

THE IMPACT OF MODULAR LEARNING ON STUDENT COMPREHENSION, MOTIVATION, AND SKILL DEVELOPMENT

¹Mohamad Rashif Qinthara Sihotang, ²Yuma Yudhayana,
³Mitha Nur Salsabilla

JC2 - Temasek Independent School Bandung

Email: atharsihotang@gmail.com,

JC2 - Temasek Independent School Bandung

Email: yuma.yudhayana@tisbandung.sch.id,

JC2 - Temasek Independent School Bandung

Email: mitha.salsabilla@tisbandung.sch.id

Abstract, *This study explores the impact of modular learning on Grade 10–12 students at Temasek Independent School using a qualitative descriptive approach through semi-structured interviews. Findings show that focusing on fewer subjects improves comprehension, though challenges like inconsistent scheduling and poor module selection can reduce motivation and self-confidence. Psychologically, students who selected modules based on personal interests showed greater motivation and autonomy, while others experienced disengagement. Project-based learning supported life skill development, particularly in time management, problem-solving, and collaboration. Despite structural inefficiencies, students used adaptive strategies such as self-regulated planning and teacher consultations to manage the system. The study emphasizes the importance of refining modern, flexible learning models to better support student engagement, autonomy, and overall growth.*

Keywords: *Modular learning, student motivation, cognitive development, psychomotor skills, self-regulated learning, project-based education.*

Introduction

Education is one of the key pillars in building the future of a nation. Through quality education, we can shape human resources that are competitive on a global scale and capable of contributing to national progress. In Indonesia, the education system has continuously undergone changes and adjustments to respond to the increasingly complex challenges of the times. The government has implemented various reforms, particularly in terms of curriculum. Over the years, the national curriculum has changed multiple times from the

Competency-Based Curriculum (KBK), the School-Based Curriculum (KTSP), the 2013 Curriculum (K-13), to the most recent Merdeka Curriculum.

Each curriculum revision aims to enhance the quality of learning so that it becomes more relevant to societal needs and global developments. The Merdeka Curriculum, for example, emphasizes student-centered learning, character development, and offers students the opportunity to learn according to their interests and capabilities. As mentioned by Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi (2022), the Merdeka Curriculum seeks to provide flexibility for students and schools in designing learning experiences that are more contextual and personalized. However, despite these ongoing updates, the implementation of these curricula in practice still faces several challenges. These include disparities in education quality across regions, limited learning facilities, and the readiness of educators to adapt to change. These challenges were further exacerbated during the COVID-19 pandemic, which affected countries worldwide, including Indonesia. Face- to-face learning was abruptly replaced by online learning, creating a demand for more flexible and adaptable learning systems. In this context, modular learning began to emerge as an effective and relevant alternative.

Modular learning is a system that enables students to learn independently through modules that are tailored to their level of understanding and learning pace. According to Majid (2014), modules are systematically arranged learning units that enable learners to study independently and achieve learning outcomes progressively. In this system, students are not required to study all subjects simultaneously. Instead, they can choose specific modules based on their needs and complete them within a flexible time frame. This approach aims to foster greater independence, motivation, and active engagement in the learning process.

As time progresses, the challenges facing the education sector continue to evolve. The rise of digital technologies, the changing mindset of younger generations, and the dynamic demands of the workforce require the education system to adapt accordingly. Trilling and Fadel (2009) emphasized that education must develop 21st- century skills such as critical thinking, creativity, communication, collaboration, and digital literacy to prepare students for a rapidly changing world. This shift is evident in various educational policies, including the development of the MerdekaCurriculum, which is more flexible, contextual, and offers students the freedom to explore and develop their potential. The curriculum also aims to reduce the academic burden and shift

the focus from rote memorization to conceptual understanding. Additionally, the government promotes more adaptive learning approaches, such as project-based learning, differentiated instruction, and technology-integrated learning. Modern education demands systems that can respond to the individual needs of learners. Not all students learn in the same way, and not all regions share equal educational conditions. Therefore, more flexible and personalized systems, such as modular learning, are essential for addressing these diverse needs. As mentioned by Knowles (1984), adult learners or self-directed learners prefer learning experiences that are problem-centered and allow them to take responsibility for their own learning.

The modular system allows education to become more “human-centered,” as it does not force all students to progress at the same pace. Students are given the opportunity to learn at their own pace and rhythm, without feeling left behind or pressured. This makes the learning process more inclusive and gives every student a chance to grow according to their unique potential. Temasek Independent School, through the implementation of the modular learning system at the secondary level (senior high school), exemplifies how schools can adopt a more relevant and contemporary education model. By integrating the Merdeka Curriculum with the Pearson Edexcel Curriculum, and implementing modular learning since the 2022/2023 academic year, Temasek seeks to bridge the gap between national standards and global expectations while adapting to each student’s individual characteristics and abilities. In the modular system at Temasek Senior High School, students are given the autonomy to select learning modules based on their interests, abilities, and pace. This aligns with the principles of the Merdeka Curriculum, which emphasizes freedom and independent learning. Students are no longer passive recipients of information but are encouraged to actively participate in shaping their own learning journey. This approach enables them to be more focused, take greater responsibility for their learning, and gain a more meaningful educational experience. Moreover, this system transforms the role of teachers from mere content deliverers to facilitators and mentors in students’ learning processes (Brookfield, 2013).

This initiative reflects a new direction for Indonesian education one that is more adaptive, student-centered, and future-oriented. However, such innovations must still be thoroughly evaluated to ensure they are truly effective in improving educational quality and preparing a generation that is equipped

to face the challenges of the times. Therefore, this study aims to explore how the current education system in Indonesia, specifically at Temasek Independent School, supports the enhancement of learning quality and encourages active student participation through the implementation of a flexible, contextual, and learner-centered modular learning system.

Referring to the background that has been presented, the research problem is formulated as follows:

1. How does the modular system affect the psychological and emotional aspects of learning motivation and self-confidence of Temasek Independent School students?
2. How does the modular system affect learning motivation and self-confidence of Temasek Independent School students?
3. Can the projects in the modular system develop Temasek Independent School students' daily life skills?

This study aims to assess the effectiveness of the modular learning system in supporting student development across cognitive, affective, and psychomotor domains at Temasek Independent School. Specifically, it seeks to examine how the modular system influences students' learning motivation and self-confidence, particularly in psychological and emotional aspects, and to explore whether its project-based components help develop students' daily life skills.

The research offers both theoretical and practical contributions. Theoretically, it expands the body of literature on alternative learning models within the Indonesian education context, highlights the long-term effects of modular learning on students' affective and psychomotor growth, and provides a foundation for future comparative studies on learning systems. Practically, it delivers insights for educators to optimize the modular curriculum, supports administrators and policymakers in improving system structure and student engagement, and helps students and parents better understand how to maximize the curriculum's benefits.

Literature Review

Education in Indonesia over the Last 10–15 Years

Over the past 10 to 15 years, Indonesia's education system has undergone substantial transformation in response to both global educational trends and local challenges. As the country continues to develop, the government has made efforts to improve access to education through the implementation of

compulsory basic education and increased funding via programs such as the School Operational Assistance (Bantuan Operasional Sekolah, BOS). This policy has allowed more children, especially in rural and underdeveloped areas, to attend school (Suryadarma & Jones, 2013). However, while access has improved, disparities in educational quality and learning outcomes remain a significant issue across regions, highlighting persistent inequality between urban and rural schools (Chang et al., 2014).

In response to these disparities and concerns over low student achievement, Indonesia has embarked on several educational reform initiatives. These include curriculum revisions, teacher competency development programs, and the adoption of information and communication technology in schools. The government launched the “Merdeka Belajar” (Freedom to Learn) program, aiming to shift away from rigid, test-oriented systems toward more student-centered, flexible, and competency-based approaches. This initiative emphasizes autonomy for schools and teachers, formative assessment, and the development of 21st-century skills among students (Chang et al., 2014). Despite these positive changes, implementation remains uneven, often hindered by bureaucratic inertia, lack of infrastructure, and limited teacher training.

A major concern that persists is the low level of learning achievement. According to the World Bank (2020), many Indonesian students face “learning poverty,” defined as the inability to read and comprehend simple text by the age of 10. International assessments such as PISA have consistently ranked Indonesia below the global average in reading, mathematics, and science. This has prompted stakeholders to rethink teaching strategies and curriculum structures to better support student engagement and deeper learning. Overall, while Indonesia has made notable strides in expanding education access and initiating reforms, the challenge now lies in ensuring that these changes translate into improved quality and equitable learning outcomes for all students.

Theories on Learning and Education

Modular learning systems emphasize flexibility, independence, and mastery-based progression, aligning closely with several prominent educational theories. One foundational framework is Constructivist Learning Theory, which asserts that learners actively construct knowledge through

personal experiences and reflective processes. In modular learning, students are encouraged to explore content at their own pace, fostering deeper understanding and personal meaning-making. Vygotsky's Social Constructivism adds that social interaction and scaffolding are critical, which can be facilitated in modular settings through teacher feedback, peer support, and multimedia tools that guide learners through their zone of proximal development.

A particularly relevant model is Self-Regulated Learning (SRL), as proposed by Zimmerman (2002), who describes self-regulated learners as those who proactively set goals, monitor progress, and reflect on outcomes. Modular learning naturally cultivates these skills by requiring students to manage their own time, plan learning schedules, and evaluate their own comprehension. Zimmerman emphasizes that SRL processes are teachable and crucial for academic success in independent learning environments like modular systems. In addition, Cognitive Load Theory supports modular learning by recommending that information be presented in small, manageable units to prevent overload and enhance retention. Modular structures, by design, segment complex topics into focused modules, allowing learners to build understanding progressively without overwhelming their cognitive capacity.

Motivation theories also illuminate the benefits of modular systems. Self-Determination Theory (Deci & Ryan, 1985) underscores that autonomy, competence, and relatedness are key to intrinsic motivation. Modular learning promotes autonomy by letting students control their learning trajectory and pacing, while competence is fostered through mastery-based assessment. Furthermore, Expectancy-Value Theory (Wigfield & Eccles, 2000) highlights that motivation increases when learners believe they can succeed and perceive the task as valuable. When modular learning is designed around student interests and readiness levels, it enhances both expectancy and value, leading to greater engagement and effort. Together, these theories affirm that well-designed modular systems are not only pedagogically sound but also psychologically empowering, as they place students at the center of their learning journey.

Cognitive, Affective, and Psychomotor Domains

The framework of learning domains cognitive, affective, and psychomotor originates from the taxonomy developed by Bloom and his colleagues (1956), and later revised by Anderson and Krathwohl (2001). This taxonomy provides a structured model for understanding how students learn across intellectual, emotional, and physical dimensions. The cognitive domain, which was the primary focus of Bloom's original taxonomy, encompasses mental skills and knowledge processes. It includes hierarchical levels such as remembering, understanding, applying, analyzing, evaluating, and creating. Mastery in this domain allows learners to process, manipulate, and transfer knowledge across different contexts, making it central to academic learning and critical thinking development (Bloom, 1956; Anderson & Krathwohl, 2001).

The affective domain, further elaborated by Krathwohl in the original taxonomy, addresses emotional aspects such as attitudes, motivation, and values. This domain progresses through levels: receiving, responding, valuing, organizing, and characterizing by a value or value complex. These stages describe how individuals internalize affective responses to learning experiences (Anderson & Krathwohl, 2001). Affective engagement influences students' enthusiasm, perseverance, and capacity to find meaning in educational content, which in turn affects learning outcomes.

Meanwhile, the psychomotor domain although less explicitly detailed by Bloom was developed further by R. H. Dave (1970). It focuses on physical skills, coordination, and the execution of motor tasks. This domain is particularly relevant in vocational, artistic, and scientific disciplines where procedural knowledge and hands-on practice are essential. Dave's taxonomy of psychomotor learning includes imitation, manipulation, precision, articulation, and naturalization, emphasizing the importance of progressing from basic physical imitation to automatic performance. Integrating all three domains into instructional design ensures holistic learning, fostering not only cognitive competence but also emotional resilience and practical ability. This multidimensional approach prepares learners not just for examinations but for meaningful participation in real-world tasks and lifelong learning.

Impact of the Cognitive Domain on Learning Processes and Outcomes

The cognitive domain plays a foundational role in shaping how students learn, process, and apply information. As elaborated by Anderson and Krathwohl (2001) in their revision of Bloom's Taxonomy, this domain includes a hierarchical structure of mental operations: remembering, understanding, applying, analyzing, evaluating, and creating. These levels reflect the progression from lower-order to higher-order thinking skills, where learners advance from basic recall of facts to complex cognitive tasks such as synthesizing information and making informed judgments. Such cognitive engagement is essential for meaningful learning, problem-solving, and the ability to transfer knowledge across contexts.

According to Bransford, Brown, and Cocking (2000), effective learning occurs when students are able to connect new information with prior knowledge and organize it in ways that promote deep understanding. This process relies heavily on well-developed cognitive functions. Students with strong cognitive skills are better at structuring information, identifying relationships among concepts, and applying knowledge flexibly. In turn, this fosters metacognitive development—the ability to plan, monitor, and evaluate one's own learning processes—which is crucial for lifelong learning and academic autonomy.

Furthermore, Mayer's (2009) theory of multimedia learning supports the cognitive domain by emphasizing the role of dual-channel processing (visual and verbal), limited capacity, and active learning. Mayer suggests that well-structured instructional materials that reduce cognitive overload and encourage active processing lead to better understanding and retention. This is particularly relevant in modular learning systems, where learners interact with segmented content and are expected to construct meaning independently. In such environments, students with advanced cognitive and metacognitive abilities are more likely to succeed because they can regulate their learning, solve problems creatively, and critically reflect on their progress. Therefore, cultivating cognitive competencies is not only pivotal for academic performance but also for empowering students to adapt to new learning contexts and navigate real-world challenges with confidence.

Impact of the Affective Domain on Student Motivation and Confidence

The affective domain plays a vital role in shaping students' motivation, engagement, and emotional well-being throughout the learning process. It encompasses elements such as attitudes, emotions, values, and self-perceptions

that influence how learners respond to educational experiences. Based on Krathwohl's taxonomy of the affective domain, emotional development progresses through stages receiving, responding, valuing, organizing, and internalizing values each representing deeper levels of affective engagement. Classrooms that foster emotional safety and value student voice tend to support students in advancing through these stages, resulting in greater investment and perseverance in learning.

Emotions significantly impact academic motivation and performance. Pekrun's (2006) Control-Value Theory of Achievement Emotions posits that learners' achievement-related emotions are shaped by their perceived control over learning tasks and the value they attach to them. Positive emotions like enjoyment and pride can enhance motivation and cognitive engagement, whereas negative emotions such as anxiety and hopelessness can hinder performance and participation. When students feel that they have meaningful goals and the ability to reach them, they are more likely to be self-driven and persistent.

In parallel, Goleman's (1995) work on emotional intelligence underscores the importance of recognizing and managing emotions both one's own and those of others as essential components of learning success. Emotional intelligence facilitates better interpersonal relationships, classroom interactions, and self-regulation, all of which are particularly important in collaborative or self-directed learning settings. Students with high emotional intelligence are better equipped to cope with setbacks, resolve conflicts, and maintain focus.

Moreover, as emphasized by Schunk, Pintrich, and Meece (2008), affective factors such as self-efficacy and goal orientation are foundational to academic motivation. Students who believe in their ability to succeed (high self-efficacy) are more likely to engage deeply with tasks, persist longer, and use effective strategies. In modular learning environments that emphasize learner autonomy and independent progression, such effective strengths become particularly crucial. Without regular external reinforcement, students must draw on intrinsic motivation, emotional resilience, and confidence to navigate the learning process successfully.

Impact of the Psychomotor Domain on Practical Skills in Daily Life

The psychomotor domain encompasses the development of motor skills, coordination, and physical manipulation, which are crucial for performing tasks that involve movement and the use of tools or instruments. This domain is especially emphasized in fields such as vocational education, physical education, laboratory science, and the performing arts, where hands-on practice is a primary mode of learning. According to Dave's (1970) psychomotor taxonomy, learners progress through stages from imitation, manipulation, and precision to articulation and naturalization, ultimately achieving automatic and efficient skill execution through practice and refinement.

Similarly, Harrow (1972) classifies psychomotor learning into categories that range from basic reflexes and fundamental movements to skilled and non-discursive communication, integrating both gross and fine motor control. These taxonomies highlight that psychomotor development is not merely mechanical but also involves cognitive decision-making and affective engagement. As students refine their motor skills, they also enhance their self-regulation and confidence, thereby supporting broader educational and personal growth.

The practical significance of psychomotor skills extends beyond educational settings. Tasks such as operating machinery, preparing meals, or using digital devices require proficient motor abilities, which in turn contribute to autonomy, self-efficacy, and workforce readiness. In modular and competency-based education systems, where learning is often individualized and outcome-focused, incorporating psychomotor tasks ensures that theoretical knowledge is applied in real-world contexts. This enhances learners' ability to transfer what they've learned into practical actions, promoting deeper understanding and retention.

Furthermore, research by Wulf & Shea (2002) emphasizes that the processes involved in complex skill acquisition are qualitatively different from those used in simple tasks. Their findings stress the importance of context-rich, variable practice environments for effective psychomotor learning. Thus, learning tasks should be authentic and integrated into broader educational goals rather than isolated drills. In modular learning environments, including project-based learning, fieldwork, or performance assessments allows students to develop meaningful, embodied experiences that unite cognitive understanding, emotional investment, and motor execution. As such, the psychomotor domain plays an essential role in cultivating holistic, applicable, and enduring competencies in students.

Student Motivation and Engagement in Modular Learning

Over the last fifteen years, Indonesia's national education curriculum has undergone substantial reform to enhance its quality, relevance, and responsiveness to global educational trends. The introduction of the School-Based Curriculum (KTSP) in 2006 marked a significant step toward decentralization, granting schools greater autonomy to design instructional strategies that match local needs and student contexts. This was followed by the 2013 Curriculum (Kurikulum 2013), which emphasized character education, scientific inquiry, and the development of higher-order thinking skills, aiming to shift education away from rote memorization toward competency-based learning (Tan, 2003).

However, implementation of the 2013 Curriculum revealed several critical challenges. These included limited teacher preparedness, an overload of administrative tasks, and confusion regarding assessment methods. In response, the Ministry of Education, Culture, Research, and Technology launched the Merdeka Curriculum in 2021, within the broader "Merdeka Belajar" policy. This curriculum emphasizes instructional flexibility, project-based learning, and differentiated teaching approaches, supporting a learner-centered paradigm that allows students to progress according to their abilities and needs.

One of the key innovations introduced in the Merdeka Curriculum is the use of modular learning, which enables students to engage with thematic modules at an individualized pace. According to Hassan, Rosli, and Zulkifli (2019), the modular approach has been shown to enhance students' learning motivation by offering clear learning outcomes, self-paced progress, and a sense of ownership over the learning process. This is particularly beneficial in diverse classrooms where students possess varying levels of prior knowledge and skills.

Additionally, in the context of distance learning and post-pandemic education, Nugroho and Suryani (2022) highlight that modular learning increases student engagement by allowing flexibility, reducing cognitive overload, and fostering active participation. These benefits align with broader constructivist principles, which posit that learning is most effective when students actively construct meaning through experience, reflection, and self-direction (Tan, 2003).

The shift toward modular, learner-centered curricula reflects a strategic adaptation to global trends and the realities of Indonesian classrooms. However, the effectiveness of these reforms depends heavily on several enabling factors, including ongoing teacher professional development, the provision of adequate learning resources, and robust monitoring and evaluation mechanisms. Without these supports, disparities in curriculum implementation may widen, undermining efforts to achieve educational equity and excellence across Indonesia.

The Concept of Modular Learning

The modular system is an instructional design that organizes learning content into self-contained and sequentially structured units, each focusing on specific competencies or themes. This method enables students to progress through material at their own pace, aligning with their individual needs, prior knowledge, and learning readiness (Bernardo & Ramos, 2020). By doing so, modular learning fosters autonomy and accountability, encouraging learners to take an active role in monitoring and directing their own educational journey.

Grounded in constructivist theory and learner-centered pedagogy, the modular approach promotes active, contextualized learning. As articulated by Piaget (1973), students construct knowledge through meaningful engagement with content, particularly when they interact with their environment and build understanding through experience. Bruner (1966) similarly emphasizes the importance of spiraled instruction and discovery-based learning, both of which are supported by modular structures that allow students to revisit and deepen their understanding over time.

In terms of pedagogy, modular learning supports differentiated instruction, which is essential in heterogeneous classrooms where student abilities, interests, and learning styles vary. Tomlinson (2014) asserts that differentiation enhances inclusivity and ensures that all students can access the curriculum meaningfully. Through modular design, teachers can tailor content delivery and assessment to align with each student's developmental level and pace of learning.

Furthermore, modular learning has proven particularly effective during periods of educational disruption, such as the COVID-19 pandemic. As highlighted by Palao, Cuenca, and De Vera (2021), modular distance learning offered a practical and accessible solution, especially in regions with limited digital infrastructure. It enabled continuity of learning and reduced

dependency on synchronous interaction by providing tangible, student-managed learning materials.

At the policy level, UNESCO (2021) advocates for educational approaches that prioritize flexibility, personalization, and learner well-being in the post-pandemic world. Modular systems resonate with these principles by supporting student agency, accommodating diverse contexts, and fostering resilience within educational systems. Overall, the modular approach represents a strategic response to the growing demand for equity, inclusiveness, and adaptability in education. By integrating principles of constructivist learning, differentiated instruction, and self-directed learning, it provides a robust framework for developing essential competencies in both traditional and alternative learning environments.

Research Methodology

This study adopts a qualitative descriptive approach to explore students' experiences with the modular learning system implemented at Temasek Independent School. The aim is to capture in-depth perspectives, especially on how students perceive, adapt to, and are affected by the modular system in terms of cognitive, affective, and psychomotor domains. Participants were selected using purposive sampling, involving 10 main respondents from grades 10 to 12, with additional input from 10 others to enhance data validation. The modular system differs by grade level. Grade 10 students follow a full-subject modular system, in which all subjects are delivered in modular format. Grades 11 and 12 implement a selective modular approach, allowing students to choose subjects based on their needs and interests. Data were collected through semi-structured face-to-face interviews, which offered both flexibility and focus. Interviews centered on three key areas: cognitive understanding, emotional engagement, and application of life skills. All interviews were recorded and transcribed verbatim to preserve nuance and meaning. Each transcript was labeled using pseudonyms and dates to protect anonymity. The transcription process followed a thematic structure and was validated by re-listening to recordings to ensure accuracy. Emotionally loaded phrases were annotated to capture their depth, which became critical for analysis.

The coding process followed two stages: open coding and axial coding. In open coding, recurring phrases such as "I understand faster" or "I lost motivation" were identified and categorized. Axial coding then grouped these

into broader themes like learning efficiency, academic misalignment, time and scheduling issues, and adaptive responses. This iterative process allowed new insights to emerge and existing codes to evolve. From the coded data, three major patterns were identified. First, students showed higher motivation and understanding in subjects they were personally interested in, suggesting that modular learning supports individualized engagement. Second, structural challenges like irregular schedules and downtime negatively affected motivation. Third, students with stronger self-management skills adapted more effectively, while others struggled with the system's flexibility. These findings highlight the need for support systems, especially in planning and orientation, to ensure all students can benefit from modular learning equally and effectively. The study thus offers valuable insights for educators and policymakers working to refine modular systems in secondary education.

Discussion and Result

Table 1 below presents the summarized results of this study based on interviews with ten students from Grades 10 to 12 at Temasek Independent School.

Subject	Grade	Cognitive	Affective	Psychomotor	P/N
1	12th	Learning faster with focused subjects	Demotivated by inconsistent schedule	Adapts with entertainment during breaks	Stagnant
2	10th	No Significant change	Tired due to long gaps in schedule	Uses time management to complete tasks	Decreased
3	11th	Improved organization	Confused during early	Consults with	Neutral

		on of materials	phase of implemen tat ion	homeroo m teacher	
4	11th	Easier understan di ng of selected subjects	Feel comfortab le, no ma jor issues	Receives guidance from homeroo m teacher	Increased
5	10th	Familiarit y with content eases learning	Adjust easily, no affective difficulty	No sp ecific strategy needed	Increased
6	10th	Enhanced scores in chosen subjects	Loss of motivatio n due to schedule conflict	Finishes assignme nts during free time	Increased
7	12th	Consistent with	Adapts well with system	Applies schedule	Increased

		modular logic		planning	
8	10th	Learns more efficiently in focused modules	Initially uncertain, now adapted	Proactive in selecting subjects	Increased

9	12th	Slight decline in some subjects	Stressed by performance drop	Uses relaxation strategies	Decrease
10	11th	Maintains stable academic performance	Motivated by interesting project tasks	Collaboration with classmates	Increase

Table 1: *Research Results*

The implementation of modular learning has shown significant cognitive impacts on students. Many students reported that the modular system allowed them to focus more intensely on selected subjects, which enhanced their understanding and concentration. As one student stated, “Because we only take two or three subjects, I can focus better and go deeper into the material.” This suggests that reduced cognitive load positively influenced students’ information processing. Additionally, the structured division of modules was noted to help in organizing study schedules, making learning less overwhelming compared to traditional methods.

However, the cognitive benefit was not equally experienced by all. One student mentioned, “My learning outcome doesn’t feel optimal; sometimes I forget the previous material because the gap between sessions is too long.” This indicates that the fragmentation of subjects over time may affect memory retention and continuity in learning. Another student who felt there was no significant change said, “I’ve already adapted; modular or not, I learn the same way.” These insights highlight how individual learning styles and preferences play a role in how effectively the modular approach supports cognitive growth.

Students identified several challenges within the modular system, primarily revolving around scheduling inconsistencies and long idle periods between classes. A common sentiment was captured in the quote, “Sometimes I get tired waiting; there’s too much free time between subjects.” This excessive downtime appeared to reduce motivation and disrupted study momentum. Furthermore, some students experienced confusion and regret in class selection, such as one participant who stated, “At first, I chose a subject just because my friend picked it, but later I realized I wasn’t interested.”

While logistical issues like overlapping schedules and class availability were emphasized, a few students reported minimal disruption, attributing their ease to prior adaptation or luck in choosing familiar modules. "So far, I don't face any problem. I just stick with what I already like," said one respondent. These varied experiences underline the need for improved guidance in class selection and timetable management to ensure equity and efficiency in implementation.

In response to the above challenges, students adopted several self-regulation and coping strategies. Many mentioned utilizing their free time productively, such as working on assignments or bringing entertainment to manage boredom. One student explained, "When I have a long gap, I do homework or read something. That way, I don't waste time." This proactive time management reveals a level of maturity and adaptability among students, encouraged by the flexibility of the modular system. Some also mentioned staying in school longer to avoid being unproductive at home.

Guidance from homeroom teachers also played a vital role in helping students navigate the new system. As one said, "I often consult my class teacher to adjust my schedule; it helps a lot." This suggests the importance of mentorship and accessible support systems during transitional educational changes. Students who developed better planning and communication skills seemed to adapt more successfully, indicating that non-academic competencies like self-management and social interaction are key components in modular learning success.

Learning outcomes under modular learning showed varied results. Several students experienced a notable improvement in performance, especially in subjects they chose based on interest or strength. One participant noted, "My grades in science improved because I only focus on what I like." This aligns with the theory that interest-driven learning can enhance intrinsic motivation and achievement. Modular learning may offer a more personalized academic experience, allowing students to invest energy into areas they feel confident in.

On the other hand, the selectiveness of modular learning might cause gaps in general knowledge or missed reinforcement of essential subjects. A student expressed concern, stating, "I feel like I forgot math because I didn't take it this term." This raises an important point about long-term curriculum balance and academic continuity. If not monitored carefully, modular flexibility may

inadvertently deprioritize foundational subjects, especially for students with weaker metacognitive awareness.

Conclusion

The implementation of the modular learning system has shown a significant positive impact on students' psychological and emotional development, particularly in enhancing their motivation and self-confidence. By offering flexible learning paths and a student-centered approach, the system allows learners to study at their own pace. This autonomy helps reduce academic stress and supports students' emotional well-being. The ability to choose modules based on personal interests and strengths also increases their sense of relevance and ownership, leading to higher engagement and deeper intrinsic motivation. Moreover, the inclusion of project-based learning within the modular structure contributes to the development of key life skills. Students gain experience in critical thinking, communication, collaboration, and time management competencies that are valuable both in academic settings and in everyday life beyond the classroom.

To maximize the benefits of this system, several improvements are recommended. First, incorporating socio-emotional learning into modules or counseling sessions can help support students' motivation, emotional resilience, and confidence. Second, reducing long idle periods between classes by optimizing schedules or introducing enrichment activities such as workshops or peer mentoring can keep students meaningfully engaged. Third, expanding project-based components in each module ensures that learning remains practical and connected to real-life situations. Additionally, guiding students more effectively in selecting their modules through orientation sessions and teacher mentoring can help them make choices that align with their academic goals and personal interests. Teachers should also provide regular constructive feedback to boost students' confidence and sense of progress. Lastly, systems should be in place to monitor long-term continuity across learning cycles, ensuring that essential knowledge and skills are not neglected over time. Through these enhancements, the modular learning system at Temasek Independent School can foster a more inclusive, adaptive, and future-ready educational experience for all learners.

Reference

- Anderson, L. W., & Krathwohl, D. R. (2001). *A Taxonomy for Learning, Teaching, and Assessing*.
- Bernardo, A. S., & Ramos, M. C. (2020). Effectiveness of modular learning approach in developing self-directed learning skills. *Journal of Education and Practice*, 11(2), 78–84.
- Bloom, B. S. (1956). *Taxonomy of Educational Objectives: The Classification of Educational Goals*, 403.
- Bransford, J. D., Brown, A. L., & Cocking, R. R. (2000). *How People Learn*, 58.
- Bruner, J. S. (1966). *Toward a Theory of Instruction*. Harvard University Press.
- Dave, R. H. (1970). Psychomotor Levels. In *Developing and Writing Behavioral Objectives*, 20–21.
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic Motivation and Self-Determination in Human Behavior*. New York: Plenum.
- Goleman, D. (1995). *Emotional Intelligence*, 352.
- Harrow, A. (1972). *A Taxonomy of the Psychomotor Domain*, 190-191
- Hassan, A., Rosli, D. I., & Zulkifli, Z. (2019). Modular Approach and Its Impact on Students' Learning Motivation. *International Journal of Instruction*.
- Kemendikbudristek. (2022). *Kurikulum Merdeka Documentation*.
- Kurniawati, Sandra et al. (2014). *Education in Indonesia: A White Paper*. Brookings Institution.
- Mayer, R. E. (2009). *Multimedia Learning*, 57–84.
- Nugroho, A., & Suryani, D. (2022). Student Engagement in Modular Distance Learning. *Jurnal Pendidikan dan Pembelajaran*.
- Pekrun, R. (2006). The Control-Value Theory of Achievement Emotions. *Educational Psychology Review*, 317.
- Piaget, J. (1973). *To Understand is to Invent: The Future of Education*. Grossman Publishers.
- Pratiwi, & Marhaeni. (2021). Curriculum Reform and Student-Centered Learning in Indonesia. *JPI (Jurnal Pendidikan Indonesia)*.
- Schunk, D. H., Pintrich, P. R., & Meece, J. L. (2008). *Motivation in Education: Theory, Research, and Applications*, 433.
- Subekti, L. (2022). Modular Learning: An Effective Strategy for Indonesian Schools. *Journal of Educational Development*.

- Suryadarma, D., & Jones, G. W. (2013). Education in Indonesia: A Snapshot. ISEAS.
- Tan, O. S. (2003). Problem-Based Learning Innovation: Using Problems to Power Learning in the 21st Century.
- Wigfield, A., & Eccles, J. S. (2000). Expectancy–Value Theory of Achievement Motivation. *Contemporary Educational Psychology*, 25(1), 68–81.
- Wulf, G., & Shea, C. H. (2002). Principles Derived from the Study of Simple Skills Do Not Generalize to Complex Skill Learning. *Psychonomic Bulletin & Review*.
- Zimmerman, B. J. (2002). Becoming a Self-Regulated Learner: An Overview. *Theory into Practice*, 41(2), 64–70

Copyrights

Copyright for this article is retained by the author(s)

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license This work is licensed under a Creative Commons Attribution 4.0 International License

