

Transforming Teacher Teaching in the Digital Age Based on Deep Learning Approach

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ABSTRACT

The success of the teaching and learning process is determined by the success of the teacher in designing or planning learning. No matter how great the curriculum content is, the teacher's factor in teaching still determines the success of learning, even the success of education on a broad scale. Today's world is in an era called the digital era. The digital era has brought rapid technological development and progress, and all lines of life must be able to adapt to the digital era, including in the field of education, especially teaching carried out by teachers. This research aims to describe how the transformation of teacher teaching in the digital era using a deep learning approach. This research uses a descriptive qualitative approach with a literature study method. Sources of research data were obtained from books and journals related to the study of learning transformation, teachers, and deep learning. The meta-analysis procedure in this research is by collecting library data, making notes, and reviewing data sources. Data analysis uses descriptive analysis by collecting and compiling data which is then analysed. The results confirm that the transformation of teacher teaching in the digital era based on a deep learning approach is by designing meaningful learning, mindful learning, and joyful learning integrated with digital learning.

Keywords: Transforming, Teacher, Teaching, Deep Learning, Digital Age.

1. INTRODUCTION

Today's world is in an era called the digital era. The digital era has brought about rapid technological development and advancement, so that the characteristics of digital era society cannot be separated from communication and information technology. The digital era comes with various good changes as a positive impact, but at the same time it also brings negative impacts, so it becomes a new challenge in human life. As stated by Wasistiono (2019) that the digital era causes very significant changes, difficult to guess the direction, and unpredictable in all aspects of life, thus making 'disruption' in various lines of human life.

Challenges in the digital era cover all aspects of human life. Setiawan (2017) revealed that challenges in the digital era cover various fields of community life, such as economics, politics, law, socio-culture, including the education sector. In the education sector, according to the Drafting Team of the Deep Learning Study of the Ministry of Primary and Secondary Education of the Republic of Indonesia (2025: iv) Indonesian education faces various challenges. First, the challenge of Indonesian education is the learning crisis which is indicated by the decline in the quality of learning; Second, the literacy, reading and numeracy skills of Indonesian students are low due to ineffective learning approaches, as the results of the Programme for International Student Assessment (PISA) show that the literacy and numeracy of Indonesian students are still below the average of international students, namely Mathematics: 472, Science: 485, Reading: 476. Indonesia is ranked 68 out of 81

countries with scores; maths (379), science (398), and reading (371) (OECD, 2023). Thirdly, teacher competence still needs to be improved so that teachers have a growth mindset. Fourth, teachers' workload is very heavy and has more to do with administrative tasks than their main role as teachers.

The success of the teaching and learning process is determined by the success of the teacher in designing or planning learning. No matter how good the curriculum content is, the teacher's factor in teaching still determines the success of learning, even the success of education on a broad scale. So it is not an exaggeration that Gafur (2012) likens the teacher to an orchestra, where the teacher actually acts as a conductor or conductor with a very large role. However, in the field, classic problems in teaching carried out by teachers are still not resolved. Winarno (2018: 5) reveals several teacher problems in learning in schools, including; 1) problems in classroom management, such as students who are busy and playing alone; 2) problems with student motivation in participating in learning, such as indifference and boredom; 3) learning process problems, such as the dominant use of the lecture method so that students are passive in learning; 4) learning resource problems, such as dependence on LKS. This reality is reinforced by a study conducted by the Drafting Team of the Deep Learning Study of the Ministry of Primary and Secondary Education of the Republic of Indonesia (2025: 1-2) that in the field, teachers still use traditional learning approaches and methods, where learning is still dominated by one-way lectures, and assessments that rely only on memorisation, as well as other learning processes that do not foster students' creativity and critical thinking skills.

Starting from the classic problems in teacher teaching in schools, these problems can only be answered through the transformation of teacher teaching using a deep learning approach. Deep learning in the Indonesian context is not a curriculum but a learning approach. Deep learning is defined as an ennobling approach that emphasises the creation of a learning atmosphere and learning process that is conscious, meaningful, and joyful through thinking, heart, taste, and physical exercise in a holistic and integrated manner (Drafting Team of the Deep Learning Study of the Ministry of Primary and Secondary Education of the Republic of Indonesia, 2025: v). According to Mu'ti (Drafting Team of the Deep Learning Study of the Ministry of Primary and Secondary Education of the Republic of Indonesia, 2025) deep learning is designed as an approach that is able to answer the challenges of the learning crisis and 21st century learning needs. This deep learning approach aims to encourage the development of higher-order thinking skills, the application of knowledge in a real-world context, as well as conscious, meaningful and joyful learning. Therefore, the transformation of teacher teaching using the deep learning approach is very important.

This research aims to explore and describe the transformation of teacher teaching in the digital era using a deep learning approach. The importance of teacher teaching transformation using deep learning approach in this digital era is because 21st century education requires teachers to not only deliver learning materials, but also build critical thinking, creativity, collaboration, and communication skills in learners. The transformation of teacher teaching from traditional learning approaches and methods that are still dominated by one-way lectures and assessments that rely only on memorisation to teaching

based on deep learning approaches in learning is an urgent solution to create innovative, effective and quality learning.

2. METHODS

This research is qualitative research. Qualitative research is used to describe, analyse, explore, and understand various social problems that occur in human life (Creswell, 2016). The approach used in this research is a descriptive approach with the literature method. Data collection was sourced from books and scientific journals related to the study of learning transformation, teachers, and academic papers on deep learning development in Indonesia. The meta-analysis procedure in this study was carried out by collecting library data, making notes, and reviewing data sources. After all the necessary data is collected, it is then analysed using descriptive analysis techniques.

3. RESULTS AND DISCUSSIONS

At the end of 2024, the deep learning approach is gaining attention from the Ministry of Primary and Secondary Education of the Republic of Indonesia and education observers. It is known that the importance of deep learning today is because 21st century education requires teachers to not only deliver learning materials, but also build critical thinking, creativity, collaboration and communication skills in students. Deep learning is a learning approach that emphasises deep understanding, where students relate new information to their existing knowledge, create conceptual links and are able to apply it in a real context. Deep learning emphasises the importance of learning that focuses on deep understanding. Instead of rote learning, it encourages students to internalise knowledge in a meaningful way. Deep learning approach is expected to prepare the young generation to face global challenges with critical, analytical and creative thinking skills. Deep learning emphasises that learning is not just the transfer of knowledge, but the creation of an atmosphere that ennobles learners (Drafting Team of the Deep Learning Study of the Ministry of Primary and Secondary Education of the Republic of Indonesia, 2025: 10).

A review of the literature shows that since the emergence of deep learning approaches, there are two concepts of this approach. First, deep learning refers to machine learning, which has been developed through research since 1940, from the early stages of cybernetics to artificial intelligence (Peters, 2018) and neural networks in the brain (Gillon et al., 2019; Richards et al., 2019). Secondly, there is the concept of deep learning used in Norwegian education, which is different from ideas in computer science (Bråten & Skeie, 2020; Drafting Team of the Deep Learning Study of the Ministry of Primary and Secondary Education of the Republic of Indonesia, 2025: 11). In the Indonesian context, the second concept is used, but not deep learning as a curriculum, but as an approach.

Deep learning in the concept of Indonesian education is an ennobling approach that emphasises the creation of a learning atmosphere and learning process that is conscious, meaningful, and joyful through thinking, heart, taste, and physical exercise in a holistic and integrated manner (Drafting Team of the Deep Learning Study of the Ministry of Primary and Secondary Education of the Republic of Indonesia, 2025: 3). In the digital era, this

approach will certainly be developed with the utilisation of digital technology to increase learners' involvement in the learning process, as well as utilising existing good practices (Drafting Team of the Deep Learning Study of the Ministry of Primary and Secondary Education of the Republic of Indonesia, 2025: 3).

The deep learning approach emphasises deep, contextual and meaningful learning, thus encouraging critical thinking, creativity and problem-solving. Therefore, the deep learning approach is very appropriate as a transformation of teacher teaching in the current digital era. The transformation of teacher teaching in the digital era using the deep learning approach is to conduct mindful, meaningful and joyful learning. Mindful, meaningful and joyful learning are the principles in the application of deep learning. As stated by the Drafting Team of the Deep Learning Study of the Ministry of Primary and Secondary Education of the Republic of Indonesia (2025: 30), there are three main principles that support the deep learning approach, namely conscious, meaningful and joyful learning. These three principles complement each other in building deep learning for students.

Here is the deep learning framework with its three main principles.

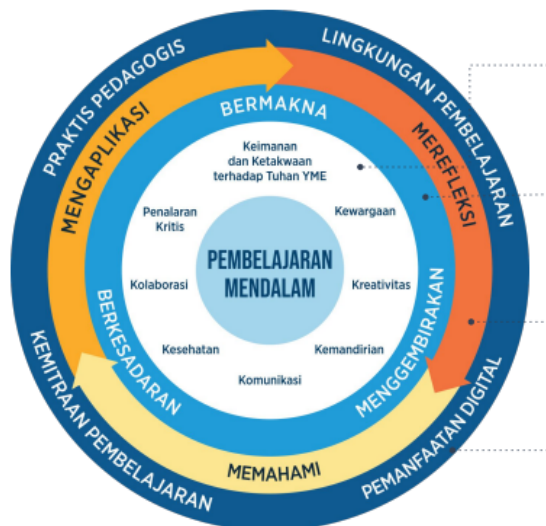


Figure 1. Learning Framework and Three Principles of Deep Learning Approach

Firstly, being mindful. Consciousness is the learning experience that students have when they realise that they are active learners and are able to self-regulate. They have an understanding of the learning objectives, feel intrinsically motivated to learn, and actively develop learning strategies to achieve those objectives. With learning awareness, students will gain knowledge and skills as lifelong learners (Drafting Team of the Deep Learning Study of the Ministry of Primary and Secondary Education of the Republic of Indonesia, 2025: 30).

Second, meaningful. Meaningful learning occurs when students can use their knowledge contextually. Students' learning process is not only limited to understanding information/content mastery, but is oriented towards the ability to apply knowledge. This ability helps long-term retention. Learning that is connected to learners' environment gives

them a better understanding of who they are, where they are and how they can contribute. Meaningful learning engages students with real problems in a personal, local, national or global context. Learning should involve parents, community or society as a source of practical knowledge and foster a sense of social responsibility and care (Drafting Team of the Deep Learning Study of the Ministry of Primary and Secondary Education of the Republic of Indonesia, 2025: 30).

Third, joyful. Joyful learning is an environment that is positive, challenging, fun and motivating. Learning with passion helps students connect emotionally, which makes understanding, remembering and applying knowledge easier. When students enjoy the learning process, they will have greater intrinsic motivation, which will encourage them to be more intelligent, creative and actively engaged in the classroom. Therefore, learning creates a memorable learning experience. When students feel comfortable and have their needs met, such as security, belongingness, affection, appreciation and self-actualisation, learning becomes enjoyable (Drafting Team of the Deep Learning Study of the Ministry of Primary and Secondary Education of the Republic of Indonesia, 2025: 30).

Finally, the transformation of teacher teaching based on the deep learning approach in the digital era is very important to be implemented and developed. This is because the deep learning approach complements and perfects the traditional learning approach so far, by adding the characteristics of pedagogical practices including; (1) engagement. Teachers build learners' involvement as learning subjects to gain meaningful learning experiences; (2) awareness. Teachers are more able to build learners' awareness to become active learners who are intrinsically motivated to learn, and actively develop learning strategies to achieve goals; (3) honouring. Teachers and learners appreciate and respect each other's potential, dignity and human values; (4) learning culture developers. Teachers are more able to develop creativity and innovate, and involve learners in developing learning experiences; (5) utilisation of digital technology. Teachers and learners are better able to utilise digital technology to provide efficiency and effectiveness in learning planning, implementation and assessment; (6) multi or interdisciplinary knowledge. Teachers and learners are better able to apply multi/interdisciplinary knowledge in the learning process (Drafting Team of the Deep Learning Study of the Ministry of Primary and Secondary Education of the Republic of Indonesia, 2025).

4. CONCLUSION

The transformation of teacher teaching based on the deep learning approach in the digital era is very important to be implemented and developed. The deep learning approach is one of the transformations of learning approaches that can improve the learning process and quality. Therefore, teaching teachers based on a deep learning approach can directly realise quality education, which is actually one of the fourth pillars of sustainable development goals (SDGs).

The transformation of teacher teaching in the digital era using a deep learning approach is carried out by applying three principles of deep learning (mindful, meaningful and joyful learning). Mindful learning is the thorough involvement of learners in the learning process, increasing awareness of thinking, feeling, and the surrounding environment. Meanwhile,

meaningful learning is where students are able to construct new knowledge based on old knowledge and apply their knowledge in real life. Meanwhile, joyful learning is a positive, challenging, fun and motivating learning atmosphere.

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