Implementation of Deep Learning in Improving Critical Thinking Skills (Case Study of SDN Pasawahan Kidul and SDN 3 Selaawi Purwakarta [2]Regency)

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ABSTRACT

This study aims to explore the implementation of deep learning in improving the critical thinking skills of elementary school students. The research was carried out at SDN Pasawahan Kidul and SDN 3 Selaawi Purwakarta Regency using a case study approach The research subjects included principals, teachers, and students. Data collection techniques were carried out through observation, in-depth interviews, and documentation studies. Data analysis is carried out interactively through the stages of data reduction, data presentation, and conclusion drawn. The results of the study show that (a) the implementation of deep learning has been carried out through learning planning oriented to active student involvement; (b) Implementation of discussion-based, problem-solving, and simple project learning, as well as learning evaluation through formative assessments and authentic assessments; (c) Deep learning encourages students to express opinions, give reasons, analyze problems, and draw conclusions, thus contributing to the improvement of students' critical thinking skills. This study concludes that deep learning can improve the critical thinking skills of elementary school students supported by structured planning, consistent implementation, and evaluation oriented to critical thinking indicators.

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1. INTRODUCTION

21st century education requires students to have high-level thinking skills, one of which is the ability to think critically. This ability is important so that students are able to analyze information, solve problems rationally, and make decisions based on evidence. The complex challenges of the digital era require elementary schools to start cultivating these competencies from an early age through a more meaningful and in-depth learning process.

The Indonesian government has consistently encouraged learning transformation to produce eight profiles of graduates who are capable in cognitive, social, and character aspects. Some of the policies that are the foundation include: Law No. 20 of 2003 concerning the National Education System, which emphasizes that education must be able to develop the potential of students as a whole, including the ability to think critically and creatively. Permendikbud No. 22 of 2016 concerning Process Standards, which mandates a learning model that encourages activeness, reasoning, and problem-solving. The Merdeka Curriculum, which emphasizes a deep learning approach through exploratory activities, inquiry, reflection, and strengthening literacy and numeracy. Eight Graduate Profiles, which contain the element of "Critical Reasoning" as the main competency that must be developed through learning.

The policy shows that the government has given a clear direction that schools need to implement learning strategies that are able to improve students' critical thinking skills. One relevant approach is deep learning that emphasizes the process of understanding concepts in their entirety, not just memorizing.

Deep learning refers to a learning process that allows learners to meaningfully connect old and new knowledge, analyze concepts, interpret information, and generate a high level of understanding. Biggs & Tang (2011) explain that deep learning occurs when students are actively engaged, think reflectively, and are able to find connections between concepts.

Meanwhile, critical thinking according to Ennis (2011) is a cognitive process that involves the ability to analyze, evaluate, and make decisions based on reason and evidence. Critical thinking does not happen automatically, but must be built through rich, challenging, and contextual learning experiences.

The synergy between deep learning and the development of critical thinking makes both relevant to be applied in elementary schools as a foundation for scientific and rational thinking habits.

Although regulations have mandated meaningful learning, the reality on the ground shows that there is a gap. Some teachers still apply learning that is oriented towards completing the material alone, not on deepening concepts. Students are heavily involved in memorization activities, doing routine problems, and listening to the teacher's explanations passively. In the context of elementary schools, obstacles that often arise include: Teachers have not fully understood the design of deep learning. Learning activities still focus on results, not processes. Students are less given space to ask questions, discuss, or evaluate their own ideas. Assessment is still dominant on the basic cognitive aspect (recall), not analysis.

This condition causes students' critical thinking skills to develop in a limited way. In other words, there is a gap between policy demands and implementation that occurs in the classroom. The root of the problem that causes students' low critical thinking skills can be traced to several aspects: Teachers' understanding of deep learning strategies is not optimal so its implementation is not consistent. The limitations of learning tools such as modules, inquiry-based LKPDs, or assessments that encourage high-level reasoning. A learning culture of students who are used to receiving information without questioning. Traditional learning models that place teachers as the primary source of information. The lack of professional assistance related to the implementation of the curriculum that fosters deep learning.

These problems show the need for alternative learning approaches that emphasize more understanding of concepts and reasoning skills. Various studies have shown that deep learning is effective in improving students' critical thinking skills: A study by Fitriani (2020) shows that the implementation of deep learning in science subjects in elementary schools is able to improve analytical and problem-solving skills. Suryani (2021) found that the application of in-depth inquiry-based learning improved students' participation, questioning ability, and argument quality. Research by Rahman & Yuliana (2022) shows that deep learning accompanied by reflective formative assessments has a significant impact on the critical thinking skills of elementary school students.

These results corroborate that deep learning is a relevant approach to meet the demands of the curriculum and help develop critical thinking skills. At SDN Pasawahan Kidul and SDN 3 Selaawi, the phenomenon of low critical thinking skills can be seen from: Students have difficulty analyzing

information in texts or questions. Students rarely ask critical questions or alternative solutions. Learning is predominantly one-way and has not facilitated deep exploration.

This condition is an actual and crucial issue, especially in the context of the implementation of the Independent Curriculum which emphasizes deep learning. Therefore, studies on the implementation of deep learning in improving students' critical thinking skills are needed to provide meaningful solutions for schools, teachers, and education policy makers.

2. METHODS

The researcher uses a case study approach to find out in depth about the phenomena, behaviors, and events that occur naturally in the implementation of deep learning in improving the critical thinking skills of elementary school students. This approach was chosen with an orientation on the exploration of the phenomenon comprehensively through direct interaction with the subject, observation of learning activities, and interpretation of meaning from the perspective of teachers and students.

Suharyanto H. Soro, (2023) defines the case study approach as scientific activities that are carried out consciously, both single and plural problems using observational data collection methods, interviews, questionnaires, and documentation or the like so that they can comprehensively and exploit the findings in depth and in depth. This is in line with the purpose of this study, which is to describe in detail how teachers implement deep learning, how students participate in the critical thinking process, and the factors that affect the success of the implementation of learning at SDN Pasawahan Kidul and SDN 3 Selaawi Purwakarta Regency. This approach allows researchers to explore extensively: (a) Patterns of implementation of deep learning in the classroom; (b) The form of student involvement in critical thinking activities; (c) Perceptions of teachers, principals, and students related to deep learning; (d) Supporting factors and obstacles that arise during the learning process.

With the study approach, researchers can obtain descriptive data in the form of words, actions, and documents so as to produce a rich and authentic picture of the phenomenon being studied. This approach also allows for flexibility during the research process, allowing researchers to adjust the focus of the study according to the findings of the field to gain a deeper understanding.

The researcher used data collection methods, namely observation, interviews, and documentation studies. The three techniques complement each other so that they can describe the phenomenon of implementing deep learning holistically.

Interview

The interviews in this study were conducted to explore the experiences, perceptions, and understandings of teachers, students, and principals related to the implementation of deep learning. The interview technique used is a semi-structured interview, where the researcher prepares a list of key questions but still provides flexibility for the respondent to explain his or her experiences and views in more depth. The informants interviewed included classroom teachers who carried out deep learning, principals, students who were selected purposively, and curriculum teams or learning coordinators.

The focus of the questions in the interview covers several aspects, including teachers' understanding of deep learning, learning planning and the preparation of Learning Implementation Plans (RPPs), the use of learning strategies that stimulate critical thinking, supporting and inhibiting factors for learning implementation, and teachers' and students' perceptions of the development of students' critical thinking skills.

Observations

In the study "Implementation of Deep Learning in Improving the Critical Thinking Skills of Elementary School Students (Case Study at SDN Pasawahan Kidul and SDN 3 Selaawi Purwakarta Regency)", observation techniques were used to directly observe the learning process in the classroom and the interaction between teachers and students during the implementation of deep learning. The

observation technique applied is participatory-structured, where the researcher is present in class as an observer and uses observation sheets that have been prepared based on indicators relevant to critical thinking skills.

The focus of observation covers several aspects, including: (a) Planning and implementation of deep learning by teachers, including the use of lesson plans and learning strategies; (b) Teacher-student interaction, especially how teachers guide and stimulate students in critical thinking; (c) Students' responses and participation in learning activities, including their ability to analyze, evaluate, and solve problems; (d) Supporting and inhibiting factors that affect the effectiveness of deep learning.

The results of this observation will later become an important source of data to analyze how the implementation of deep learning contributes to improving students' critical thinking skills.

Documentation Studies

In the study "Implementation of Deep Learning in Improving Critical Thinking Skills of Elementary School Students (Case Study at SDN Pasawahan Kidul and SDN 3 Selaawi Purwakarta Regency)", a documentation study was carried out as one of the data collection techniques to complement the information obtained through interviews and observations. The documentation study aims to obtain secondary data in the form of written evidence and recordings of activities related to the implementation of deep learning.

The documentation studied includes the Learning Implementation Plan (RPP), syllabus, school learning program, learning activity reports, student work results, and other relevant supporting documents. Documentation analysis was carried out to assess the suitability of learning planning with deep learning principles, the use of strategies that stimulate critical thinking, and evidence of the development of students' critical thinking skills over time.

This research was carried out in two state basic education units in Purwakarta Regency, namely SDN Pasawahan Kidul and SDN 3 Selaawi. The two schools were chosen purposively because they have implemented a deep learning approach as part of the implementation of the Independent Curriculum and have a commitment to develop students' critical thinking skills. SDN Pasawahan Kidul is an elementary school that has actively participated in learning assistance programs and strengthening the Pancasila Student Profile. This school demonstrates teachers' readiness in designing problem-based learning and reflective discussions. Meanwhile, SDN 3 Selaawi is known as a school that consistently develops integrative thematic learning by emphasizing active student involvement and collaboration between teachers.

Both schools have heterogeneous student characteristics in terms of academic ability and social background, thus providing a rich context to examine the implementation of deep learning in improving students' critical thinking skills. The results of the research are presented based on the POCCC (Planning, Observation, Checking, Collaboration, Conclusion) framework as the main instrument to analyze the implementation of deep learning and its impact on students' critical thinking skills.

The results of observational analysis, teacher interviews, and initial lesson plan documents show that teachers in both schools have developed learning plans that lead to deep learning principles. The lesson plan and teaching modules contain learning objectives that not only focus on mastery of the material, but also on the development of high-level thinking skills (HOTS), especially analysis, evaluation, and problem-solving.

Teachers design learning activities by utilizing the Problem Based Learning (PBL), Project Based Learning (PjBL) model, and simple inquiry that are tailored to the characteristics of elementary school students. Learning objectives are formulated contextually, using real problems that are close to students' lives, thereby encouraging students' cognitive and emotional involvement in the learning process. Variations were found in the depth of planning. At SDN Pasawahan Kidul, learning planning tends to be more systematic and explicit in containing critical thinking indicators. Meanwhile, at SDN 3 Selaawi, although a deep learning strategy has been designed, the critical thinking indicators have not been fully formulated operationally in the lesson plan.

3. FINDINGS AND DISCUSSION

The results of observations show that the implementation of learning in both schools has reflected the characteristics of deep learning. Teachers provide ample space for students to ask questions, discuss, express opinions, and solve problems collaboratively.   At SDN Pasawahan Kidul, teachers consistently use high-level lighter questions that encourage students to analyze cause and effect, compare information, and give reasons for their opinions. Students are seen actively engaging in group discussions, demonstrating the ability to interpret information and present simple arguments.

Meanwhile, at SDN 3 Selaawi, deep learning is realized through thematic project activities and simple experiments. Students are involved in the process of observation, data collection, and presentation of the work. This activity triggers the students' ability to draw conclusions and explain the results of their thoughts, although on some occasions the teacher still needs to provide more intensive scaffolding to help the students achieve a more in-depth analysis.

The function of checking in this study is shown through formative assessment activities and learning reflection. Teachers use various forms of authentic assessment, such as project assessments, student worksheets (LKS), portfolios, and observations during discussions. The results of the analysis show that critical thinking indicators such as interpretation, analysis, evaluation, and inference are starting to be seen in students, especially when they are faced with problem-based tasks and projects. Students are able to identify problems, come up with simple solutions, and explain the reasons behind their choices.

The control and monitoring of critical thinking skills has not been carried out consistently with a standardized analytical rubric. In both schools, teachers still rely on descriptive assessments without detailed written indicators, so that the development of students' critical thinking has not been optimally documented. Collaboration is one of the main supporting factors in the implementation of deep learning. The results of interviews with the principal and curriculum team showed that there was institutional support in the form of routine discussions, academic supervision, and sharing of good practices between teachers.

At SDN Pasawahan Kidul, teacher collaboration is manifested in joint learning planning and post-learning reflection. Teachers exchange experiences with each other on effective strategies in stimulating students' critical thinking. At SDN 3 Selaawi, collaboration occurs more in the form of developing thematic projects across subjects. This collaboration has a positive impact on the consistency of the implementation of deep learning and increases teachers' confidence in implementing active learning strategies.

Based on the teacher's reflection and observation results, the supporting factors for the implementation of deep learning include teacher commitment, the support of the principal, the availability of learning media, and the discussion culture that has begun to form in the classroom. Deep learning has been proven to increase student engagement and trigger the gradual development of critical thinking skills. The inhibiting factors found include limited learning time, variations in students' abilities, and lack of optimal teachers' understanding in compiling comprehensive critical thinking assessment instruments. In addition, some students still need time to adapt to active and reflective learning.

The results showed that the implementation of deep learning at SDN Pasawahan Kidul and SDN 3 Selaawi was in line with the concept of deep learning which emphasized high levels of cognitive engagement, contextual problem solving, and meaningful learning. These findings reinforce the view that deep learning is an effective medium in developing critical thinking skills in elementary school students.

The application of POCCC principles has been proven to help teachers manage learning more systematically. Planning provides a clear direction to the goals of HOTS, organizing and observing ensures that the learning process runs actively, while checking and conclusion play a role in maintaining the quality and sustainability of learning. However, the results also show that the success of deep learning is highly dependent on teachers' capacity to design high-level questions and authentic

assessments. Without the support of structured assessment instruments, students' critical thinking development is difficult to monitor objectively.

 Overall, deep learning not only improves students' conceptual understanding, but also forms habits of reflective, analytical, and responsible thinking. These findings confirm that deep learning is a relevant and contextual strategic approach to improving the quality of learning in primary schools.

4. CONCLUSION

The implementation of deep learning can improve the critical thinking skills of elementary school students. However, the success of its implementation still requires strengthening the aspects of indicator planning, critical thinking assessments, and sustainable teacher capacity building.

Deep learning planning has been implemented by teachers with reference to the principle of active and student-centered learning. The Learning Implementation Plan (RPP) and teaching modules have contained learning objectives that lead to the development of high-level thinking skills. However, the formulation of critical thinking skill indicators has not been fully operational and measurable, so it requires strengthening the assessment planning aspect.

The implementation of deep learning in the classroom shows the active involvement of students through discussion activities, group work, and problem-based assignments. Students begin to show the ability to express opinions, give reasons, and draw simple conclusions. This indicates that deep learning contributes positively to the development of students' critical thinking skills, although the quality of cognitive stimulation still varies between teachers and classes.

Evaluation and monitoring of learning have been carried out through formative assessments and authentic assessments. However, not all teachers use analytical assessment rubrics that specifically measure critical thinking indicators. This condition causes the monitoring of the development of students' critical thinking skills to be systematically and continuously documented. Collaboration and managerial support from school principals play an important role in supporting the implementation of deep learning. Academic supervision, reflective discussions, and sharing of good practices among teachers encourage the creation of a culture of learning and reflection in the school environment. The role of school principals as learning leaders is a strategic factor in maintaining the consistency and sustainability of the implementation of deep learning.

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