



DEVELOPING SELF-CONTROL AND REFLECTION SKILLS IN ADOLESCENT STUDENTS USING ARTIFICIAL INTELLIGENCE TOOLS

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Abstract. *This article discusses the pedagogical possibilities of using artificial intelligence tools in developing self-control and reflection skills in adolescent students. During adolescence, it is important for a student to plan his / her own activities, evaluate the results of the work performed, identify mistakes, and improve his/her further activities. From this point of view, interactive tasks based on artificial intelligence, individual recommendations, automated analysis, and reflective questions can help the student understand his/her own activities.*

Keywords: *artificial intelligence, adolescent student, self- monitoring, reflection, digital learning, individual learning, pedagogical technology, self- assessment, metacognitive skills.*

Today, the digitalization of the educational process requires the development of students not only knowledge and skills, but also the ability to independently learn, manage their own activities and evaluate their results. Especially in adolescence, a student 's personal responsibility, independence, self - management of their behavior and a critical approach to their activities are gradually formed.

Self - control refers to the ability of a student to monitor and control their own activities in accordance with the established goals, identify errors, and correct them when necessary. Reflection is the process of understanding and analyzing the student 's own activities, thinking, results achieved, and mistakes made.

Digital technologies, particularly artificial intelligence tools, are creating new pedagogical opportunities for developing these skills. Artificial intelligence can be used to analyze student responses, provide individual feedback, generate follow-up questions, guide self - assessment, and individualize the learning process.

The concept of "self - control" is interpreted as the ability of a person to consciously control, check and, if necessary, correct his own behavior, thinking process and activity in accordance with a set goal, norm or rule. The concept of "reflection" is interpreted as the process of understanding, analyzing and evaluating a person's own activity, thinking process, behavior and their results.

The relationship between self - control and reflection is such that effective control is not possible without reflexive analysis: in order to compare the results of their activities with the norm, the student must first understand these results, that is, reflect on them. In turn, the

results of reflection serve as the basis for monitoring and correcting the student's further activities. Thus, both skills together constitute the student's ability to independently manage his educational activities, that is, the components of self-regulation competence.

Adolescence is a period with its own characteristics in developmental psychology: during this period, abstract-logical thinking develops, the individual's critical attitude towards himself increases, dependence on the social environment increases, but volitional qualities and self-control mechanisms are not yet fully stabilized. It is this contradiction, the expansion of cognitive capabilities and the instability of volitional-control mechanisms, that creates the need for a purposeful and systematic development of self-control and reflection skills in adolescents.

In modern pedagogical and psychological research, self-control and reflection skills are often considered as components of metacognitive competence. According to the theory of metacognition, founded by J. Flavell, a person's knowledge of his own cognitive processes (metacognitive knowledge) and the ability to actively manage these processes (metacognitive control) are one of the main factors determining the effectiveness of educational activities. From this point of view, it can be concluded that self-control performs the function of metacognitive control, and reflection performs the function of deepening metacognitive knowledge.

Modern artificial intelligence technologies serve to develop self-control and reflection skills in the learning process by performing the following main functions: providing individualized feedback, real-time monitoring and visualization of student activity, generating reflexive questions, and pedagogically guiding student self-assessment activities. The table below systematizes the main types of artificial intelligence tools, their functional characteristics, and the skills they develop.

Table 1.

Functional classification of artificial intelligence tools

SI tool type	Main function	A skill to develop	Practical example
Intelligent chatbot assistant	Encourage communication in question-and-answer mode, expressing opinions out loud	Reflection, verbal -logical analysis	SI tutor in conversation mode on science
Adaptive learning platform	student progress, recommending individual assignments	Control, activity planning	Systems that shape individual learning paths
Digital reflective	Analysis of written opinions, generation of in-	Reflection, deep thinking	SI- supported journaling apps



SI tool type	Main function	A skill to develop	Practical example
diary	depth questions		
Learning analytics dashboard	Presenting performance indicators in the form of graphs and diagrams	Control , self - monitoring	Statistics panel within the LMS
Voice/text SI assistant	Real - time advice and guidance	Control, correction	Virtual learning support systems

Intelligent chatbot assistants address the student in a question-and-answer format, translating the logic of their answers into a “think-aloud” format, which activates reflective thinking. Adaptive learning platforms generate individual recommendations based on the student’s errors in completing each task, the time spent, and the dynamics of progress, which develops the student ’s ability to plan and control their activities. Digital reflective diaries require the student to analyze their learning experience through daily or weekly entries, and the system offers additional, in-depth questions based on the content of the entry. Learning analysis panels provide the opportunity for self - monitoring by presenting the student’s learning performance indicators in the form of graphs and diagrams.

At the same time, it is necessary to take into account precautions when using artificial intelligence tools: excessive dependence on AI systems can weaken the student 's ability to think independently, and issues of data confidentiality and providing age-appropriate content require special pedagogical supervision.

A three-stage pedagogical mechanism for developing the above skills in adolescent students has been developed.

During the diagnostic phase, the SI system analyzes test items, questionnaires, and observation data to determine the student 's initial level of self - control and reflection, and forms an individual development map for each student.

In the formative stage, the student is in a process of regular interaction with the SI-assistant: after each learning task, the system presents the student with reflexive questions (“What difficulties did you encounter in completing this task?”, “What strategy will you use next time?”), and based on the answers, it gives individual recommendations. At this stage, the teacher provides additional pedagogical support to the student based on analytical reports provided by the SI system.

In the consolidation-generalization stage, the student independently demonstrates the skills of planning, monitoring, and reflecting on his/her activities, with minimal involvement of the SI assistant; the SI system at this stage acts only as an observer, intervening only when necessary.



To assess the effectiveness of this mechanism, it is advisable to use four criteria - motivational, cognitive, reflexive and correctional criteria and a system of indicators corresponding to them. The motivational criterion reflects the student's internal interest in self - development, the cognitive criterion reflects knowledge of control and reflection methods, the reflexive criterion reflects the level of ability to analyze one's own activities, and the correctional criterion reflects the ability to eliminate identified shortcomings.

It is recommended to divide the level of development of the student according to each criterion into low, medium and high levels. For example, according to the reflexive criterion, the low level describes students who have difficulty describing their activities, the medium level describes students who partially understand their mistakes with the help of an SI assistant, and the high level describes students who are able to independently, deeply and systematically analyze. Such a gradation allows the teacher and the SI system to choose an individual pedagogical support strategy for each student.

the above mechanism in school practice, it is recommended to adhere to the following pedagogical conditions:

- from an organizational and managerial perspective - developing clear regulations and data security policies for the use of information technology tools at school;
- pedagogical and methodological - conducting special training courses for teachers on the methodology of using SI tools;
- from a psychological and pedagogical perspective - not to completely separate the interaction between the student and the SI system from the participation of the teacher and parents, that is, to maintain a "human-centered" approach;
- technologically and didactically - ensuring that SI tools comply with the goals of the curriculum, age characteristics, and national educational standards.

The following recommendations can also be made for practicing educators: organize a 3-5 minute "digital reflection" exercise at the end of each lesson; explain to students clear instructions and ethical rules for working with the SI assistant; regularly share analytical data provided by the SI with parents.

the above -listed conditions and recommendations will ensure the harmonious integration of artificial intelligence tools into the learning process, while ensuring the stable and continuous development of self - control and reflection skills in adolescents.

In conclusion, artificial intelligence technologies have great potential as a new, effective and individualized tool for developing self - control and reflection skills in adolescent students. Self-control and reflection are complementary components of self - regulation competence, and their development requires continuous, individualized and operational feedback, which is not always possible in traditional pedagogical conditions.



LIST OF REFERENCES USED

1. Holmes W., Bialik M., Fadel C. Artificial Intelligence in Education: Promises and Implications for Teaching and Learning. – Boston: Center for Curriculum Redesign, 2019.
2. Luckin R., Holmes W., Griffiths M., Forcier LB Intelligence Unleashed: An Argument for AI in Education. – London: Pearson, 2016.
3. Yuldoshev JG., Usmanov SA Fundamentals of pedagogical technology. – T.: O'qitu, 2004.
4. Tolipov O'.K., Usmonboyeva M. Applied foundations of pedagogical technologies. – T.: Fan, 2006.
5. Ochilov M. New pedagogical technologies. – Karshi: Nasaf, 2000.
6. Muslimov NA Organization of independent activity of students in the process of vocational education. – T.: Science and Technology, 2015.
7. Ibragimov XI, Abdullayeva Sh.A. Theory and history of pedagogy. – T.: Talqin, 2008.