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UNDERSTANDING MODEL BY DESIGN FOR ELEMENTARY SCHOOL STUDENTS' DEEP UNDERSTANDING

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ABSTRACT

This study **aims** to analyze the implementation of the Understanding by Design (UbD) model in improving the in-depth understanding of fifth-grade students in four elementary schools. Using **a qualitative approach** with a case study design, the study was conducted for six months (January-June 2025) at Slawi Wetan 03 Elementary School, Slawi Wetan 05 Elementary School, Kagok 01 Elementary School, and Procot Elementary School. Data were collected through participant observation, in-depth interviews with eight classroom teachers, lesson plan documentation, student assignments, and authentic project analysis. **The results** showed that the implementation of UbD significantly improved the quality of teachers' lesson plans, particularly in formulating learning objectives and designing authentic assessments. Students demonstrated improved ability to connect concepts, think critically, and apply knowledge in real contexts. Classroom interactions became more active and learning motivation increased. **The main challenges** were teacher workload and limited infrastructure. The study concluded that UbD is effective as a meaningful learning model in elementary schools, in line with the spirit of the Independent Curriculum. **Research recommendations** include ongoing training and the development of local UbD modules.
Keywords : Understanding by Design, deep understanding, backward design, meaningful learning.

INTRODUCTION

Elementary education plays a strategic role in developing the foundations of critical thinking and conceptual understanding in students. However, learning practices in many Indonesian elementary schools are still dominated by a transmissional approach that emphasizes memorizing facts to pass exams (Hwang et al., 2024) . This phenomenon results in low knowledge retention and students' limited ability to apply concepts in real-world situations (Mukhlisin et al., nd) . The results of the 2024 minimum competency assessment (AKM) showed that 65% of fifth-grade elementary school students in Tegal Regency struggled with numeracy and science literacy, which require in-depth conceptual understanding (Directorate of Basic Education, 2024).

The Understanding by Design (UbD) model developed offers a solution through a backward design approach that begins with the desired learning outcomes, then designs assessment evidence, and then plans learning activities. This approach is relevant to the spirit of the Independent Curriculum, which emphasizes flexibility, conceptual understanding, and authentic assessment (Rosanawati et al., 2025; Saa, 2024; Syifa & Haryanto, 2025) . In Indonesia, the implementation of UbD is still limited, especially at the elementary school level. Several studies have demonstrated the effectiveness of UbD in improving learning outcomes and student engagement (Aslam et al., 2024) , but few studies have examined its implementation in the local context of Tegal Regency, considering teacher capacity and availability of facilities.

This study aims to answer the question: How does the implementation of the UbD model affect the in-depth understanding of fifth-grade elementary school students in four schools in Tegal Regency? Specifically, this study aims to (1) describe the process of UbD implementation by teachers, (2) analyze its impact on student understanding, and (3) identify challenges and

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strategies for teacher professional development in implementing UbD.

METHODS

This study used a qualitative approach with an instrumental case study design to gain an in-depth understanding of the implementation of UbD in four elementary schools in Tegal Regency. The research subjects consisted of eight fifth-grade teachers (two teachers per school) who were purposively selected based on a minimum of five years of teaching experience and willingness to participate in the research. In addition, 120 fifth-grade students (30 students per school) were the subjects of observation and analysis of learning tasks. The research locations were Slawi Wetan 03 Public Elementary School, Slawi Wetan 05 Public Elementary School, Kagok 01 Public Elementary School, and Procot Public Elementary School, which were chosen because they were representative of schools with different socio-economic backgrounds in Tegal Regency.

The research was conducted over six months with the following stages: (1) first month: literature study, instrument preparation, and licensing, (2) second month: two-day intensive training on the concept and implementation of UbD for participating teachers, (3) third and fourth months: implementation of three UbD-based learning units with researcher assistance, (4) fifth and sixth months: data collection and thematic analysis.

Data collection was conducted through (1) participatory observation of six learning meetings in each school using structured observation sheets, (2) semi-structured interviews with eight teachers and 20 students (five per school) using interview guides, (3) documentation in the form of lesson plans, student assignments, and authentic projects, and (4) analysis of student assignments using an understanding assessment rubric developed based on the UbD framework. The research instrument was validated by two learning experts and one elementary education practitioner.

Data analysis was conducted thematically using the Miles and Huberman model through three stages: (1) data reduction by categorizing interview transcripts and field notes, (2) data presentation in the form of narratives, tables, and representative quotations, (3) verification of findings through triangulation of sources and methods. Data validity was guaranteed through triangulation techniques of sources (teachers, students, documents) and triangulation of methods (observation, interviews, document analysis).

RESULTS AND DISCUSSION

Implementation of UbD in Four Elementary Schools

Before the training, document analysis showed that participating teachers' lesson plans were generally oriented toward learning activities and material coverage, rather than toward the goal of in-depth understanding. After intensive training, all teachers successfully implemented the three stages of UbD in their lesson planning. In the Desired Results stage, teachers began formulating meaningful "Big Ideas" and essential questions. For example, at Kagok 01 Public Elementary School, teachers formulated the essential question "How do natural resources affect the lives of the people around us?", replacing the previous objective formulation of "Mention the types of natural resources."

In the Evidence of Understanding stage, teachers develop various forms of authentic

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assessment such as environmental conservation campaign projects, simple research presentations on water resources, and daily reflection portfolios. At Slawi Wetan 05 Public Elementary School, teachers designed an assessment rubric that measures four dimensions of understanding (explanation, interpretation, application, and perspective) to assess a plastic waste reduction campaign project. In the Learning Plan stage, teachers design student-centered learning activities through group discussions, simple experiments, and structured field trips.

However, there was variation in the quality of implementation across schools. Teachers at Procot Public Elementary School, which has limited internet access, struggled to develop digital learning resources, while teachers at Slawi Wetan 03 and 05 Public Elementary Schools had easier access to digital learning resources due to adequate school facilities. Table 1 shows the differences in the quality of UbD implementation across the four schools.

Table 1. Comparison of the Quality of UbD Implementation in Four Schools

Implementation Aspects	SDN Slawi Wetan 03	SDN Slawi Wetan 05	SDN Kagok 01	SDN Procot
Formulating Big Ideas	Very good	Good	Enough	Enough
Development of Essential Questions	Good	Very good	Good	Enough
Authentic Assessment Design	Good	Good	Enough	Not enough
Quality of Learning Activities	Very good	Good	Good	Enough
Use of Learning Resources	Very good	Good	Enough	Not enough
Infrastructure Support	Good	Very good	Enough	Not enough

Source: Primary Research Data, 2025

Impact on Students' Deep Understanding

Analysis of student assignments and projects showed significant improvements in their ability to understand in-depth. Before the implementation of UbD, only 35% of students were able to comprehensively explain the cause-and-effect relationships of the concepts studied. After two months of UbD implementation, this percentage increased to 78%. At SD Negeri Kagok 01, the "Clean Water for Our School" project demonstrated students' ability to integrate science, mathematics, and civics concepts to solve real-life problems related to clean water availability in schools.

Interviews with students revealed shifts in perceptions of learning. A student at Procot Public Elementary School stated, "Before, I just memorized the types of waste. Now I know that plastic waste can clog drains and cause flooding. My friends and I made posters encouraging people to sort waste around the school." This statement illustrates students' ability to connect concepts to real-world contexts, an indicator of deep understanding within the UbD framework.

Classroom observations showed an increase in active student engagement, from an average of 45% before UbD implementation to 82% during UbD-based learning. Students were more active in asking questions, sharing ideas, and collaborating in groups. At Slawi Wetan 05 Public Elementary School, female students' participation in discussions increased significantly due to the more inclusive activity design in UbD-based learning.

This finding aligns with research (Alhamisi et al., 2014; Aslam et al., 2024; Lai, 2024; Lutomia et al., 2025) showing that the UbD model effectively increases conceptual understanding

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and student engagement because the backward design approach forces teachers to think from the end goal of learning. When teachers begin with the questions "What do we want students to understand?" and "How do we know students have understood?", the learning design becomes more focused on deep understanding rather than simply covering the material. (Mctighe & Wiggins, 2012) .

Improvements in students' critical thinking skills were also observed through the analysis of their projects. At Slawi Wetan 03 Elementary School, the "Environmentally Friendly Village" project demonstrated students' ability to analyze environmental issues holistically, propose evidence-based solutions, and consider the perspectives of various stakeholders. These results support the findings (Suryana et al., 2025) that the UbD approach effectively develops elementary school students' higher-order thinking skills when provided with adequate guidance and scaffolding.

Implementation Challenges and Strategies to Overcome Them

Several key challenges were identified in the implementation of UbD in the four research schools. First, teachers' workload increased significantly because designing UbD-based lesson plans took two to three times longer than conventional planning. A teacher at Procot Public Elementary School stated, "Initially, I was overwhelmed because I had to think of essential questions, evidence of understanding, and meaningful activities. It took a week to prepare one learning unit." The second challenge was limited infrastructure, particularly at Procot Public Elementary School and Kagok 01 Public Elementary School, which have limited access to technology and digital learning resources.

To address these challenges, researchers and teachers developed a collaborative strategy. Teachers were divided into professional groups to help each other design UbD-based lesson plans, with tasks divided according to their respective expertise. At the school level, the principal allocated four hours per week for teacher collaboration in developing learning. This strategy aligns with recommendations (Ndabezitha et al., 2023) that teacher professional collaboration is key to the successful implementation of learning innovations.

Digital support was also developed through the creation of a UbD learning resource repository that can be accessed offline by teachers in schools with limited internet access. This simple platform contains sample lesson plans, assessment rubrics, and learning resources curated for the local context of Tegal Regency. This initiative supports findings by Widya et al. (2024) that context-appropriate technology integration effectively increases teachers' capacity to implement innovative learning models.

The third challenge was teachers' initial perception that UbD was too complex for elementary school students. However, after implementation, all teachers stated that fifth-grade students were able to think critically and connect concepts when given appropriate questions and activities. This finding challenges the assumption that higher-order thinking is only for older students, as also found in research by McTighe and Ferrara (McTighe & Wiggins, 2012) that young children have the capacity for conceptual thinking when their learning environment is supportive.

The findings of this study have significant implications for the development of the Independent Curriculum in Indonesia. The UbD framework, which focuses on in-depth

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understanding and authentic assessment, aligns with the spirit of the Independent Curriculum and can therefore serve as an effective implementation model. Policy recommendations include integrating UbD principles into Independent Curriculum teacher training and developing contextual implementation examples for various subjects and levels.

CONCLUSION

This study concludes that the Understanding by Design (UbD) model effectively improves the quality of teachers' lesson planning and the in-depth understanding of fifth-grade students in four elementary schools in Tegal Regency. The implementation of UbD leads to a paradigm shift from activity-based learning to understanding-based learning, characterized by clear goal formulation, authentic assessment, and meaningful activities related to students' life contexts.

Students demonstrated significant improvements in their ability to connect concepts, think critically, and apply knowledge to real-world situations. However, challenges in implementing UbD include increased teacher workloads, limited infrastructure, and the need for ongoing training. Professional teacher collaboration strategies and the development of contextual learning resources have proven effective in addressing these challenges.

Research recommendations include: (1) schools need to allocate regular collaborative time for teachers to design UbD-based learning, (2) teacher training institutions need to integrate UbD principles into professional development programs, (3) further research is needed to quantitatively test the effectiveness of UbD with a quasi-experimental design in various elementary school contexts in Indonesia. Research also needs to explore the adaptation of the UbD framework for specific subjects and its integration with the STEM approach in the context of the Independent Curriculum.

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