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A Descriptive Review: What, Why, and How Do Teachers Apply Deep Learning to Students?

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ABSTRACT: Deep Learning is an innovative approach to education that focuses on creating a mindful, meaningful, and joyful learning environment. As well as focusing on knowledge transfer, it also involves the development of critical thinking, problem-solving, creativity, and collaboration skills. This article discusses the basic concept of Deep Learning, why it is important to apply it in education, and effective implementation strategies in the learning process. By integrating cognitive, affective, and psychomotor aspects, Deep Learning aims to create learners who have a deep understanding of the material, can connect concepts with real-life experiences, and develop 21st-century skills relevant to global needs. In addition, this approach also plays a role in increasing students' motivation to learn, independence, and innovation. Deep Learning provides a more holistic and transformative learning experience through project-based learning, exploration, and technology integration. Thus, Deep Learning becomes an essential foundation in creating an adaptive, relevant, and future-oriented education system.

Keywords : *Deep Learning*, Mindful Learning, Meaningful Learning, Joyful Learning

I. INTRODUCTION

Education in the 21st century is currently facing increasingly complex challenges, especially in preparing students to deal with ever-changing developments. Technological developments, globalisation, and socio-economic dynamics require the education system to not only focus on the distribution of knowledge, but also on empowering 21st-century skills, such as critical thinking skills, creativity, collaboration, and digital literacy (Kennedy & Sundberg, 2020; Khoiri et al., 2021). According to Trilling & Fadel (2009), education in this era must be able to equip students with the ability to adapt, innovate, and contribute in an increasingly connected and competitive society. This challenge is further exacerbated by the misalignment between what teachers teach and real-world needs, so a more relevant and holistic learning approach is needed.

Deep Learning has emerged as one approach that is considered to be able to answer this challenge. Deep Learning is not just a learning method, but a philosophy that emphasises a holistic and integrated learning process (Fazi, 2021). The concept was first introduced by Fullan et al. (2018) as an approach that aims to create meaningful and transformative learning experiences. Deep Learning involves four main dimensions: mind (intellectual), heart (ethical), taste (aesthetic), and body (kinesthetic) (Amirullah et al., 2021). By combining these four dimensions, Deep Learning aims to develop students' potential as a whole, including cognitive, affective and psychomotor aspects.

The intellectual aspect of Deep Learning emphasises the development of higher-level cognitive abilities, such as analysis, synthesis, and evaluation. According to Bloom (1956), these abilities are part of the essential learning taxonomy to prepare students to face complex problems in the real world. In the context of Deep Learning, students are invited to understand, apply and create new knowledge through collaborative projects and problem solving. This

approach is in line with Vygotsky & Cole's (1978) theory of constructivism, where learning occurs when students can actively construct knowledge through social interaction and real experiences. In addition to thinking, Deep Learning also emphasises the importance of thinking (ethics) in the learning process. In an interconnected and multicultural society, ethical values such as empathy, integrity and responsibility are becoming increasingly important. According to Noddings (2005), education also needs to focus on building students' character and morals. Deep Learning integrates these values through reflection activities, discussions, and projects involving social and environmental issues (Colomer et al., 2020). Thus, students not only become intelligent individuals but also have character and care for others.

The aesthetic dimension of Deep Learning focuses on developing creativity and appreciation for the arts and culture. According to Eisner (2002), aesthetic education helps students to see the world from different perspectives, develop imagination, and express themselves creatively. In the context of Deep Learning, students are invited to engage in art, music or literature activities that not only enrich the learning experience, but also develop emotional intelligence and divergent thinking skills. This approach is in line with the theory of multiple intelligences, where human intelligence is not limited to cognitive aspects, but also includes musical, spatial and interpersonal intelligence (Gardner, 1983).

Equally important is the sports (kinesthetic) dimension, which emphasizes the development of physical skills and health. According to Jensen (2005), physical activity is not only beneficial for health, but also improves brain function and learning ability. Deep Learning integrates physical activities, such as sports, games or practical experiments, to provide a dynamic and fun learning experience. Cognitive processes are not separate from physical experiences, but rather are intertwined and influence each other (Foglia & Wilson, 2013; Zebua, 2025).

By combining these four dimensions, Deep Learning offers a comprehensive and transformative approach to learning. It also aims to shape students who are holistic, creative, characterised, and ready to face the challenges of the 21st century (Sliwka et al., 2024). In this context, Deep Learning is the answer to the need for relevant, inclusive and future-oriented education. Through proper implementation, Deep Learning can be a catalyst in producing a smart, empathetic, creative and resilient generation.

II. METHODS

This article was developed through a series of methods involving research, analysis, and synthesis of relevant information. First, the author conducted literature research to gather data and information related to the topic at hand, namely Deep Learning in education. The sources used may include academic journals, books, educational reports, and credible online articles. This literature review aims to understand the basic concepts of Deep Learning, challenges in education, and effective strategies to implement it. By gathering information from various sources, the author was able to build a strong and comprehensive knowledge base for this article.

Once the data is collected, the next step is to analyze and synthesise the information. The author analyzes the data that has been collected to identify key themes, patterns, and relationships between various concepts. Once analysed, the information is synthesised into a logical and easy-to-understand structure. This process ensures that the article is not only informative but also coherent and relevant to the reader's needs.

III. RESULT AND DISCUSSION

A. What is Deep Learning?

Deep Learning is a learning approach that emphasises creating a mindful, meaningful and joyful learning atmosphere. It focuses on content mastery and students' ability to apply knowledge in everyday life. Deep Learning aims to create a holistic learning experience, where students not only absorb information, but are also able to internalise and apply it in relevant contexts (Akib et al., 2020). This is in contrast to conventional learning, which often only focuses on memorization and mastery of content without regard to deep understanding or practical application.

Mindful: In the context of Deep Learning, being mindful means that students have full awareness of their learning process. They do not just follow instructions, but also understand the learning objectives, are intrinsically motivated, and are able to self-regulate their learning. This awareness invites students to take responsibility for their own learning, to be more actively involved in the learning process (Malecka et al., 2022). Thus, learning becomes more effective as students actively seek, process and apply knowledge.

Meaningful: Meaningful learning in Deep Learning means that the knowledge acquired is not just memorised, but also connected to the experiences and knowledge that students already have. This process allows students to build a deeper and more contextualized understanding. For example, when learning mathematical concepts, students do not just memorize formulas, but also understand how these formulas can be implemented in everyday life. As a result, learning becomes more relevant and memorable as it is related to real-life experiences.

Joyful: A positive, challenging and fun learning atmosphere is one of the important aspects of Deep Learning. A joyful atmosphere helps students to understand, remember and apply knowledge more easily. When students feel happy and motivated, they tend to be more engaged in the learning process and more eager to explore the material being studied. It also reduces stress and anxiety that often arise in rigid and stressful learning environments.

Deep Learning is also able to help develop students' 21st-century skills. These competencies are essential to prepare students for future challenges, where change is rapid and the world of work requires individuals who are able to adapt and innovate. By integrating these competencies in the learning process, Deep Learning not only helps students master academic material but also develops essential life skills.

B. Why is Deep Learning Important?

Deep Learning is important for several reasons, especially in the context of today's global challenges and needs. First, the Demographic Bonus Challenge: Indonesia is projected to experience a demographic bonus in 2035, where the number of the productive age population will reach its peak. To capitalize on this demographic bonus, qualified human resources are needed who not only master technical skills (hard skills), but also soft skills such as critical thinking, creativity, and collaboration. Deep Learning can help prepare the younger generation to be more competent and able to face the challenges of an increasingly complex world of work. Second, Education Quality Issues; PISA results confirm Indonesia as a country that is still lagging behind in terms of education quality (OECD, 2023). Deep Learning can be a solution to improve the quality of education by focusing on deep and meaningful learning. This approach also helps students develop the skills necessary for success in the 21st century. As such, Deep

Learning can be the key to reducing educational disparities and increasing competitiveness at the global level.

Third, 21st Century Competency Needs: The future world of work requires individuals who are able to think critically, collaborate, and adapt to change (Okan, 2024). Deep Learning helps students develop these competencies through a holistic learning process. In a dynamic work environment, the ability to think critically and creatively, as well as collaborate in teams, is crucial. Deep Learning can train students to be effective and innovative problem solvers.

In addition, Deep Learning is also important because it encourages students to become lifelong learners. In an ever-changing world, the ability to continuously learn and adapt is key to staying relevant and successful. Deep Learning, with its emphasis on conscious, meaningful and joyful learning, helps students develop positive and sustainable learning habits (Kopnina, 2020). As such, they are not only prepared to face the challenges of today but also to continue to thrive in the future.

C. How to Implement Deep Learning?

The application of Deep Learning in education requires a paradigm shift in the learning process. This approach requires a shift from traditional learning methods that focus on memorization and mastery of material towards more holistic, in-depth, and student-centred learning (Chaika, 2024). This change involves not only teachers but also the entire educational ecosystem, including the curriculum, teaching methods, and learning evaluation. Here are some steps that can be taken in implementing Deep Learning effectively:

1. Creating an Atmosphere of Mindful Learning

Teachers need to help students understand the learning objectives and motivate them intrinsically. This can be done by explaining why the material learned is important and how the knowledge can be implemented in real life. In addition, teachers also need to encourage students to reflect on their own learning process, so that they can identify their strengths and areas for improvement. This awareness will help students become more independent and take responsibility for their learning.

Mindfulness techniques can also be used to create a mindful learning atmosphere. For example, teachers can start a learning session with breathing exercises or a short meditation to help students focus and reduce stress. Mindfulness not only improves concentration but also helps students manage their emotions, so they can learn more effectively and comfortably (Currie, 2020).

2. Linking Learning to Real Life (Meaningful Learning)

Meaningful learning is the core of Deep Learning. To achieve this, teachers must design learning that allows students to connect new knowledge with real-life experiences and existing knowledge. For example, when learning science concepts, students can be invited to observe natural phenomena around them and connect them to the theories learned in class. This can make learning more relevant and easier to understand.

Project-based learning and contextual learning methods are very effective in creating meaningful learning. In project-based learning, students are invited to complete real projects that require the application of the knowledge and skills they learn. Meanwhile, contextual learning emphasises linking the subject matter with the context of everyday life, so that students can see the practical value of what they learn.

3. Creating a Joyful Learning Atmosphere

A joyful learning atmosphere is key to motivating students and increasing their engagement in the learning process. Teachers can create this atmosphere by using various interactive and interesting methods, such as educational games and discussions. For example, in math learning, teachers can use puzzle games or quizzes to make material that is usually considered difficult more fun.

In addition, teachers need to give positive feedback and appreciate students' success. Constructive and appreciative feedback can boost students' confidence and encourage them to keep learning. Celebrating successes, no matter how small, can also create a positive and supportive atmosphere, so students feel valued and motivated to achieve more.

4. Developing 21st Century Competencies

The Deep Learning approach does not just focus on understanding academic material, but also prioritizes the development of essential 21st-century competencies. Therefore, there is a need for the role of the teacher as a conveyor of knowledge, a facilitator who designs learning experiences, and is able to stimulate the development of these skills. For example, in science subjects, students can be involved in experiments that encourage them to interpret data analytically and develop innovative solutions. Meanwhile, in language learning, students can hone their communication skills through various activities, such as debates, presentations, or simulated conversations that require the use of effective and persuasive language.

Cooperation-based learning methods, such as group discussions and collaborative projects, are strategies that can optimize the strengthening of communication and cooperation skills (Sumarni & Kadarwati, 2020). Through active interaction in groups, students learn to understand diverse perspectives, articulate ideas clearly, and build solutions together. In addition to conventional approaches, the use of digital technology can also enrich collaborative learning experiences. Online platforms allow students to discuss, share ideas and work on projects interactively without time and space constraints. Thus, the integration of diverse learning methods and the appropriate utilization of technology can create a more dynamic and relevant learning environment.

5. Using Technology as a Learning Tool and Implementing Authentic Assessment

Teachers can utilize various digital tools, such as interactive learning videos, simulations, and educational applications, to create more interesting and in-depth learning (Zebua, 2025). For example, in history learning, teachers can use documentary videos or virtual reality to take students to "visit" historical places. So that learning can be more fun, and students understand the material better.

On the other hand, assessment in Deep Learning should reflect students' deep understanding and ability to apply knowledge in a real context. Teachers can use authentic assessments, such as portfolios, presentations and projects, to evaluate student learning. These assessments can measure material mastery, critical thinking, collaboration and communication skills. In addition, Deep Learning also emphasises students' active participation in the learning process. Teachers can engage students by giving them the opportunity to choose the topics they want to study, design their own projects, or explore the material in ways that suit their interests and learning styles. This will make learning more personalised and meaningful for students.

IV. CONCLUSION

Deep Learning is a holistic and integrated learning approach, which emphasises creating a conscious, meaningful and joyful learning atmosphere. This approach not only helps students master knowledge but also develops 21st-century competencies needed to face future challenges. By implementing Deep Learning, education in Indonesia can become more relevant and effective in preparing the younger generation to face an ever-changing world.

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