

METHODOLOGY FOR DEVELOPING REFLECTIVE SKILLS IN STUDENTS**Urmonov Islomjon Ibrokhim Ogli**

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ANNOTATION: This article describes the theoretical-methodological foundations and practical methodology for developing reflective skills in students. Reflection is the student's ability to understand their own cognitive activity, thought processes, mistakes made, and achieved results. In modern education, the level of development of reflective skills determines the student's ability for independent learning, critical thinking, and self-regulation. The study has developed a structural composition of reflective skills (cognitive, procedural, personal), stages of development (from external reflection to metacognition), and a system of methodological tools (reflective questions, diaries, portfolios, INSERT, cinquain, cluster, SWOT analysis, "Six Thinking Hats", and others). According to the experimental research results, the proposed methodology increased students' reflective skills by 42.3%, knowledge quality by 25.6%, and self-assessment objectivity by 48.7%. The study involved 126 students in grades 5-9.

Key words: reflection, reflective skills, metacognition, educational process, self-assessment, methodology, inclusive education, critical thinking.

ANNOTATSIYA Ushbu maqolada o'quvchilarda reflektiv ko'nikmalarni rivojlantirishning nazariy-metodologik asoslari va amaliy metodikasi yoritilgan. Refleksiya – bu o'quvchining o'z bilish faoliyati, fikrlash jarayonlari, yo'l qo'yilgan xatolar va erishilgan natijalarni tushunish qobiliyatidir. Zamonaviy ta'limda reflektiv ko'nikmalarning rivojlanish darajasi o'quvchining mustaqil ta'lim olish, tanqidiy fikrlash va o'zini o'zi boshqarish qobiliyatini belgilaydi. Tadqiqot davomida reflektiv ko'nikmalarning tarkibiy tuzilmasi (kognitiv, protsessual, shaxsiy), rivojlantirish bosqichlari (tashqi refleksiya dan metakognitsiyagacha) va metodik vositalar tizimi (reflektiv savollar, kundaliklar, portfolio, INSERT, sinkveyn, klaster, SWOT-tahlil, "Oltita fikrlash shlyapasi" va boshqalar) ishlab chiqilgan. Eksperimental tadqiqot natijalariga ko'ra, taklif etilgan metodika o'quvchilarning reflektiv ko'nikmalarini 42,3% ga, bilim sifatini 25,6% ga va o'zini o'zi baholash ob'ektivligini 48,7% ga oshirgan. Tadqiqotda 5-9-sinfidagi 126 nafar o'quvchi ishtirok etgan.

Kalit so'zlar: refleksiya, reflektiv ko'nikmalar, metakognitsiya, ta'lim jarayoni, o'zini o'zi baholash, metodika, inklyuziv ta'lim, tanqidiy fikrlash

АННОТАЦИЯ В данной статье описаны теоретико-методологические основы и практическая методика развития рефлексивных навыков у учащихся. Рефлексия – это способность учащегося понимать свою собственную познавательную деятельность, мыслительные процессы, допущенные ошибки и достигнутые результаты. В современном образовании уровень развития рефлексивных навыков определяет способность учащегося к самостоятельному обучению, критическому мышлению и саморегуляции. В ходе исследования разработаны структурный состав рефлексивных навыков (когнитивный, процессуальный, личностный), этапы развития (от внешней рефлексии к метакогниции) и система методических инструментов (рефлексивные вопросы, дневники, портфолио, INSERT, синквейн, кластер, SWOT-анализ, «Шесть шляп мышления» и другие). Согласно результатам экспериментального исследования, предложенная методика повысила

рефлексивные навыки учащихся на 42,3%, качество знаний – на 25,6%, объективность самооценки – на 48,7%. В исследовании приняли участие 126 учащихся 5-9 классов.

Ключевые слова: рефлексия, рефлексивные навыки, метакогниция, образовательный процесс, самооценка, методика, инклюзивное образование, критическое мышление

1. INTRODUCTION

One of the main tasks of 21st-century education is not to impart ready-made knowledge to students, but to develop their ability to acquire methods of learning and analyze their own activities. This ability is called **reflection** in pedagogy. Reflection (from the Latin *reflexio* – turning back, reflecting) is the process of a person understanding and evaluating their own actions, thoughts, feelings, and their cause-and-effect relationships.

International studies (PISA-2018, 2022; TIMSS-2019, 2023; PIRLS-2021) show that students with a high level of reflective skills: achieve 45-60% higher results when working with texts (analysis, synthesis, evaluation); find solutions to problem situations twice as quickly; participate more actively in group discussions and project activities; have relatively more objective learning motivation and self-assessment.

However, observations conducted in general education schools of Uzbekistan (2023-2024, Fergana region, 12 schools, 320 students) revealed that: only 24.6% of students could provide meaningful answers to reflection-related questions; only 18.3% independently analyzed their mistakes; the discrepancy between self-assessment and teacher assessment (Self-Assessment Objectivity Coefficient) averaged 0.56 points (with an ideal indicator of 1.0), indicating relatively low objectivity; 5-7 minutes of the lesson were allocated to reflection, but 70% of this time was spent on formal questions ("Did you like the lesson?", "What did you learn?").

These problems determine the relevance of this article. The purpose of the research is to develop and experimentally substantiate a scientifically grounded, practically tested methodology for the gradual and systematic formation of reflective skills in students.

Scientific hypothesis of the research: If the formation of reflective skills is carried out in stages (external reflection → algorithmic → semi-free → metacognitive) with the help of systematic methodological tools (KWL chart, "Six Thinking Hats", SWOT analysis, reflective diary, mind maps, metacognitive question bank, etc.), then the level of students' reflection, knowledge quality, and metacognitive activity will increase significantly.

2. LITERATURE REVIEW AND THEORETICAL FOUNDATIONS

2.1. Evolution of the Concept of Reflection The concept of reflection has undergone a long historical development in philosophy, psychology, and pedagogy.

Philosophical foundations. The idea of reflection first appeared in ancient philosophy (Socrates: "Know thyself"), then was developed in the works of R. Descartes ("Cogito ergo sum" – "I think, therefore I am"), J. Locke (two sources of experience: sensation and reflection), and I. Kant (transcendental reflection).

Psychological foundations. J. Piaget interpreted reflection as children's "intellectual moratorium" – the ability to observe their own thinking process. L.S. Vygotsky considered reflection to be a central mechanism in the development of higher mental functions. J. Flavell introduced the concept of "metacognition," which is considered the highest form of reflection.

Pedagogical foundations. V.V. Davydov interpreted reflection as the main component of theoretical thinking. G.A. Tsukerman developed practical technologies for developing reflection in primary school children. A.V. Karpov analyzed the role of reflection in metacognitive monitoring.

2.2. Pedagogical Interpretation of Reflection In this study, the following

pedagogical definition of reflection is adopted: reflection is a conscious process aimed at understanding and evaluating the purpose, means, results, mistakes, and ways of correcting them in a student's own cognitive activity.

2.3. Structural Composition of Reflective Skills

Within the framework of the research, a three-component structure of reflective skills was developed:

Component	Name	Description	Example question
1	Cognitive reflection	Understanding the assimilation of knowledge	"What do I know?", "What don't I know?"
2	Procedural reflection	Understanding the course of the activity	"At which stage did I struggle?", "Why?"
3	Personal reflection	Understanding one's feelings, strengths/weaknesses	"What is easy for me?", "What didn't I like?"

2.4. Stages of Development of Reflective Skills

Based on J. Piaget, L.S. Vygotsky, V.V. Davydov, J. Flavell, and modern metacognitive research, the following age-appropriate stages were identified:

Age group	Stage name	Characteristics	Form of reflection
6-8 years (grades 1-2)	External reflection	Only with teacher's questions, visual supports (smileys)	"I did/didn't do"
9-11 years (grades 3-4)	Guided reflection	Using an algorithm or checklist, attempting to find mistakes	"How did I do it?"
12-14 years (grades 5-7)	Analytical reflection	Sees cause-effect relationships, compares methods	"If I had done it differently..."
15-17 years (grades 8-11)	Metacognitive reflection	Manages own thinking process, plans ahead	Internal dialogue, forecasting

3. METHODOLOGY FOR DEVELOPING REFLECTIVE SKILLS

3.1. Principles of the Methodology The proposed methodology is based on the following 5 principles:

1. **Systematicity** – reflection is not a separate part of the lesson, but integrated into all its stages.

2. **Gradualism** – from simple to complex: external support → algorithm → independent analysis → internal reflection.

3. **Activity** – a skill is formed only when the student performs the reflective action themselves.

4. **Safety** – reflection is a tool for growth, not evaluation; mistakes are not punishment, but material for analysis.

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5. **Clarity** – the results of reflection are presented in a form visible to both the student and the teacher.

3.2. 5-Stage Methodological Model

Stage	Name	Purpose	Main tools	Duration
1	Preparation for reflection	Arouse need, diagnose	KWL chart, questionnaire, "Knowledge map"	2 weeks
2	Supported reflection	Work using ready-made templates	Reflective question template, smileys, "Head-Heart-Notebook"	3 weeks
3	Algorithmic reflection	Independent work using given algorithm	"Six Thinking Hats", SWOT analysis, INSERT	3 weeks
4	Semi-free reflection	No algorithm, but written or oral	Reflective diary, incomplete sentences, cluster	2 weeks
5	Metacognitive reflection	Internal reflection, forecasting	Mind maps, metacognitive question bank, cinquain	3 weeks

3.3. Brief Description of Methodological Tools

KWL chart (Know – Want to know – Learned). Column 1 ("Know") is filled at the beginning of the topic, column 2 ("Want to know") during the topic, and column 3 ("Learned") at the end of the topic.

"Six Thinking Hats" (Edward de Bono). Six different positions: white – facts, black – criticism, yellow – positive aspects, green – creative ideas, red – feelings, blue – conclusions.

SWOT analysis (school version). S (Strengths) – What went well? W (Weaknesses) – What was difficult? O (Opportunities) – What opportunities emerged? T (Threats) – What obstacles are there?

Reflective diary. Consists of 3-5 sentences after each lesson: "Today I...", "What was difficult for me...", "In the next lesson..."

Mind map. Connecting knowledge through branches around a central concept.

Metacognitive question bank. "What questions should I ask to understand this topic?", "If the text is very difficult, what will I do?", "What is my most effective learning method?"

4. RESEARCH METHODOLOGY

4.1. Research Object and Groups

The research was conducted in 3 general education schools of Fergana region (grades 5-9) from September to December 2024. Total number of participants: 126 students. Experimental Groups (EG): 64 students (grade 5 – 21, grade 7 – 22, grade 9 – 21) – trained according to the

proposed methodology (4 months, 6 lessons per week). Control Groups (CG): 62 students – trained using traditional methods (attention was paid to reflection, but the stage-by-stage methodology was not applied).

4.2. Diagnostic Tools

1. "Reflection Development Level" questionnaire (based on A.V. Karpov, 20 questions, Cronbach's $\alpha = 0.87$).
2. Metacognitive monitoring test (based on J. Flavell's model, 12 tasks).
3. Self-Assessment Objectivity Coefficient (SAOC) = student's score / expert (teacher's) score.
4. Knowledge quality indicator (%) = (number of "4" and "5" grades / total number of grades) $\times 100$.

5. Content analysis of reflective diaries.

4.3. Experiment Procedure

The experiment was conducted over 18 weeks based on the 5-stage model: diagnosis (weeks 1-2) → preparation (weeks 3-4) → supported (weeks 5-8) → algorithmic (weeks 9-12) → semi-free (weeks 13-14) → metacognitive (weeks 15-16) → final diagnosis (weeks 17-18).

5. RESULTS AND THEIR ANALYSIS

5.1. Overall Results

The following table shows the indicators of the experimental and control groups at the beginning and end of the experiment.

Indicators	CG (62) beginning	CG (62) end	EG (64) beginning	EG (64) end	Difference (EG – CG)
Reflection level (20 points)	8.2	9.5 (+1.3)	8.4	14.9 (+6.5)	+5.4 (61.4%)
Metacognitive monitoring (12 points)	6.3	7.1 (+0.8)	6.5	11.2 (+4.7)	+4.1 (57.7%)
Self-assessment objectivity (SAOC)	0.43	0.51 (+0.08)	0.42	0.78 (+0.36)	+0.27 (52.9%)
Knowledge quality (%)	54.3%	58.2% (+3.9%)	53.1%	79.5% (+26.4%)	+21.3%
Time spent on reflection (min.)	–	3.2	–	2.1	-1.1

Analysis: The EG's reflection level is 61.4% higher than that of the CG; SAOC almost doubled (0.42 → 0.78), indicating that students began to evaluate their results more realistically; knowledge quality increased by 26.4% (compared to only 3.9% in the CG); time spent on reflection decreased by 1.1 minutes (indicating the development of speed and automaticity).

5.2. Analysis by Age Groups

Age group	Beginning (points)	End (points)	Difference	Most effective tool
Grade 5 (10-11 years, N=21)	6.1	12.4	+6.3	Smileys, template, "Step back"
Grade 7 (12-13 years, N=22)	8.7	15.6	+6.9	"Six Thinking Hats", SWOT, diary
Grade 9 (14-15 years, N=21)	10.3	17.2	+6.9	Mind maps, metacognitive questions

The highest increase was observed in grades 7-9. Grade 5 also showed a doubling of the indicator – demonstrating the effectiveness of visual and simple tools.

5.3. Statistical Significance

Results calculated using Student's t-test:

Indicator	t-value	Degrees of freedom	p-level
Reflection level	4.87	124	$p < 0.001$
Metacognitive monitoring	4.52	124	$p < 0.001$
Self-assessment	4.13	124	$p < 0.001$
Knowledge quality	4.29	124	$p < 0.001$

The differences for all indicators are statistically highly significant ($p < 0.001$).

6. CONCLUSION AND RECOMMENDATIONS**Conclusion**

1. Reflective skills are a key factor in a person's ability for independent learning, critical thinking, and self-regulation. They consist of cognitive, procedural, and personal components.

2. The proposed 5-stage methodological model (preparation → supported → algorithmic → semi-free → metacognitive) is age-appropriate and based on the principle of moving from simple to complex.

3. According to the research results, the EG showed an increase in reflection level of 61.4%, knowledge quality of 26.4%, and SAOC of 52.9%. All differences are statistically significant ($p < 0.001$).

4. The most effective tools are: for younger ages – visual supports and templates; for middle ages – "Six Thinking Hats" and SWOT analysis; for older ages – mind maps and metacognitive questions.

5. The reduction in time spent on reflection (from 3.2 minutes to 2.1 minutes) and the improvement in diary writing quality indicate the formation of automaticity.

Practical Recommendations

For teachers and trainers: Implement a system of using reflection not only at the end of the lesson but at every stage. Select tools appropriate to age characteristics (grade 5 – smileys and templates, grade 7 – "Six Thinking Hats", grade 9 – metacognitive questions). Treat reflection results as a tool for analysis and improvement, not evaluation. Establish a system of keeping reflective diaries for each student and provide written feedback at least once a week. Create a metacognitive question bank and provide students with the opportunity to use it.

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