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Enhancing Pancasila Student Profiles Through Differentiated Learning with Understanding by Design

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ABSTRACT

Education in Indonesia has yet to fully accommodate the diverse interests, talents, and abilities of students, limiting the development of their creativity and character. This study aims to (1) examine the effectiveness of differentiated learning using the Understanding by Design (UbD) framework in enhancing aspects of the Pancasila Student Profile, and (2) explore student responses to this instructional approach. The research employed a mixed-methods design, specifically a sequential exploratory strategy, combining qualitative and quantitative data. The quantitative component followed a quasi-experimental design with a non-equivalent control group using a pretest-posttest format. Data were gathered through observations, interviews, tests, and questionnaires. The findings indicate a significant improvement in the Pancasila Student Profile in the treatment group after the implementation of UbD-based differentiated instruction. The normalized gain score (N-Gain) was 0.82, categorized as high, while the effect size (Cohen's d) was 0.49, indicating a moderate impact. Additionally, student responses measured via Likert-scale questionnaires showed a very strong positive perception of the learning experience, particularly in aspects of engagement, relevance, and collaboration. These results suggest that differentiated instruction designed through the UbD framework is effective in promoting the core competencies of the Pancasila Student Profile—independence, mutual cooperation, and critical thinking. This approach provides a practical pathway for educators to implement learner-centered instruction aligned with the goals of the Kurikulum Merdeka, fostering both academic and character development among elementary students.

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1. INTRODUCTION

Education plays a central role in shaping human character, values, and behavior. It enables individuals to understand social norms, develop reasoning, and function meaningfully within society

(Olugbenga, 2022; Zuhdi et al., 2021). However, the educational system in Indonesia has long been critiqued for applying a uniform approach to teaching that does not adequately accommodate students' diverse interests, talents, and abilities. As a result, learning often neglects the uniqueness of each student, limiting creativity, independence, and problem-solving capacity (Machost & Stains, 2023; Mahmawati, 2022). In many elementary schools, for example, learning is delivered uniformly across students with varied learning profiles, leading to disengagement and reduced self-efficacy. These issues highlight a mismatch between pedagogical practice and the developmental needs of learners.

In response to this, the Indonesian government has introduced the Kurikulum Merdeka (Independent Curriculum)—a student-centered initiative aimed at fostering **aut**onomy, creativity, and character in learners. Drawing on the philosophy of Ki Hajar Dewantara, this curriculum promotes "liberating education," encouraging students to grow in alignment with their nature, through freedom of thought and self-expression (Aini & Adiyono, 2023; Qur'ani & Basri, 2023). Education should, therefore, serve as a medium to empower students' intrinsic potential through meaningful, personalized learning experiences (Rifai et al., 2022). As Mahur, Riyanto, and Roesminingsih (2019) suggest, education is not just the transmission of knowledge, but a transformative process through which individuals learn to interpret and respond to real-world contexts.

Effective learning requires strategic management that involves planning, organizing, implementing, and evaluating activities to meet targeted learning goals (Kaehler & Grundei, 2019; Juhji et al., 2020). Within this process, the role of the teacher is pivotal—not merely as a source of knowledge but as a facilitator who guides students through self-directed, meaningful, and socially relevant experiences (Kolb, 1976a; Supardi, 2013; Rusman, 2013). Thus, the management of learning must account for individual student needs, interests, and readiness levels, aligning with the principles of differentiated instruction**.**

Differentiated learning refers to an instructional approach that tailors content, process, product, or learning environment based on learners' needs, preferences, and readiness (Tomlinson et al., 2003). It enables all students—regardless of their starting point—to engage in appropriately challenging tasks, thereby enhancing motivation and achievement. In the context of the *Pancasila Student Profile*, differentiated learning becomes particularly relevant. The Pancasila Student Profile is a national framework introduced to instill six key competencies in students: faith and piety, global diversity, independence, mutual cooperation, critical thinking, and creativity (Irawati et al., 2022; Lubaba & Alfiansyah, 2022). These values are integral to Indonesia's educational vision, aiming to produce well-rounded individuals capable of navigating complex 21st-century challenges.

While differentiated instruction offers a promising pathway, its implementation often lacks structure. In this regard, the Understanding by Design (UbD) framework can provide a systematic approach to planning and delivering differentiated learning. UbD is a "backward design" model in which educators begin with clearly defined learning outcomes, identify acceptable evidence of learning, and then plan instructional activities accordingly (Wiggins & McTighe, 2005). This method ensures that learning remains focused, purposeful, and aligned with essential understandings and skills. UbD also emphasizes deep understanding, transfer of learning, and student-centered pedagogy—principles that align closely with the objectives of *Kurikulum Merdeka* (Newell et al., 2023; Halimah & Dewi, 2023).

Existing studies have explored the effectiveness of UbD in various educational contexts. For instance, Ozyurt et al. (2021) found that the UbD framework improved student engagement and conceptual understanding in science education. Similarly, Agustiani and Rahman (2023) demonstrated that combining UbD with collaborative learning strategies increased students' cooperation and responsibility. However, limited research has examined the integration of UbD with differentiated instruction in the specific context of enhancing the *Pancasila Student Profile*.

This study seeks to fill that gap by examining how UbD-based differentiated learning can support the development of *Pancasila competencies*, particularly independence**,** mutual cooperation, and critical thinking—three dimensions identified as underdeveloped in elementary-level learners. Prior research

has often focused on differentiated instruction to improve academic achievement (Purnawanto, 2023) or creative thinking (Astria & Kusuma, 2023), but rarely has it been linked systematically with national character-building initiatives like the Pancasila Student Profile.

Furthermore, while many studies have assessed the outcomes of UbD in terms of academic performance, few have investigated student perceptions and responses to this approach. Understanding student responses is essential for designing instruction that not only meets curricular goals but also engages learners affectively and cognitively (Gloria et al., 2018; Burson, 2011). This study thus also explores how students respond to learning experiences that integrate differentiated instruction and UbD, with the goal of understanding their engagement, satisfaction, and perceived relevance of learning.

In light of the challenges in Indonesia's current educational landscape, there is a compelling need to adopt instructional models that are both structured and flexible—capable of addressing national educational goals while adapting to individual learner needs. By investigating the impact of differentiated learning through the UbD framework on students' development of the *Pancasila Student Profile*, this study aims to contribute meaningful insights for educators, policymakers, and curriculum designers.

Accordingly, the research addresses two primary questions:

1. Can differentiated learning designed through the UbD framework improve the *Pancasila Student Profile* in elementary school students?
2. How do students respond to differentiated learning based on UbD in relation to the development of Pancasila competencies?

2. METHODS

This study employed a mixed-methods approach that integrated qualitative and quantitative strategies to provide a comprehensive understanding of the effectiveness of differentiated learning using the Understanding by Design (UbD) framework in enhancing the Pancasila Student Profile. The research followed a sequential exploratory design, beginning with qualitative exploration to understand learning experiences and student responses, followed by quantitative analysis to measure the instructional impact.

The qualitative phase aimed to capture the dynamics of classroom instruction and student behavior related to the UbD-based learning model. Data were collected through classroom observations, semi-structured interviews with teachers and students, and open-ended questionnaires. These instruments allowed researchers to explore students' engagement, participation, and responses to the learning process. To ensure the credibility and validity of the qualitative data, triangulation was applied by cross-verifying information across different data sources. Data analysis was conducted using the interactive model developed by Miles, Huberman, and Saldaña (2014), which consists of three stages: data condensation, data display, and drawing conclusions. In the data condensation phase, raw data were organized, coded, and filtered to extract relevant information aligned with the study's objectives. Data were then presented in descriptive narratives, tables, and visual representations to support interpretation. Finally, conclusions were drawn based on identified patterns and themes, particularly in relation to two core areas: the implementation of differentiated learning through UbD, and the development of student competencies in independence, mutual cooperation, and critical reasoning.

The quantitative component of the study adopted a quasi-experimental design using a pretest-posttest nonequivalent control group structure. This approach was chosen to examine the causal relationship between the instructional model and the development of students' competencies, acknowledging that participants could not be randomly assigned. The study involved elementary school students participating in a school-based practicum led by prospective elementary school teachers enrolled in a Field Experience Practice course. Participants were divided into two groups: the

experimental group received instruction through the UbD-based differentiated model, while the control group received conventional instruction without UbD integration.

The research design can be described as follows: the experimental group underwent a pretest (O_1), followed by the instructional treatment (X), and then a posttest (O_2). Similarly, the control group completed a pretest (O_3) and posttest (O_4) without receiving the treatment. The instructional intervention in the experimental group specifically aimed to improve the dimensions of the Pancasila Student Profile, including independence, mutual cooperation, and critical reasoning. Data collection for this phase involved a combination of multiple-choice tests (20 items) and essay questions (5 items) designed to assess students' conceptual understanding and application of the targeted competencies. Additionally, Likert-scale questionnaires were administered to evaluate students' attitudes and responses toward the instructional approach.

Experimental	0_1	x	0_2
Control	0_3	x	0_4

Information:
0_1: Mean pretest score of the experimental group
0_2: Mean posttest score of the experimental group
0_3 : Mean pretest score of the control group
0_4: Mean posttest score of the control group
X: Treatment treatment is based on UbD

The average learning outcomes between the experimental group and the control group that were not selected randomly are shown with a dotted line (Cohen et al., 2007). This study was conducted in Elementary Schools. The sample was taken by purposive sampling. Data collection in this experimental method was a test and questionnaire. This test was used to evaluate the achievement of the Pancasila Student Profile improvement process. The evaluation was carried out in the experimental class and the control class. The test consisted of two stages, namely the pretest and posttest which would be given to the experimental group and the control group. The test was multiple choice with 20 questions and essays with 5 questions. The questionnaire was also used to capture students' responses to learning in the experimental class. The criteria for interpreting student response scores are shown in Table 1 (Cohen et al., 2007).

Table 1. Score Interpretation Criteria

Score Percentage	Interpretation
81% - 100%	Very Strong
61% - 80%	Strong
41% - 60%	Medium
21% - 40%	Weak
0% - 20%	Very Weak

The N-Gain formula is used to measure the increase before treatment (pretest) after treatment (posttest). Calculate the normalized Gain score based on the formula according to Archambault (Archambault, 2008), namely:

$$N - Gain = \frac{Skor\ Postest - Skor\ Pretest}{Skor\ Maksimal\ -\ Skor\ Pretest} \times 100$$

Meanwhile, the effectiveness of treatment using UbD compared to treatment without using UbD, the study used effect size analysis. The indicator that measures the magnitude of the influence of a treatment is Effect Size (Becker, 2000).

$$Effect\ Size\ d\ Cohen\ = \frac{Average\ Difference}{Standard\ Deviation}$$

The standard deviation is the standard deviation of their mixture s_p. If the sample standard deviation is s_1 and s_2 with sample sizes n_1 and n_2 then s_p is:

$$Sp\ = \sqrt{\frac{(n_1 - 1){s_1}^2 + (n_2 - 1){s_2}^2}{n_1 + n_2 - 2}}$$

Information :
S_p: Standard Deviation
S_1: Sample average 1
S_2: Sample average 2
Source: (Cohen et al., 2007).

The integration of qualitative and quantitative data provided a robust framework for interpreting the findings. While the quantitative results demonstrated measurable gains in student performance, the qualitative data offered contextual insights that helped explain these outcomes. Together, these approaches offered a comprehensive understanding of how UbD-based differentiated instruction influences the development of the Pancasila Student Profile and how students perceive and respond to this learning experience.

3. FINDINGS AND DISCUSSION

This study specifically concentrates on three key dimensions of the Pancasila Student Profile: mutual cooperation, independence, and critical reasoning. In accordance with the goals of the Independent Curriculum, each learning experience is expected to nurture these competencies as part of the broader framework of the Pancasila Student Profile. This national framework comprises six core competencies—faith and devotion to God Almighty, noble morals, global diversity, mutual cooperation, independence, creativity, and critical reasoning (Marsidin, 2022).

Preliminary diagnostic tests indicated that the competencies of independence, mutual cooperation, and critical reasoning required greater emphasis and improvement among students. In response, differentiated instruction designed through the UbD framework was implemented using science learning materials on food webs to target these competencies. The results revealed noticeable progress in students' development of independence, mutual cooperation, and critical reasoning.

In addition to diagnostic tests, systematic classroom observations were conducted both before and after the differentiated learning intervention to monitor changes in student behavior and engagement. These observations highlighted clear differences in the targeted Pancasila Student Profile competencies between the pre-learning and post-learning phases. A summary of these findings is presented in Table 2.

Table 2. Increasing the Pancasila Student Profile in the Aspects of Mutual Cooperation, Independence and Critical Reasoning

	Aspects of the Pancasila Student Profile					
	Independent	**Percentage**	**Mutual cooperation**	**Percentage**	**Critical Reasoning**	**Percentage**
Before Treatment	9	33.33%	20	74.07%	7	26%
After Treatment	25	92.6%	27	100%	18	67%

Table 2 highlights clear improvements in all three targeted aspects of the Pancasila Student Profile following the implementation of differentiated learning using the UbD framework. Prior to the intervention, only 9 out of 27 students (approximately 33%) demonstrated indicators of independence—such as self-discipline, responsibility, initiative, and self-regulation. After the UbD-based learning approach was applied, this number significantly increased to 25 students, or 92.6%.

A similar improvement was seen in the dimension of mutual cooperation. Initially, 20 students (74%) were observed actively working together and supporting peers in completing tasks. Following the intervention, all 27 students (100%) demonstrated collaborative behavior. Critical reasoning also showed notable progress. Before the differentiated learning model was applied, only 7 students (26%) exhibited the ability to think critically—such as asking questions or offering thoughtful opinions. After the learning intervention, this increased to 18 students, or 67%.

Qualitative data from teacher interviews supported these findings. Teachers noted a marked change in student independence after the implementation of UbD-based differentiated instruction. Previously, students often relied heavily on peers when completing assignments. However, after receiving tasks that were tailored to their individual abilities and learning styles, students became more confident and capable of working independently.

Student interviews further reinforced this shift, particularly in the area of mutual cooperation. Students expressed greater enthusiasm when working in groups, stating that collaborative tasks felt more enjoyable and yielded better results due to the exchange of ideas among peers. In terms of critical reasoning, teachers observed that students became more inquisitive, frequently asking questions and confidently expressing their opinions during lessons. These behavioral shifts were also reflected in students' written work, with group reports showing improvements in structure, clarity, and depth following the differentiated learning process.

To quantify the learning gains more precisely, the results from the diagnostic tests and classroom observations were followed by an N-Gain analysis. This calculation was used to determine the magnitude of improvement in students' Pancasila Profile scores before and after the intervention. The results of this analysis are summarized in Table 3.

Table 3. Results of the N-Gain Test on Improving the Profile of Pancasila Students

		Average N-Gain Value	**Category**
Control Group	Pretest-Posttest 1	0.11	Low
	Pretest-Posttest 2	0.30	Low
	Pretest-Posttest 3	0.59	Medium
Treatment Group	Pretest-Posttest	0.82	High

The N-Gain calculation shows that there is a difference between before and after differentiated learning with UbD. Based on the pretest results compared to the post-test results, the treatment group got a score of 0.82, which is included in the high category. While the N-Gain results of the control group for the first pretest and post-test were 0.11 (low), the second pretest and post-test were 0.30 (low), and the third pretest and post-test were 0.59 (moderate). Additional analysis to measure the effectiveness of differentiated learning with UbD, namely using Cohen's effect size as in Table 4.

Table 4. The results of the effect size test

Class	N	Mean	Varians	Standard Deviation	Cohen's d	Effect Size
The experimental class	27	90.74	53.28	7.299	0.4926	Medium Effect
The control class	18	77.33	179.08	13.382		

Table 4 above shows that the average value, variance, and standard deviation in both groups produce different values, and the influence value (Cohen value) reaches 0.4926 or can be categorized as moderate. The mean value between the experimental class and the control class with a difference of 13.41 indicates a significant difference. The data shows that the average Pancasila Student Profile of the experimental class is better than that of the control class. So, differentiated learning with UbD is effective in improving the Pancasila Student Profile in the aspects of independence, mutual cooperation and critical reasoning. There are other factors that influence the Pancasila Student Profile, namely: internal conditions of students, environment, facilities, teacher competence, and learning strategies. Especially in the current era of independent curriculum, teachers are required to be able to manage learning that frees participants to work according to their talents and abilities. Teachers must be able to manage learning that is meaningful, enjoyable, and fulfilling.

The distribution of the questionnaire was carried out to determine the improvement of the Pancasila Student Profile, so a questionnaire was distributed regarding differentiated learning through the development of UbD. The results of the distribution of student response questionnaires on differentiated learning through the development of UbD to improve the Pancasila Student Profile are shown in Table 5 below.

Table 5. Student Responses to Differentiated Learning Through UbD

Aspect		Indicator	Student Response	
			Percentage Score	Category Score
Respons	Supporting facilities	Media use	78.5	Strong
	Meaningfulness	The benefits of learning in everyday life	85.6	Very strong
Average response to the response aspect			82.05	Very strong
Reaction	Interest	Interesting, boring, curiosity,	87	Very strong
	Satisfaction	Positive student satisfaction	82.5	Very strong
	Self-confident	Students are optimistic about succeeding	80	Strong
Average response aspect of reaction			83.2	Very strong
Overall average			82.6	Very strong

Table 5 above shows that, in general, students gave a positive response to differentiated learning with UbD. Student responses in the very strong category with an average score above 80%. Thus, it can be concluded that differentiated learning through the development of UbD was well-received by students. Students who did not respond well or positively to differentiated learning based on UbD became a challenge for teachers to manage learning. Starting from planning, implementation, and closing must be managed intensively to create meaningful and enjoyable learning.

The results of the study stated that differentiated learning with UbD can improve students' attitudes of independence, mutual cooperation, and critical thinking. This improvement is also influenced by the family's treatment of their children. The results of the study showed that there were still two students who were not yet independent. Among the causes is that parents still often help and worry about their children. As a result, children become dependent. Low test scores cause children to lack self-confidence. The attitude of independence is also influenced by the learning process in the classroom. The strategies, methods, and media used by teachers affect student independence.

The independent curriculum directs teachers to implement differentiated learning.This type of learning maps each student's interests and competencies differently. This is because each child has different competencies from the others. Therefore, the learning process is different or differentiated. In fact, differentiation learning can be maximized by linking the use of UbD in learning. According to the definition, UbD is a construction design that can help teachers connect learning objectives, evaluation and steps, making it easier for students to gain a comprehensive and maximum understanding (McTighe & Willis, 2019a). The use of UbD can help students construct something independently in learning. Minbiole's research results also state that UbD provides a clear picture of learning objectives, evaluations, and interrelated learning steps so that students are able to overcome learning weaknesses independently (2016; Tshering, 2022).

The results of the study showed evidence of an increase in students' cooperative attitudes. Students appeared to work well together when doing assignments. This attitude is also the result of parents' habits for their children. In addition, teachers' habits in group learning can strengthen students' cooperative attitudes. This finding is in line with the results of research by Pertiwi et al. on UbD which focuses on student learning and understanding (2019). UbD emphasizes unconventional learning steps. Usually teachers design learning starting from determining objectives to evaluation, in contrast to UbD, the design starts from learning objectives, then compiles evaluations, and then plans learning steps (McTighe & Willis, 2019b). The results of previous studies have shown that UbD is considered effective in improving students' skills and attitudes (Almasaeid, 2017). In addition, the results of previous studies also stated that the use of UbD can improve the collaboration skills of grade IV elementary school students (Agustiani & Rahman, 2023).

Through differentiated learning, all students are given the responsibility to complete assignments and respond to their peers' work. Thus, it requires students to be more critical in thinking. Therefore, the attitude of critical reasoning has been proven to increase to 18 students or 67% of 27 students. The findings of this study are in line with the results presented by previous researchers that test results increased after using UbD when compared to before using UbD (Yurtseven & Altun, 2016). This is clear because through UbD, teachers can ensure that learning objectives lead to learning steps, and learning evaluations. Ultimately, learning objectives are achieved, and student grades improve.

The results of the N-Gain calculation showed that there was a high difference (0.82) after differentiated learning was carried out through UbD development. Thus, it can be said that there has been a high increase in the Pancasila Student Profile on independent attitudes, mutual cooperation, and critical reasoning in treatment classes with differentiated learning through UbD. Differentiated learning through the development of UbD contributes to increasing attitudes of independence, mutual cooperation and critical thinking by 0.49 or in the moderate category. This is supported by the results of Hanratty and Aydin,'s research (2023) which states that the use of UbD provides opportunities for students to develop skills in the intensity of their knowledge and be able to compete globally. Apart from that, other research concludes that the application of UbD in learning proves that there is an increase in students' mathematical understanding (Pramesti & Dewi, 2023). This is because students are actively involved and learning is not centered on the teacher. UbD design can produce learning tools that lead to increasing students' literacy attitudes (Asari, 2015). Also, another research shows that the UbD approach is able to increase students' interest in learning and students become more active in class (Ozyurt et al., 2021; Sumandya et al., 2023). So, it can be concluded that UbD is very good as a basis development of learning tools.

The results of the questionnaire distribution regarding student responses to differentiated learning with UbD obtained results in the very strong category. This means that students gave positive and happy responses to differentiated learning through the development of UbD. The strongest response was in the interest indicator. This means that students have a high interest in differentiated learning through UbD. This is influenced by the maximum development of UbD. This finding is supported by Burson's opinion (2011) that positive student behavior in the classroom (including discipline in doing assignments), as well as student attention and participation, can be built through Backward Design. In terms of the benefits of differentiated learning, the student learning process becomes more focused on the abilities of each student (Bai & Guo, 2021). This focus shows an enthusiastic attitude in learning. Indirectly, students' high enthusiasm for learning has an impact on other attitudes, such as being independent and critical of learning problems. In addition, students find it easier to collaborate with friends who have similar learning interests (Roberts & Inman, 2023).

The very strong student response is also supported by the results of research by Tomlinson et al (2003) which states that differentiated learning occurs widely and is an effective method. Furthermore, Setiyawati and Septiani (2023) found that the results of students' learning responses with UbD can be seen from the ability to explain, the ability to interpret, the ability to apply, the ability to empathize, the ability to have perspective, and the ability to have self-knowledge. Previous findings stated that student responses regarding the use of UbD in learning are effective to use, and can increase student motivation and learning activities(Gloria et al., 2018; Ostinelli, 2016; Roth, 2007) Other findings state that the application of UbD provides effective results in learning related to the sustainability of the learning system (Uluçinar, 2021). For this reason, it should be followed up on the next occasion, namely teachers implementing differentiated learning management through the development of UbD to improve the Pancasila Student Profile.

4. CONCLUSION

This study concludes that implementing differentiated learning through the Understanding by Design (UbD) framework effectively enhances the Pancasila Student Profile, particularly in the areas of independence, mutual cooperation, and critical reasoning among elementary school students. Quantitative analysis demonstrated substantial improvements, with an N-Gain score of 0.82 (high category) and an effect size of 0.49 (moderate category), indicating that UbD-based differentiated learning significantly contributes to both behavioral and cognitive outcomes. Student responses also reflected very strong positive perceptions of the learning approach, suggesting that it increased engagement and relevance in the classroom. However, this research is limited by its small sample size, focus on only three aspects of the Pancasila Student Profile, and reliance on a quasi-experimental design without random assignment, which may restrict the generalizability of the findings. Future research should expand to larger and more diverse student populations, explore the effects on all six Pancasila Profile competencies, and incorporate longitudinal or randomized designs to better assess the sustained impact of UbD-based differentiated learning. Additionally, further studies could investigate teacher readiness, diagnostic tools, and the scalability of this approach to support its broader implementation in Indonesian elementary schools.

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