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THE EFFECT OF IMPLEMENTING A DEEP LEARNING APPROACH ON STUDENTS' LEARNING OUTCOMES IN JUNIOR HIGH SCHOOL

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Abstract

The purpose of implementing the deep learning approach is to create a learning process that is mindful, meaningful, and joyful. The objective of this study is to identify the effect of the deep learning approach on the learning outcomes of seventh-grade students. This study involved a total of 60 students divided into two classes. This study used a test as its research instrument. The results of the Independent T-test showed a significant difference between the scores of the experimental class (M = 26.86, SD = 3.58) and the control class (M = 19.46, SD = 4.02); t (7.51), p = 0.001. Thus, it can be concluded that the application of the deep learning approach has a significant effect on students' learning outcomes. Based on the eta-squared results, deep learning also has a high-level effect on learning outcomes, with a value of 0.49. The implications of this study indicate that the implementation of deep learning contributes to the improvement of skills and creativity and makes learning more meaningful.
Keywords: Deep learning, student's learning outomes, junior high school.

INTRODUCTION

The Indonesian education system has undergone several curriculum changes. This is in line with changing demands for quality and competency for graduates. In the 13th curriculum, the government implemented a contextual teaching and learning approach, a learning approach that focuses on linking subject matter to real-world situations to meet graduate competencies. Furthermore, this approach aims to encourage students to apply knowledge in meaningful contexts. Students are guided to actively and flexibly construct knowledge according to their own life context, with the teacher acting as a facilitator.

The application of the CTL approach can significantly improve student learning outcomes. This study concluded that the CTL approach can develop contextual thinking skills and provide more meaningful understanding (Haziyah SF et al., 2024). Subsequently, the Indonesian education system implemented the Independent Curriculum, which shifted the CTL approach to a constructivist learning approach, focusing on how individuals or groups construct their own knowledge and understanding through experience, social interaction, and reflection. In this context, students actively construct concepts through discovery learning and problem-based learning. Indicators of the success of the constructivist approach can be seen from: a). Students are actively involved directly in learning; b) the educator acts

as a facilitator; c) the learning context is in authentic situations, where learning occurs through real-life problems and relevant activities; d) the focus of learning is discovery-based.

Research (Rosita et al., 2024) explains that the constructivist approach is a learning approach that emphasizes active student learning by directly constructing new knowledge from pre-existing meanings and knowledge. The constructivist approach can be integrated with learning models such as discovery learning, cooperative learning, problem-based learning, and project-based learning. The application of the constructivist approach can train, enhance, and positively impact 21st-century learning skills such as critical thinking, writing, reading, communication, collaboration, and creativity.

Based on the explanation of the learning approaches above, it is clear that each new curriculum is accompanied by a new learning approach. In general, the implementation of this new approach has a positive impact on learning outcomes according to established success indicators. In early 2025, the learning approach being developed is deep learning. This is a priority for the Ministry to address the various challenges facing the teaching and learning process in primary and secondary schools today. The primary priority of deep learning is what to teach before how to teach. Many current learning issues stem from students' lack of ability to actualize learning materials. Learning from previous policy experiences, the learning approaches in the 13th curriculum and the independent curriculum have weaknesses that have not been addressed with awareness and meaningfulness. Furthermore, the learning environment feels forced and does not create joyful learning. This results in suboptimal learning objectives (Aminah, 2021).

To address these weaknesses, the Ministry launched a deep learning policy. The goal of the deep learning approach is to create mindful, meaningful, and joyful learning. Indicators of successful deep learning include: (1) Collaboration; (2) Independence; (3) Health; (4) Communication; (5) Faith and devotion to God Almighty; (6) Citizenship; (7) Critical reasoning; and (8) Creativity. Socialization of the deep learning approach is carried out through provincial and city education offices, as well as within schools. To intensify teachers' understanding of deep learning, the Department of Education is recommended to conduct outreach, training, and mentoring in its application through learning. Implementing deep learning policies requires evaluation of achievement. Therefore, this study aims to identify the impact of deep learning implementation on student learning outcomes.

LITERATURE REVIEW

Deep Learning

The concept of Deep Learning was introduced by Marton and Saljo Dario of Sweden in 1976 and continues to evolve today in line with advances in science and technology. The current use of artificial intelligence (AI) is largely supported by deep learning. Deep learning is a branch of AI and machine learning that utilizes multiple-layer neural networks to complete

tasks with high accuracy (Muzawi, R. 2024). The application of deep learning to computers enables data processing similar to the way the human brain works.

Deep learning is supported by three pillars: mindful learning, meaningful learning, and joyful learning. Mindful learning focuses on activating, building, and enhancing students' critical thinking skills. Students are stimulated with contextual problems and guided to solve them creatively. In mindful learning, students' minds are honed to increase their knowledge and insight. Their critical and analytical skills are sharpened, and their problem-solving abilities are developed through experience, experimentation, or hands-on practice. Students' curiosity is nurtured through inquiry, discovery, experimentation, problem-based learning, or project-based learning.

Deep learning emphasizes a profound understanding of concepts, not just memorization. Understanding concepts in depth is not merely surface learning, but involves the development of critical thinking, creativity, and the ability to apply knowledge in various real-world situations.

Deep learning is an approach that emphasizes creating a conscious, meaningful, and enjoyable learning atmosphere and process through holistic and integrated thought, heart, feeling, and exercise. Learning consists of four components: (1) graduate profile dimensions, (2) learning principles, (3) learning experiences, and (4) learning frameworks. The principle of deep learning is mindfulness, which directs students to be constantly aware of the learning process they are undergoing. This awareness consists of several aspects:

1. Awareness of what they already understand or have mastered,
2. Awareness of what they have not yet understood or mastered,
3. Awareness of the importance of understanding or mastering the competencies of what they are learning,
4. Awareness of the learning process they are currently undergoing to achieve the understanding or competency they desire,
5. Awareness of progress in their understanding or competency after reflecting on the learning process they have gone through,
6. Awareness of things that can still be explored further in the next learning process.

Students are guided to become active agents responsible for their own learning process. Educators must continuously foster this awareness from the beginning to the end of the learning process. For example, educators encourage students to draw their own conclusions at the end of a teaching session and reflect on the development of their understanding or competencies. This reflective process leads students to understand their individual strengths and weaknesses and establish clearer targets for future learning.

The meaningful principle is the teacher's effort to help students understand and give meaning to the material they are learning. The joyful aspect honors teachers, students, and other educational stakeholders and provides learning experiences that involve

understanding, application, and reflection. The Joyful Learning element emphasizes the importance of creating a positive learning environment so students can enjoy every part of the learning process. For example, a learning approach through games or interactive activities can increase student enthusiasm for learning.

Research on the application of deep learning in learning is still limited, as mentoring for educators has only recently been completed and only a few schools have implemented it. This study also outlines a deep learning framework encompassing the dimensions of graduate profiles, learning principles, learning experiences, and learning frameworks (Rachmawati Y et al., 2025). The constructivist approach can be linked to the surrounding environment. The literature review provides a classification for research in Mathematics, Science, Social Studies, Civics, Indonesian Language, and Art. The analysis indicates that the constructivist approach can be integrated with learning models such as Discovery Learning, Cooperative Learning, Problem-Based Learning (PBL), and Project-Based Learning (PjBL). Based on this research, the application of the constructivist approach can train, enhance, and positively impact 21st-century skills, such as critical thinking, writing, reading, communication, collaboration, and creativity (Rosita R et al., 2024).

Contextual Teaching and Learning is a learning concept that helps teachers connect the material taught to students' real-world situations and encourages students to make connections between their knowledge and its application in their lives as family members and members of society. The contextual learning model is not exclusive but can be combined with other learning models. A contextual approach demands innovative, creative, dynamic, effective, and efficient teacher skills to create conducive learning. Teachers are no longer the sole resource in learning, and activities have shifted to students as the center of learning activities, with the teacher's role being merely a motivator and facilitator. Student enthusiasm can be increased by using a variety of methods, materials, and media.

Implementing activities that allow students to construct or build their own knowledge trains them to reason and think critically through inquiry activities, questioning, or learning communities. This involves training students to collaborate, share ideas, share experiences, and knowledge, and communicate with each other, fostering positive interactions among students, ultimately leading to active collaborative learning (Hasnawati, 2006).

RESEARCH METHOD

This study employed an experimental research design. The research location was at SMPN-7 Jember, a 7th-grade junior high school (SMP). There are 11 classes, but in this study, we selected two classes: Class 7A as the experimental class and Class 7B as the control class. Class 7C was selected for reliability and validity testing. The control and experimental classes were selected because they met similar criteria. Class 7A, the experimental group, received treatment using deep learning. Class 7B, the control class, was taught using a different

approach, contextual teaching and learning. The instrument used in this study was a test set to identify student learning outcomes. The instrument was first tested for validity and reliability. Data analysis used an independent sample t-test using SPSS.

RESULTS

Validity and Reliability Test

Validity and reliability tests were conducted on 32 students. Validity and reliability tests aim to ensure that the instruments used in the study actually measure what they are supposed to measure. The following are the results of the validity test, which show that the value of sig. All items are below 0.05 then all items are declared valid.

Table 1. Validity test

Number	R	Sig.	Description
Item 1	0.534	0.002	Valid
Item 2	0.454	0.012	Valid
Item 3	0.862	0.001	Valid
Item 4	0.543	0.002	Valid
Item 5	0.499	0.005	Valid
Item l 6	0.499	0.005	Valid
Item 7	0.595	0.001	Valid
Item 8	0.761	0.001	Valid
Item 9	0.862	0.001	Valid
Item 10	0.811	0.001	Valid
Item 11	0.752	0.001	Valid
Item 12	0.624	0.001	Valid
Item 13	0.656	0.001	Valid
Item 14	0.656	0.001	Valid
Item 15	0.862	0.001	Valid
Item 16	0.811	0.001	Valid

Commonly used reliability tests include Cronbach's Alpha (for scaled or continuous items) and Kuder-Richardson (KR-20) (for dichotomous/multiple-choice true-false items) or associated with the Pearson Product Moment Correlation Coefficient formula. These formulas measure the internal consistency of the instrument where a higher Alpha or KR-20 value, usually above 0.6 or 0.7, indicates good reliability. The following are the results of the reliability test on the instrument. Based on the reliability test of the instrument that has been distributed to 30 students in the pilot study, it shows that all items are reliable. This is indicated

by the Cronbach's alpha value of 0.723 which means >0.700. These results indicate that the instrument has high reliability (Pallant, J. (2010).

Table 2. Reability test of instrument

Reability Test	
Cronbach's Alpha	N of Items
0.723	16

Hypothesis Testing

H0 = There is no significant effect of deep learning implementation on student learning outcomes.

Ha = There is a significant effect of deep learning implementation on student learning outcomes.

Normality Test

A normality test is a test conducted to assess whether the data distribution is normally distributed. Normality tests can be performed using the Chi-Square or Kolmogorov-Smirnov test. In this study, the normality test used was the Kolmogorov-Smirnov value. The following are the results of the normality test in this study. The normality test indicates that the data is normally distributed with a sample size of 30. Therefore, the normality test can be ignored because 30 samples are considered to meet the minimum sample size. The Kolmogorov-Smirnov value is at the normal level of 0.200 > 0.05.

Table 3. Normality test

Variable	Respondent	Sig.	Description
Instrument	30	0.200	Normal

Independent Sample T-test

This study used a t-test. The analysis process was carried out using SPPSS. A t-test is a statistical test used to compare the means of one or two groups of data to test hypotheses about significant differences/influences, such as whether an independent variable influences the dependent variable in a regression, or whether there is a difference in the means between two sample groups. There are three main types: the one-sample t-test (comparing one group to a standard value), the two-independent sample t-test (comparing two independent groups), and the paired sample t-test (comparing two measurements in the same group, for example, before/after). Decisions are made based on the significance value (p-value) or the calculated t-test versus the t-table, with the following general criteria: if $p < 0.05$, H_0 is rejected

(there is a significant effect/difference); if p > 0.05, H_0 is accepted (there is no significant effect/difference). In this study, the researcher used a two-sample independent t-test (comparing two independent groups), the analysis process used the SPPS program.

Table 4. Descriptive statistics

Class	N	$\bar{x}$	σ	SE
Experiment	30	26.8667	3.58862	0.65519
Control	30	19.4667	4.02349	0.73459

Table 5. Independent Sample T-test

	F	Sig.	T	df	Sig. one side	Sig. two side	Mean difference	Std. error	Lower	upper
Equal variances assumed	0.085	0.772	7.51	58	0.001	0.001	7.4	0.98	5.42	9.37
Equal variances not assumed			7.51	57.2	0.001	0.001	7.4	0.98	5.42	9.37

Eta squared = $\frac{t^2}{t^{2+(N1+N2-2)}}$

Eta squared = $\frac{7.51^2}{7.51^{2+(30+30-2)}}$

Eta squared = 0.49

An independent sample t-test was run to identify differences in scores between the control and experimental classes. There was a significant difference between the scores of the experimental class (M=26.86, SD=3.58) and the control class (M=19.46, SD=4.02); t (7.51), p = 0.001. Therefore, it can be concluded that the implementation of Deep Learning significantly impacted student learning outcomes. The eta-squared test showed that deep learning had a high effect of 0.49 on learning outcomes, based on Cohen's 1988 calculation, which indicates that 0.01 = small effect, 0.06 = moderate effect, and 0.14 = large effect. Therefore, it was concluded that H0 was rejected and Ha was accepted.

DISCUSSION

The learning process focused on strengthening the cognitive, affective, and psychomotor domains. The deep learning approach to cognitive aspects was implemented, starting from low-level cognitive to high-level cognitive. As stated in Bloom's theory, cognitive abilities consist of six levels: C-1 knowing, C-2 understanding, C-3 applying, C-4 analyzing, C-5

evaluating, and C-6 creating. C-1 to C3 are included in the category of lower-order thinking skills (Lower Order Thinking Skills), while C-4 to C-6 are included in the category of higher-order thinking skills (Higher Order Thinking Skills). The affective domain in learning is related to emotions, attitudes, values, interests, and motivation. In its implementation, affective can be seen in the attitudes of accepting, responding, appreciating, organizing, and characterizing values. In the deep learning approach, the affective aspect is evident in students during learning. Meanwhile, the psychomotor domain, which includes imitation, manipulation, accuracy, articulation, and naturalization skills, is all evident in students during learning. Fulfillment of the three Bloom domains in the application of the deep learning approach means that students' learning outcomes are achieved according to the expected targets. Achieving these three domains provides students with meaningful learning experiences. A fun learning experience must begin with a fun teacher. Teachers are able to design and implement lessons that create enthusiasm and enthusiasm for learning. Teachers are expected to teach comprehensively. Various approaches, models, strategies, methods, and techniques can be used. After students experience meaningful learning, they can reflect. Another aspect that makes the deep learning approach effective is joyful learning, which directs students to be actively involved, both physically (hands-on) and mentally (minds-on) during the learning process. Contextual problems, engaging learning strategies and methods, and appropriate and relevant stimuli can increase students' interest and enthusiasm for learning. Furthermore, students feel happy, making learning activities enjoyable for them. Hours of study time pass quickly because students perceive learning as an academic recreation.

Based on classroom observations, teachers are quite creative in developing learning according to conditions, subject matter characteristics, student characteristics, and field needs. Implementing a deep learning approach is a way to improve the quality of learning. However, regardless of the approach used, teaching with interest is fundamental to enjoyable and student-centered learning. The impact of the deep learning approach on learning is also evident in interviews with students, who found that they learned something meaningful from the teaching materials provided by the teacher.

CONCLUSION

Based on the test results, there is a significant difference between the scores of the experimental class ($M=26.86$, $SD=3.58$) and the control class ($M=19.46$, $SD=4.02$); t (7.51), $p = 0.001$. Therefore, it can be concluded that the implementation of the Deep Learning Approach has a significant effect, with a high eta-squared range of 0.49, on the learning outcomes of junior high school students. The following are some suggestions for further research: 1) The need for broader research to other schools in order to improve the quality of education at the junior high school level; 2) Socialization programs, training, and mentoring for the implementation of the deep learning approach continue to be developed not only in public

schools but also in private schools and schools under the Ministry of Religious Affairs; 3) Teacher capacity development can be carried out through collaboration with universities, especially those with faculties of education.

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