

Implementation of Active Deep Learner Experience (Adlx) IntrofleX to Improve Independent Learning in Elementary School Students

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ABSTRACT. Strengthening independent learning at the elementary school level has become a strategic priority in 21st-century learning, amid increasing demands for critical, collaborative, and reflective thinking skills. However, independent learning among elementary school students is often considered underdeveloped due to their age and dependence on teacher guidance. This study aims to analyze in depth how the application of the ADLX-Introflex approach facilitates the growth of student learning independence at the Integrated Islamic Elementary School (SDIT). The study uses a phenomenological qualitative approach, with data collected through participatory observation, in-depth interviews, and learning documentation. Thematic and cross-case analyses were conducted to trace the gradual shift in learning regulation patterns throughout the learning cycle. This analysis was conducted to reveal the structure of students' learning experiences during the implementation of ADLX-Introflex. The results showed that the Active Deep Learner eXperience (ADLX)-based learning design, reinforced through the Introflex cycle, which includes individualization, interaction, observation, and reflection, shaped reflective, internalized learning independence. Students showed initiative in completing tasks, the ability to manage learning strategies contextually, and awareness of their learning processes and responsibilities. These findings challenge the assumption that independence in learning develops only at higher levels of education. Implicitly, the ADLX-Introflex approach can serve as a strategic pedagogical framework for building a foundation for long-term learning autonomy from elementary education onward.

Keywords: ADLX-Introflex, independent learning, elementary school, reflective learning.

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INTRODUCTION

The transformation of education in the 21st century places self-regulation and independent learning as fundamental competencies in shaping lifelong learners (Adela and Ritonga 2023; Ahyani, Siswanto, and Romadhan 2024; A'lawi and Budianto 2025). The 2022 Programme for International Student Assessment (PISA) report conducted by the OECD shows that Indonesia's reading literacy score is 359, mathematics 366, and science 383, which is still below the average of OECD member countries. These results not only reflect academic content mastery but also indicate challenges in problem-solving, critical thinking, and students' independent learning capacity. Recent studies confirm that low academic performance in primary education correlates with weak self-regulated learning (SRL) skills and a lack of structured reflective learning experiences (Olid Luque et al. 2024; Panadero 2017). After the Covid-19 pandemic, various studies have shown

learning loss, which has led to a decline in intrinsic motivation, increased student dependence on teacher guidance, and weakened independent learning habits (Devi and Neviyarni 2025; Pratiwi and Warlizasusi 2023). This condition shows that learning in elementary schools still tends to be oriented towards completing tasks and achieving academic results, without systematically building self-regulation and learning reflection mechanisms. However, recent literature emphasizes that strengthening SRL at the elementary school age is an important foundation for long-term academic development.

A number of studies in the last five years have explored active learning and deep learning as approaches to improve student engagement and conceptual understanding (Sins et al. 2024). The Active Deep Learner Experience (ADLX) approach emphasizes the integration of active learning activities with deep cognitive processing to create meaningful learning experiences. On the other hand, the practice of reflection and metacognition has been shown to contribute significantly to increasing students' learning awareness and academic responsibility (Zohar and Dori 2021). However, empirical studies that explicitly integrate deep experience-based active learning with internal reflection mechanisms as a pedagogical structure for shaping learning independence at the elementary school level are still limited. Previous studies tend to position active learning and reflection as two separate interventions, without explaining the integrative mechanisms that enable these learning experiences to be internalized into sustainable self-regulation. In addition, value-based school contexts such as Integrated Islamic Elementary Schools (SDIT) have been relatively unexplored in the international literature on SRL development through structured learning experience design.

Based on these conceptual and empirical gaps, this study aims to analyze in depth the implementation of the ADLX-Introflex approach in elementary school learning and examine its contribution to the formation of student learning independence. The focus of this study lies in how the integration of active learning activities and structured reflection (Individualization, Interaction, Observation, and Reflection) facilitates the process of internalizing learning experiences so that they develop into self-regulated learning. The main argument put forward in this study is that the learning independence of elementary school students does not develop automatically through the intensity of learning activities, but rather through the design of active learning experiences that are systematically internalized through guided reflection. Thus, the integration of ADLX and Introflex is positioned as a pedagogical mechanism that has the potential to bridge the gap between learning engagement and the formation of self-regulation in primary education. The scientific contribution of this study lies in strengthening the conceptual framework of the relationship between active learning experiences, internal reflection, and the formation of self-regulated learning in the context of primary education, as well as in providing empirical evidence regarding the implementation of this model in a value-based school environment.

METHOD

This study uses a qualitative approach with a descriptive research type, which aims to describe in depth the process of implementing the ADLX-Introflex learning approach and its implications for the learning independence of elementary school students. The focus of the study is directed at two main aspects, namely the implementation of the ADLX-Introflex approach in learning activities and student learning independence as a phenomenon that arises during the learning process. The research was conducted at SDIT Pluit Raya Jakarta in 2025, in a learning context that had been continuously implementing the ADLX-Introflex approach. The research subjects included elementary school students who were directly involved in ADLX-Introflex-based learning and classroom teachers who acted as learning facilitators. The subjects were selected purposively, taking into account their active involvement in the implementation of ADLX-Introflex and the relevance of the subjects to the research objectives. Supporting informants consisted of teachers and school officials who understood the policies and implementation of ADLX-Introflex learning at the school. The determination of subjects and informants was based

on the data requirements to obtain a complete picture of the learning process and student learning independence.

The research instruments in this study are qualitative and were developed by the researchers in accordance with the focus of the study. The main instruments include observation guidelines, interview guidelines, and documentation studies. The observation guide was used to directly observe the implementation of ADLX-Introflex learning in the classroom, focusing on student activities that reflect independent learning, such as initiative in following lessons, active involvement in discussions, time management, and the ability of students to complete tasks independently. Interview guides were used to explore the views and experiences of teachers and students regarding the implementation of ADLX-Introflex and changes in student learning behavior. Documentation studies were conducted by examining learning documents, such as teaching tools, learning reflection notes, student assignment results, and other supporting documents relevant to the implementation of ADLX-Introflex.

Data collection was conducted through direct observation in the classroom, in-depth interviews with informants, and analysis of learning documents. Observations were made during the learning process to obtain factual data on the application of ADLX-Introflex and the dynamics of student learning independence. Interviews were conducted in a semi-structured manner so that researchers could obtain in-depth and flexible data in accordance with the context of the findings in the field. Documentation was used as supporting data to reinforce the results of observations and interviews, as well as a means of data triangulation.

Data analysis was conducted continuously from the data collection process until the research was completed. The stages of analysis include data reduction, data presentation, and conclusion drawing and verification. Data reduction is carried out by sorting and focusing on data relevant to the implementation of ADLX-Introflex and indicators of student learning independence. Data presentation is carried out in the form of a narrative description that describes the learning process, student learning experiences, and informants' views. Conclusions are drawn by systematically interpreting the main findings, accompanied by verification through triangulation of sources and techniques to ensure data validity. Through this procedure, this study produces a comprehensive and contextual picture of how the ADLX-Introflex approach is implemented in

learning and how it contributes to the growth of learning independence in elementary school students.

RESULT AND DISCUSSION

Result

The analysis was conducted on 18 hours of classroom observation, 8 in-depth student interviews, 1 teacher interview, 24 written assignments, and 48 individual reflections. The coding process produced 37 initial codes, which were then reduced to 11 categories and finally integrated into three major themes. Data saturation was achieved in the fifth meeting when no new substantive codes emerged, but rather reinforcement of the patterns that had already been formed. Of the eight students who were the subjects, six showed consistent patterns of development across all key indicators, one showed partial development, and one showed gradual development at a slower pace. This variation was analyzed across cases to ensure that the findings were not merely a representation of individual experiences, but rather a recurring collective pattern.

Transformation of Academic Readiness and Responsibility

In the first two meetings, almost all students showed an instructional orientation of waiting for the teacher's instructions before starting activities. The code "waiting for instructions" appeared 14 times in the initial observation notes. However, starting from the third meeting, there was a significant decrease in this pattern and an increase in the code "initial initiative," which appeared 19 times until the end of the cycle. In one classroom situation, before the teacher conveyed the learning objectives, two students had already opened their books, written down the date, and read the subheadings of the material.



Figure 1
Students Take Initiative in Following Lessons

When asked in an interview why they did this, one student explained at length:

"If I keep waiting, sometimes I'm not ready when the teacher explains. Once, I hadn't opened my book yet and fell behind. Now I open it first, read a little, so when it's explained, I already know where we're going. It feels easier to follow."

Another student said:

"Before, I thought assignments were just something to be done. Now I think about it again, whether the answer is clear or not. Sometimes I add explanations to make it more complete."

Document analysis shows a change in the quality of responses. In the first and second meetings, 75% of responses consisted of a single sentence without elaboration. In the fifth and sixth meetings, 68% of responses showed elaboration in the form of additional reasons or concrete examples. Task revisions increased from 8% at the beginning of the cycle to 70% at the end of the cycle.

Teachers confirmed these changes: *"Now I rarely see assignments that are submitted without being reread. They seem to care more about quality."*

Cross-case analysis shows that six students exhibited strong transformation, one student showed improvement but was still sporadic, and one student tended to follow their friends' initiatives before finally beginning to show independence in the last two meetings. This pattern shows that transformation is not uniform, but has a clear collective direction of development.

Self-Regulation in Social Interaction and Class Participation

The second theme emerged from the consistency of the codes "group settings," "time reminders," "spontaneous role distribution," and "questioning initiative." The total number of appearances of codes related to social regulation increased almost twofold between the first and second half of the observation. At the beginning of implementation, group discussions tended to be dominated by one student with other members being passive. In the observation notes of the second meeting, the researcher wrote that two groups completed the task without explicit role division. However, in the fifth meeting, five of the six groups spontaneously divided roles without instruction from the teacher.



Figure 2
Active Student Interaction

In one discussion, a student said:

"I'll write it down, and you read it slowly. If anything is missing, we'll add it later."

Another student added:

"The time is almost up, let's conclude now so we don't run out of time."

When interviewed, the student explained:

"If we don't divide the tasks, only one person will do the work. So now we'll organize it first to make it fair."

The courage to express opinions also showed a longitudinal increase. The number of students who actively asked questions or responded to presentations increased from three students at the initial meeting to six students at the final meeting.

One student who was initially passive stated:

"I used to be afraid of being wrong. Afraid my friends would laugh at me. But during the discussion, it turned out that my answer was almost the same as theirs. So I thought it was okay to be wrong, as long as I tried."

Observation notes show a change in the student's body language: from sitting with their head down and speaking softly to sitting upright and speaking steadily in the last two meetings.

However, one student still tended to speak only when called upon. In an interview, he revealed:

"I am still shy about speaking first. But now, when asked, I am not too afraid."

This negative case shows that social regulation develops gradually and may be influenced by individual confidence factors.

Deepening Reflection and Expanding Learning Initiatives

The third theme shows the most conceptual change. Analysis of 48 written reflections shows a shift from descriptive reflections to strategic reflections. Initially, 80% of reflections contained only general statements such as "Today's learning was fun." At the end of the cycle, 75% of reflections included identification of specific difficulties and improvement plans.



Figure 3
Writing Reflections

One student wrote in their reflection:

"I was wrong earlier because I didn't read the question carefully. Tomorrow I have to be more patient and not answer immediately."

In an interview, he explained in more detail:

"When I wrote my reflection, I remembered the part that was wrong. So I knew where I went wrong. If I hadn't written it down, I might have forgotten."

Another student said:

"Now, if I don't understand something, I write down the part that confuses me first. Later, I ask about it or look it up in another book."

In the last two meetings, three students took additional reference books without the teacher's instructions. The teacher stated:

"That has never happened before. Usually, they only rely on one book."

Cross-case analysis shows that deep reflection appeared consistently in six students, while two students still wrote simpler reflections but began to show elements of error identification. When synthesized longitudinally, student development progressed gradually from reactive readiness to academic responsibility, developing into social regulation, and finally leading to strategic reflection and independent learning initiatives. No significant regression patterns were found after the third meeting, indicating stability in development. Individual variations remained, but the collective direction showed consistency. Data saturation was achieved when the same patterns were repeated in the fifth and sixth meetings without the emergence of new categories.

These findings indicate that the implementation of the ADLX-Introflex model not only influences behavior (such as participation), but also triggers changes at the level of internal regulation and learning awareness. These changes were confirmed through triangulation of interviews, observations, and documentation, as well as cross-case analysis showing consistency among the majority of subjects with individually contextual variations. These results provide a strong empirical foundation for conceptual analysis in the discussion section, particularly regarding the dynamics of self-regulation and the transformation of learning behavior in the context of basic learning.

Discussion

Dynamics of Learning Independence Development: From Social Regulation to Intrapersonal Regulation

The findings of this study indicate that the development of learning independence in elementary school students does not occur as a sudden surge in autonomy, but rather as a gradual process that begins with social regulation. Observational data show that in the early stages of ADLX-Introflex implementation, students still exhibited strong patterns of dependence on teacher guidance and group dynamics. They tended to wait for instructions before starting activities, followed the answers of peers who were considered more capable, and did not yet show explicit learning planning. Interviews also confirmed that learning motivation in the early stages was more responsive than strategic. However, in the next learning cycle, a significant shift occurred. Students began to read the material before instructions were given, asked for clarification on questions, and showed efforts to correct mistakes based on previous reflections. The quality of their written reflections also improved, from simple descriptive statements to more analytical explanations of learning strategies. This transformation marked the process of internalizing regulation.

In Lev Vygotsky's sociocultural perspective, higher mental functions develop through a process of internalization from social interaction to individual control. The findings of this study empirically demonstrate this mechanism in the context of learning regulation. Social regulation that occurs through group discussions, teacher scaffolding, and peer reinforcement becomes the initial foundation before intrapersonal regulation strengthens. When compared to the Self-Regulated Learning model proposed by Barry J. Zimmerman, there is a difference in emphasis. Zimmerman's model places regulation as an intrapersonal cycle consisting of forethought, performance, and self-reflection. Recent literature from the past five years in this tradition has extensively researched how metacognitive strategy interventions can improve self-regulation in adolescents and college students. However, these studies generally assume that students already possess a sufficiently stable basic reflective capacity.

This study shows that at the elementary school level, this assumption does not fully apply. Intrapersonal regulation has not yet been formed autonomously at an early stage. Instead, social regulation dominates as the initial mechanism of learning regulation. In other words, the intrapersonal cycle described in the classical model is not immediately active, but is preceded by a significant phase of social regulation (.). The literature on socially shared regulation of learning in the last five years has indeed emphasized the importance of collective regulation in collaborative learning. These studies show that groups can jointly plan, monitor, and evaluate tasks. However, most of these studies focus on the effectiveness of task completion or academic performance, rather than on long-term transformation towards individual independence. This is where this study differs. The findings do not stop at describing collective regulation, but show how social regulation is internalized into more stable self-control through structured reflection. These findings also provide a correction to the tendency in educational reform that demands independence from the very beginning of active learning implementation. Many educational policies encourage students to be "independent" without considering their cognitive and social development stages. The research data shows that independence is not a starting point, but rather the result of a consistent process of social scaffolding. Social regulation in this context is not a sign of dependence, but rather a prerequisite for development. The literature on metacognitive development states that the ability to monitor and evaluate oneself in elementary school children develops gradually. This study reinforces this argument by showing that the quality of student reflection improves gradually after experiencing structured and repeated learning experiences. This means that intrapersonal regulation does not arise because of normative demands, but because of a process of internalization that is facilitated systematically.

When positioned against the current literature, the novelty of this research can be confirmed in three ways. First, this research empirically integrates the theory of sociocultural

internalization with the Self-Regulated Learning model in the context of basic education, rather than merely conceptually. Second, this research shows that social regulation is not only a group work phenomenon, but an essential stage of development towards self-regulation. Third, this study formulates a more contextual developmental trajectory, namely social regulation – structured reflection of intrapersonal regulation. Thus, the contribution of this study is not merely to support existing theory, but to expand it with a developmental dimension that is sensitive to age context and pedagogical design. Learning independence in elementary school students cannot be understood as a stand-alone individual ability, but rather as the result of social interactions that are internalized through systematic reflection. This model emphasizes that self-regulation is a social-reflective process before it becomes a stable intrapersonal capacity.

Structured Reflection as a Mechanism for Internalization and the Formation of Learning Agency

Empirical data shows that the most significant changes in the development of learning independence do not occur solely because of collaborative activities, but because of the existence of consistent structured reflection in each learning cycle. In the early stages of implementation, students' reflective responses were brief, descriptive, and did not yet show awareness of strategy. Students tended to write general statements such as "I don't understand yet" or "I need to study more." These statements did not indicate specific self-monitoring. However, in the next cycle, the quality of reflection improved substantially. Students began to explain their mistakes in more detail, identify the causes, and formulate concrete improvement steps such as reading questions more carefully or discussing before answering. This change marked the occurrence of a shift from mere outcome awareness to process awareness (). In other words, reflection served as a bridge between learning experiences and the formation of regulatory strategies.

In the literature on Self-Regulated Learning, the reflection phase is indeed seen as an important part of the regulation cycle. In Barry J. Zimmerman's model, reflection serves to evaluate performance and determine strategy adjustments for the next cycle. However, most research in this tradition views reflection as a process that occurs after students have relatively mature planning and monitoring capacities. This study shows that in the context of basic education, reflection is not only the final phase of regulation, but also the mechanism that shapes regulation itself. When compared to trends in active learning research over the past five years, any studies show that increased participation is not always accompanied by increased metacognition. Discussion activities, problem-based learning, or collaborative tasks often result in high engagement, but without a clear reflective structure, students are not always able to internalize these experiences into long-term learning strategies. The findings of this study reinforce this criticism by showing that collaborative activities in ADLX have not resulted in regulatory transformation until structured reflection is systematically integrated.

From Carl Rogers' humanistic perspective, meaningful learning occurs when individuals are able to relate external experiences to self-understanding. This study provides empirical elaboration on this idea. Structured reflection provides space for students to connect learning actions with personal awareness, so that social experiences do not stop at the level of participation, but develop into self-understanding as learners. Furthermore, recent literature on student agency emphasizes that agency is not merely freedom of choice, but the capacity for conscious self-direction. Agency develops when students are able to understand the consequences of their actions and independently devise corrective measures. The data from this study show that structured reflection acts as a catalyst for the formation of such agency. When students begin to explicitly write down improvement strategies, they are taking control of their learning process. These findings also challenge active learning approaches that only emphasize method variation without designing internalization mechanisms. Many educational practices focus on activity innovation but pay less attention to the systematic reflection process. As a result, active learning risks producing episodic

and superficial participation. This study shows that learning depth is not only determined by task complexity but also by the quality of accompanying reflection.

The novelty of this research lies in the assertion that structured reflection functions as the main mediator between social regulation and intrapersonal regulation. Unlike studies that position reflection as the final stage of evaluation, this study shows that reflection is a developmental mechanism. Without reflection, social regulation remains at the level of group coordination. With reflection, social regulation is internalized into a sustainable personal strategy. Thus, the conceptual contribution of this study is the formulation of structured reflection as the architecture of internalization in the formation of learning independence in elementary school. Reflection is not a complement to active learning, but rather the core of regulatory transformation. These findings enrich the international literature by providing empirical evidence that in the early stages of development, self-regulation is built through social experiences that are processed reflectively and systematically.

The Social-Reflective Regulation-Based Model of Learning Independence Development and Its Implications for Primary Education Theory and Policy

The integration of empirical findings and theoretical dialogue in this study resulted in the formulation of a progressive and contextual model of learning independence development. Based on field data, this development can be understood as a gradual process that begins with social regulation, is mediated by structured reflection, and culminates in relatively stable intrapersonal regulation. At the social regulation stage, students regulate their learning behavior through external interactions. Group discussions, teacher guidance, and peer reinforcement are the main sources of learning control. Observation data show that at this stage, students do not yet have explicit learning strategies but rather follow the available social dynamics. In Lev Vygotsky's sociocultural perspective, this stage represents the interpsychological level, where regulatory functions are still in the social realm. The second stage is marked by an increase in the quality of structured reflection. Reflection is no longer descriptive but analytical and strategic. Students begin to identify mistakes, formulate improvements, and show awareness of their thought processes. At this phase, gradual internalization occurs. Social regulation, which was previously external, begins to be processed into personal awareness. Reflection functions as a transitional mechanism that transforms collective experiences into individual strategies. The third stage is marked by the emergence of intrapersonal regulation. Students show initiative without waiting for direction, prepare materials before learning begins, and monitor themselves more consistently. At this point, the regulation cycle as formulated in Barry J. Zimmerman's model begins to operate more autonomously. However, unlike the classical model's assumption that it starts with the individual, this study shows that the cycle is preceded by a significant social and reflective phase (Aslihah and Washudin 2023; Fajri, Ardianto, and Sholihah 2025).

The theoretical contribution of this study lies in the elaboration of the development of Self-Regulated Learning in the context of elementary education. While mainstream literature emphasizes regulation as an individual capacity, this study shows that in the early stages of development, regulation is the result of social interaction that is internalized through systematic reflection. Thus, the resulting model does not replace existing theories, but expands them with dimensions of development that are more sensitive to age and pedagogical context. In addition, this model also enriches the discourse on student agency. Agency in much of the literature is understood as an individual's capacity to make decisions and direct learning. However, this study shows that agency does not arise spontaneously from freedom, but is constructed through pedagogical structures that enable social experiences to be processed reflectively. In other words, structure and autonomy are not mutually exclusive dichotomies. Rather, consistent reflective structures are a prerequisite for the emergence of authentic autonomy. Critically, this model also provides a correction to active learning approaches that only emphasize activity variation without internalization architecture. Many educational reforms adopt active learning with the assumption

that participation will automatically result in independence. The research data shows that participation without reflection only results in temporary engagement. Long-term regulatory transformation only occurs when these activities are integrated with systematic and repeated reflection. The policy implications of these findings are significant for basic education. First, curriculum development is not sufficient to simply incorporate active learning methods, but needs to integrate structured reflection mechanisms as a core component. Second, teacher training needs to focus on effective reflection design, not just discussion facilitation techniques. Teachers in this context act as architects of regulation, not just conveyors of material or drivers of activity.

This study also confirms that the formation of learning independence is a medium to long-term process that requires consistency in the cycle of experience. Therefore, the evaluation of the success of pedagogical innovation cannot be measured in a short period of time. Regulatory changes require repetition, deepening, and continuous reflective reinforcement. The main novelty of this research can be clearly formulated as follows: this research produces a model of learning independence development based on social-reflective regulation, which empirically shows that intrapersonal regulation in elementary school students is the result of the gradual internalization of social interactions mediated by structured reflection. This model integrates sociocultural and Self-Regulated Learning perspectives into one applicable developmental framework. Thus, the contribution of this research is integrative and contextual. It not only enriches self-regulation theory but also provides a more realistic conceptual basis for primary education practice. Learning independence is not understood as a normative requirement that must exist from the outset but as the result of a pedagogically designed social-reflective construction.

CONCLUSION

This study found that the application of the ADLX-Introflex approach not only increased learning activity but also significantly facilitated the growth of reflective learning independence in elementary school students. The main findings show that students are able to develop learning initiatives, set simple strategies, and consciously reflect on their learning experiences. These results challenge the assumption that learning independence only develops optimally at higher levels of education, and confirm that independence can also be formed at the elementary school level if learning experiences are designed to be active, in-depth, and reflective. Scientifically, this study reinforces the theory of Self-Regulated Learning while expanding it through a phenomenological perspective that positions independence as the result of internalizing learning experiences, not merely as measurable behavioral achievements. The conceptual contribution of this research lies in affirming the relationship between ADLX learning design, Introflex reflective reinforcement, and the formation of learning independence as a pedagogical experience construct. Thus, this study enriches the discourse on basic pedagogy by showing that active-in-depth learning has structural implications for the formation of student learning awareness.

However, this study is limited to a relatively small context and number of participants, so the generalizability of the findings is still limited. Variations in student characteristics and the broader educational context have not been fully accommodated. Further research with a more diverse range of participants and a more comprehensive methodological approach is needed to test the consistency and strengthen the external validity of the resulting model.

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