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PEDAGOGICAL MECHANISMS FOR DEVELOPING SELF-AWARENESS AND SELF-DIRECTED LEARNING AMONG GRADE 5–8 STUDENTS: A MULTI-REGIONAL QUASI-EXPERIMENTAL STUDY IN UZBEKISTAN

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ABSTRACT
Self-awareness and self-directed learning enable adolescents to evaluate their learning, regulate effort, and assume increasing responsibility for academic decisions. This study examined an integrated pedagogical model combining reflective learning, self-assessment, teacher mentoring, collaborative learning, and independent educational activity among Grade 5–8 students in three regions of Uzbekistan. A nonrandomized pretest–posttest design was implemented over five months during 2023–2025 with 852 students (426 experimental; 426 comparison). Outcomes were summarized using a 12-indicator, three-point criterion-referenced framework informed by surveys, observations, reflective journals, and teacher records. Because only group-level aggregate scores were available, analyses were descriptive. The experimental group increased from 54.2% to 66.1%, whereas the comparison group increased from 53.8% to 54.4%. The resulting descriptive difference-in-differences was 11.3 percentage points. The pattern supports further investigation of the integrated model but does not establish causality or statistical significance. Stronger evaluation requires participant-level data, validated measures, documented implementation fidelity, cluster-aware analysis, and follow-up assessment.

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Keywords: *self-awareness, self-directed learning, self-regulated learning, reflective practice, learner agency, quasi-experimental study.*



Introduction

Contemporary education requires students not only to acquire curricular knowledge but also to judge what they understand, recognize ineffective strategies, seek appropriate support, and decide how to proceed. These capacities are particularly consequential in early adolescence, when habits of study and patterns of responsibility become more stable. Uzbekistan's Law on Education presents education as a continuous process directed toward intellectual, moral, and personal development (Republic of Uzbekistan, 2020). International frameworks likewise connect learner agency with anticipation, action, reflection, participation, and shared responsibility (OECD, 2019; UNESCO, 2021).

Several related constructs inform this study. Self-awareness concerns recognition of one's strengths, limitations, emotions, motives, values, and recurring responses. Metacognitive awareness is narrower, referring to knowledge and monitoring of cognition. Self-regulated learning concerns the cyclical management of goals, strategies, effort, and evaluation, whereas self-directed learning places

greater emphasis on learner initiative in identifying needs, locating resources, and judging outcomes. In Uzbek pedagogical usage, a term often translated as self-education can encompass both independent study and deliberate personal development. The present article uses self-directed learning as the operational English term while recognizing that the measured profile also contains relational and personal-development indicators.

The conceptual model draws on several traditions. Dewey (1933) treated reflection as disciplined reconsideration of experience. Bandura (1997) explained how perceived capability shapes persistence and choice. Vygotsky (1978) showed that autonomy can emerge through guided and collaborative activity rather than through isolation. Knowles (1975) emphasized learner initiative in identifying needs and evaluating progress, while Zimmerman (2002) described self-regulation as a cycle of forethought, performance, and self-reflection. Read together, these accounts indicate that learner autonomy depends on both internal processes—awareness, judgment, intention—and external supports such as feedback, modeling, dialogue, and progressively reduced scaffolding.

Research on self-regulation provides a basis for testing such an integrated approach. Meta-analytic evidence indicates that school-age learners benefit when cognitive and metacognitive strategies are taught explicitly, embedded in meaningful tasks, and paired with opportunities to monitor and evaluate performance (Dignath & Büttner, 2008; Dignath et al., 2008). Classroom observation studies distinguish direct strategy instruction from indirect activation through task design and teacher discourse (Dignath & Veenman, 2021). Across major models, planning, monitoring, control, and reflection recur, although the models differ in their treatment of motivation, emotion, and social regulation (Panadero, 2017).

Self-assessment and feedback are central to the proposed mechanism because they turn reflection into a comparison between current performance and explicit criteria. Student self-assessment has been associated with self-regulation and self-efficacy, but its usefulness depends on clear criteria, exemplars, practice, and feedback (Andrade, 2019; Panadero et al., 2017). Feedback is most productive when it clarifies the goal, the learner's present position, and an attainable next step (Hattie & Timperley, 2007). A journal or rubric, therefore, is not an instructional mechanism by itself; its educational value depends on the evidence, questions, dialogue, and subsequent action it prompts.

A recurring problem is fragmentation. Reflection journals may be assigned without feedback, independent tasks may precede instruction in planning, mentoring may remain teacher-controlled, and group work may divide labor without encouraging co-regulation. The source study addressed this problem by combining five mechanisms—reflective learning, self-assessment, teacher mentoring, collaborative learning, and independent educational activity—within a recurring instructional process in three regions of Uzbekistan. The aim was to examine descriptive change in a 12-indicator learning-development profile after a five-month intervention and to state clearly what can and cannot be inferred from the available evidence.

Method

Design and Participants

The study used a quasi-experimental, nonrandomized pretest–posttest design with an experimental group and a comparison group. Fieldwork was reported between 2023 and 2025 in general secondary schools in the Samarkand, Namangan, and Tashkent regions. The active intervention lasted five months and was incorporated into regular lessons and extracurricular activities. Purposive selection and matching, rather than random allocation, justify the quasi-experimental designation.

The reported analytic sample consisted of 852 students in Grades 5–8, with 426 students in each condition. Research documentation indicates that matching considered age, grade level, baseline academic records, gender composition, and socioeconomic background. The corresponding distributions and matching tolerances were not available, however. Baseline comparability can therefore be discussed only

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for the reported composite outcome, not for demographic or school-level characteristics. The number of schools, classes, and teachers was also unavailable, preventing reconstruction of clustering by site.

Table 1

Study Design and Evidence Available for Analysis

Element	Reported specification	Analytical boundary
Setting	Secondary schools in Samarkand, Namangan, and Tashkent regions	School and class counts not supplied
Period	Fieldwork during 2023–2025; five-month intervention	Exact dates and delayed follow-up not supplied
Participants	852 students in Grades 5–8	Age, gender, grade, and region distributions not supplied
Groups	Experimental n = 426; comparison n = 426	Nonrandom allocation; matching algorithm not documented
Outcome	12 indicators rated on a 1–3 scale; aggregate percentages reported	No item-level scores, variance estimates, or reliability coefficients
Evidence sources	Survey, observation, reflective journal, teacher rubric	Weighting and rater-assignment rules not documented

Intervention

The experimental condition combined five pedagogical mechanisms. Their integration was the defining feature: students were asked to notice a learning experience, judge it against criteria, discuss it or receive feedback, select a next step, act independently or with peers, and return to reflection. This sequence corresponds broadly to cyclical accounts of self-regulation while remaining adapted to ordinary middle-grade classroom practice.

Reflective learning used structured discussion and journal prompts to help students identify what occurred, why it occurred, and what should change. Self-assessment required learners to compare work or conduct with explicit criteria and justify a judgment rather than merely assign a mark. Teacher mentoring relied on questions, feedback, and graduated guidance intended to make planning and monitoring visible while retaining learner responsibility. Collaborative learning used peer dialogue and joint problem-solving to support explanation, strategy comparison, mutual feedback, and co-regulation. Independent educational activity required students to set goals, organize resources, make decisions, and review outcomes.

The comparison group continued the standard curriculum without the supplementary five-part package. Available documentation did not include a session-by-session manual, contact hours, teacher-training duration, adherence checklist, or contamination assessment. The intervention can therefore be described conceptually, but its fidelity cannot be verified from the available record.

Outcome Framework and Procedure

Student development was assessed through 12 criteria rated on a three-point scale (1 = low, 2 = moderate, 3 = high). Four diagnostic sources were named: structured student surveys, systematic observation, reflective journals, and teacher tracking rubrics. The record did not specify whether every source informed every criterion, how disagreements were resolved, or how the composite percentage was calculated. The reported percentages were therefore treated as supplied group-level composites rather than reconstructed scores.

The study proceeded through diagnostic, intervention, and evaluation stages. Both groups completed baseline procedures using the stated sources. During the intervention stage, the experimental group engaged in reflective discussions, personal journals, mentoring exchanges, collaborative problem-solving, independent projects, and self-checks, while the comparison group continued standard instruction. After five months, the same 12-criterion framework was administered. Using the same framework at both time points supports descriptive comparison, although the absence of documented rater training and blinding leaves measurement and expectancy effects unresolved.

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Table 2

Construct Map for the 12 Reported Indicators

Domain	Reported indicators	Interpretive caution
Reflective self-knowledge	Curiosity about self-discovery and growth; identification of strengths and weaknesses	Directly relevant to self-awareness, but self-report and teacher judgment may differ
Contextual and critical awareness	Situational awareness; extracting central ideas; evaluating behavior; connecting media with real contexts	Combines metacognitive, critical-thinking, and social-interpretive skills
Agency and self-directed learning	Expressing views; autonomous decisions; journal consistency; valuing continuous growth	Journal completion is behavioral evidence, not equivalent to reflection quality
Relational learning context	Family communication; home/parental engagement in learning	Partly contextual conditions rather than solely student competence

Data Analysis

Analysis was restricted to the aggregate percentages available in the research record. Absolute change was calculated as the postintervention score minus the preintervention score. A descriptive difference-in-differences (DiD) contrast was calculated as (Postexperimental − Preexperimental) − (Postcomparison − Precomparison). This contrast separates the experimental group's observed change from concurrent change in the comparison group.

The DiD estimate remains descriptive. Assumptions required for causal inference, including parallel preintervention trends, stable composition, and the absence of differential concurrent interventions, could not be tested. Participant-level observations, standard deviations, intraclass correlations, and missing-data records were unavailable. Consequently, no t test, confidence interval, p value, standardized effect size, internal-consistency coefficient, or interrater reliability statistic is reported.

Ethical Reporting

The participants were school-age students. The available documentation did not identify an ethics committee, approval number, guardian consent procedure, student assent procedure, or data-protection protocol. These details should be verified and inserted by the corresponding author before journal submission. No personally identifiable student information is reported in this manuscript.

Results

At baseline, the reported composite score was 54.2% for the experimental group and 53.8% for the comparison group, a difference of 0.4 percentage points. The small gap indicates similar starting values on this composite measure, but it does not establish equivalence on individual indicators or on unreported characteristics.

The experimental group's composite score rose from 54.2% to 66.1%, an absolute gain of 11.9 percentage points and a relative increase of approximately 22.0%. The comparison group rose from 53.8% to 54.4%, an absolute gain of 0.6 points and a relative increase of approximately 1.1%. The postintervention gap was 11.7 percentage points. The descriptive DiD was 11.3 percentage points: (66.1 − 54.2) − (54.4 − 53.8).

Table 3

Aggregate Preintervention and Postintervention Outcomes

Group	n	Pre (%)	Post (%)	Absolute change (pp)	Relative change (%)
Experimental	426	54.2	66.1	+11.9	+22.0
Comparison	426	53.8	54.4	+0.6	+1.1

Note. pp = percentage points. Relative change is calculated from the reported group-level composite percentages.

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Field documentation also described teacher-observed improvements in participation, accountability, ownership of assignments, reflective thinking, autonomous decision-making, study motivation, and self-assessment. These observations are consistent with the direction of the composite result. They are not treated as a separate qualitative dataset because observation frequencies, coded excerpts, assessor agreement, and criterion-level scores were not supplied.

Discussion

The central empirical result is an 11.3-percentage-point difference in change between the groups. The near-aligned baseline composite and the limited movement in the comparison group make the experimental pattern worthy of further testing. The available evidence nevertheless supports an association rather than a definitive causal claim. Nonrandom assignment, unknown clustering, teacher effects, unmeasured site differences, and the locally developed outcome instrument could each have contributed to the observed divergence.

The direction of change accords with research indicating that self-regulation can be strengthened when strategies are made explicit and practiced within subject learning rather than presented as detached advice (Dignath & Büttner, 2008; Dignath et al., 2008). It also fits Zimmerman's (2002) cyclical account. Reflection identifies a gap; self-assessment makes the standard visible; mentoring supports strategy selection; collaboration provides explanation and co-regulation; and independent activity tests whether regulatory control transfers to the learner. This interpretation explains how the components may work together, but the aggregate design does not identify the independent contribution of any single component.

The five mechanisms address different points at which self-directed learning can falter. A learner may recognize a weakness yet lack a suitable strategy. Another may know a strategy but have little confidence in using it, making self-efficacy and calibrated feedback relevant (Bandura, 1997). Planning can also fail at the point of persistence, where monitoring and social support matter. Successful performance, in turn, does not necessarily produce transferable learning unless the learner reviews why a strategy worked. A connected cycle therefore links awareness to action and action back to evaluation.

The social components do not contradict learner autonomy. Vygotsky's (1978) account of guided development suggests that regulatory language first encountered in dialogue can later be internalized. Mentoring may strengthen autonomy when teachers move from telling toward questioning and reduce support as students become ready to assume control. Collaborative learning has a similar condition: it is useful when students explain reasoning, compare approaches, exchange feedback, and remain accountable for decisions. Mere group placement does not constitute co-regulation.

The measurement framework raises a separate conceptual concern. Most indicators concern learner awareness, judgment, or behavior, but family communication and parental engagement are partly contextual. They may influence self-directed learning without being student competencies in the same sense as goal setting or self-assessment. A future instrument should either place these indicators in a contextual-support subscale or exclude them from the core competence score. Doing so would improve construct clarity and make changes in the learner outcome easier to interpret.

The study's contribution lies in organizing familiar practices into a recurring instructional sequence and linking that sequence to a locally used outcome framework. It also provides a transparent aggregate comparison rather than presenting only a conceptual model. The novelty is therefore limited and empirical: the study documents a multi-regional pretest–posttest pattern that can guide a stronger replication. Claims of effectiveness should await participant-level data and a design capable of addressing clustering, measurement quality, and alternative explanations.

Implications for Practice and Replication

For classroom use, the model is better understood as a repeated routine than as an occasional activity. Students clarify a goal, identify evidence of their current position, select an action, use teacher or peer feedback, and document the next step. Teachers retain responsibility for instructional quality and

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safeguarding while transferring decisions that students are prepared to manage. Curriculum designers can embed the cycle within subject tasks so that self-directed learning develops through disciplinary work rather than through a disconnected personal-development lesson.

Table 4

Recommended Fidelity Framework for a Confirmatory Replication

Mechanism	Observable classroom routine	Proximal learner evidence	Fidelity record
Reflective learning	Prompt linking an event, reason, evidence, and next step	Specific rather than generic reflection	Prompt used; dated student entry
Self-assessment	Comparison with criteria or exemplar before revision	Judgment supported by cited evidence	Completed rubric; revision trace
Teacher mentoring	Question-led conference with a learner-owned action point	Student states goal and selected strategy	Conference log; feedback sample
Collaborative learning	Peer explanation, strategy comparison, and reciprocal feedback	Each learner explains a decision	Observation checklist; task artifact
Independent activity	Student plans resources, milestones, and review	Timely action and justified adaptation	Plan; product; final reflection

A confirmatory study should specify intervention dosage in advance, train teachers to apply common criteria, and retain a small set of artifacts that permit fidelity checks. Recruitment and allocation should be documented by school and class. Where feasible, a cluster-randomized design would address allocation at the level at which instruction is delivered; otherwise, a carefully matched longitudinal design should include multiple preintervention measurements. Psychometric work should include expert content review, student cognitive interviews, pilot testing, internal-consistency and interrater estimates, and examination of factor structure. Multilevel analysis should account for students nested within classes and schools, and delayed assessment should test whether gains persist after structured support is reduced.

Limitations

Several limitations materially restrict interpretation. Sampling was purposive and allocation was not randomized. School, class, and teacher counts were not reported, so clustering and site heterogeneity could not be modeled. Only aggregate group means were available at each time point; standard deviations, item-level distributions, attrition records, and subgroup results were absent. The 12-indicator rubric has no reported content-validity index, internal-consistency estimate, factor structure, interrater reliability, or measurement-invariance evidence. Intervention dosage and adherence were not quantified, observers were not reported as blinded, and no delayed follow-up was conducted. The outcome may therefore reflect a mixture of learner change, rater expectations, familiarity with the rubric, contextual differences, and short-term implementation effects.

Conclusion

Across the reported five-month period, the experimental group's aggregate competence score increased by 11.9 percentage points, compared with 0.6 points in the comparison group, producing a descriptive DiD of 11.3 points. The pattern is consistent with the proposition that reflection, self-assessment, mentoring, collaboration, and independent activity can function coherently as a learning cycle. It does not establish statistically proven effectiveness. The next stage of research should combine validated measurement, documented implementation fidelity, ethical reporting, participant-level data, cluster-aware analysis, and follow-up assessment. Such evidence would permit a more rigorous test of whether the model strengthens self-awareness and self-directed learning among secondary-school students.

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Declarations

Ethics approval and consent to participate. The available study documentation did not state the approving body, approval number, guardian consent process, or student assent process. Because participants were minors, the corresponding author should insert verified details before submission.

Data availability. This article reports the aggregate values available in the research record. De-identified participant-level data and the instrument manual were not available for reanalysis and should be archived subject to applicable consent and data-protection requirements.

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Conflict of interest. No conflict-of-interest information was recorded in the available documentation. The author should confirm the final statement before submission.

Originality and prior publication. The corresponding author remains responsible for disclosing any earlier dissemination of the same dataset, intervention, tables, or findings.

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