Understanding by Design (UbD) Learning Model for Developing Independent Learning Competencies in a Madrasah Ibtidaiyah

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Abstract

This study aims to develop a learning design utilizing the Understanding by Design (UbD) framework to enhance the self-regulated learning competence of fifth-grade students in Madrasah Ibtidaiyah. The background of this research is rooted in the low level of students' learning independence, as reflected in their lack of initiative, planning, task execution, and responsibility throughout the learning process. The study employed a Design-Based Research (DBR) approach through four stages: problem identification, solution design, limited implementation, and reflection with design revision. Data were collected triangulatively through questionnaires, observations, written interviews, documentation, and student performance assessments. The developed learning design follows the principles of backward design, focusing on four main aspects of self-regulated learning: initiative, planning, independent task completion, and learning responsibility. The trial results revealed that UbD-based learning had a positive impact on nurturing student independence in affective, cognitive, and psychomotor aspects. Observation data indicated an increase in students' active engagement and sense of responsibility, while the project-based mini-booklets and reflective journals demonstrated their ability to plan and complete tasks independently. The study concludes that the UbD learning design is effective in supporting the development of students' self-regulated learning competence in Madrasah Ibtidaiyah. This research offers practical contributions in designing contextual and character-oriented learning and reinforces the "Independent" dimension in the Pancasila Student Profile.

Keywords: Understanding by Design (UbD), Self-Regulated Learning (SRL), Madrasah Ibtidaiyah, Pancasila Student Profile, Design-Based Research (DBR)

Abstrak

Penelitian ini bertujuan untuk mengembangkan desain pembelajaran berbasis model Understanding by Design (UbD) guna meningkatkan kompetensi kemandirian belajar siswa kelas V Madrasah Ibtidaiyah. Latar belakang penelitian ini didasarkan pada rendahnya tingkat kemandirian belajar siswa MI, sebagaimana tercermin dalam minimnya inisiatif, perencanaan, pelaksanaan tugas, dan tanggung jawab siswa dalam proses belajar. Penelitian ini menggunakan pendekatan Design-Based Research (DBR) melalui empat tahap: identifikasi masalah, perancangan solusi, implementasi terbatas, serta refleksi dan revisi desain. Teknik pengumpulan data dilakukan secara triangulatif melalui angket, observasi, wawancara tertulis, dokumentasi, dan penilaian hasil belajar siswa. Desain pembelajaran yang dikembangkan mengacu pada prinsip backward design dengan fokus pada empat aspek utama kemandirian belajar: inisiatif, perencanaan, pelaksanaan tugas, dan tanggung jawab belajar. Hasil uji coba menunjukkan bahwa pembelajaran berbasis UbD memberikan dampak positif terhadap tumbuhnya kemandirian siswa, baik dari aspek afektif, pengetahuan, maupun keterampilan. Observasi sikap siswa menunjukkan peningkatan keterlibatan aktif dan tanggung jawab dalam proses belajar, sedangkan hasil proyek mini-booklet dan refleksi menunjukkan kemampuan siswa dalam merencanakan dan menyelesaikan tugas secara mandiri. Simpulan dari penelitian ini menyatakan bahwa desain pembelajaran UbD efektif dalam mendukung pengembangan kompetensi kemandirian belajar siswa MI. Penelitian ini memberikan kontribusi praktis dalam merancang pembelajaran kontekstual dan berorientasi karakter serta memperkuat dimensi "Mandiri" dalam Profil Pelajar Pancasila.

INTRODUCTION

Recent reforms in Indonesian education, particularly through the implementation of the Kurikulum Merdeka, emphasize the cultivation of autonomous, reflective learners aligned with the Pancasila Student Profile, especially in the dimension of "Mandiri" (independent). However, empirical studies indicate that many students at the Madrasah Ibtidaiyah (MI) level continue to show limited initiative and self-management skills in their learning process (Emiliya & Aziz, 2024; Rahnasari et al., 2020). These limitations became particularly evident during the COVID-19 pandemic, where students struggled to sustain learning activities without continuous teacher supervision. During the COVID-19 pandemic, the challenges of independent learning became even more evident. Firdaus et al. (2021) reported that the implementation of the Self Organized Learning Environment (SOLE) model through Classroom Action Research (CAR) in Grade IV at SD Negeri Sleman V succeeded in increasing the percentage of students with a "good" category of learning independence from 61.3% in the first cycle to 77.4% in the second cycle. Similarly, Kristin et al. (2022) found that learning models which support student activeness have a significant positive effect on independent learning in elementary school during the pandemic, although the explanatory power of the model was relatively small (R-Square value of only 0.011).

Furthermore, research by Sundari et al. (2022) examined mathematics learning independence during the pandemic among elementary school students. Their study found that despite significant challenges, some students demonstrated adequate independence in online mathematics learning, particularly when supported by appropriate strategies. Another study by Mas et al. (2021) in senior high schools showed that independent learning had a moderate relationship and influence on mathematics achievement during the pandemic—around 23%. Contributing factors included parenting style (26%), educational environment (22%), daily life habits (30%), and heredity (22%).

In addition, Nailufar et al. (2021) focused on five indicators of independent learning—self-confidence, discipline, responsibility, initiative, and non-dependence on others—within the context of distance learning at SDN Dukuhan Kerten. They found that responsibility and self-confidence were the most dominant dimensions observed, although initiative and autonomy still required significant improvement. Similarly, a study by Dwi Amiza & Syofyan (2023) at the vocational school level identified family environment, interest, communication, creativity, motivation, and socio-economic status as key factors influencing independent learning during the pandemic, with the family environment emerging as the most dominant factor.

Several studies, such as Hidayat et al. (2020) and Supriyadi (2021), have further revealed that classroom instruction in many MI contexts remains heavily teacher-centered and lacks reflective, contextual learning experiences that foster independence. Students are accustomed to receiving step-by-step directions, limiting their ability to engage in self-regulated learning. Even after returning to face-to-face classes, residual habits from remote learning—such as passivity and dependence—persist, presenting a challenge for educators to reintroduce active, student-centered approaches.

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In Islamic elementary schools such as Madrasah Ibtidaiyah, which operate under the Ministry of Religious Affairs, the dual mandate of academic excellence and character formation intensifies the need for effective learning models. Supriyadi (2021) highlights that innovative and contextual instructional designs are necessary to prepare students for both global demands and local values. This calls for pedagogical strategies that do not only transmit knowledge but also encourage learners to take ownership of their learning.

According to constructivist learning theory, students learn best when they are actively involved in constructing their own understanding (Theobald et al., 2020). Saad et al. (2023) argue that student-centered learning significantly enhances motivation, critical thinking, and problem-solving abilities. In this regard, the Understanding by Design (UbD) model, developed by Wiggins & McTighe (2005, 2018), provides a structured framework to design backward-planned learning experiences focused on outcomes, evidence, and meaningful activities. It enables learners to grasp not only what they are learning, but why it matters.

Recent studies support the potential of UbD to increase student motivation and independence. Ahmad & Sari (2021) reported that elementary school students taught using UbD-based strategies demonstrated greater initiative and self-direction. Similarly, Rahman (2022) emphasized that when learning is well-planned and meaningful, students are more inclined to explore independently and take responsibility for their progress.

Despite its promise, the practical implementation of student-centered models remains inconsistent. A survey by the Ministry of Religious Affairs' Education and Training Agency (Badiklat Kemenag, 2021) found that many teachers still rely on conventional instruction methods, such as rote learning and lecturing. Furthermore, limited teacher training and inadequate support systems hinder the adoption of reflective and inquiry-based pedagogies in Islamic schools.

Emiliya & Aziz (2024) found that MI students largely depend on teachers for guidance and show minimal self-regulation in learning. Observations revealed that students rarely reflect on their learning outcomes and engage in tasks only when explicitly instructed. Izzati & Wiratama (2025), in an action research study, reported an increase in learning independence from 47.9% to 80.6% after applying contextual teaching and learning (CTL), underscoring the impact of appropriate instructional strategies.

Additional factors, such as parenting styles, also affect learning independence. Ubaidillah et al. (2025) demonstrated that students from permissive or authoritarian households often show passivity in academic settings. Nevertheless, they argue that school-based interventions remain a decisive factor in compensating for environmental limitations, especially when designs are well-targeted. Ainur Rizqi (2025) reported increased initiative and accountability among students engaged in seamless learning, although challenges in teacher readiness and technical resources limited its scalability.

According to Badiklat Kemenag (2021), only around 40% of MI students are able to complete tasks independently—highlighting a clear disconnect between the national vision of student independence and the current classroom reality. This gap necessitates the implementation of instructional designs that are not only theoretically grounded but also practical, adaptable, and scalable.

In response, this study adopts the UbD framework as a strategic solution to improve student independence in MI contexts. UbD emphasizes backward design by aligning instructional goals with assessments and activities, fostering learner autonomy and reflection (Wiggins & McTighe, 2018).

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When combined with Self-Regulated Learning (SRL) theory (Zimmerman, 2002), which focuses on learner initiative, planning, monitoring, and evaluation, this approach offers a coherent design for cultivating independent learning.

Accordingly, this research aims to design and implement a UbD-based learning model to strengthen the independent learning competencies of MI students. By focusing on initiative, planning, task execution, and responsibility, the study addresses the urgent need for sustainable instructional innovations in Islamic elementary schools. It is expected to contribute to both educational theory and classroom practice by offering practical, research-based recommendations for educators and policymakers in improving the quality of character-based learning in Indonesia.

RESEARCH METHOD

This study employed the Design-Based Research (DBR) approach to systematically develop, implement, and iteratively refine a UbD-based learning design within an authentic fifth-grade Madrasah Ibtidaiyah classroom. DBR was chosen for its capacity to bridge educational theory and classroom practice through repeated cycles of design, enactment, analysis, and reflection, yielding both practical solutions and theoretical contributions (Mckenney & Reeves, 2012; Hoadley, 2022; Scott et al., 2020). The methodological stance aligns with a constructivist paradigm in which learning is contextual, collaborative, and driven by learners' active participation (Do et al., 2023; Le & Nguyen, 2024; Wibowo et al., 2025). In parallel, evidence from recent K-12 studies indicates that UbD's backward-design logic effectively orients goals, assessments, and learning experiences to deepen understanding and transfer (Pramesti & Dewi, 2023).

The research followed four core DBR stages: (1) Problem Identification, based on empirical observations and prior studies indicating low levels of independent learning among students; (2) Design of a Solution, involving the development of UbD-based learning scenarios integrated with SRL principles; (3) Implementation in a Limited Setting, where the design was tested over four sessions; and (4) Reflection and Design Revision, informed by field data collected during implementation (Mckenney & Reeves, 2012); (Amiel & Reeves, 2008). These stages were applied in a natural classroom setting to examine both the feasibility and impact of the learning design.

To ensure methodological rigor, data collection employed triangulation techniques, including classroom observation, student questionnaires, reflective journals, documentation of learning artifacts, and performance assessments. The aim was to capture a holistic understanding of how students engaged with the learning design and how their independent learning competencies evolved, particularly in the dimensions of initiative, planning, task execution, and responsibility (Zimmerman, 2002). This also enabled contextual analysis of how learning strategies influenced student behavior and cognitive engagement.

The DBR methodology not only provided a framework for evaluating learning outcomes, but also enabled a deep exploration of learning dynamics in a real-life classroom setting. By integrating iterative revisions based on stakeholder input and empirical findings, DBR allowed the researchers to refine the learning design in response to student needs and classroom realities. As emphasized by Bogdan & Biklen (1982), this type of qualitative inquiry focuses on the depth of understanding rather than generalizability, making it particularly suitable for investigating transformative pedagogical practices in localized educational contexts.

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Thus, the DBR approach in this study facilitated the development of a reflective, contextual, and adaptable UbD-based learning model aimed at enhancing students' self-regulated learning capacities. The process yielded not only practical instructional tools but also empirical insights into how instructional design can foster autonomy and metacognitive growth among elementary learners in Islamic education settings.

RESULTS AND DISCUSSION

Factual Conditions of Independent Learning Competencies of Islamic Elementary School Students

This study began by examining the baseline conditions of independent learning competencies among fifth-grade students in several Madrasah Ibtidaiyah (MI) located in Bandung Regency. To ensure the validity of the findings, data were collected using a structured questionnaire encompassing four core dimensions of Self-Regulated Learning (SRL): (1) initiative, (2) learning planning, (3) independent task execution, and (4) responsibility for the learning process and outcomes. The questionnaire, constructed using a 4-point Likert scale (1 = Strongly Disagree to 4 = Strongly Agree), was administered to 30 students as an initial diagnostic tool.

The results revealed that students' self-reported competencies generally ranged from moderate to low. The initiative dimension recorded the lowest average score (2.6), indicating a prevalent passivity in student behavior. Most students refrained from initiating learning activities independently—such as reading or note-taking—unless explicitly instructed by the teacher. This reflects a reactive rather than proactive learning attitude, which limits students' engagement and autonomy.

In the learning planning domain, scores also remained below optimal levels. A significant portion of students reported difficulty in setting personal learning goals or organizing study schedules. These findings suggest that students lack metacognitive awareness and strategic planning abilities, which are essential components of self-directed learning.

While the dimensions of task execution and learning responsibility showed relatively moderate average scores, the responses still reflected a heavy reliance on teacher guidance. Students were more likely to complete assignments when given structured instructions but showed limited initiative in taking responsibility for outcomes or evaluating their own progress.

These patterns affirm previous findings by Emiliya & Aziz (2024), who noted that MI students exhibit low levels of self-regulation and require considerable scaffolding to engage meaningfully with academic tasks. The results are also consistent with Zimmerman (2002) assertion that self-regulated learning does not emerge spontaneously but must be deliberately nurtured through pedagogical intervention.

Taken together, the findings illustrate a clear need for instructional models that can foster initiative, strategic planning, and learner accountability. Without such interventions, students are unlikely to internalize the dispositions necessary for lifelong learning. Therefore, enhancing student independence through well-structured and reflective learning designs becomes an urgent imperative for educational practice in Madrasah Ibtidaiyah.

Learning Design Using the UbD Model

In response to the diagnostic findings indicating low to moderate levels of independent learning competencies among students, the researchers designed a structured learning intervention grounded in the Understanding by Design (UbD) framework (Wiggins & McTighe, 2005, 2018). The UbD model employs a backward design approach, which begins with the formulation of long-term learning goals, proceeds to the development of authentic assessments, and concludes with the construction of engaging and purposeful learning experiences. This systematic approach ensures alignment between learning objectives, assessment strategies, and classroom activities.

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The learning design comprised four instructional sessions built around the integrated theme "Build Your Body and Soul", which combines character education with the cultivation of self-regulated learning (SRL) skills. Each session was intentionally mapped to address one core dimension of student independence:

1. Session 1: Initiative
2. Session 2: Learning Planning
3. Session 3: Task Execution
4. Session 4: Responsibility

Learning activities were designed to promote active participation, reflection, and autonomy. These included listening to motivational narratives, engaging in peer and group discussions, drafting individual learning plans, developing a personal mini-booklet project in stages, and presenting final products. Reflective practices were embedded through structured journal writing and end-of-session reflections to foster metacognitive awareness.

To ensure pedagogical coherence, the design was supplemented with supporting instruments such as worksheets, daily reflection logs, goal-setting templates, and assessment rubrics. These tools functioned as scaffolding mechanisms to help students internalize learning objectives, monitor progress, and evaluate outcomes.

The instructional design was conceptually anchored in both UbD principles and Zimmerman (2002) Self-Regulated Learning (SRL) theory, which emphasizes the cyclical processes of planning, monitoring, and reflection. By integrating these two frameworks, the learning model aimed to cultivate not only cognitive and behavioral autonomy but also affective engagement and personal responsibility.

Ultimately, this design reflects a contextual and reflective learning model tailored to the characteristics and needs of Madrasah Ibtidaiyah students. It aligns with the goals of the Kurikulum Merdeka and the Pancasila Student Profile, particularly in fostering the "Mandiri" (independent) dimension as part of holistic student development.

Table 1 Structure of the Four Learning Sessions

Session	Focus Area	Learning Objectives	Core Activities	Assessment Method
1	Initiative	Students demonstrate initiative in starting learning activities without prompts.	- Listen to a motivational story- Identify personal learning habits- Group discussion: what makes a learner independent	Reflection journalTeacher observation checklist
2	Learning Planning	Students can set personal learning goals and plan study strategies.	- Analyze learning goals- Fill out learning plan template- Peer review of learning plans	Completed learning plan templatePeer feedback sheet
3	Task Execution	Students complete tasks independently and on time.	- Create a personal mini-booklet project (draft phase)- Work independently in structured steps-	Draft mini-booklet productSelf-monitoring checklist

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			Self-monitor using checklist	
4	Learning Responsibility	Students take ownership of their learning process and reflect on their progress.	- Finalize and present mini-booklet project- Participate in group reflection- Write final reflection in learning journal	Final product rubricFinal reflection entryTeacher's holistic observation note

As shown in Table 1, the four learning sessions were systematically structured to target each core dimension of independent learning: initiative, learning planning, task execution, and learning responsibility. Each session's focus area, objectives, core activities, and assessment methods were clearly aligned to support students' self-regulated learning development.

Design Validation by Experts

Prior to classroom implementation, the UbD-based learning design underwent a structured validation process conducted by three education experts with diverse yet complementary expertise: (1) an instructional design specialist, (2) an expert in elementary educational psychology, and (3) a senior practitioner from an Islamic elementary school (Madrasah Ibtidaiyah). The validation aimed to evaluate several critical aspects of the learning design, including: content relevance, coherence among learning components, alignment with the developmental characteristics of MI students, and the appropriateness of assessment instruments in supporting the development of independent learning competencies.

The validation employed a standardized evaluation rubric using a 4-point Likert scale (1 = not appropriate, 4 = very appropriate). The overall average score from the three validators reached 3.7 out of 4.0, which falls into the "very appropriate" category, indicating a strong alignment between the designed instructional model and pedagogical expectations for the MI level.

Despite this high rating, the validators provided constructive feedback to enhance the clarity and usability of the design materials. Key recommendations included:

1. Simplifying the language used in reflection indicators to ensure comprehensibility for fifth-grade students;

2. Adding descriptive guidelines to the performance rubric to assist teachers in more accurately assessing student competencies;

3. Rearranging the sequence of learning activities to better align with the logical and cognitive progression typical of MI students.

All recommendations were incorporated into a revised version of the learning design. The adjustments involved refining the layout and content of the daily reflection journal, enriching the student worksheets with scaffolding prompts, and providing detailed descriptors in the mini-booklet project assessment rubric to improve evaluation transparency and reliability.

These revisions enhanced the design's adherence to key validation criteria: content validity, contextual appropriateness, and practical feasibility. Consequently, the finalized learning design was deemed suitable for implementation in the MI context and ready to support the targeted development of students' independent learning skills.

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Table 2 Summary of Validation Results and Design Revisions of the UbD Learning Model

Validated Aspect	Average Validation Score (1–4)	Category	Suggestions from Validators	Follow-Up Revisions Implemented
Content alignment with learning objectives	3.8	Very Appropriate	- No specific notes	- Retained as originally designed
Coherence among learning components	3.6	Very Appropriate	- Sequence of activities should follow the logical flow of MI students' cognitive development	- Reordered activities to align with concrete thinking patterns of elementary students
Suitability to MI students' characteristics	3.7	Very Appropriate	- Reflective prompts use abstract language that may be difficult for fifth-grade students	- Simplified language in the reflection journal to enhance comprehension
Appropriateness of assessment instruments	3.6	Very Appropriate	- Rubrics require clearer success indicators to guide teachers	- Enriched the booklet assessment rubric with descriptive indicators and concrete examples
Practical applicability in the MI context	3.8	Very Appropriate	- No specific notes	- Design deemed ready for limited classroom trial

The summary of expert validation results is presented in Table 2. The table indicates that all validated aspects scored in the "very appropriate" category, with detailed suggestions implemented to improve language clarity, rubric descriptors, and activity sequencing.

UbD Learning Design Trial Results

Following expert validation, the Understanding by Design (UbD)-based learning design was implemented in a limited classroom trial at MI Darul Kirom, involving 30 fifth-grade students over the course of four sessions. The primary objective of this trial was to evaluate the effectiveness of the design in fostering students' independent learning competencies, assessed across three domains: affective, cognitive, and psychomotor.

1. Affective Domain

The affective aspect was evaluated through systematic classroom observations, focusing on indicators such as student engagement, initiative, responsibility, and confidence during the learning process. Observational data showed a consistent positive trend over the four sessions:

Session 1: 76.2% of students exhibited positive learning attitudes
Session 4: Increased to 88.3%
Overall average: 82.3%

These results suggest that the participatory and reflective nature of the UbD approach encouraged students to take emotional ownership of their learning. By positioning students as

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active agents, the design stimulated a stronger sense of responsibility and motivation—critical components of the Self-Regulated Learning (SRL) framework (Zimmerman, 2002).
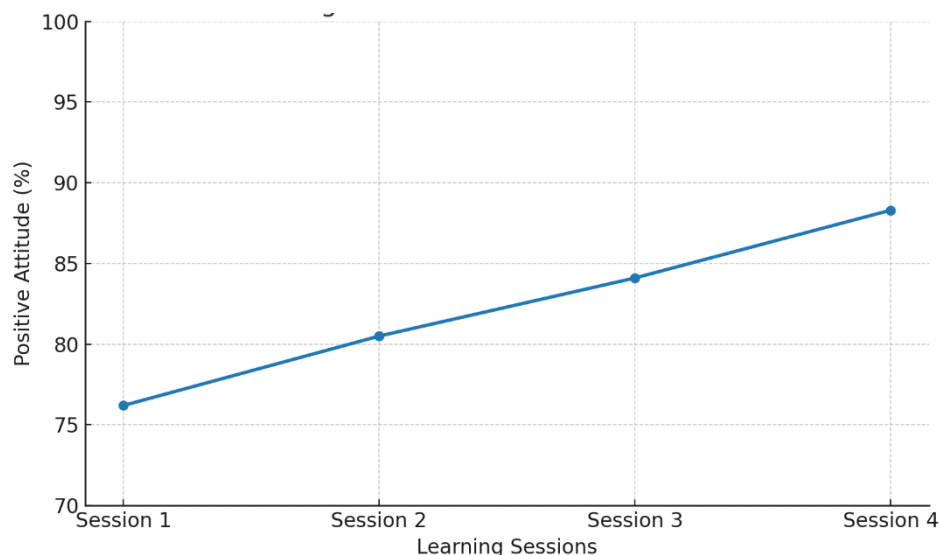

Figure 1 Increase in the Percentage of Positive Student Attitudes Across Sessions

Figure 1 illustrates the increase in the percentage of students exhibiting positive learning attitudes from Session 1 to Session 4, showing a rise from 76.2% to 88.3%, which reflects the positive impact of the UbD-based learning model on affective engagement.

2. Cognitive Domain

The cognitive dimension was assessed through student presentations of personal mini-booklets, which served as performance-based evidence of learning. Each presentation was evaluated not only on communication skills, but more importantly on content mastery, conceptual coherence, and reflection on the learning process. The rubric focused on four core indicators of independent learning: initiative, planning, task execution, and responsibility.

Total cognitive score (30 students): 2502

Average score: 83.4

Highest: 98; Lowest: 75

These results demonstrate that students were able to internalize and articulate the concepts of independent learning, transforming classroom experiences into structured personal insights.

3. Psychomotor Domain

The psychomotor domain was evaluated through the quality of the final product—a mini-booklet developed independently by each student. The project required students to demonstrate their ability to plan, organize, and complete tasks systematically. Each mini-booklet included:

Daily reflections

Personal study plans

Inspirational narratives

Self-evaluation sheets

The products were assessed using a rubric that emphasized neatness, completeness, creativity, and consistency.

Total psychomotor score: 2599

Average: 86.6

Highest: 98; Lowest: 73

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The consistently high scores indicate that students not only engaged actively with the project but also displayed discipline, organization, and perseverance—hallmarks of independent learners.

Table 3 Recapitulation of Affective, Cognitive, and Psychomotor Scores

Learning Domain	Total Score	Average Score	Highest Score	Lowest Score	Interpretation
Affective	–	**82.3**%	–	–	Students showed increasing engagement and learning responsibility across sessions.
Cognitive	2502	83.4	98	75	Students demonstrated strong understanding and reflection through presentations.
Psychomotor	2599	86.6	98	73	Students completed well-organized, creative mini-booklets independently.

As presented in Table 3, students demonstrated strong performance across the affective, cognitive, and psychomotor domains, with average scores of 82.3%, 83.4, and 86.6 respectively, indicating balanced growth in engagement, conceptual understanding, and skill execution.

CONCLUSION

This research resulted in the development of a learning design grounded in the Understanding by Design (UbD) model, which proved effective in fostering the independent learning competencies of fifth-grade students in Madrasah Ibtidaiyah (MI). Constructed using a Design-Based Research (DBR) approach, the design emerged in response to empirical findings indicating that most MI students exhibited a high dependency on teacher guidance, especially in initiating learning activities, planning their studies, completing tasks independently, and assuming responsibility for their learning outcomes.

By applying the backward design framework, each instructional session was purposefully directed to strengthen one key aspect of independence: initiative, planning, task execution, and learning responsibility. The integration of reflective and contextual learning strategies—such as personal mini-booklet projects and daily learning journals—enabled students to become more autonomous, self-directed, and engaged in their learning journeys.

Expert validation and classroom trials confirmed both the theoretical soundness and practical feasibility of the learning design. The learning intervention demonstrated a measurable positive impact on students' development across affective, cognitive, and psychomotor domains.

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Students showed increased engagement, deeper conceptual understanding, and improved ability to manage and present their learning independently.

These findings reinforce the potential of the UbD model as a strategic pedagogical framework to address the ongoing challenge of low learning autonomy in Islamic elementary schools. By nurturing reflective thinking, active participation, and goal-oriented learning behavior, this design contributes meaningfully to the realization of the "Independent" dimension within the Pancasila Student Profile.

Therefore, the UbD-based learning model developed through this study can serve as a practical reference for educators and curriculum developers seeking to design contextual, character-based, and meaningful instructional models tailored to the needs of Madrasah Ibtidaiyah students. Further research is recommended to explore its scalability across diverse subjects and educational levels, as well as its potential integration with digital learning platforms to support 21st-century learning environments.

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