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The Implementation of the Constructivist Paradigm in the Curriculum Merdeka: Strategies, Challenges, and Its Implications for 21st-Century Education

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Abstract: This study aims to explore the implementation of the constructivist paradigm within Indonesia's Curriculum Merdeka and its implications for developing 21st-century competencies. Employing a Systematic Literature Review (SLR) methodology, it synthesizes empirical and theoretical studies from major academic databases. The results confirm that constructivist principles student autonomy, experiential learning, collaboration, and reflection effectively cultivate critical thinking, creativity, and problem-solving skills. A key novelty is the explicit alignment of these principles with the local educational philosophy of Ki Hajar Dewantara, framing constructivism as a realization of 'freedom to learn' and holistic character development. However, significant implementation barriers are identified, including gaps in teacher pedagogical understanding, insufficient digital literacy, and inadequate systemic support. The primary practical implication is the urgent need for comprehensive teacher professional development, reformed assessment systems, and policy-practice alignment to enable meaningful constructivist learning. This study contributes a synthesized scholarly perspective that bridges global constructivist theory with Indonesia's specific curricular reform and cultural context, offering evidence-based guidance for sustainable educational transformation.

Keywords: Constructivism Philosophy, Curriculum Merdeka, Education Reform, Freedom to Learn, 21st-Century Learning

A. Introduction

Education serves as the fundamental foundation for shaping the character, intelligence, and civilization of a nation. In the era of globalization and rapid technological advancement, Indonesia's education system is required to continually transform to produce creative, innovative, adaptive, and independent generations. One of the most significant transformations is the implementation of the Merdeka Curriculum, which emphasizes learning freedom, differentiation, and a paradigm shift from teacher-centered to student-centered learning (Hakiky et al., 2023).

In this transformation, constructivist theory plays a crucial philosophical role. Constructivism, as an ideology, methodology, and educational technology, provides new directions for understanding learning interactions, didactic communication, and the evolution of pedagogical practice (Akhmetova et al., 2021). The theory posits that knowledge cannot be transmitted passively from teachers to learners; rather, it must be actively constructed through direct experience, reflection, collaboration, and social interaction (Fitria et al., 2021). Consequently, learners act as active subjects in constructing their own understanding, while teachers function as facilitators who create exploratory and problem-solving-oriented learning environments.

Although the constructivist paradigm has become the philosophical foundation of the Independent Curriculum, its implementation in Indonesian schools has not yet reached optimal effectiveness. Preliminary observations in five elementary schools revealed the continued dominance of teacher-centered instruction and limited integration of constructivist principles in classroom practices. Interviews with ten teachers indicated that, although the curriculum provides flexibility for differentiated learning, most teachers still lack a deep understanding of how to apply constructivist approaches effectively. This condition reflects a gap between curriculum design and classroom practice, which may hinder the achievement of the Independent Curriculum's goals in cultivating adaptive, reflective, and self-directed learners. Therefore, an in-depth empirical investigation into the implementation of constructivism within this curriculum context is essential.

Globally, numerous studies have highlighted the positive impacts of constructivist approaches on learning motivation, problem-solving skills, and students' conceptual understanding (Primarni et al., 2024; Rehman et al., 2024; Hursen & Soykara, 2012). Zohar (2023) and Tsehay et al. (2024) further emphasize the role of digital technology, project-based learning, and reflective practices in enhancing constructivist pedagogy in the twenty-first century. In Indonesia, found that applying constructivist principles within the Independent Curriculum promotes collaborative, contextual, and critical-thinking-oriented learning Wijayanti et al. (2025). Similarly, argue that project- and problem-based learning allows students to discover meaning and relevance in their daily experiences Walad et al. (2024).

Moreover, constructivist learning has been shown to strengthen character education and increase students' emotional engagement with learning (Prabawati et al., 2024; Walad et al., 2024). The application of Vygotsky's social constructivism promotes enjoyable and pressure-free learning through collaborative and reflective approaches (Setiyaningsih & Subrata, 2023). In addition, constructivism has demonstrated relevance in inclusive education, as it fosters empathy, social collaboration, and mutual respect among learners with diverse abilities and backgrounds (Çibukçiu, 2025; Musundwa, 2024).

From a national perspective, the values of constructivism align closely with Ki Hajar Dewantara's educational philosophy, which emphasizes learning freedom, personal responsibility, and moral balance. A liberated form of education is not merely free from external constraints but allows learners to develop their intellectual, social, and moral capacities holistically (Walad et al., 2024). Nevertheless, challenges remain, particularly regarding teachers' readiness and consistency in applying constructivist principles effectively in the classroom (Wijayanti et al., 2025).

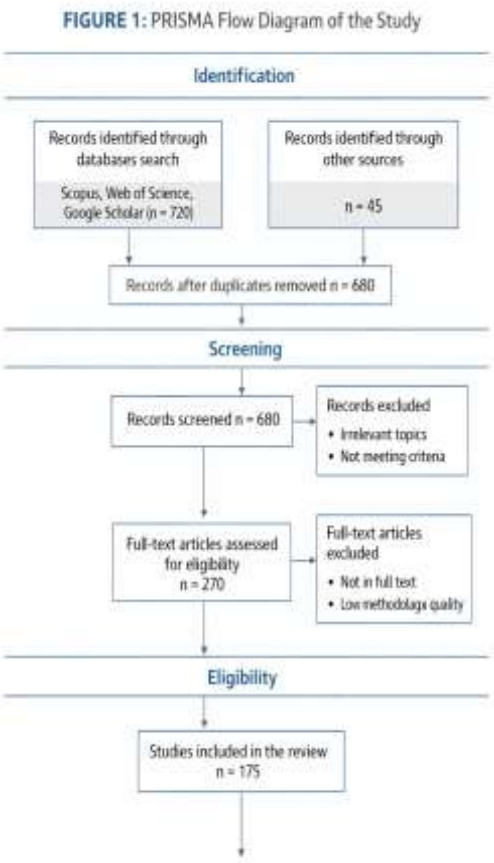
Furthermore, Biggs's constructive alignment offers an essential framework for modern curriculum design. This approach requires the alignment of learning objectives, teaching activities, and assessment methods to ensure meaningful and measurable learning outcomes (Loughlin et al., 2021). In the context of the Independent Curriculum, constructive alignment encourages teachers to value not only the final learning results but also the process of knowledge construction that occurs during learning activities.

Philosophically, constructivism provides the theoretical framework necessary for realizing meaningful and contextual learning, in harmony with the vision of Merdeka Belajar (Freedom to Learn) that emphasizes autonomy, diversity, and reflective thinking (Alfaruki, 2022; Hamida et al., 2025). Therefore, the implementation of constructivist theory within the Independent Curriculum plays a strategic role in enhancing student-centered learning quality, fostering learner autonomy, and strengthening inclusive education in Indonesia.

B. Methods

This study employed a Systematic Literature Review (SLR) to comprehensively analyze the implementation of the constructivist paradigm within the Curriculum Merdeka and its implications for 21st-century education. The SLR approach was selected to ensure a rigorous, transparent, and replicable process in identifying, evaluating, and synthesizing relevant empirical and theoretical studies related to constructivist learning strategies, challenges, and pedagogical impacts.

The literature selection process followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to enhance methodological transparency and validity. Literature searches were conducted across leading academic databases, including Scopus, Web of Science, and Google Scholar, using keywords such as constructivism in education, constructivist learning strategies, implementation of constructivism in the Merdeka Curriculum, 21st-century learning, and Independent Curriculum. Additional records were identified through reference tracking and relevant academic sources.



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The inclusion criteria include: (1) peer-reviewed journal articles published between 2019 and 2024, (2) studies focusing on constructivist learning theories, strategies, or practices within curriculum implementation, (3) relevance to student-centered learning and 21st-century competencies, and (4) availability of full-text articles in English or Indonesian. Exclusion criteria included non-scholarly publications, opinion-based articles, and studies that did not explicitly address constructivist pedagogy or curriculum implementation.

Data analysis was conducted using a thematic analysis approach. All selected studies were regularly coded and categorized to identify recurring patterns, themes, and

research gaps. The analysis focuses on three main dimensions: (1) strategies for implementing constructivist learning within the Independent Curriculum, (2) challenges encountered by educators and institutions, and (3) pedagogical implications for developing critical thinking, creativity, collaboration, and learner autonomy in 21st-century education. Through this structured synthesis, the study provides a comprehensive understanding of how constructivist principles support the realization of Merdeka Belajar and contribute to meaningful, inclusive, and student-centered learning in Indonesian schools.

C. Results and Discussion

A systematic review of various literature sources indicates that the implementation of the constructivist paradigm within the Merdeka Curriculum has made a significant contribution to the transformation of 21st-century learning. The key findings of this study identify the dominant teaching strategies employed, the challenges educators face in practical applications, and the philosophical and pedagogical implications that emerge within the context of primary education in Indonesia.

An analysis of selected studies reveals thematic patterns that reflect a paradigm shift from teacher-centered instruction to a constructivist approach that emphasizes authentic experiences, collaboration, and student autonomy in learning. Based on the analysis conducted on 15 selected academic journals that meet the established criteria, the research findings are presented as follows.

Table 1. Review Mapping of Journal Articles and Related Research Findings

No.	Journal Title	Authors	Research Objective	Research Methodology	Research Findings	Challenges
1.	Constructivist pedagogy in context of modern philosophy of education	(N. P. Koptseva, 2020)	The objective of this study is to identify the key characteristics of constructivist pedagogy in order to develop an effective educational design—a set of teaching practices that enable educators to optimally acquire knowledge and skills within the context of evolving educational technologies, such as e-learning and distance learning.	This study employs a qualitative approach using critical analysis of modern constructivist epistemology. Additionally, the research applies ideal-type differentiation techniques, content analysis, and concept definition principles to systematically describe the substance of the constructivist pedagogical paradigm, both conceptually and methodologically.	The analysis of the constructivist pedagogical paradigm reveals that this approach effectively addresses various critical challenges in the general transition toward digital and distance learning models. Findings indicate that enhancing teachers' information literacy is key to maximizing the potential of constructivist methods and fostering students' ability to construct their own learning meaning. Additionally, this study highlights the innovative potential of incorporating creative artistic tasks, even within non-artistic professional education, as an integral part of constructivist learning strategies.	The primary challenges in this context include the lack of a strong conceptual and methodological framework to guide the improvement of educational practices in alignment with the transition to new learning technologies. Additionally, there is an urgent need to enhance digital literacy and teachers' information competence, enabling them to effectively integrate constructivist approaches into online learning environments.
2.	Constructivism-Based Teaching and Learning in Indonesian Education	(Suhendi et al., 2021)	This study aims to explore the role of constructivist-based learning in the context of education in Indonesia and evaluate its impact on students' ability to construct knowledge both independently and socially. The research also focuses on the	This study adopts a case study approach, as referenced in Kothari's (2004) methodological framework, to ensure the validity of the findings. The case study method is employed to provide an in-depth depiction of the implementation of	The research findings indicate that the constructivist approach has a positive impact on the advancement of education in Indonesia. This method not only enhances students' abilities but also fosters creativity and the construction of knowledge tailored to individual needs. Constructivism shifts the focus of learning from teacher-led	The primary challenge in the implementation of constructivism is the paradigm shift from behaviorist-based education to cognitive-based education, which requires fundamental changes in teachers' pedagogical approaches. Additionally, the integration of micro-

			application of Dewey's constructivist theory in instructional practices.	constructivist learning in the context of Indonesian education, with the analysis grounded in John Dewey's constructivist theory.	knowledge transmission to an active process of meaning construction by students themselves. Additionally, this approach supports student engagement in authentic and meaningful activities, both individually and within learning communities.	technology and linguistic approaches into constructivist learning narratives is a complex process, necessitating careful conceptual and methodological adjustments.
3.	A Future Trend for Science Education: A Constructivism-Humanism Approach to Trans-Contextualization	(Holbrook et al., 2022)	his study aims to re-evaluate the focus of science education/STEM schools in addressing increasing social challenges, particularly those related to sustainability. Through a constructivist-humanist approach, this research develops a theoretical four-phase learning model by incorporating a trans-contextualization phase into the existing three-stage teaching model. The objective is to enhance the contribution of science education to societal development and the formation of active, sustainability-aware citizens.	This study employs a theoretical-qualitative approach based on constructivism-humanism, with model development conducted through literature review and initial validation of the proposed framework. The validation process involves collecting insights from science educators already familiar with the three-stage teaching approach to assess the value, feasibility, and potential challenges of the proposed four-phase model.	The research findings indicate that the four-phase model, incorporating the trans-contextualization phase, was positively received by science educators. They consider the model to have high value, be feasible for implementation, and be aligned with contemporary educational needs, particularly in preparing students to face social and global environmental challenges. These perspectives are also consistent with previous studies, which have demonstrated widespread support from teachers for contextual learning innovations.	The primary challenges in implementing this model lie in the practical application of the trans-contextualization phase within school environments. These challenges include resource limitations, teacher readiness, and the curriculum's adherence to traditional learning standards. Additionally, the paradigm shift in education from a classroom-focused approach toward a broader social impact necessitates systemic adjustments in instructional design and a redefinition of the teacher's role as a social change agent.

4.	Ibnu Khaldun's Constructivism in Islamic Education	(Ferianto et al., 2024)	This study aims to analyze Ibn Khaldun's constructivist thought in the context of Islamic religious education and explore how the application of his ideas can strengthen constructivist approaches in the learning process.	This study employs a qualitative approach using a case study method, focusing on the Master's Program in Islamic Education at Singaperbangsa Karawang University. Data collection techniques include interviews, observations, and documentation. The data analysis follows Miles and Huberman's model, which consists of data reduction, data presentation, and drawing conclusions/verification.	The research findings indicate that, according to Ibn Khaldun, constructivist learning can be achieved through social interaction, which encourages students to develop understanding through discussion, experience, and reflection. This practice is manifested in the freedom given to students to design course contracts, form discussion groups, select references, and collaboratively solve case studies. This approach provides learners with the space to actively construct knowledge in alignment with their real-world experiences and personal perspectives.	This study is limited in scope as it focuses solely on the thoughts of Ibn Khaldun from the perspective of Islamic education. Additionally, the primary challenge in broadly implementing Ibn Khaldun's ideas lies in the integration of this approach into the formal education system, which remains conventional and teacher-centered. Further efforts are required to adapt Islamic constructivist values into broader educational practices across diverse contexts.
5.	The Future of Constructivist Education	(Kritt & Budwig, 2022)	This study aims to examine the gap between theory and practice in constructivist education and propose ways to bridge the conceptual differences between the theoretical perspectives of constructivist scholars and the practical approaches of educators in the field. The analysis covers both K-12	This study employs a theoretical and analytical approach, examining core aspects of constructivist education, including processes, agency, and holism. Additionally, the research conducts a comparative analysis between theoretical understanding and classroom practices that	The study reveals a significant discrepancy between constructivist theory and classroom practices that are labeled as constructivist. This misalignment stems from the complexity of constructivist theory itself and the challenges practitioners face in fully understanding and implementing it. The key difference emerges between the theoretical approach, which	Key Challenges The complexity of constructivist theory, which makes it difficult for practitioners to fully comprehend. The misalignment between philosophical approaches and pedagogical implementation. The lack of explicit dialogue on how constructivist theory

			education and higher education contexts.	are claimed to be constructivist, in order to identify sources of discrepancies in their implementation.	emphasizes relational development processes, and the practitioner approach, which tends to adopt separate and mechanistic frameworks.	is developed and presented to educators. The need for a redefinition and reformulation of constructivist concepts to make them more applicable and relevant in contemporary educational contexts.
6.	The Role of Constructivism in Modern Educational Philosophy: A Comparative Analysis (Primarni et al., 2024)	(Primarni et al., 2024)	This study aims to compare the role of the constructivist paradigm within modern educational philosophy by analyzing its impact across various educational contexts. Specifically, the research evaluates how constructivist principles are integrated into teaching strategies and examines their effect on student learning outcomes in comparison to traditional approaches.	The study employs a qualitative comparative analysis, incorporating: Literature review of scholarly articles and educational reports. Case studies from various educational institutions. Interviews with educators implementing constructivist approaches. Cross-national comparisons to explore the global application of constructivist pedagogy.	Constructivist-based teaching strategies enhance students' critical thinking, problem-solving, and collaborative skills. Schools that implement constructivist approaches report higher student engagement levels and better long-term knowledge retention. In contrast, traditional methods are more effective for rote memorization but provide limited support for the development of higher-order thinking skills.	The implementation of constructivism varies across countries and educational systems. Teacher readiness and educational infrastructure remain obstacles in adopting this approach in certain contexts. The constructivist approach requires a fundamental shift in the teacher's role from a knowledge transmitter to a facilitator, a transition that is not yet fully understood or embraced in traditionally structured systems. The assessment of learning outcomes aligned with constructivist principles such as authentic assessment continues to be a challenge in global education practices.

7.	Constructivism as pedagogical framework and poetry learning outcomes among Nigerian students: An experimental study	(Ugwuozor, 2020)	This study aims to measure the impact of the constructivist approach on poetry learning among junior secondary school students in southeastern Nigeria. Additionally, the research evaluates whether gender influences the effectiveness of the constructivist approach in this context.	This study employs an experimental approach with a randomly assigned control and treatment group design. The analytical technique used is Repeated-Measures ANOVA to measure students' achievement levels in poetry learning. Participants are divided into two groups: one applying the constructivist approach (treatment group) and one following a conventional approach (control group).	The constructivist approach significantly enhanced poetry learning outcomes in the treatment group compared to the control group. No significant differences were found in the effectiveness of the constructivist method based on gender. The results indicate that constructivism can improve learning outcomes, particularly in literary contexts such as poetry.	The limited interaction time between teachers and students presents a major challenge to the optimal implementation of the constructivist approach. The availability of adequate resources, including instructional materials and teacher training, is crucial for achieving maximum effectiveness in constructivist education. The lack of empirical evidence in the African context, particularly regarding poetry as an independent subject, highlights the need for further local research to strengthen these findings.
8.	Theoretical foundations of design thinking – A constructivism learning approach to design thinking	(Pande & Bharathi, 2020)	This study aims to: Identify and map the principles of constructivism within the Design Thinking learning process. Develop an integrative approach that connects theory, methodology, and practice to design a constructivist-based Design Thinking course.	A qualitative-conceptual approach is employed, focusing on the development of a taxonomy of constructivist principles integrated into the processes and activities of Design Thinking. The study includes the creation of a constructivist-theory-	A taxonomy of constructivist principles has been developed to map the steps and activities within the Design Thinking process. The "Constructivism Tenets–Design Thinking" dashboard has been designed as a practical and theoretical guide for developing and implementing Design Thinking courses.	The need to adapt the dashboard to the specific context and requirements of each discipline or industry. Practical limitations in implementation if educators lack sufficient understanding of constructivist principles. - The necessity for further testing to assess the dashboard's effectiveness in

			- Create a "Constructivism Tenets–Design Thinking" dashboard, which can be flexibly applied across various disciplines, particularly in business education (MBA programs).	based dashboard, serving as a tool for designing and evaluating Design Thinking learning. This research follows a curriculum design framework (curriculum design research) to structure and refine educational methodologies.	While this dashboard is particularly beneficial for business education, it is also flexible enough to be applied across various disciplines, especially those emphasizing user experience or problem-based learning.	real-world learning environments across different educational levels and institutions.
9.	The Relevance of Constructivist Learning Theory to the Application of Independent Learning	(Afifah et al., 2024)	This study aims to enhance understanding of the relevance between constructivist theory and the implementation of the Curriculum Merdeka in Indonesia.	This study employs a literature review approach, aiming to describe the relationship between constructivist theory and the Curriculum Merdeka in Indonesia through scholarly analysis.	The analysis highlights three key aspects that demonstrate the relevance between constructivist theory and the Curriculum Merdeka: Enhanced social interaction in learning, aligning with constructivism's emphasis on the role of social interaction in knowledge construction. The teacher's role as a facilitator and guide (scaffolding), supporting the concept of the zone of actual and potential development within constructivist theory. - Opportunities for students to develop social skills through the reinforcement of the Pancasila Student Profile, consistent with constructivist perspectives on the	The need for further empirical research on the effectiveness of project-based learning in the implementation of Curriculum Merdeka. Teacher readiness to adopt the role of a facilitator (scaffolder) within the Curriculum Merdeka framework.

					importance of social environments in shaping cognitive and social abilities.	
10.	Teachers' perceptions of constructivist curriculum change as a predictor of their perceptions of the implementation of constructivist teaching–learning activities	(Yildirim & Kasapoglu, 2015)	This study aims to investigate the relationship between teachers' perceptions of constructivist learning activities and curriculum changes within constructivist education.	This study employs a survey method, utilizing questionnaire-based data collection. - Respondents: 236 elementary school teachers. - Instrument: A questionnaire developed through a literature review, with content validity assessed by experts and reliability tested via a pilot study. - Data Analysis: Bivariate correlation and linear regression are applied to examine the relationships between the investigated variables.	- There is a positive correlation between teachers' perceptions of constructivist learning activities and curriculum changes within constructivist education. - Teachers' perceptions of constructivist curriculum changes serve as a predictor for the implementation of constructivist learning activities.	- Validity and reliability of the questionnaire should be continuously strengthened to ensure the accuracy of teachers' perception measurement. - Additional influencing factors, such as teaching experience, educational background, and policy support, should be accounted for in future research. - Successful implementation of the constructivist curriculum requires readiness from multiple stakeholders, including teachers, students, and educational institutions. This analysis serves as a foundation for future studies in constructivist education and the role of teachers' perceptions in curriculum reform.
11.	Study of Independent Learning, Independent	(Perdima et al., 2024)	This study aims to examine the alignment between Indonesia's Freedom of Learning	A qualitative approach utilizing the library research method.	There is a strong alignment between the philosophy of constructivism and the Merdeka Belajar policy introduced by	The subjective nature of learning outcomes and their unpredictability largely

	Campus in Constructivism Philosophy and the Challenges of Implementation		(Merdeka Belajar) policy, introduced by the Ministry of Education, Culture, Research, and Technology (Kemendikbud RI), and the principles of constructivist philosophy.	The data analysis procedures include: - Data Reduction - Data Presentation (Data Display) - Conclusion Drawing	Minister of Education Nadiem Makarim. Its core focus includes: - Freedom - Independence - Institutional flexibility in understanding students' competencies. The learning process, which embraces a chaos approach, enables students to learn in a safe, comfortable, and enjoyable environment. Learners actively participate in the learning process, demonstrating high levels of initiative and motivation.	depend on individual learners. Constructivism is regarded as a "Chaos Paradigm," making this approach difficult to standardize. A positive attitude and perception toward learning from students are essential for the success of the learning process. The main challenge lies in balancing freedom and flexibility while maintaining structured and meaningful learning experiences.
12.	Smart Learning in the 21st Century: Advancing Constructionism Across Three Digital Epochs	(Levin et al., 2025)	Exploring the evolution and relevance of constructionism as an educational framework across three pivotal technological eras: - The Personal Computer Era - The Networked Society Era - The Generative AI Era This study also aims to: - Analyze the alignment between constructionist principles and digital technological	A qualitative narrative/descriptive approach employing conceptual and philosophical analysis, Based on literature review and educational theories, including Seymour Papert's constructionism, Examining the evolution of learning approaches in the context of digital technology and AI advancements.	The transformation from instructionism to constructionism, emphasizing: - Learner autonomy - Creative and interactive engagement - The emergence of the "expanded personality" as a consequence of digital technology and AI integration in shaping self-identity and social interactions. Constructionism remains relevant and even crucial in supporting adaptive,	The complexity of integrating technologies like AI within a humanistic and student-centered education framework. Balancing personalization and equitable access to prevent digitalization from deepening educational inequalities. Realizing a truly constructionist learning environment within an education system that remains largely hierarchical and instruction-driven.

			advancements in both personal and collective learning, - Propose constructionism as a fundamental approach for personalized and digitalized education (smart education).		personalized, and democratic learning in the digital era. It offers a technology-based educational framework centered on the learner, fostering 21st-century learning.	A paradigm shift for educators and policymakers to comprehend and implement constructionist principles in technology-based curricula and learning practices.
13.	Challenges in EFL Constructivist Classrooms From Teachers' Perspectives: A Case Study in Vietnam	(Nguyen & Le, 2024)	To address the gap in the literature by investigating the challenges faced by teachers in implementing constructivist approaches in learning, particularly in the context of English as a Foreign Language (EFL) instruction in Vietnam. This study also aims to validate and expand Windschitl's framework concerning the four key dilemmas encountered in constructivist classrooms.	A mixed-methods approach employing data triangulation, consisting of: - Questionnaires - Classroom observations - Semi-structured interviews Participants: 120 EFL teachers from a private university in Vietnam.	Teachers encounter various challenges in implementing constructivist classrooms, including: - Conceptual dilemmas - Pedagogical dilemmas - Cultural dilemmas - Political dilemmas - Technological dilemmas Many teachers lack a deep understanding of constructivism, possibly due to: - Superficial comprehension of the theory - The influence of Confucian cultural values, which emphasize hierarchy and obedience. This study validates and expands Windschitl's framework on the four dilemmas of constructivist teaching. It also presents theoretical and practical implications for:	The lack of deep conceptual understanding of constructivism among teachers. The cultural value conflict (such as Confucianism) with constructivist principles that emphasize student autonomy. Pedagogical and technological barriers in facilitating interactive and participatory learning. Political and policy dilemmas that hinder teacher autonomy in implementing flexible learning approaches.

					- Future researchers - Educational policymakers - Institutional leaders, particularly regarding readiness before adopting a constructivist approach.	
14.	Constructivism learning theory: A paradigm for students' critical thinking, creativity, and problem solving to affect academic performance in higher education	(Almulla, 2023)	To investigate whether creativity and critical thinking assist students in problem-solving and academic achievement, by mediating their relationship with 21st-century skills such as: - Learning motivation - Cooperativity - Peer interaction and engagement - Smart classroom environments	A quantitative approach utilizing Structural Equation Modeling (SEM). Participants: 297 undergraduate and graduate students from four faculties at King Faisal University, Saudi Arabia. Sampling technique: Random sampling with voluntary participation.	Learning motivation, cooperation, peer interaction, engagement, and smart classroom environments → positively impact creativity and critical thinking. Creativity and critical thinking → directly enhance problem-solving abilities and academic achievement. Problem-solving skills → directly contribute to academic success. This study develops a measurement model that explains how creativity and critical thinking serve as mediators between 21st-century skills and academic success.	The complexity of mediated relationships involving multiple 21st-century skill variables. The generalizability of findings may be limited to higher education in Saudi Arabia. Potential participant bias due to voluntary participation, despite the random sampling approach. Challenges in valid and reliable measurement of abstract variables such as creativity, critical thinking, and problem-solving using Structural Equation Modeling (SEM).
15.	Analysis of the Independent Curriculum from the Perspective of the School of Education Philosophy and	(Sukiastini et al., 2024)	To explore the philosophical principles underlying Curriculum Merdeka, highlighting key aspects such as: - Freedom to learn - Diversity - Equality	Research Type: Qualitative Method: Literature Study Data Sources: Books, research journals, news articles, and online publications	Curriculum Merdeka is influenced by various educational philosophies, primarily Progressivism, Perennialism, Essentialism, Constructivism, and Ki Hajar Dewantara's educational philosophy.	Analyzing and integrating various educational philosophies, despite occasional conflicting principles. Empirical validation of the direct relationship between philosophy and curriculum

the Philosophy of Ki Hajar Dewantara	- Student-centered learning Additionally, this study compares Curriculum Merdeka with other educational philosophies, including: - Perennialism - Essentialism - Progressivism	Data Collection Technique: Documentation Data Analysis Technique: Content Analysis	The integration of academic philosophy with Indonesia's national educational philosophy (Ki Hajar Dewantara) fosters a holistic approach to education. As a result, this curriculum shapes generations that are not only intellectually capable, but also creative, competitive, and morally strong.	practice may be challenging due to the nature of literature-based studies. Potential interpretative bias in analyzing educational texts and documents. Limited literature explicitly linking Curriculum Merdeka to all the mentioned educational philosophies.

The constructivist paradigm in education has demonstrated high significance in addressing 21st-century learning challenges, particularly in the shift toward digital learning and personalized education (Chu et al., 2021; Rafiq et al., 2024). Based on empirical findings and theoretical studies, constructivism not only enhances students' active participation but also strengthens the development of critical thinking, creativity, and problem-solving skills, which are key indicators of modern educational success.

The application of constructivism supports the transition from behaviorist approaches to cognitive and humanistic education. In the context of Indonesia's Curriculum Merdeka, constructivist principles such as freedom to learn, student autonomy, experiential learning, and reflective practice are central elements aligned with the spirit of Merdeka Belajar. This is further reinforced by the integration of Ki Hajar Dewantara's values with modern educational philosophies, including progressivism and constructionism, which emphasize holistic and comprehensive personality development. However, the implementation of this paradigm faces various systemic and cultural challenges. Teachers, as key actors in learning, encounter conceptual, pedagogical, cultural, political, and technological dilemmas (Windschitl, 2002). Many teachers lack a deep understanding of constructivism, often due to limited pedagogical literacy or the influence of local cultural values, such as Confucianism in certain Asian countries, which promotes hierarchical and teacher-centered learning. In this context, developing teachers' informational and digital literacy competencies is critical to their role as effective facilitators. Moreover, constructivist approaches also face methodological and infrastructural constraints. The lack of a strong conceptual framework to guide teachers in designing constructivist-based learning, especially in online settings, remains a major concern. In many schools, the implementation of contextual or trans-contextual learning, which connects lesson content with social and global environmental issues, has not been fully optimized due to resource limitations, teacher preparedness, and the persistence of traditional curricula.

Interestingly, constructivism is now being integrated into domains previously considered non-cognitive, such as poetry learning or business education through design thinking principles (Chan, & Erduran, 2025). These findings suggest that constructivism is not merely a teaching method, but rather a flexible paradigm adaptable to various disciplines. However, this adaptability demands conceptual readiness from educators, to prevent constructivism from being oversimplified as mere student-centered activities.

Recent studies indicate that creativity and critical thinking serve as significant mediators between 21st-century skills (motivation, collaboration, social interaction, smart learning environments) and students' learning outcomes (Bhuttah et al., 2024). This provides strong justification that constructivism emphasizing meaning-making through interaction and experience is an effective approach to achieving future educational goals.

Ultimately, the successful implementation of constructivism relies on systemic transformations in teachers' roles, instructional design, and learning assessment. A redefinition of the teacher's role from instructor to facilitator, along with adjustments to assessment methods toward more authentic and reflective practices, is essential. Without these structural changes, constructivism risks becoming merely a pedagogical slogan, without true realization in classroom practices.

D. Conclusion

This study affirms that the constructivist paradigm is a pivotal driver in transforming 21st-century education, particularly within Indonesia's Curriculum Merdeka framework. The key finding is that constructivism through principles of student autonomy, experiential learning, and collaborative reflection effectively cultivates essential competencies such as critical thinking, creativity, and problem-solving. This pedagogical approach aligns seamlessly with the curriculum's emphasis on freedom, flexibility, and holistic development, resonating with the educational philosophy of Ki Hajar Dewantara. However, its implementation encounters significant barriers, including insufficient teacher pedagogical understanding, cultural resistance to student-centered learning, a lack of structured methodological guidance, and uneven digital infrastructure. The practical implications of these findings are substantial. To realize the potential of constructivist learning, systemic interventions are necessary. These include designing comprehensive and continuous professional development programs to enhance teachers' constructivist pedagogical skills and digital literacy. Additionally, educational policies must be refined to provide clearer implementation frameworks, while assessment systems should evolve to measure process-oriented and competency-based outcomes rather than mere content retention. Schools and policymakers must also invest in inclusive digital infrastructure to support collaborative and contextual learning experiences, especially in underserved regions. For future research, it is recommended to conduct longitudinal studies to examine the sustained impact of constructivist methods on student competency development and character formation. Further investigation is needed into culturally responsive models of constructivism that respect local values while fostering innovation. Additionally, action research exploring effective strategies for teacher mentorship and professional learning communities would be valuable. Finally, comparative studies between regions or school types could identify contextual success factors and barriers, contributing to a more nuanced and adaptive implementation roadmap for constructivist education across Indonesia's diverse educational landscape.

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References

Afifah, A., Febrianto, R., & Sjech Djamil Djambek Bukittinggi, U. M. (2024). Indonesian Journal of Education the Relevance of Constructivist Learning Theory to the Application of Independent Learning. *Indonesian Journal of Education*, *1*, 27–34. https://doi.org/10.71417/ije.v1i2.171

Akhmetova, T. A., Retnawati, H., Azman, M. N. A., & Kassymova, G. K. (2021). Constructivist approach in pedagogical science. *Challenges of Science. Issue IV*, 12–17. https://doi.org/10.31643/2021.02

Alfaruki, A. (2022). The Concept of Merdeka Belajar from The View of Constructivism. *Jurnal EL-Tarbawi*, *15*(2), 225–250. https://doi.org/10.20885/tarbawi.vol15.iss2.art4

Almulla, M. A. (2023). Constructivism learning theory: A paradigm for students' critical thinking, creativity, and problem solving to affect academic performance in higher education. *Cogent Education*, *10*(1). https://doi.org/10.1080/2331186X.2023.2172929

Bhuttah, T. M., Xusheng, Q., Abid, M. N., & Sharma, S. (2024). Enhancing student critical thinking and learning outcomes through innovative pedagogical approaches in higher education: The mediating role of inclusive leadership. Scientific Reports, 14(1), 24362. https://doi.org/10.1038/s41598-024-75379-0

Chan, J., & Erduran, S. (2025). Future-oriented science learning and its effects on students' emotions, futures literacy and agency in the Anthropocene. Research in Science Education, 55(4), 899-919. https://doi.org/10.1007/s11165-024-10213-1

Chu, S. K. W., Reynolds, R. B., Tavares, N. J., Notari, M., & Lee, C. W. Y. (2021). 21st century skills development through inquiry-based learning from theory to practice. Springer International Publishing. https://link.springer.com/book/10.1007/978-981-10-2481-8

Çibukçiu, B. (2025). The relationship between constructivist approach and inclusive education in primary school. *Frontiers in Education*, *10*. https://doi.org/10.3389/feduc.2025.1600711

Ferianto, F., Munafiah, N., Makbul, M., & Firmansyah, F. (2024). Ibnu Khaldun's Constructivism in Islamic Education. *Al-Hayat: Journal of Islamic Education*, *8*(2), 550. https://doi.org/10.35723/ajie.v8i2.557

Fitria, D., Studi Doktor, P., & Negeri Padang, U. (2021). Implementation of Constructivism Learning Theory in Science. In *International Journal of Humanities Education and Social Sciences,* 1(3). https://ijhess.com/index.php/ijhess/

Hakiky, N., Nurjanah, S., & Fauziati, E. (2023). Independent Curriculum from the Perspective of Constructivism Philosophy. *Tsaqofah*, *3*(2), 194–202. https://doi.org/10.58578/tsaqofah.v3i2

Hamida, E., Thoha, M., Christiana, Y., & Andika, C. (2025). Constructivist Philosophy in the Context of Merdeka Belajar. *Indonesian Journal of Innovation Multidiscipline Research*, *3*, 85–94.

Hursen, C., & Soykara, A. (2012). Evaluation of Teachers' Beliefs Towards Constructivist Learning Practices. *Procedia - Social and Behavioral Sciences*, *46*, 92–100. https://doi.org/10.1016/j.sbspro.2012.05.074

Kritt, D., & Budwig, N. (2022). The Future of Constructivist Education. *Human Development*, *66*(4–5), 295–309. https://doi.org/10.1159/000526275

Levin, I., Semenov, A. L., & Gorsky, M. (2025). Smart Learning in the 21st Century: Advancing Constructionism Across Three Digital Epochs. *Education Sciences*, *15*(1). https://doi.org/10.3390/educsci15010045

Loughlin, C., Lygo-Baker, S., & Lindberg-Sand, Å. (2021). Reclaiming constructive alignment. *European Journal of Higher Education*, *11*(2), 119–136. https://doi.org/10.1080/21568235.2020.1816197

Musundwa, S. (2024). Implementing constructivist teaching to foster inclusive educational practices in accounting programmes. *Accounting Education*. https://doi.org/10.1080/09639284.2024.2367132

N. P. Koptseva. (2020). Perspectives of Science and Education. *International Scientific Electronic Journal*, *6*, 40–54. https://doi.org/10.32744/pse

Nguyen, L. Q., & Le, H. Van. (2024). Challenges in EFL Constructivist Classrooms from Teachers' Perspectives: A Case Study in Vietnam. *SAGE Open*, *14*(2). https://doi.org/10.1177/21582440241245187

Pande, M., & Bharathi, S. V. (2020). Theoretical foundations of design thinking – A constructivism learning approach to design thinking. *Thinking Skills and Creativity*, *36*, 100637. https://doi.org/10.1016/j.tsc.2020.100637

Perdima, F. E., Suwarni, Danim, S., & Connie. (2024). Study of Independent Learning, Independent Campus in Constructivism Philosophy and the Challenges of Implementation. *Cogent Education*, 273–280. https://doi.org/10.2991/978-2-38476-108-1_26

Prabawati, P. L. S., Suarni, N. K., & Margunayasa, I. G. (2024). Implementation of Learning with the Independent Curriculum for Elementary School Students Reviewed from the Constructivism Theory. *Ideguru: Jurnal Karya Ilmiah Guru*, *9*(1), 432–438. https://doi.org/10.51169/ideguru.v9i1.864

Primarni, A., Hoxha, A., & Rzayev, R. (2024). The Role of Constructivism in Modern Educational Philosophy: A Comparative Analysis. *International Journal of Educational Narratives*, *2*(6), 546–556. https://doi.org/10.70177/ijen.v2i6.1691

Rafiq, S., Iqbal, S., & Afzal, A. (2024). The impact of digital tools and online learning platforms on higher education learning outcomes. Al-Mahdi research journal (MRJ), 5(4), 359-369. https://ojs.mrj.com.pk/index.php/MRJ/article/view/342

Rehman, N., Huang, X., Mahmood, A., AlGerafi, M. A. M., & Javed, S. (2024). Project-based learning as a catalyst for 21st-Century skills and student engagement in the math classroom. *Heliyon*, *10*(23). https://doi.org/10.1016/j.heliyon.2024.e39988

Setiyaningsih, S., & Subrata, H. (2023). Implementation of Integrated Problem Based Learning with Vygotsky's Constructivism Paradigm in the Independent Learning Curriculum. *Jurnal Ilmiah Mandala Education (JIME)*, *9*(2), 2656–5862. https://doi.org/10.58258/jime.v9i1.5051

Suhendi, A., Purwarno, P., & Chairani, S. (2021). Constructivism-Based Teaching and Learning in Indonesian Education. *KnE Social Sciences*, 76–89. https://doi.org/10.18502/kss.v5i4.8668

Sukiastini, I. G. A. N. K., Suharta, I. G. P., & Lasmawan, I. W. (2024). Analysis of the Independent Curriculum from the Perspective of the School of Education Philosophy and the Philosophy of Ki Hajar Dewantara. *Path of Science*, *10*(5), 3085–3093. https://doi.org/10.22178/pos.104-31

Tsehay, S., Belay, M., & Seifu, A. (2024). Challenges in constructivist teaching: Insights from social studies teachers in middle-level schools, West Gojjam Zone, Ethiopia. *Cogent Education*, *11*(1). https://doi.org/10.1080/2331186X.2024.2372198

Ugwuozor, F. O. (2020). Constructivism as pedagogical framework and poetry learning outcomes among Nigerian students: An experimental study. *Cogent Education*, *7*(1). https://doi.org/10.1080/2331186X.2020.1818410

Walad, M., Suastra, W., Nasri, U., & Manap, A. (2024). Independent Curriculum Analysis from Constructivism and Ki Hajar Dewantara Philosophy Perspective. *Jurnal Ilmiah Profesi Pendidikan*, *9*(1), 221–228. https://doi.org/10.29303/jipp.v9i1.1915

Wijayanti, P. T., Rhamadani, N., Oktadika, U., Jaya Adiputra, M., & Yulita Sari, M. (2025). Analysis of Teachers' Understanding of Constructivism Theory in the Independent Curriculum in Elementary Schools. *Jurnal Pendidikan Dasar Dan Keguruan*, *10*(1), 32–37. https://doi.org/10.47435/jpdk.v10i1.3219

Windschitl, M. (2002). Framing constructivism in practice as the negotiation of dilemmas: An analysis of the conceptual, pedagogical, cultural, and political challenges facing teachers. Review of educational research, 72(2), 131-175. https://doi.org/10.3102/00346543072002131

Yildirim, A., & Kasapoglu, K. (2015). Teachers' perceptions of constructivist curriculum change as a predictor of their perceptions of the implementation of constructivist teaching–learning activities. *Asia Pacific Education Review*, *16*(4), 565–577. https://doi.org/10.1007/s12564-015-9394-5

Zohar, A. (2023). Scaling-up Higher Order Thinking: Demonstrating a Paradigm for Deep Educational Change. In *Scaling-up Higher Order Thinking: Demonstrating a Paradigm for Deep Educational Change*. Springer International Publishing. https://doi.org/10.1007/978-3-031-15967-1