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Factors Influencing The Teaching And Learning Process: Multidimensional Analysis In The Contemporary Indonesian Education Ecosystem

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Abstract

The writing of this assignment aims to comprehensively map the factors that affect the teaching and learning process in the context of the Indonesian education system, especially during the transition period of the Independent Curriculum and the post-pandemic era (2024-2025). The main problems raised are the stagnation of national literacy and numeracy achievement and the existence of a digital gap that hinders the effectiveness of learning in remote areas. The urgency of this writing lies in the urgent need to identify determinant variables that can improve the quality of education in the midst of global challenges and technological disruption. The methodology applied is a descriptive qualitative literature study through integrative analysis of dozens of accredited national scientific journals, official government statistical reports, and international assessment data. The results found showed that the teaching and learning process was simultaneously influenced by three main pillars: internal factors (physiological and psychological), external factors (family, school, and community environment), and learning approach factors (pedagogical strategies and digital literacy). Key findings emphasize that teachers' pedagogic competence coupled with technological literacy has a significant positive correlation with students' academic performance, while environmental factors in disadvantaged, frontier, and outermost (3T) areas remain structural barriers that require affirmative policies. This paper concludes that the success of national education requires a holistic approach that brings together students' mental readiness, educator professionalism, and equitable distribution of digital infrastructure.

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Keywords: Learning Process, Internal Factors, External Factors, Digital Literacy, Independent Curriculum.

INTRODUCTION

The dynamics of education in Indonesia in the 2024-2025 period reflect the complexity of intertwined social, religious, economic, political, and environmental facts. Socially, Indonesian people are facing the phenomenon of shifting learning patterns in generations Z and Alpha who are highly dependent on instant access to information through the internet. Religious facts show the central role of spiritual values in character building, where the implementation of the Pancasila Student Profile is integrated with religious habits such as congregational prayers and tadarus to build noble morals as the foundation of student morality. From an economic perspective, the government gives high priority through the allocation of the education budget in the 2025 State Budget for teacher welfare programs, school operational assistance, and free nutritious food programs to overcome the problem of malnutrition that has an impact on the learning concentration of students from underprivileged families. Politically, the sustainability of the Independent Curriculum policy under the new national leadership emphasizes flexibility and personalization of learning to achieve the target of superior human resources towards a Golden Indonesia 2045. However, environmental facts reveal a wide infrastructure gap between urban areas and 3T areas, where access to technology and the quality of school buildings are still a concern, which is a major obstacle to equitable distribution of education quality.

Literature facts show that there is a strong relationship between the quality of educational input and learning outcomes. Previous studies have long classified factors that influence learning into two broad categories: internal (endogenous) and external (exogenous) factors. The classical literature of Slameto and Muhibbin Syah remains the main reference in defining intelligence, motivation, and the family environment as key variables. However, the latest literature developments in 2024-2025 have begun to highlight new variables such as teachers' digital literacy and self-efficacy in dealing with artificial intelligence (AI) technology as factors that greatly influence teacher performance and student involvement in the classroom. Indonesia's low PISA score that is consistently below the OECD average has triggered academic discourse on the need to update learning strategies that are more oriented towards higher-order thinking skills and technological adaptability.

The purpose of this paper is to analyze in depth the multidimensional factors that determine the success of the teaching and learning process in Indonesia's modern education

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ecosystem. This paper aims to provide a detailed understanding for educators and policymakers regarding the interaction between students' psychological conditions, the supporting role of the family environment, and the instructional quality of the school. In addition, this paper seeks to map specific obstacles that occur in the implementation of the curriculum in various geographical areas, so that targeted solutions can be formulated to increase the effectiveness of national learning.

The main argument put forward is that an effective teaching and learning process cannot be achieved only through curriculum reform at the policy level, but must be accompanied by strengthening internal factors of students and external factors at the micro level (family and teachers). This paper hypothesizes that strengthening educators' digital literacy and improving student nutrition is a crucial moderation variable to overcome the negative impact of learning loss and technology access gap. By understanding the causal relationship between intrinsic motivation, family emotional support, and innovative teaching methods, the national education system is expected to be able to produce graduates who are not only cognitively intelligent but also mentally and spiritually resilient.

LITERATURE REVIEW

Learning is defined as an effort process by individuals to obtain a new overall behavioral change as a result of their own experience in interacting with their environment. In Slameto's view, learning is not just the accumulation of knowledge, but includes changes in skills, habits, attitudes, and rewards. Internal factors as the first concept include everything that comes from within the individual, which is broadly divided into physiological and psychological aspects. The physiological aspect includes physical health and the functioning of the five senses, while the psychological aspect involves intelligence, attention, interest, talent, motive, maturity, and readiness. Current trends suggest that students' mental health and psychic readiness are the main focus, given the increasing academic pressure and the impact of social isolation during the digital transition period.

Further categorization of internal factors can be seen in patterns of intelligence and talent. Intelligence is not only a matter of pure cognitive ability, but also the psycho-physical ability to adapt to the environment appropriately. The intelligence patterns identified by Gardner include a diversity of human potential that demands a differentiated pedagogical approach. Motivation as a second concept is an internal and external encouragement in students who are learning to make behavior changes. Slameto describes motivation as a process that determines the intensity and

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consistency of behavior. The manifestation of learning motivation can be seen from the desire to succeed, the need for learning, and the expectation of goals, which are often influenced by parental parenting as the main motivator at home.

External factors as a third concept include variables outside of students that have an impact on the learning process, namely the family, school, and community environment. The definition of the family environment emphasizes how to educate parents, relationships between family members, and economic conditions. In schools, external factors are manifested through the quality of teachers, curriculum, teaching methods, and infrastructure. The pattern of interaction between teachers and students who are academic but still respect good manners creates a classroom atmosphere that is conducive to intellectual development. On the other hand, society influences learning through socializing and community life forms that can have a positive and negative influence on learning discipline.

The manifestation of the learning approach in the digital age involves the integration of technologies such as *Learning Management Systems* (LMS) and interactive applications that are in line with Vygotsky's theory of social constructivism. This theory emphasizes that knowledge is built through social interaction within *the Zone of Proximal Development* (ZPD), where the teacher plays the role of a provider *of scaffolding* or timely assistance. Weaknesses that are often found in contemporary literature are the low technological literacy of teachers which hinders the optimization of digital platforms, as well as students' dependence on instant results from technology that can erode critical thinking skills and deep focus. The Merdeka Curriculum seeks to overcome this weakness by providing flexibility for teachers to design student-centered, project-based learning (PjBL).

Key Concepts	Definition/Manifestation	Influence Patterns
Internal (Psychological) Factors	Intelligence, Interest, Motivation, Readiness	Determine students' cognitive capacity and absorption of the material.
Internal (Physiological) Factors	Health, Five Senses, Nutrition	Biological basis that supports concentration and stamina in learning.

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External Factors (Family)	Parenting, Economy, Moral Support	The first environment that forms basic character and motivation.
External Factors (School)	Teacher Competencies, Facilities, Curriculum	Determinants of instructional quality and availability of digital learning resources.
Learning Approach	Strategy, Method (PBL/PjBL), Technology	A way of transmitting knowledge that connects teachers and students.
Digital Environment	Internet Access, Technology Literacy	Modern variables that determine material accessibility in the industrial era 4.0.

Evidence of Description and Statistics of National Literacy-Numeracy Achievement

The data of the Indonesian Education Report Card in 2024 shows significant dynamics in the competency profile of national students. There was an increase in the proportion of students who achieved the minimum competency in the field of literacy and numeracy compared to previous years. Statistics show that post-pandemic learning recovery efforts are starting to bear fruit, although global standards challenges remain tough.

National Indicators	2022 Achievements (%)	2023 Achievement (%)	2024 Achievement (%)
Literacy Competency (Students)	59,49	68,05	70,03
Numeracy	45,24	62,45	67,94

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Competency (Students)			
PISA (Mathematics) Score	-	379 (2022)	-
PISA Score (Reading)	-	359 (2022)	-
PISA (Science) Score	-	383 (2022)	-
Source: Synthesized from data from the Ministry of Education and Culture and OECD PISA 2022.			

Data explanatory data shows that although domestically the percentage of competence has increased, Indonesia's PISA score in 2022 has actually decreased compared to 2018 and remains well below the international average (OECD) which is in the range of 472-485. This indicates that there is a gap between the national curriculum and the demands of global competencies. The data relationship revealed that the low quality of teachers in facilitating learning based on *higher-order thinking skills* (HOTS) and the disparity in quality between regions were the main causes of the stagnation of the international score. In addition, the *learning loss* factor during the pandemic is estimated to be equivalent to 5-6 months of learning, which will still have an impact until the 2024/2025 school year.

Evidence of the Influence of Teacher Competence and Digital Literacy

The results of quantitative research on the performance of educators show that digital literacy has a positive and significant relationship with the effectiveness of the teaching and learning process. In urban areas such as Bogor, regression studies show similarities $Y = 39,290 + 0,072X$, meaning any increase in teachers' digital literacy will be followed

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linearly with improvements in their instructional performance. Pearson's statistical analysis of correlation shows a value $r = 0,62$ ($p < 0,01$) between digital media innovation and student learning interest, proving that interactive media contributes 38% to increased student participation in the classroom.

Data analysis from various classroom observations revealed that teachers who integrate digital tools such as Canva, Kahoot, and animated videos are able to increase student active engagement by up to 75%. However, the data relationship shows a major challenge in the pedagogic competency aspect of the Independent Curriculum. Many teachers still struggle to design differentiated learning and conduct diagnostic assessments appropriately due to the limitations of ongoing training. In the 3T area, this barrier is exacerbated by the digital divide, where 34% of the region is still constrained by fast internet access, which makes teachers more likely to revert to monotonous traditional lecture methods.

Evidence of Learning Environment Conditions and Obstacles in the 3T Region

Case studies in disadvantaged, frontier, and outermost (3T) areas such as Bima, Lumpatan, and Brosot reveal field facts that contrast with developed areas. Schools in the region face systemic problems ranging from severely damaged building infrastructure to a lack of qualified educators. About 62% of teachers in remote areas have qualifications below the S1/D4 standard, and one teacher often has to teach a variety of subjects outside of his core competencies due to staff shortages.

Data explanation in the 3T area shows that the limitations of infrastructure facilities such as the absence of LCD projectors and an unstable internet network hinder the optimal implementation of the Independent Curriculum. The relationship of data shows that the socio-economic impact of families in this region is also very influential; Low parental literacy and poverty make learning support at home minimal, so that students' intrinsic motivation is not optimally formed. The dropout rate in the 3T region is higher because students are often faced with the choice between helping the family economy or continuing an education that is difficult and risky to access.

Evidence of Manifestation of Digital Age Learning Interest in Generation Z

Research on the learning patterns of generation Z (born 1995-2010) shows significant changes in character due to the influence of digitalization. Students of this generation prefer information in visual format (video/images) rather than long texts and have a tendency to learn

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independently through online tutorials. As many as 75-80% of students show higher enthusiasm when learning using interactive media such as gamification compared to conventional methods.

However, data explanations reveal the dark side of fast internet access. There is a tendency to reduce the ability to think deeply and focus due to the habit of looking for instant answers without going through a critical analysis process. The data relationship shows that uncontrolled use of technology can lead to a "morality crisis" and a decline in interpersonal skills due to a lack of physical interaction. In college, students who rely too much on AI (ChatGPT) in assignments tend to have a superficial understanding of the material, which indicates that technology must be accompanied by strict ethical guidance and information literacy.

DISCUSSION

The summary of the research results shows that the teaching and learning process in Indonesia is currently in a complex transformation phase, where technological advances offer great opportunities as well as challenges that are no less great. Learning success is fundamentally influenced by the interaction between students' internal variables—especially motivation and mental readiness—and the external qualities of the school and family environment. The increase in literacy and numeracy competencies in the 2024 Education Report by approximately 10% compared to 2022 is proof of the initial success of the transition to a more flexible Independent Curriculum. However, the low international PISA score is a reminder that the national education system is still struggling with structural problems such as the pedagogic quality of teachers and nutritional gaps that have an impact on cognitive function.

Discursively, these findings reinforce Vygotsky's theory of constructivism which emphasizes the importance of social interaction and mediation tools (in this case digital technology) to achieve the maximum potential of students in ZPD. Compared to traditional era research that only focuses on lecture methods, the results of the 2024-2025 study show that the "rapid outcome-based learning" triggered by fast internet has shifted students' learning patterns to be more pragmatic but prone to distractions. There is a significant difference between learning outcomes in urban areas supported by high digital literacy of teachers and learning outcomes in 3T areas that are still shackled by limited basic facilities, which creates a systemic "achievement inequality" in Indonesia.

The reflection of the results of this study is a sign that national education can no longer rely only on interventions in the classroom, but must touch on holistic welfare aspects. The low motivation to learn among underprivileged students in the 3T area is a sign of a crisis of hope

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triggered by an unsupportive economic environment. The integration of religious values and character formation in the Pancasila Student Profile is a reflection of the government's efforts to maintain a balance between intellectual sophistication and moral resilience in the midst of the onslaught of negative digital content. Consistently lower numeracy achievement than literacy also indicates the need to strengthen science literacy and mathematical logic from an early age.

The implications (SO-WHAT) of the results of this study are crucial for the future of Indonesian human resources. Without equitable distribution of digital infrastructure and improving the quality of teachers in 3T areas, the Golden Indonesia 2045 target will be difficult to achieve because most of the young population will be left behind in mastering technology. Another implication is the need for curriculum design that places more emphasis on "peace of mind" and critical literacy to compensate for the tendency to think instantly due to fast internet. Failure to manage teachers' digital literacy will result in technology only becoming a distraction "gadget" in the classroom, not a meaningful educational transformation tool.

Why do the results of the study show a trend like this (WHY)? This is due to several root factors of the problem: first, the uneven distribution of quality teachers due to the lack of incentives in remote areas; second, the curriculum is sometimes too dense so that teachers focus more on the completeness of the material than on students' in-depth understanding; and third, the unbalanced cognitive load between academic demands and nutritional intake and emotional support from family. The historical factor of "upgrading but not learning" that has been going on since 2000 has also created inertia in the education system that is difficult to break without radical steps in improving pedagogical competence.

As a future step (NOW-WHAT), the government needs to integrate policies to improve teachers' digital literacy with incentive schemes and reflective practice-based training in each learning community. The implementation of blended learning models that combine the power of face-to-face with online flexibility should be extended to rural areas through smart device assistance programs and satellite access. In addition, the role of parents must be revitalized through family literacy programs in order to create a strong synergy of the "tri educational centers" (family, school, community) in supporting students' cognitive and emotional development in the era of artificial intelligence.

CONCLUSION

Based on the multidimensional analysis that has been carried out, it can be concluded that the factors that affect the teaching and learning process in Indonesia in the 2024-2025 era are

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greatly influenced by the readiness of the digital ecosystem and the quality of educators' pedagogic competence. The most important findings show that despite a positive trend of increasing national literacy and numeracy achievement through the implementation of the Independent Curriculum, Indonesia still faces serious challenges in terms of teacher quality and disparity in education quality between regions. Internal factors in the form of intrinsic motivation and physical-psychological readiness of students are the main foundations, but external factors in the form of teachers' digital literacy and family economic support act as determinants of whether this potential can develop optimally or is hampered by environmental limitations.

The contribution of this research lies in the comprehensive mapping of the causal relationship between digital transformation and changes in the learning character of Generation Z in Indonesia, as well as the identification of systemic barriers in the 3T area that require more concrete affirmative policies. An added value of this analysis is the integration of national statistical data with the perspective of cognitive and sociocultural psychology, which provides a holistic picture for educational practitioners. The use of technology such as AI and interactive learning media has proven to be a catalyst for learning interest, but its use must be accompanied by strengthening information literacy to maintain the quality of students' focus and critical thinking skills.

The limitation of this research lies in its nature based on literature studies, so that the microdynamics in each educational unit may not be fully represented in depth through direct observation throughout the province. Therefore, the direction of further research is recommended to conduct a longitudinal study on the effectiveness of artificial intelligence (AI)-based learning models on the academic achievement of students in areas with limited internet access. In addition, further research is needed on strategies to strengthen the role of parents as digital literacy companions at home to support the success of the vision of the Golden Indonesia 2045 national education.

FUTURE DIRECTIONS

Given that this study identifies digital ecosystem readiness as a primary determinant of educational success, future research must move beyond theoretical frameworks to empirical testing Conduct a longitudinal study tracking the implementation and effectiveness of specialized Artificial Intelligence (AI) learning models designed for low-resource environments.

Measure the direct impact of offline or low-bandwidth AI tools on the academic achievement, literacy, and numeracy of students in Indonesia's 3T (*terdepan, terluar, tertinggal*)

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regions.

A multi-year, mixed-methods approach to observe whether adaptive technology can bridge the regional quality disparity identified in the 2024–2025 era.

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