

Deep Learning Approaches To Teaching And Learning: An Integrative Review From The Perspectives Of Multiple Learning Theories

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Abstract

The deep learning approach in education is a learning strategy oriented toward in-depth conceptual understanding, reflection, and integration of knowledge. This study aims to analyze the deep learning approach from the perspectives of multiple learning theories, namely behaviorism, cognitivism, humanism, and constructivism. The deep learning approach is considered relevant to addressing the challenges of twenty-first-century education because it emphasizes deep conceptual understanding, critical thinking skills, and learners' active engagement in the learning process. However, the implementation of this approach is often not supported by a strong theoretical understanding. Therefore, this study employs a descriptive qualitative literature review method by analyzing various academic sources to identify the contributions of each learning theory to the deep learning approach. The findings indicate that behaviorism shapes purposeful learning behaviors; cognitivism provides a foundation for information-processing strategies and metacognition; humanism emphasizes the importance of intrinsic motivation, personal values, and individual growth; while constructivism supports active, collaborative, and contextualized learning. The synthesis of these four perspectives establishes a comprehensive conceptual foundation for developing transformative and holistic deep learning instructional designs. This study makes a significant conceptual contribution to the development of learning strategies that integrate behavioral, cognitive, affective, and social dimensions in a balanced manner.

Keyword: Deep Learning, Behaviorism, Cognitivism, Humanism, Constructivism.

INTRODUCTION

Twenty first century education requires learning approaches that move beyond one-way information transmission toward the comprehensive development of learners' potential. In this context, the deep learning approach has become increasingly relevant because it emphasizes meaningful conceptual understanding, the integration of knowledge across disciplines, and the development of critical and reflective thinking skills. Fatmawaty, (2024) explains that the deep learning approach plays an important role in fostering deeper conceptual understanding through analysis, evaluation, and the application of knowledge to real-life situations. This approach emphasizes learners' active engagement in the learning process, requiring them to construct personal meaning through interaction, exploration, and reflection on their learning experiences. Nevertheless, the implementation of the deep learning approach continues to face challenges across various educational levels, particularly because surface learning, which emphasizes memorization and the reproduction of information, remains prevalent.

In practice, a gap persists between the ideals of the deep learning approach and the realities of educational implementation. Some educators have yet to develop a comprehensive understanding of the theoretical foundations underpinning deep learning. Consequently, the instructional strategies they employ are often inconsistent with the characteristics of meaningful learning. This situation is further compounded by the suboptimal integration of this approach into curricula and instructional designs that prioritize learners' internalization of knowledge. In light of these challenges, a critical and reflective examination of the deep learning approach is essential, particularly through a review and synthesis of four major perspectives in learning theory: behaviorism, cognitivism, humanism, and constructivism. Learning theories explain how individuals acquire knowledge and skills (Giannoukos, 2024). These theories encompass various perspectives, including cognitive, humanistic, and constructivist approaches. They also highlight the role of teachers in facilitating learners' development, recognizing individual potential, and adapting instructional processes to diverse information systems and learner needs to promote effective education (Abdurakhman & Rusli, 2017).

Behaviorism constitutes an important theoretical framework for learning, emphasizing observable behavior and the use of reinforcement and punishment to shape and regulate behavior effectively in educational contexts (Ulm & Fauzi, 2023). From the perspective of deep learning, behaviorism offers structured and effective strategies for enhancing specific aspects of learning, including motivation, retention, and technical skills, particularly when integrated with digital tools (Juraganda et al., 2025).

Cognitive learning theory conceptualizes learning as an active mental process through



which information is organized and knowledge structures are developed. This theory maintains that new information is best understood when connected to existing knowledge, thereby enhancing memory and comprehension (Aprilia, 2024). Cognitive learning theory also emphasizes the mental processes involved in learning and highlights the importance of active interaction with the environment in facilitating changes in knowledge, understanding, behavior, skills, and attitudes (Sriastuti & Masing, 2022).

Humanistic theory views learning as a means of self actualization, emphasizing personal meaning and learner autonomy. Humanistic learning theory underscores the importance of individual experiences and personal growth in the educational process. This approach seeks to humanize learners by nurturing their unique qualities and promoting self-actualization. From this perspective, learning extends beyond memorization to encompass self-understanding and an understanding of the surrounding environment, thereby enhancing motivation and engagement in learning activities. This theory is closely associated with personal experiences, which have been reported to exert a significant influence on learning outcomes (Setiadi et al., 2023). Furthermore, humanistic learning theory emphasizes individual experience, freedom in learning, and the humanization of learners, with a focus on personal growth, exploration, and the development of independence throughout the learning process (Habsy et al., 2023).

Constructivism, meanwhile, regards knowledge as the product of individuals' active construction based on experience and social interaction. Constructivist learning theory emphasizes that learners actively construct knowledge through experience and reflection, thereby significantly shaping educational practices. It advocates learner centered approaches that engage students in critical thinking, problem solving, and collaborative learning. Through reflection on their experiences, learners develop and refine their understanding, reinforcing the importance of active, learner centered education (Jumaah, 2024).

A cross theoretical analysis is essential for strengthening the philosophical and pedagogical foundations of the deep learning approach and for providing a basis for developing more comprehensive, contextualized, and transformative instructional models. By formulating a deep learning framework grounded in diverse theoretical perspectives, this study is expected to make a significant conceptual contribution to the development of instructional designs across educational levels. Furthermore, this multidimensional perspective may assist educators and policymakers in developing instructional strategies that extend beyond cognitive achievement to encompass character development, humanistic values, and twenty first century competencies.

Accordingly, this study is particularly important in the context of contemporary





educational reform, in which learning must address the complex challenges of the modern world while positioning learners at the center of the educational process. It also contributes to pedagogical literature by integrating contemporary learning approaches with classical educational theories that remain relevant today. Collectively, the four theoretical perspectives provide a comprehensive conceptual framework for understanding how and why the deep learning approach can serve as a valuable strategy for twenty first century education. Therefore, this article aims to analyze the alignment between the deep learning approach and the four learning theories through a literature review.

Previous studies have examined the relationship between deep learning and learning theories from various perspectives. Li, (2025) reported that deep learning significantly improves academic performance, knowledge comprehension, learning experiences, and the development of thinking and cognitive abilities. Silalahi et al., (2022) suggested that the deep learning approach is particularly compatible with learning designed around constructivist principles. From a humanistic perspective, Ursula, (2024) found that the relationship between deep learning and humanistic learning theory primarily concerns the potential of humanistic principles to enhance student motivation by addressing emotional and psychological needs, rather than examining the methodology of deep learning itself. Meanwhile, the application of behaviorist principles has been reported to improve student motivation and conceptual retention in deep learning contexts (Juraganda et al., 2025). In addition, the strong synergy between cognitivism and deep learning offers considerable potential for establishing a more meaningful, reflective, and sustainable learning framework (Togatorop et al., 2025).

The novelty of this study lies in its simultaneous and comprehensive integration of four major learning-theory perspectives behaviorism, cognitivism, humanism, and constructivism within a unified framework for the deep learning approach. Unlike previous studies, which have tended to examine these relationships separately or focus on a single theoretical perspective, this study offers a comprehensive theoretical synthesis intended to establish a stronger, more contextualized, and more relevant pedagogical foundation for implementing deep learning across educational levels.

Furthermore, this study develops an interdisciplinary analytical framework that can serve as a foundation for designing instructional strategies that integrate the formation of purposeful learning behaviors (behaviorism), information processing (cognitivism), personal development and motivation (humanism), and learning experiences grounded in social interaction and reflection (constructivism). Through this integration, the study offers an original conceptual contribution to the development of more transformative and holistic instructional



designs based on the deep learning approach.

METHOD

This study employed a literature review approach using a descriptive qualitative method. The data analyzed were obtained from various indexed scholarly journal articles relevant to the deep learning approach in education and learning theories. Data collection was conducted through systematic searches using Google Scholar as the academic database. The literature inclusion criteria were as follows: (1) relevance to the deep learning approach or to behaviorist, cognitive, humanistic, and constructivist learning theories; and (2) the provision of conceptual and practical information within educational contexts. Data were analyzed through data reduction, thematic categorization, and theoretical synthesis to develop an integrative conceptual framework. Data validity was maintained through source triangulation and in-depth examination of multiple references. Through this approach, the study is expected to make a conceptual contribution to the development of instructional designs grounded in a synthesis of multiple learning theories.

RESULTS AND DISCUSSION

RESULT

Based on the literature review conducted, the following findings were identified.

1. The Behaviorist Perspective

Deep learning in education requires both a high level of conceptual understanding and repeated technical practice. Behaviorist learning theory provides a systematic framework for organizing stimuli, responses, and reinforcement, thereby enabling the gradual development of learning behaviors necessary for achieving deep learning. Behaviorism can serve as an initial foundation for cultivating learning behaviors that lead to deeper understanding through several key principles, including reinforcement, shaping, repetition, and feedback. Behaviorism provides an operational framework for establishing purposeful learning behaviors, whereas deep learning emphasizes the quality of understanding to be achieved.

2. The Cognitive Perspective

Cognitive learning theory emphasizes the mental processes involved in learning, particularly how individuals perceive, process, and store information. From this perspective, meaningful learning occurs when students actively engage in internalizing and organizing information within their existing knowledge structures. In the context of the deep learning



approach, this principle is reflected in instructional strategies that emphasize elaboration, reflection, and the development of critical thinking.

3. The Humanistic Perspective

Humanistic learning theory places individuals at the center of the learning process and emphasizes the importance of psychological, emotional, and spiritual needs in fostering learning engagement and motivation. The deep learning approach is consistent with this principle because it encourages learners to explore the personal meaning of learning materials while providing opportunities for autonomy and self reflection. This approach considers students' engagement and emotional states, offering insights that can help improve instructional quality. Effective learning is characterized by its capacity to transform perspectives through critical reflection and experiential learning. This process involves examining and refining one's knowledge and assumptions, leading to a deeper understanding of oneself and the surrounding environment. In deep learning, students do not merely comprehend information; they also evaluate and reshape their perspectives on the world, making learning a process of identity development and self awareness.

4. The Constructivist Perspective

Constructivist learning theory maintains that knowledge is not passively transferred from teachers to students but is actively constructed by students through experience and social interaction. The deep learning approach facilitates this process by presenting intellectual challenges that encourage students to revise their understanding in response to new experiences. Within deep learning, scaffolding through group work, teacher guidance, and peer to peer discussions strengthens deeper conceptual understanding. Deep learning incorporates these principles by directing instruction toward real world problem solving, case studies, and collaborative projects. These approaches enable students to construct knowledge actively, critically, and reflectively within a supportive learning community.

DISCUSSION

The deep learning approach in education fundamentally emphasizes a learning process that goes beyond memorization toward deeper understanding, conceptual interconnectedness, and the ability to transfer knowledge to new situations. In much of the literature, this approach is more frequently associated with cognitive and constructivist learning theories. Nevertheless, a critical examination reveals that principles derived from behaviorist theory can also make a



significant contribution to the realization of deep learning.

1. The Behaviorist Perspective

Behaviorist theory, pioneered by John B. Watson and further developed by B. F. Skinner, conceptualizes learning as an observable change in behavior resulting from the interaction between stimuli and responses. Within this framework, learning is considered successful when behavioral changes align with predetermined learning objectives (Juraganda et al., 2025). At first glance, this approach may appear inconsistent with deep learning, which emphasizes internal cognitive processes. However, a closer examination suggests that behaviorism can provide an initial foundation for developing learning behaviors that support deeper understanding.

One of the central concepts in behaviorism is reinforcement. In the context of deep learning, reinforcement should not be limited to correct answers but should also recognize the quality of students' thinking processes (Knox et al., 2019). For example, when students are able to explain the reasoning underlying a mathematical concept, teachers can acknowledge their efforts or provide positive feedback. Consequently, analytical and reflective thinking behaviors can gradually develop into habitual practices. In this respect, behaviorist principles function as a mechanism for fostering higher order thinking through consistent reinforcement.

Furthermore, the concept of shaping, or the gradual formation of behavior, is highly relevant. Deep learning does not emerge instantaneously; rather, it develops through successive stages. Students initially learn to recall and understand fundamental concepts before gradually progressing toward application, analysis, and evaluation. Each stage is reinforced through systematic practice and feedback. In other words, deep thinking behaviors can be cultivated through a sequence of responses that are progressively reinforced in accordance with behaviorist principles.

Moreover, the behaviorist principle of repetition can also be adapted to support deep learning. Repetition should not necessarily be understood as a mechanical, memorization based activity; instead, it can be designed as varied and challenging practice (Gao, 2025). In mathematics education, for example, students should not merely solve problems that follow identical patterns but should also encounter variations in context that require flexible conceptual understanding. In this way, repetition can strengthen knowledge transfer, which is one of the defining characteristics of deep learning.

Feedback also plays an important role in connecting behaviorism with deep learning. Timely and specific feedback can help students recognize errors and improve their thinking strategies (Nainggolan & Listiani, 2024). From a behaviorist perspective, feedback functions as a reinforcing mechanism that guides students' responses. Within the deep learning framework,



however, feedback also contributes to the development of students' metacognitive awareness of their own learning processes. Thus, although behaviorism does not explicitly address metacognition, effective feedback practices can bridge the two approaches.

In practice, the integration of these approaches can be demonstrated in mathematics instruction. Teachers can design learning activities that begin with a stimulus in the form of a contextual problem, followed by students' responses in the form of proposed solutions. Teachers then reinforce not only the final answers but also the strategies used to obtain them. Through repeated and varied practice, students can become accustomed to engaging in deeper thinking. For example, when solving PISA style problems, students can be trained to interpret contexts, represent problems mathematically, and engage in reasoning. Success at each stage can be reinforced to cultivate higher order thinking habits.

Nevertheless, behaviorism has limitations in explaining deep learning comprehensively. Behaviorism tends to overlook internal mental processes, such as understanding, reflection, and meaning construction, which are central to deep learning (Ulum & Fauzi, 2023). Consequently, when used in isolation, this approach may result in mechanistic learning. Students may demonstrate the expected behaviors without necessarily developing a deep understanding of the material.

Despite these limitations, behaviorism remains valuable when positioned within a broader instructional framework. It can help establish foundational learning habits, including perseverance, accuracy, and consistency. Once these foundations have been established, other approaches, particularly cognitive and constructivist perspectives, can be employed to develop understanding and reflection. In this sense, behaviorism can serve as an initial stage that supports the development of deep learning.

Therefore, the relationship between the deep learning approach and behaviorist theory should not be viewed as inherently contradictory but rather as complementary. Behaviorism provides an operational framework for establishing purposeful learning behaviors, whereas deep learning provides an orientation toward the quality of understanding that education seeks to achieve. Integrating these perspectives can facilitate learning that is not only structured and measurable but also meaningful and sustainable.

2. The Cognitive Perspective

Cognitive learning theory emphasizes that understanding and organizing knowledge are essential to effective learning, promoting active engagement and problem solving skills. Students are encouraged to connect new information with existing knowledge, thereby



improving knowledge retention and recall (Aprilia, 2024). From this perspective, learning is understood as a process of information acquisition and organization that is essential for developing higher order thinking skills (Yuliadi & Hindun, 2023). Furthermore, teachers can facilitate cognitive development by creating learning environments that promote critical thinking and problem solving (Sundari & Tarsono, 2023).

David Ausubel emphasized the importance of connecting new information with existing cognitive structures in the process of meaningful learning. Ausubel's theory has been applied across various educational contexts, demonstrating its versatility and potential to foster deeper learning experiences. Meaningful learning occurs when new information is linked to relevant concepts already present in learners' cognitive structures. These connections facilitate the assimilation and retention of new knowledge (Nurhasanah et al., 2022); (Silva, 2020).

Within the deep learning approach, this principle is reflected in instructional strategies that emphasize elaboration, reflection, and the development of critical thinking. The revised Bloom's Taxonomy, developed by Anderson and Krathwohl, further supports the emphasis on higher-order cognitive processes, including analysis, evaluation, and creation. Deep learning also enhances problem solving capabilities by enabling learning systems to learn from data and improve over time (Mohanta et al., 2024).

Deep learning is an integral component of educational strategies aimed at developing higher order thinking skills. It promotes critical thinking, problem solving, and creativity, all of which are essential for lifelong learning and students' ability to adapt to a rapidly changing world (Pan et al., 2023). Integrating deep learning into education can also enhance digital literacy by fostering higher order thinking skills that are necessary for navigating and using digital technologies effectively (Liu, 2023).

Therefore, from a cognitive perspective, the deep learning approach not only encourages students to understand learning materials but also develops their metacognitive capacity, namely, their ability to reflect on their own thinking processes. This capacity constitutes an important element in fostering transformative and sustainable learning.

3. The Humanistic Perspective

Humanistic learning theory places individuals at the center of the learning process and emphasizes the importance of psychological, emotional, and spiritual needs in fostering learning engagement and motivation. Buchweitz, (2016) argues that meaningful learning occurs when students feel valued and safe and are given the freedom to determine the direction of their learning. Such freedom and trust can strengthen students' confidence, enabling them to



discover answers independently and develop their own knowledge. The deep learning approach aligns with these principles by encouraging learners to explore the personal meaning of learning materials while providing opportunities for autonomy and self reflection.

In educational practice, deep learning models take students' engagement and emotional states into account, generating insights that can contribute to improved instructional quality. This approach supports students by fostering a more engaging and supportive learning environment (Gazawy et al., 2023). Deep learning models can enhance student engagement and emotional well-being, thereby contributing to a student-centered learning environment. Such an environment promotes psychological safety, values participation, and encourages self-actualization, ultimately improving educational quality and supporting students' learning experiences.

Effective learning is characterized by its capacity to transform perspectives through critical reflection and experiential learning. This process involves examining and refining one's knowledge and assumptions, leading to a deeper understanding of oneself and the surrounding environment. Critical reflection is essential for effective learning because it encourages individuals to question their beliefs and assumptions (Khabanyane et al., 2014).

Within deep learning, students do not merely understand information, they also evaluate and reconstruct their perspectives on the world. Learning thus becomes a process of identity development and self-awareness.

4. The Constructivist Perspective

Constructivist learning theory maintains that knowledge is not passively transferred from teachers to students but is actively constructed by learners through experience and social interaction. Jean Piaget's theory of cognitive development explains that learning is facilitated through the processes of assimilation and accommodation, which are essential to the formation and evolution of cognitive schemas. These processes enable individuals to adjust their understanding of the world when confronted with new experiences. The equilibrium between assimilation and accommodation supports cognitive development as individuals strive to achieve a coherent understanding of their experiences (Silva et al., 2024). The deep learning approach facilitates this process by presenting intellectual challenges that encourage students to revise their understanding in response to new experiences.

Lev Vygotsky's concept of the Zone of Proximal Development (ZPD) emphasizes that optimal student development occurs through social support, particularly from peers or adults with greater knowledge or expertise. Such support facilitates cognitive growth by bridging the



gap between what learners can accomplish independently and what they can achieve with assistance (Tamburlini, 2022). Students can achieve optimal development through appropriate social support, such as guidance from teachers or peers, which helps them gradually solve problems independently while strengthening their cognitive skills and understanding (Salsabila & Lessy, 2024). In deep learning, scaffolding through group work, teacher guidance, and peer to peer discussions strengthens conceptual understanding.

Bruner's emphasis on discovery learning highlights its significance in fostering deep learning strategies, in which language plays an important role in meaning construction. Discovery learning encourages active engagement, allowing learners to explore concepts and develop cognitive skills through structured stages. This approach aligns with the principles of meaningful and deep learning, which emphasize higher-order thinking and the application of knowledge in authentic contexts. These characteristics are also central to deep learning strategies. Mystakidis, (2021) argues that discovery learning emphasizes critical thinking and problem-solving, both of which are essential for deep learning.

Situated learning theory and scaffolding theory also support the deep learning approach by demonstrating that effective learning occurs in authentic and social contexts that enhance student engagement and understanding, particularly in problem-based and clinical learning environments (Bridges et al., 2016). Deep learning incorporates these principles by directing instruction toward real world problem solving, case studies, and collaborative projects. These approaches enable students to construct understanding actively, critically, and reflectively within a supportive learning community.

The three learning theories cognitive, humanistic, and constructivist complement one another in providing a theoretical foundation for the deep learning approach. The cognitive perspective provides a foundation for thinking processes and mental strategies, the humanistic perspective adds motivational and value based dimensions, and the constructivist perspective provides a framework for social interaction and authentic learning experiences. This integrative approach supports a comprehensive and contextually grounded model of deep learning. Learning is no longer oriented solely toward final outcomes but also toward the thinking processes, reflection, experiences, and meanings constructed by learners.

By integrating these perspectives, teachers can design learning experiences that empower students cognitively, emotionally, and socially. This approach is consistent with the demands of twenty first century education, which emphasizes critical thinking, learner autonomy, and character development. This study recommends that the implementation of deep learning be supported by a strong theoretical understanding, adequate teacher training,



and learning environments that facilitate reflection, exploration, and collaboration.

CONCLUSION

The deep learning approach is aligned with and reinforced by the four major learning theories. Behaviorist theory provides a strong foundation for developing discipline, practice habits, and perseverance, which are essential for deep learning. However, to avoid reducing learning to mechanical memorization, stimulus response principles and reinforcement should be integrated with cognitive, constructivist, and humanistic approaches to ensure the continued development of conceptual understanding, creativity, and learner autonomy. From a cognitive perspective, deep learning supports the active and structured internalization of knowledge. From a humanistic perspective, it creates opportunities for affective engagement and personal growth. Meanwhile, from a constructivist perspective, deep learning facilitates meaning-making through authentic experiences and social interaction. Thus, deep learning represents not merely a pedagogical strategy but also a paradigm shift toward comprehensive and holistic understanding.

Based on the findings of this study, several recommendations are proposed. Educators should integrate deep learning principles into their teaching practices through challenging, reflective, and collaborative instructional designs. Curricula should also be developed to encourage students to explore meaning, connect knowledge to real-world contexts, and continuously reflect on their learning processes. Furthermore, teacher training should focus on developing a thorough understanding of learning theories so that educators can translate theoretical principles into effective and contextually appropriate instructional strategies.

REFERENCE

- Abdurakhman, O., & Rusli, R. K. (2017). Teori Belajar dan Pembelajaran. 2(1).
<https://doi.org/10.30997/DT.V2I1.302>
- Aprilia, C. (2024). Cognitive Learning Theory: Skill Acquisition and Conditional Knowledge. 1(2).
<https://doi.org/10.62872/0y4sm303>
- Bridges, S., Chan, L. K., & Hmelo-Silver, C. E. (2016). Situated Learning and Educational Technologies: Theory and Practice (pp. 1–6). Springer International Publishing.
https://doi.org/10.1007/978-3-319-08275-2_1
- Buchweitz, B. (2016). Aprendizagem significativa: idéias de estudantes concluintes de curso superior. 6(2), 133–141.
<https://www.if.ufrgs.br/cref/ojs/index.php/ienci/article/view/581/374>



- Fatmawaty (2024). Deep Learning: Sebuah Pendekatan untuk Pembelajaran Bermakna. *Harmoni Pendidikan : Jurnal Ilmu Pendidikan*. 1, 1 (Feb. 2024), 71–85. DOI:<https://doi.org/10.62383/hardik.v1i1.2121>.
- Gao, W. (2025). The Cognitive Logic of Repetition: A Theoretical Analysis of Repetition in Learning and Cognitive Reinforcement. *Lecture Notes in Education Psychology and Public Media*, 113(1), 93–98. <https://doi.org/10.54254/2753-7048/2025.ns26625>
- Gazawy, Q., Buyrukoğlu, S., & Akbaş, A. (2023). Deep Learning for Enhanced Education Quality: Assessing Student Engagement and Emotional States. <https://doi.org/10.1109/asyu58738.2023.10296748>
- Giannoukos, G. (2024). Main Learning Theories in Education. *European Journal of Contemporary Education and E-Learning*, 2(5), 93–100. [https://doi.org/10.59324/ejceel.2024.2\(5\).06](https://doi.org/10.59324/ejceel.2024.2(5).06)
- Habsy, B. A., Oktafiani, F., Salsabila, D. M., & Zahro, C. I. (2023). Teori Humanistik dalam Proses Pembelajaran. *Jurnal Teknologi Pendidikan*. <https://doi.org/10.47134/jtp.v1i2.162>
- Jumaah, F. M. (2024). Exploring constructivist learning theory and its applications in teaching english. *The American Journal of Social Science and Education Innovations*, 6(8), 7–19. <https://doi.org/10.37547/tajssei/volume06issue08-02>
- Juraganda, C., Laowo, N., Butar-Butar, N., Situmorang, P., Sitepu, R., Manik, E., & Pangaribuan, F. (2025). Memanfaatkan Teori Belajar Behaviorisme untuk Memperkuat Pembelajaran Deep Learning. *Ndrumi : Jurnal Ilmu Pendidikan dan Humaniora*. <https://doi.org/10.57094/ndrumi.v8i1.3115>.
- Khabanyane, K. E., Maimane, J. R., & Ramabenyane, M. J. (2014). A Critical Reflection on Transformative Learning as Experienced by Student-Teachers during School-Based Learning. *Mediterranean Journal of Social Sciences*, 5, 452. <https://doi.org/10.5901/MJSS.2014.V5N27P452>
- Knox, J., Williamson, B., & Bayne, S. (2019). Machine behaviourism: future visions of 'learnification' and 'datafication' across humans and digital technologies. *Learning, Media and Technology*, 45, 31 - 45. <https://doi.org/10.1080/17439884.2019.1623251>.
- Li, W. (2025). The Current Status of Empirical Research on Deep Learning within the Educational Domain. *International Journal of Education and Humanities*, 18(1), 106–110. <https://doi.org/10.54097/g94w0n14>.
- Liu, Q. (2023). Deep Learning Influences on Higher Education Students' Digital Literacy: The Meditating Role of Higher-order Thinking. *International Journal of Engineering Pedagogy (iJEP)*. <https://doi.org/10.3991/ijep.v13i6.38177>



- Mohanta, S. K., Mohapatra, A. G., Mohanty, A., & Nayak, S. K. (2024). Deep Learning is a State-of-the-Art Approach to Artificial Intelligence. 27–43. <https://doi.org/10.1201/9781003433309-3>
- Mystakidis, S. (2021). Deep Meaningful Learning. 1(3), 988–997. <https://doi.org/10.3390/ENCYCLOPEDIA1030075>
- Nainggolan, B. V. H., & Listiani, T. (2024). Pentingnya Pemberian Umpan Balik untuk Memperbaiki Kesalahan Siswa dalam Menyelesaikan Soal Matematika. <https://doi.org/10.31980/plusminus.v4i1.1460>
- Nurhasanah, A., Ramadhanti, S., Utami, S., & Putri, F. A. (2022). Improving Elementary School Students' Understanding of the Concept through Meaningful Learning in David Ausbel's Perspective. Jurnal Basicedu, 6(4), 5728–5734. <https://doi.org/10.31004/basicedu.v6i4.2935>
- Pan, Q., Zhou, J., Yang, D., Shi, D., Wang, D., Chen, X., & Liu, J. (2023). Mapping Knowledge Domain Analysis in Deep Learning Research of Global Education. Sustainability, 15(4), 3097. <https://doi.org/10.3390/su15043097>
- Salsabila, Y. R., & Lessy, Z. (2024). Korelasi antara teori belajar konstruktivisme lev vygotsky dengan model pembelajaran problem based learning (pbl). Learning, 4(3), 813–827. <https://doi.org/10.51878/learning.v4i3.3185>
- Setiadi, W. A., Aryani, D., & Fuadin, A. (2023). Teori Belajar Humanistik Terhadap Motivasi Siswa Meningkatkan Prestasi Belajar. 1(6), 632–635. <https://doi.org/10.62379/jishs.v1i6.887>
- Silalahi, S. A., Zainal, A., & Sagala, G. H. (2022). The Importance of Deep Learning on Constructivism Approach. <https://doi.org/10.2991/aebmr.k.220104.036>
- Silva, C. V. da, Pereira, F. A., Belém, B. de C., Ferreira, L. K. R., Oliveira, L. de J., Silva, J. dos S., Vasconcelos, A. C. da S., & Neves, L. E. de O. (2024). Estudo sobre a Teoria da Aprendizagem de Jean Piaget. <https://doi.org/10.51473/ed.al.edi10>
- Silva, J. B. (2020). David Ausubel's Theory of Meaningful Learning: an analysis of the necessary conditions. Research, Society and Development, 9(4), 09932803. <https://doi.org/10.33448/RSD-V9I4.2803>
- Sriastuti, L., & Masing, M. (2022). Application of jean piaget's cognitive learning theory in early childhood education. 2(1), 14–22. <https://doi.org/10.55606/sokoguru.v2i1.101>
- Sundari, S., & Tarsono, T. (2023). Cognitive Learning Theory and Its Application in Learning Islamic Religious Education at SMK Muhammadiyah 1 Sumedang. Fondatia. <https://doi.org/10.36088/fondatia.v7i3.3920>





- Tamburlini, G. (2022). Zone of Proximal Development. <https://doi.org/10.4324/9780367198459-reprw163-1>
- Togatorop, F. H., Purba, B. P. P., Sihombing, A. H., Lahagu, K. M. S., Manik, E., & Pangaribuan, F. (2025). Memanfaatkan teori belajar kognitivisme untuk memperkuat pembelajaran deep learning. *Civic Society Research and Education*, 6(1), 44–61. <https://doi.org/10.57094/jpkn.v6i1.3137>
- Ulum, M., & Fauzi, A. (2023). Behaviorism Theory and Its Implications for Learning. *Journal of Insan Mulia Education*. <https://doi.org/10.59923/joinme.v1i2.41>.
- Ursula, P. A. (2024). Application of Humanistic Learning Theory in Increasing Student Learning Motivation. *International Journal of Sustainable Social Science*, 2(5), 323–334. <https://doi.org/10.59890/ijsss.v2i5.2625>
- Yuliadi, A. A., & Hindun, H. (2023). Implementasi Teori Belajar Kognitif Pada Kurikulum 2013. <https://doi.org/10.55606/jpbb.v3i1.2656>

