that would both facilitate HoM and HOTS. This is all the more pertinent in the contemporary environment, when it is no longer merely required that the cognitive abilities, but also the affective and metacognitive ones, including cognitive flexibility and the ability to solve complex problems and resilience amid failure (Al Abbasi et al., 2023; Alhamlan et al., 2017; Dweck, 2017). In this regard, the insights gained from this review can enlighten educators to build learning environments that support intellectual development and adaptability.

Moreover, the research creates space for the development of innovative instructional models that consider cognitive, social, and emotional aspects within a single framework. This aligns with recent research directions, which focus on the convergence of 21st-century skills, emotional intelligence, and a growth mindset in education (Al-Zoubi & Suleiman, 2021; Shahroom & Hussin, 2018). This review adds conceptual value to the literature, as it approaches the topic through descriptive narratives with a synthesis that can serve as a basis for future research and teaching. At last, this contribution justifies the necessity to introduce holistic methods of integration between internal (motivation, self-regulation, and self-efficacy) and external (collaborative learning conditions, instructors, and socio-emotional support) systems of influence to adapt HoM and HOTS (Brookhart, 2010; Costa, A. L., & Kallick, 2021; Dweck, 2017; Marzano, 2010).

METHODS

Research Design

This study adopted a narrative literature review approach to map, analyze, and synthesize existing research on Habits of Mind (HoM) in the educational context. This approach was selected because it allows for an integrative understanding of HoM's conceptual development, its relationship to higher-order thinking skills (HOTS), and its relevance to 21st-century learning (Altan et al., 2019).

Data Collection and Search Strategy

Relevant literature was collected from major academic databases, including Scopus, Web of Science, SpringerLink, ScienceDirect, and Taylor & Francis Online, as well as selected accredited Indonesian journals, to ensure representation from both global and local research perspectives. The search process used Boolean operators to combine keywords such as "Habits of Mind," "critical thinking," "higher-order thinking skills," "reflective thinking," "creativity in education," and "socio-emotional learning" Booth et al., 2016). The initial search, covering the period 2010–2024, yielded 203 articles. After duplicate removal and screening of titles and abstracts for relevance, 87 articles remained. Subsequent full-text review and application of the inclusion–exclusion criteria resulted in 42 eligible articles, which were retained for comprehensive analysis.

Inclusion and Exclusion Criteria

The inclusion criteria for this review required that sources be peer-reviewed journal articles, book chapters, or conference proceedings published between 2010 and 2024, written in either English or Indonesian, and that they explicitly discuss Habits of Mind (HoM) in relation to educational practice or theory at the primary, secondary, or higher education levels. Conversely, exclusion criteria eliminated non–peer–reviewed publications, such as opinion pieces, blogs, or popular articles, as well as studies unrelated to the field of education and any publications lacking conceptual or methodological clarity (Petticrew & Roberts, 2006).

Data Analysis

The final 42 articles were coded and organized using Microsoft Excel to facilitate thematic grouping, comparison, and synthesis (Bowen, 2009). A thematic synthesis approach was applied (Thomas & Harden, 2008), identifying four main thematic clusters:

1. HoM and critical thinking.
2. HoM and reflective learning.
3. HoM and socio-emotional learning.
4. Integration of HoM with HOTS.

This process enabled the identification of patterns, thematic gaps, and implications for future pedagogical practices.

Validity and Reliability

To ensure the rigor and credibility of this review, several validation strategies were implemented. Source triangulation was applied by utilizing multiple academic databases to enhance the comprehensiveness of data collection. Additionally, peer debriefing sessions were conducted with educational experts to verify interpretations and improve the trustworthiness of the findings. Furthermore, an audit trail was maintained to systematically record the search process, inclusion and exclusion decisions, and coding procedures, thereby ensuring transparency, consistency, and replicability throughout the review process (Lincoln & Guba, 1985).

RESULT AND DISCUSSION

The narrative synthesis of 42 selected articles revealed that various interdependent factors contribute to the development of Habits of Mind (HoM). As consistent with the conceptualization provided by Costa, A. L., & Kallick (2009, 2015, 2021), HoM is not simply a collection of cognitive skills, but also entails dispositions, motivation, and thinking strategies that facilitate productive problem-solving. The studies reviewed supported the assumption that HoM is a result of a dynamic interaction between internal and external factors, which correlates with theories of thinking dispositions and self-regulated learning (Nurdiansyah et al., 2021; Sinaga & Arliani, 2024). Based on the analysis, five Pivots categories of factors were identified, namely: (1) cognitive, (2) affective, (3) social, (4) pedagogical, and (5) contextual. Such themes enable the development of a broad perspective on how HoM can be nurtured in the educational context, and they form the foundation of the discussion that follows below.

Cognitive Factors

Cognitive factors are among the most fundamental determinants of Habits of Mind (HoM), as they are directly related to the individual's skills in receiving, processing, and applying information to complex problem-solving tasks. Providing the cognitive foundation of HoM, learning will equip students with the higher-order thinking skills (HOTS) of analysing, evaluating, and creating, which are the essence of HoM as productive dispositions that are mobilised when encountering uncertain or new situations (Costa, A. L., & Kallick, 2021). In this respect, cognition is viewed not only as a prerequisite for effective learning but also as a critical enabler of intellectual dispositions that extend beyond academic performance. The literature consistently highlights that without a sufficient level of cognitive engagement, students may struggle to sustain HoM indicators such as persistence, flexibility, and the capacity to draw connections across different learning contexts (Brookhart, 2010; Marzano, 2010).

Within the framework of cognitive psychology, HoM has been closely linked to metacognition, which refers to the awareness and regulation of one's own thinking processes. Increased capacity to track understanding, detect areas of ignorance, and modify methods used in the learning process carried out by metacognitive learners facilitates HoM dispositions, such as thinking about thinking and applying existing knowledge in new contexts. As an example, studies such as Using Educational Chatbots with Metacognitive Feedback to Improve Science Learning (Yin et al., 2024) and Metacognitive Strategies, Language Learning Motivation, Self-Efficacy Belief and English Learning Achievement

During Remote Learning (Teng et al., 2023) discovered that metacognitive regulation, belief in one's abilities (self-efficacy), and responsiveness to feedback are associated with improved academic achievement. Based on such studies, it appears that metacognition is not a specific cognitive ability, but rather a motivating process that ensures the continuation of HoM in the form of a lifelong learning orientation.

The other vital aspect of the cognitive domain is the working memory capacity, as this is a crucial aspect that helps learners combine and manipulate information when solving problems. Information processing theory (Atkinson & Shiffrin, 1968) suggests that working memory is a temporary, dynamic workspace into which useful information can be stored and rearranged to form new meaning. When students have enough working memory capacity, it is more likely that they make connections between what they already know and new experiences, hence they activate HoM dispositions like connecting past to present, questioning, and problem posing. This process of integration becomes essential in complex learning settings, where learners must work with various sources of information simultaneously.

Besides metacognition and working memory, HoM has a cognitive underpinning of critical thinking. Critical thinking involves the systematic and rational evaluation of evidence, as well as reflection on various aspects, all of which are vital to dispositions such as working towards accuracy and flexible thinking (Sinaga & Arliani, 2024). Empirical literature, such as Nurmaliza et al. (2022), on Indonesian students and science education, has shown that critical thinking is also associated with the regular use of HoM, especially those indicators that require rational evaluation and consideration of various aspects of a story. This is an addition to the notion that the concept of HoM is not merely an intellectual habit. Still, it constitutes a whole in which cognitive dispositions form the skeleton of high-order thinking.

Combined, the information demonstrates that consideration of cognitive parameters is indispensable in developing HoM, as well as ensuring that students can effectively work with uncertainty, complexity, and novelty in both academic and real-life settings. The combination of metacognitive awareness, working memory, and critical thinking exemplifies how the process of cognition underlies and maintains HoM. What is more significant, these findings reinforce the necessity of teaching and learning processes that overtly encourage cognitive engagement, i.e., motivating often inquiry-based learning, problem-based activities, and reflective exercises. In the absence of deliberate attempts to enhance these cognitive pillars, HoM can remain unexpressed and unsatisfied, failing to fulfill its potential in benefiting lifelong learning and adaptive expertise.

Affective Factors

Affective factors play a vital role in the formation and maintenance of Habits of Mind (HoM) because they relate to the emotive condition, drive, and disposition that a person applies to challenging tasks. Although cognitive capability serves as a structural foundation of HoM, emotional preparation and internal willingness play equally essential roles in maintaining a productive thinking disposition amid uncertainty or adversity (Costa, A. L., & Kallick, 2014). This is to say that learners cannot make deliberate HoM work without the emotional equilibrium, momentum, or assurance to continue going on with whatever it is they think caused their thought to stutter through setbacks. Based on the discovered literature, it is evident that affective dispositions are regarded as the gas that ensures the successful mobilization of cognitive abilities by bridging the divide between potential and performance.

Intrinsic and extrinsic motivation are among the most frequently discussed emotional factors. Intrinsic motivation refers to the motivation that arises from personal interest, curiosity, and satisfaction with the information gained through the actual learning activity itself (Ryan & Deci, 2020). Learners who are intrinsically motivated are more likely to explore a problem in depth, maintain attention for extended periods, and display intellectual curiosity, all of which are closely correlated with other Hoase dispositions, such as persisting and managing impulsivity. On the other hand, extrinsic motivation, which encompasses rewards, grades, or recognition, may be a first step in engaging and motivating. Still, the results are often short-term without intrinsic motivation (Ryan & Deci, 2020). This duality highlights that long-term cultivation of HoM requires learning environments that emphasize intrinsic value and autonomy, not only external reinforcement.

In addition to motivation, another crucial affective factor that affects HoM is emotional regulation. Students who can cope with negative emotions such as frustration, anxiety, or boredom tend to maintain their focus and think clearly under pressure. (Santosa & Aprilisia, 2022) Gross, J. J., & Thompson (2014) explain that, through effective emotion regulation strategies, such as cognitive reappraisal and self-soothing, learners can transform stressful situations into

opportunities for growth. Similarly, Pekrun et al. (2017) highlight the role played by academic emotions, pointing out the positive correlations between positive emotions, such as curiosity and awe, and HoM dispositions, including responding with wonderment and awe, as well as remaining open to continuous learning. Emotionally regulated learners are less likely to perceive challenges as a threat and more likely to view them as an opportunity to learn, which directly supports the adaptive nature of HoM.

Another affective dimension that is central to HoM is self-efficacy, or belief in one's own ability to complete tasks and solve problems successfully. According to Bandura (1997), individuals with high self-efficacy are more persistent, exhibit greater resilience, and are more likely to adopt new strategies, characteristics similar to those associated with HoM, which involve taking responsible risks and finding humor. Recent empirical findings, by Juliani et al. (2024), explain this connection in the sense that students in the university with higher levels of self-efficacy can utilise HoM indicators more effectively and gain insights into academic issues, particularly the need to develop the heart of intellectual and independent decision-making. This implies that it might be just as relevant, or even more appropriate, to assist students in developing confidence in their cognitive and emotional abilities as to teach them the mental skills.

The combination of these findings reiterates that the affective continually is not subordinate to the cognitive factors, but instead, as complementary conditions, HoM will flourish. The psychological strengths and perseverance needed to continue thinking productively include motivation, emotion management, and self-efficacy. In the case of educators, strategies beyond creating cognitively challenging tasks are necessary to develop HoM; it also requires creating supportive environment strategies that cultivate positive emotions, intrinsic motivation, and self-confidence. The evolution of HoM is vulnerable in the absence of a response to these emotional layers, being unstable and often interfered with by failure.

Social and Environmental Factors

The social and physical environment in which learning occurs has played a central role in determining and reinforcing Habits of Mind (HoM). The ecological systems theory proposed by Bronfenbrenner (2005) focuses on the reciprocal nature of social interaction between the individual behavior and thinking patterns and the nine ecological systems: the microsystem (family, peers, and teachers) and the macrosystem (culture, educational policies, and values of society) through which these behaviors are formed. In the context of higher education, social environments that promote support provide students with opportunities to exhibit behaviors of HoM, critical thinking, engagement in cognitive flexibility, and reflexivity. When these environmental conditions are conducive and promote collaboration, inquiry, and open communication, students will be better equipped to take advantage of inevitable opportunities to develop dispositions that foster a lifelong learning approach. Conversely, situations with inflexible guidelines, sparse dialog support, and/or inadequate assistance can adversely influence the development of this kind of disposition, thereby proving the importance of social ecology in educational outcomes.

Educator support is one of the social factors that affect the development of HoM. (Costa, A. L., & Kallick (2015) describe how teachers and lecturers can help students develop constructive thinking habits through the process of providing appropriate scaffolding, offering positive feedback, and allowing students to discover something on their own. The effect of these practices on pedagogical approaches is not merely positive in terms of cognitive engagement, but also in terms of the affective dispositions that enable learners to overcome intellectual challenges every time they encounter them. The study conducted by Sumartini (2022) also reveals that students engaged in collaborative learning environments, where sharing ideas is encouraged and diverse perspectives are considered, exhibit numerous gains in the HoM dimension, including flexible thinking and responding with wonder and awe. All these observations indicate that we must have classrooms that are communities of practice, where dialogue and respect towards otherness become the pillars of both intellectual and personal growth.

The social environment is also a critical element in HoM, as peer interaction is a constituent of it. Peer-based learning provides them with models of problem-solving and promotes growth-oriented dispositions. A report by Yeager & Dweck (2020) indicates that students who have peers who also hold a growth mindset persist, exhibit resilience in the face of failure, and are receptive to feedback, all of which are central tenets of HoM. Alternatively, non-supportive conditions among peers, such as unhealthy competition or limited cooperation, should discourage the acquisition of positive thinking dispositions. Besides the social sphere, the physical learning environment does have an impact. Adequate structures, the availability of resources, and classrooms that can reduce anxiety and enhance

interactivity and engagement represent only a few of the areas that keep students focused and demonstrate active interaction (Tu, 2021). This aligns with the findings of Kassab et al. (2024), who assert that safe, comfortable, and positively structured learning environments facilitate the internalization of productive thinking habits. Combined, these social and environmental circumstances serve as the basis on which HoM can be cultivated and maintained in schools.

Pedagogical Factors

Pedagogical factors relate to the strategies, approaches, and methods used by educators during the teaching and learning process, and they are decisive in forming Habits of Mind (HoM). A well-designed pedagogical approach has the potential to create challenging and engaging learning experiences that challenge students and encourage them to move beyond superficial learning to profound, thoughtful thinking. According to Marzano, R. J., & Kendall (2007), instructional designs that focus on gradually enhancing students' order thinking skills activate students' internalization of critical, creative, and reflective higher-order thinking habits. In this regard, it can be contended that pedagogical strategies serve as the liaison between cognitive possibility and the factualization of intellectual dispositions, offering students guided possibilities to use, streamline, and maintain the process of HoM in any situation. Even students with strong cognitive or affective preparation may struggle to form HoM-related dispositions when deliberate instruction is offered.

The learning approaches that are effective in developing HoM through student-centered methods have consistently proven to be effective learning methods. Indicatively, a study conducted by Zarouk et al. (2020) establishes that being able to endure, maintain impulsivity, and think flexibly are some of the dispositions enhanced through project-based learning, which requires students to design, implement, and reflect on their work. Such methods also help students to become resilient, flexible, and strategic by encouraging them to tackle real-world problems. Moreover, such approaches will enable learners to take control of the learning process, which is vital for developing reflective and self-directed habits. Likewise, collaborative, case-based, and inquiry-based assignments are consistent with the purpose of HoM development, as they frame learning within real-life situations and require members to be flexible and open-minded in their approach to studying and engaging with different ideas.

There is also another aspect of pedagogy: the role of scaffolding in the development of students' thought processes. Based on Vygotsky's theory of the Zone of Proximal Development (ZPD) (1978), scaffolding can be defined as the temporary and adaptive guidance that a teacher provides to their students to help them reach higher levels of understanding. The form scaffolding, as assumed in the context of HoM, could be guiding questions, reflexive comments, or the modelling of an expert thought by adopting a process of "thinking aloud". Bobi & Ahiavi (2023) emphasize that metacognition and self-regulation, as elements of HoM, can be significantly enhanced in response to students' needs through responsive pedagogy and differentiated instruction. Similarly, the use of formative evaluation strategies that facilitate reflection helps HoM development because it encourages learners to evaluate the results of their actions, including their own thoughts. According to Costa, A. L., & Kallick (2015), reflective assessment instills habits such as utilizing knowledge gained in the past to examine new circumstances and the willingness to engage in continuous learning, thus incorporating positive dispositional habits as components in the learning process.

Contextual and Cultural Factors

The contextual and cultural factors are essential in creating and maintaining Habits of Mind (HoM) because patterns of thinking, values, and problem-solving behaviors are deeply rooted in the socio-cultural contexts within which people learn and live. Culture is simply a framework that helps human beings to determine issues, choose activities that can help them, and analyze the consequences. Çelik İskifoğlu et al. (2022) emphasized that the dimensions of power distance, collectivism/individualism, and uncertainty avoidance are key determinants of thinking dispositions. Indicatively, high power-distance cultures are those in which students are likely to trust the authority of teachers and are less eager to challenge ideas, which can pose an obstacle to developing critical and reflective thinking. On the other hand, educational cultures that promote open communication and intellectual freedom are a rich source of HoM dispositions, including questioning, posing problems, and interdependent thinking.

In addition to these macro-cultural aspects, local contexts, such as religious values, social norms, and educational traditions, also dictate the cultivation of HoM. Dispositions related to flexible thinking might not be effectively stimulated in learning settings where the values of social harmony and conflict avoidance are prioritized, as students tend to be hesitant to share their divergent views that might disrupt the conversation (Bernardo & Presbitero, 2018; Karakuş, 2024). However, as the culture of growth mentality is adopted in which failures are perceived as healthy aspects of the learning model, students are bound to show the dispositions of persisting, maintaining impulsivity, and being ready to be constantly in learning (Bernardo & Presbitero, 2018; Karakuş, 2024). These results indicate that culture is not merely a backdrop, but an operational factor by which students revolve and utilize HoM in both academic and non-academic school environments.

Besides the cultural values, social values, and various contextual factors, including curriculum policy, institutional expectations, and assessment schemes that affect the implementation of HoM, are addressed at the educational value system level. As noted by Fullan, M., & Quinn (2020), educational reforms that focus on 21st-century skills are capable of causing a shift in classroom culture to more collaborative, creative, and reflective practices, which can genuinely enhance HoM dispositions. Quite on the contrary, high-stakes assessment systems based on rote memorization and written tests do not allow students to exercise HoM in real-life situations. This highlights the multidimensional nature of contextual and cultural variables, which overlap with cognitive, affective, social, and pedagogical aspects to create a comprehensive model for developing HoM in schools.

The HOTS and Habits of Mind (HoM) are two concepts in education that are often associated, as they are both identified as critical educational concepts for exposing learners to the realities of the 21st century. A meta-analytic structural equation modeling (MASEM) study involving 166 studies by Budsankom, Sawangboon, and Damrongpanit (2015) indicated that psychological characteristics, such as motivation, self-regulation, and curiosity, were associated with the most significant proportion of variance in HOTS ($\beta = 0.762$). Such psychological variables have a very high overlap with the dispositions characterised by HoM, including persistence, reflective thinking, and impulsivity control (Costa, A. L., & Kallick, 2014). Still more recent research goes further to argue that the development of HOTS should be based on dispositional principles; accordingly, Costa, A. L., & Kallick, (2014) note that these students are more apt to be productively involved in creative and critical problem-solving, demonstrating higher socio-emotional readiness and those with higher dispositional thinking. Similarly, Colomer et al. (2020) argue that developing reflective and adaptive dispositions in thinking can provide a solid foundation for advancing students' analysis and assessment abilities. HoM is a necessity in maintaining higher-order learning.

The interaction between HoM and HOTS may be observed at the classroom level, where people teach students using instructional settings that foster dispositional preparation and cognitive activity. Brookhart (2010) and Marzano (2010) observe that, unless the depiction of dispositions such as accuracy striving, questioning, and posing problems is encouraged, any move to endorse HOTS can be hollow. Empirical studies in recent time also confirm this association: (Santosa & Aprilisia, 2022) Nurmaliza et al., (2022) discovered that higher incidences of critical thinking among students of Indonesian science education positively correlated with frequent application of HoM, whereas Sun & Zhang, (2022) established that when metacognitive regulation is heightened, there was an improvement in the dispositional involvement and the higher level of cognitive performance in students. The results can be related to the overall discussion that HoM provides psychological, motivational, and reflective scaffolding needed by HOTS to thrive (Costa, A. L., & Kallick, 2021; Dweck, 2016; Sinaga & Arliani, 2024; Siti Rahmatina et al., 2022). Combined, the references suggest that HoM strengthening should not be viewed as a complement, but rather as a necessary condition, to help develop a vibrant HOTS, where not only is the learner cognitively adept, but also dispositionally equipped to work through complexity, indecision, and innovation in contemporary knowledge.

CONCLUSION

This literature review shows that the development of Habits of Mind (HoM) is shaped by five interconnected domains: cognitive, affective, social, pedagogical, and contextual-cultural. Rather than being a purely cognitive skill, HoM emerges as a multifaceted disposition influenced by emotional support, learning environments, teaching approaches, and cultural values. The paper's contribution lies in bringing these elements together into an integrated conceptual synthesis and linking them to higher-order thinking skills (HOTS), which enriches theoretical understanding and points to practical directions for twenty-first-century teaching.

For future research, we recommend moving beyond description toward empirical testing of the relationships identified here. Specifically, studies that employ mixed-methods designs or longitudinal approaches would help uncover causal pathways and developmental trajectories of HoM across different educational levels. Experimental or quasi-experimental designs could test which pedagogical interventions most effectively foster particular habits. At the same time, qualitative work could illuminate how cultural and contextual factors shape the enactment of HoM in classrooms. Research that investigates curriculum integration and authentic assessment of HoM would be especially valuable, as would studies that examine teacher beliefs and leadership practices as mediators of student outcomes.

In short, this review highlights HoM as a foundational target for lifelong learning, one that supports critical, creative, reflective, and adaptive learners, who are prepared for the challenges of Industry 4.0 and Society 5.0. By suggesting concrete, empirical, and design directions, the paper aims to bridge theory and practice, guiding researchers and educators who seek to make HoM a tangible part of teaching and assessment

REFERENCES

Al Abbasi, R. H. A. K., Taha, H. H. I., & Suleiman, D. S. M. (2023). Habits of mind and the ability to solve problems among middle school students with learning disabilities. *Educational Research and Innovation Journal*, *3*(8), 100–121. https://doi.org/10.21608/erji.2023.268605

Al-Zoubi, A. M., & Suleiman, L. M. (2021). Flipped Classroom Strategy Based on Critical Thinking Skills: Helping Fresh Female Students Acquire Derivative Concepts. *International Journal of Instruction*, *14*(2), 791–810. https://doi.org/10.29333/iji.2021.14244a

Albarracín Vanoy, R. J. (2023). Navigating the 21st Century: The Internationalization of the Curriculum and Critical Competencies for the Future. *Salud, Ciencia y Tecnología - Serie de Conferencias*, *2*, 539. https://doi.org/10.56294/sctconf2023539

Alexander, K., & Vermette, P. (2019). Implementing Social and Emotional Learning Standards by Intertwining the Habits of Mind with the CASEL Competencies.[1] *Excelsior: Leadership in Teaching and Learning*, *12*(1). https://doi.org/10.14305/jn.19440413.2019.12.1.03

Alhamlan, S., Aljasser, H., Almajed, A., Almansour, H., & Alahmad, N. (2017). A Systematic Review: Using Habits of Mind to Improve Students' Thinking in Class. *Higher Education Studies*, *8*(1), 25. https://doi.org/10.5539/hes.v8n1p25

Altan, S., Lane, J. F., & Dottin, E. (2019). Using Habits of Mind, Intelligent Behaviors, and Educational Theories to Create a Conceptual Framework for Developing Effective Teaching Dispositions.[2] *Journal of Teacher Education*, *70*(2), 169–183. https://doi.org/10.1177/0022487117736024

Atkinson, R. C., & Shiffrin, R. M. (1968). Human Memory: A Proposed System and its Control Processes.[3] *Psychology of Learning and Motivation*, *2*, 89–195. https://doi.org/10.1016/S0079-7421(08)60422-3[45]

Bandura, A. (1997).[6] *Self-efficacy: The exercise of control*. W. H. Freeman.[78]

Bernardo, A. B. I., & Presbitero, A. [9](2018). Cogniti[10]ve flexibility and cultural intelligence: Exploring the cognitive aspects of effective functioning in culturally diverse contexts. *International Journal of Intercultural Relations*, *66*, 12–21. https://doi.org/10.1016/j.ijintrel.2018.06.001

Bobi, C. B., & Ahiavi, M. A. (2023). Using Differentiated Instruction to Promote Creativity, Critical Thinking, and Learning: Perspective of Teachers. *Journal of Education and Practice*, *7*(2), 1–30. https://doi.org/10.47941/jep.1227

Booth, A., Sutton, A., & Papaioannou, D. (2016). *Systematic approaches to a successful literature review* (2nd ed.). Sage.

Bowen, G. A. (2009). Document Analysis as a Qualitative Research Method. *Qualitative Research Journal*, *9*(2), 27–40. https://doi.org/10.3316/QRJ0902027

Bronfenbrenner, U. (2005). *Making human beings human: Bioecological perspectives on human development*. Sage.

Brookhart, S. M. (2010). *How to assess higher-order thinking skills in your classroom*. ASCD.

Çelik İskifoğlu, T., Çerkez, Y., & İskifoğlu, G. (2022). Thinking culture and critical thinking dispositions of high school students in Turkish Republic of Northern Cyprus. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.1017747

Colomer, J., Serra, T., Cañabate, D., & Bubnys, R. (2020). Reflective Learning in Higher Education: Active Methodologies for Transformative Practices. *Sustainability*, *12*(9), 3827. https://doi.org/10.3390/su12093827

Costa, A. L., & Kallick, B. (2009). *Learning and leading with habits of mind: 16 essential characteristics for success*. ASCD.

Costa, A. L., & Kallick, B. (2014). *Dispositions: Reframing teaching and learning*. Corwin Press.

Costa, A. L., & Kallick, B. (2015). *Habits of mind: 16 essential characteristics for success*. ASCD.

Costa, A. L., & Kallick, B. (2021). *Habits of mind in the classroom: A guide for teachers, students, and parents*. ASCD.

Dweck, C. S. (2016). *Mindset: The new psychology of success*. Ballantine Books.

Dweck, C. S. (2017). *Mindset: Changing the way you think to fulfill your potential*. Robinson.

Fatahillah, A., Liyandri, V. A., & Monalisa, L. A. (2021). Senior High School Students' Higher Order Thinking Skills in Solving Combinatorics Problems. *Jurnal Pendidikan Matematika*, *16*(1), 89–102. https://doi.org/10.22342/jpm.16.1.15121.89-102

Fullan, M., & Quinn, J. (2020). *Deep learning: Engage the world change the world*. Corwin Press.

Gross, J. J., & Thompson, R. A. (2014). *Handbook of Emotion Regulation* (2nd ed., pp. 3–20). Guilford Press.

Juliani, L. Y., Hanifah, H., & Haji, S. (2024). Pengaruh Habits Of Mind Dan Self Efficacy Terhadap Berpikir Kritis di SMP Negeri 6 Kota Bengkulu. *Jurnal Lebesgue: Jurnal Ilmiah Pendidikan Matematika, Matematika Dan Statistika*, *5*(3), 1465–1481. https://doi.org/10.46306/lb.v5i3.654

Karakuş, İ. (2024). University students' cognitive flexibility and critical thinking dispositions. *Frontiers in Psychology*, *15*. https://doi.org/10.3389/fpsyg.2024.1420272

Kassab, S. E., Rathan, R., Taylor, D. C. M., & Hamdy, H. (2024).[11] The impact of the educational environment on student engagement and academic performance in health professions education. *BMC Medical Education*, *24*(1), 1278. https://doi.org/10.1186/s12909-024-06270-9

Khotimah, K., Widiati, U., Mustofa, M., & Ubaidillah, M. F. (2019).[12] Autonomous English learning: Teachers' and students' perceptions. *Indonesian Journal of Applied Linguistics*, *9*(2). https://doi.org/10.17509/ijal.v9i2.20234[13]

Lincoln, Y. S[14]., & Guba, E. G. (1985).[15] *Naturalistic inquiry*. Sage.

Marzano, R. J., & Kendall, J. S. (2007). *The new taxonomy of educational objectives* (2nd ed.). Corwin Press.[16]

Marzano, R. J. (2010). *Teaching and assessing 21st-century skills*. Solution Tree Press.

Nurdiansyah, S., Sundayana, R., & Sritresna, T. (2021). Kemampuan Berpikir Kritis Matematis serta Habits Of Mind Menggunakan Model Inquiry Learning dan Model Creative Problem Solving. *Mosharafa: Jurnal Pendidikan Matematika*, *10*(1), 95–106. https://doi.org/10.31980/mosharafa.v10i1.644

Nurmaliza, N., Ariawan, R., Dahlia, A., Nufus, H., & Nurdin, E. (2022).[17] Analysis of Mathematical Critical Thinking Ability Viewed from Habits of Mind. *Jurnal Pendidikan MIPA*, *23*(3), 904–917. https://doi.org/10.23960/jpmipa/v23i3.pp904-917

Pekrun, R., Lichtenfeld, S., Marsh, H. W., Murayama, K., & Goetz, T. (2017). Achievement Emotions and Academic Performance: Longitudinal Models of Reciprocal Effects. *Child Development*, *88*(5), 1653–1670. https://doi.org/10.1111/cdev.12704

Petticrew, M., & Roberts, H. (2006).[18] *Systematic reviews in the social sciences: A practical guide*. Blackwell Publishing.

Retnawati, H., Djidu, H., Kartianom, Apino, E., & Anazifa, R. D. (2018). Teachers' knowledge about higher-order thinking skills and its learning strategy. *Problems of Education in the 21st Century*, *76*(2), 215–230. https://doi.org/10.33225/pec/18.76.215

Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology*, *61*, 101860. https://doi.org/10.1016/j.cedpsych.2020.101860

Shahroom, A. A., & Hussin, N. (2018). Industrial Revolution 4.0 and Education. *International Journal of Academic Research in Business and Social Sciences*, *8*(9). https://doi.org/10.6007/IJARBSS/v8-i9/4593

Šimunović, Z., & Vekić-Kljaić, V. (2024). Competencies for the 21st Century: Is Education Keeping up with Industry 4.0? *Technological and Industrial Applications*, 335–343. https://doi.org/10.1007/978-3-031-66271-3_36

Sinaga, Y. D. K., & Arliani, E. (2024). Do Habits of Mind and Cognitive Style Affect Critical Thinking Ability of High School Students? *Jurnal Kependidikan: Jurnal Hasil Penelitian Dan Kajian Kepustakaan Di Bidang Pendidikan, Pengajaran Dan Pembelajaran*, *10*(3), 1243. https://doi.org/10.33394/jk.v10i3.12730

Siti Rahmatina, Nova Fahradina, Afrida Hanum, & Risy Mawardati. (2022). Pengaruh Habits Of Mind dan Self Concept terhadap Berpikir Kritis Matematis. *Jurnal Pendidikan MIPA*, *12*(4), 1229–1235. https://doi.org/10.37630/jpm.v12i4.777

Sumartini, T. S. (2022). Pengaruh Habit of Mind terhadap Kemampuan Berpikir Kreatif Matematis melalui Metode Pembelajaran Improve. *Mosharafa: Jurnal Pendidikan Matematika*, *11*(1), 167–178. https://doi.org/10.31980/mosharafa.v11i1.696

Sun, Q., & Zhang, L. J. (2022). Understanding learners' metacognitive experiences in learning to write in English as a foreign language: A structural equation modeling approach. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.986301

Susanti, E. (2020). Pendidikan Karakter Melalui Mathematical Habits Of Mind. *Pasundan Journal of Mathematics Education: Jurnal Pendidikan Matematika*, *2*(1), 1–11. https://doi.org/10.23969/pjme.v2i1.2465

Teng, M. F., Wang, C., & Wu, J. G. (2023). Metacognitive Strategies, Language Learning Motivation, Self-Efficacy Belief, and English Achievement During Remote Learning: A Structural Equation Modelling Approach. *RELC Journal*, *54*(3), 648–666. https://doi.org/10.1177/00336882211040268

Thomas, J., & Harden, A. (2008). Methods for the thematic synthesis of qualitative research in systematic reviews. *BMC Medical Research Methodology*, *8*(1), 45. https://doi.org/10.1186/1471-2288-8-45

Tu, X. (2021). The Role of Classroom Culture and Psychological Safety in EFL Students' Engagement. *Frontiers in Psychology*, *12*. https://doi.org/10.3389/fpsyg.2021.760903

Yandari, I. A. V., Supartini, S., Pamungkas, A. S., & Khaerunnisa, E. (2019). The Role of Habits of Mind (HOM) on Student's Mathematical Problem Solving Skills of Primary School. *Al-Jabar: Jurnal Pendidikan Matematika*, *10*(1), 47–57. https://doi.org/10.24042/ajpm.v10i1.4018

Yeager, D. S., & Dweck, C. S. (2020). What can be learned from growth mindset controversies? *American Psychologist*, *75*(9), 1269–1284. https://doi.org/10.1037/amp0000794

Yin, J., Zhu, Y., Goh, T.-T., Wu, W., & Hu, Y. (2024). Using Educational Chatbots with Metacognitive Feedback to Improve Science Learning. *Applied Sciences*, *14*(20), 9345. https://doi.org/10.3390/app14209345

Zarouk, M. Y., Olivera, E., Peres, P., & Khaldi, M. (2020). The Impact of Flipped Project-Based Learning on Self-Regulation in Higher Education. *International Journal of Emerging Technologies in Learning (IJET)*, *15*(17), 127. https://doi.org/10.3991/ijet.v15i17.14135