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Deep Learning: The Implementation of the ABCD5E Learning Model with the Stimulation of High Order Thinking Skills

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Keywords

Deep Learning, the ABCD5E Learning Model, Stimulation of High Order Thinking Skills.

Abstract

Deep Learning is a choice of learning approach used in the learning process by the current Minister of Education and Culture of the Republic of Indonesia. Currently, Teachers in Indonesia have put their concern on studying more deeply about Deep Learning. The purpose of this study is to examine the theory of Deep Learning in the ABCD5E Learning Model at Early Childhood Education Labschool UNNES in stimulating children's High Order Thinking Skills. The research method uses a Systematic Literature Review study. The literature review is sourced from primary and secondary data. Primary data was sourced from Direct interviews with the ABCD5E learning model creator team. The secondary data was taken from the ABCD5E learning model guidebook, scientific articles from both national and international journals, and webinar videos organized by the Ministry of Education, Culture, Research, and Technology. The results of this study showed the existence of children's stimulation towards High Order Thinking Skills in Deep Learning in the implementation of the ABCD5E learning model. The conclusion is based on the results of the Systematic Literature Review study, Deep Learning in the implementation of the ABCD5E learning model at Early Childhood Education Labschool UNNES can explain the stimulation of High Order Thinking Skills in children.

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INTRODUCTION

Nowadays, Deep Learning is used as a learning approach in Indonesia. Thus, the teachers in Indonesia have put their concern to learning Deep Learning. Likewise, conducted by the teachers in the Early Childhood Education Labshool UNNES. Currently, they are studying and examining the theory of Deep Learning in the implementation of the ABCD5E Learning Model. The ABCD5E Learning Model was created by Sri Wiji Handayani in 2020 to realize the resilience of partner teachers in Indonesia during the Covid-19 pandemic in the 2020 Ministry of Education, Culture, Research and Technology Partnership Program (Handayani et al., 2021).

This model has been learned by the Early Childhood Education teachers in Indonesia. This is proven by the participation of teachers throughout Indonesia (Java, Sumatra, Sulawesi, Kalimantan, Jayapura, NTT) in the ABCD5E community webinar activity. This also can be seen in one of the graphs of participants in the ABCD5E learning model webinar.

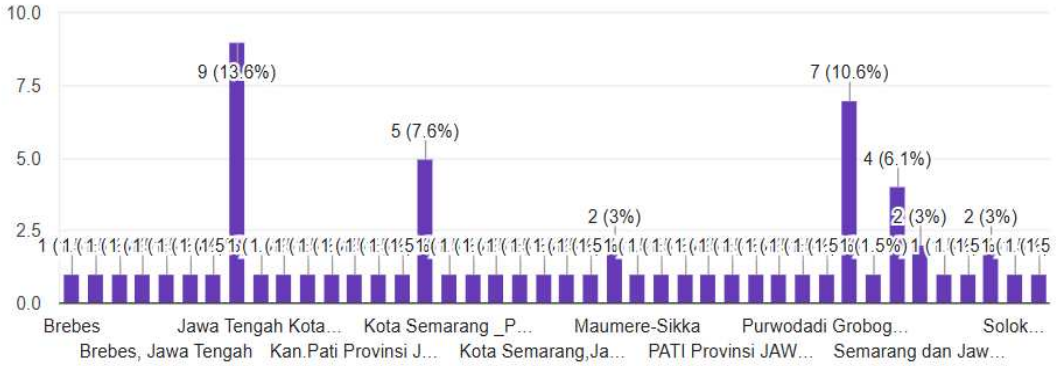

Figure. Graph of the Participants of the ABCD5E Learning Model Webinar based on Province of Origin

It is seen from the enthusiasm of the community, thus during an interview with the creator team of the ABCD5E Learning Model, they, the creator team of the ABCD5E Learning Model also conveyed the importance of more information about Deep Learning in the ABCD5E Learning Model.

In the webinar held by BPGP Central Java on Deep Learning, Mr. Yuli Cahyono said that in creating quality learning for all, there are High Order Thinking Skill achievements which are described based on Bloom's Taxonomy theory and Solo's Taxonomy Theory (BBGP Provinsi Jawa Tengah, 2025).

High Order Thinking Skills are a part of students' achievements that have been analyzed in the assessment of the implementation of the ABCD5E learning model (Handayani, 2021). So far, High Order Thinking Skills in the implementation of the ABCD5E learning model uses the analysis of Bloom's Taxonomy theory. Therefore, in this study, how High Order Thinking skills in the implementation of the ABCD5E learning model can also be known through Solo Taxonomy. So, through this study, it can be seen that there is stimulation of High Order Thinking Skills in the implementation of the ABCD5E learning model, both based on Bloom's taxonomy theory and Solo's taxonomy theory.

METHODS

The method used in this research is a Literature Review. The approach used is Systemic Literature Review (SLR) which is sourced from primary data and secondary data. The primary data is from direct interviews with the creator team of the ABCD5E Learning Model. The secondary data was taken from the ABCD5E learning model guidebook, scientific articles from both national and international journals, and webinar videos organized by the Ministry of Education, Culture, Research, and Technology. The secondary data is analyzed by a systematic literature review based on the guidelines proposed by Kitchmen (Wahono,

2015). The process of the Literature Review study is carried out by identifying, assessing, and interpreting existing research evidence.

The research stages can be seen in the scheme in Figure 1. The Systematic Literature Review is carried out through 3 stages, namely planning, data collection, reporting the results of the review followed by publication. The first review stage is a systematic review based on why setting learning objectives is important. Continued by how to set learning objectives. This review is carried out by reducing bias in research. The second stage is defining research questions for developing the review, the third stage is evaluating, the fourth stage is searching for the topic in question, the fifth stage is the research problem study selection process, and the sixth stage is an assessment focused on quality and process, the last is making a research report then discussing the results of the research and concluding, followed by a scientific publication.

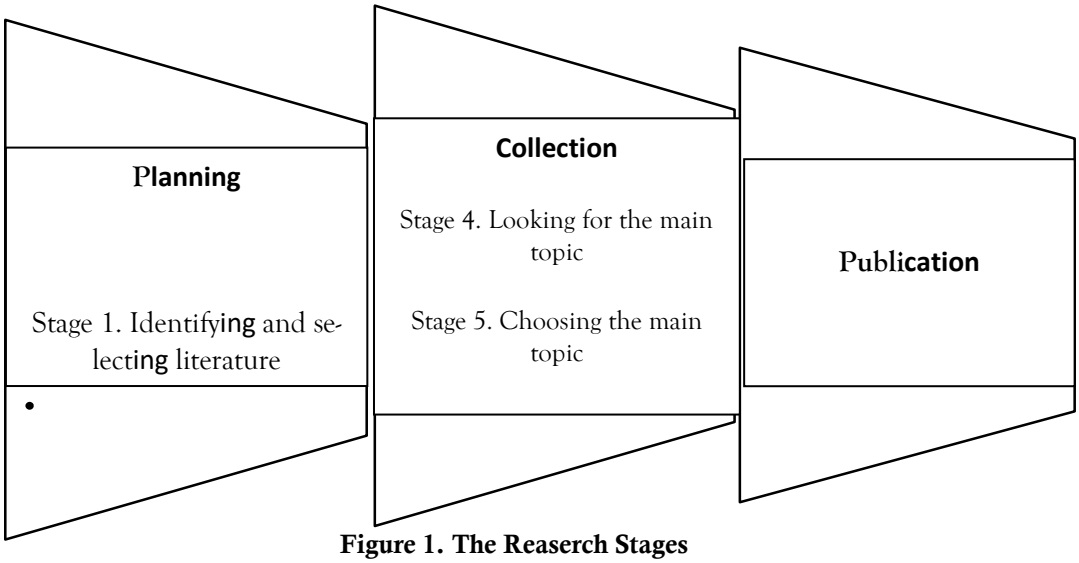

Figure 1. The Reaserch Stages

Research questions, abbreviated as RQ, are used to keep the systematic review focused on the desired search. The Research Question is prepared based on the theory of PICOC, namely population, intervention, comparison, outcomes, and context (Kitchenham et al., 2009).

Inclusion and exclusion criteria were used to select primary data. These criteria are shown in Table 2. Furthermore, the strategy carried out in this Systematic Literature Review (SLR) consists of a search string that is by the stages with the following development: 1) Identify search terms from PICOC, especially from Population and Intervention 2) Identify search terms from the research question 3) Identify search terms in the title, abstract, and relevant keywords. Searches for research articles were carried out in national and international journals as well as Google Scholar. Research questions on the literature review are presented in Table 3. Then the data is taken based on research questions in RQ 1, RQ 2, RQ 3, RQ 4 and RQ 5. Priority is given to research in the last 10 years and in accordance with research questions both from national and international publications.

Table 1. PICOC Summary

Population	:	Deep Learning, the ABCD5E Learning Model, Stimulation of High Order Thinking Skills
Intervention	:	Deep Learning, the ABCD5E Learning Model, High Order Thinking Skills, Cognitive domain according to experts, Stimulation of High Order Thinking Skills, Process in the implementation of the ABCD5E Learning Model,
Comparison	:	n/a
Outcomes	:	The existence of stimulation of High Order Thinking Skills in Deep Learning at the implementation of the ABCD5E Learning Model
Context	:	Deep Learning in the implementation of the ABCD5E Learning Model is

found stimulation of High Order Thinking Skills

Table 2. Research Question on Literature Review

Research Question		Motivation
RQ1. Which journal corresponds to research theme	:	Identify and search for journals according to the topic being researched
R Q2. Who is the researcher who has written a lot about Deep Learning, the ABCD5E Learning Model dan High Order Thinking Skills	:	Identify who the researchers are in the Deep Learning, the ABCD5E Learning Model dan High Order Thinking Skills
RQ3. How Deep Learning on the implementation of the ABCD5E Learning Model can stimulate High Order Thinking Skills	:	Identify and look for articles that support the answer to the questions on how Deep Learning in the implementation of the ABCD5E Learning Model can stimulate High Order Thinking Skills
RQ4. What methods are used to set learning objectives	:	Identify articles that answer the question of how to set learning objectives
RQ5. What methods are used by researchers	:	Identify the methods used by the article

RESULTS AND DISCUSSION

Theoretically, Deep Learning has superiority in learning, namely developing a deep understanding and critical thinking (Putri, 2024). Deep Learning is a learning that involves critical analysis, and connects information with existing information brought into application with real concepts. Deep learning encourages students to integrate deep knowledge into real life which then grows a lifelong learning mindset (Diputera, 2024). Based on Michael Fullan Deep Learning is the process gained from six Global competencies, they are: character, citizenship, collaboration, communication, creativity, and critical thinking. These competencies include compassion, empathy, social-emotional learning, entrepreneurship, and related skills needed to function well in a complex universe (Fullan et al., 2018).

This critical thinking is part of the cognitive domain. The cognitive domain itself is part of the human development aspect. This critical thinking is one of the graduate profiles in learning in Indonesia with a Deep Learning approach as seen in the deep learning framework. (BBGP Central Java Province, 2025)

What is meant by critical thinking in Deep learning is High Order Thinking Skills which based on Bloom's taxonomy can be found in the cognitive domain. There are six cognitive domains based on Bloom, they are knowing, understanding, applying, analyzing, and evaluating (Nafiati, 2021). This domain is classified into Low Order Thinking Skills and High Order Thinking Skills. That High Order Thinking Skills

is beyond the stage of knowledge and understanding domain as well as conceptual things. When critically thinking, means being in the cognitive process of High Order Thinking Skills (Tsaparlis, 2020).

This critical thinking skills is the result of the analysis of learning process achievement by using the ABCD5E Learning Model (Handayani, 2021). In the ABCD5E Learning Model is explained that there is analysis with the use of the STAR Technique in conducting learning assessment to know the learning achievement, development achievement, 21st-century competency achievement, Critical Thinking Skills achievement with Bloom's taxonomy (Handayani et al., 2022)

Moreover, the Critical Thinking Skills in Deep Learning is explained by Yuli Cahyono in the Webinar creating quality learning for all, said that knowing Critical Thinking Skills in a structured manner is measured using solo Taxonomy. Solo is an abbreviation of Structure of the Observed Learning Outcome (structure of learning outcomes obtained through observation). According to Big and Choils, the observation of learning outcomes is obtained with the following stages:

1. Pre-structural: This stage is seen for example when the first response shows a lack of understanding of the material presented and the implications of the questions asked. At this stage, students do not use data in completing the task.
2. Uni-structural: In this stage, the students have focused on one aspect of the data and have used it to support their answer to the question.
3. Multi-structural: These students have chosen their answer to the question (i.e., they have asked for a closed result) by considering some features that stand out to them in the data, and have treated those features as independent and unrelated. They have not considered the pros and cons of each alternative and come to a balanced conclusion about its likelihood.
4. Relational: This is a more thoughtful response than the previous one; it includes most of the data, considers alternatives, and relates the facts.
5. Extended Abstract: This response demonstrates the students' ability to not close off the results while considering evidence from both perspectives. The students have included information from outside the data and the structure of their response demonstrates their ability to reason deductively.

(White, 1982)(Herliani, 2019)

The stimulation of Critical Thinking in the ABCD5E learning model is conducted through the 5E Phase (Engagement, Exploration, Explanation, Elaboration, and Evaluation) (Handayani, 2022). In the 5E phase, the students carry out a more detailed examination of what is created/studied when carrying out self and peer assessments. The self and peer assessment process involves the work of some cognitive, they are criticize, analyze, and make decisions so that what is learned is in accordance with learning outcomes (Handayani et al., 2023). The students' Critical Thinking Skills can be known by using the STAR Technique (Situation, Task, Action and Result) during learning in the 5E phase as shown in the table below:

Table 1: The Analysis of HOTS Achievement Based on Observation with the STAR Technique on the ABCD5E Learning Model.

Students' Name	Situation	Task	Action	Result	Learning Achievement	HOTS Achievement	21st Century Competency Achievement	Graduate Profile Achievement
AL	When making a turtle shape	The turtle's body part has no tail (Self-	Completing by making a tail from pom poms in various	Turtle's body parts complete	AL has the ability to design things and solve problems	Cognitive level C6 = creating works	Critical Thinking and Problem Solving	Have critical thinking

	with a winnowing basket	Assessment)	sizes, large, medium and small.	with tail				
Rafai	When Rafai saw his friend, his friend couldn't close his lunch box	Rafai knows what caused the lunch box couldn't be closed. (Peer Assessment)	Rafai explained by showing the reason why the lunch box could not be closed.	Rafai's friend can close the lunch box well	Raffi can communicate important information, express his ideas to solve problems.	Rafai is able to reach cognitive level C5: criticizing and then evaluating	Critical thinking and Problem Solving	Have critical thinking

The table above explains that the High Order Thinking Skill in the implementation of the ABCD5E Learning Model is obtained based on observation with the STAR Technique. The process of self and peer assessment occurs when the students are in the Elaboration and Evaluation phase in the ABCD5E Learning Model (Handayani et al., 2022). The stimulation of High Order Thinking Skills in the Elaboration phase happens when AL conducts a re-observation of the turtle shape made using a winnowing basket. The observation was made by AL himself that the turtle was not yet equipped with a tail. So, AL in the Evaluation phase decided to complete the shape of the turtle's body with a tail. AL made a turtle tail using various large, medium, and small-sized pom-poms.

The next discussion is how when learning outcomes are carried out through observation with the STAR technique and measured using Solo Taxonomy. The following is a table of Solo Taxonomy and Bloom Taxonomy in learning with a deep learning approach.

Table 2: Solo Taxonomy and Bloom Taxonomy in the Learning with a Deep Learning Approach

Learning Level		Solo Taxonomy	Bloom Taxonomy	Learning Experience with DL	Description
Excellence	Deep Learning	Extended Abstract	Creating Evaluating	Reflecting	Expanding and implementing Ideas
Secure		Relational	Analyzing Applying	Applying	Connecting ideas

Developing		Multi-structural	Understanding		Have many ideas
Foundation		Uni-structural	Remembering	Understand-ing	Recalling
Incompetence	Basic Learning	Pre-structural			

Information:
Blue table colour = High Order Thinking Skill domain
Table colour = Low Order Thinking Skill domain
Table colour = Incompetence

Based on Table.2, it is stated that the Solo Taxonomy and Bloom Taxonomy can be aligned at the level of thinking ability (BBGP Provinsi Jawa Tengah, 2025). This makes it easier for us, the implementers of the ABCD5E learning model, to measure learning outcomes using the Solo Taxonomy. The ability of High Order Thinking Skills according to Bloom's theory is at the level of thinking of applying, analyzing, and creating works. The ability of High Order Thinking Skills in the solo taxonomy is at the level of thinking Relational and Extended Abstract. The level of High Order Thinking Skills by Bloom's Taxonomy, namely creating works and evaluating, is aligned with the level of High Order Thinking Skills by Solo's Taxonomy, namely Extended Abstract. While the ability of High Order Thinking Skills by Bloom's Taxonomy at the level of applying and analyzing is aligned with the ability of High Order Thinking Skills by Solo's Taxonomy at the level of thinking Relational. When measuring learning outcomes as in Table 1, the alignment of achievements can be displayed using Bloom's taxonomy and Solo's Taxonomy as shown in Table 3 below:

Table 3 : The Analysis of High Order Thinking Skills Achievement through Observation with the STAR Technique in the Implementation of the ABCD5E Learning Model with Measuring instrument Bloom Taxonomy and Solo Taxonomy in the Learning with Deep Learning Approach.

Stu-dents' Name	**Situa-tion**	**Task**	**Action**	**Result**	**Learning Achieve-ment**	**HOTS Achieve-ment with Bloom Tax-onomy**	**HOTS Achievement with Solo Tax-onomy**
AL	When making a turtle shape with a winnow-ing bas-ket	The tur-tle's body part has no tail (Self-Assess-ment)	Com-pleting by mak-ing a tail from pom poms in various sizes, large, medium and small.	Turtle's body parts complete with tail	AL has the ability to design things and solve prob-lems	Cognitive level C6 = creating works	Extended Ab-stract

Rafai	When Rafai saw his friend, his friend couldn't close his lunch box	Rafai knows what caused the lunch box couldn't be closed. (Peer Assessment)	Rafai explained by showing the reason why the lunch box could not be closed.	Rafai's friend can close the lunch box well	Raffi can communicate important information, express his ideas to solve problems.	Rafai is able to reach cognitive level C5: criticizing and then evaluating	Extended Abstract

CONCLUSION

The conclusion of the results and discussion above is that there is stimulation of High Order Thinking Skills in the implementation of the ABCD5E learning model. Currently, learning with the Deep Learning approach is expected to know the results of the learning measurement of children's thinking level by using Solo Taxonomy, thus it can be done by aligning Bloom'S taxonomy and Solo Taxonomy theory. The findings of this study provide information that stimulation of High Order Thinking Skills is found in the implementation of the ABCD5E learning model and this is in line with learning using the Deep Learning approach such as adaptations that nowadays, must be done in the learning process in Indonesia.

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