

## ELEMENTARY SCHOOL STUDENTS' REFLECTIONS ON CHESS LEARNING DIFFICULTIES\*\*\*\*

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**Lusine Gharakhanyan, PhD, Associate Professor, Associate Professor, Director of Hovhannes Toumanyan Museum, ESCS Republic of Armenia**

**Email:** [sargsyanvahan@aspu.am](mailto:sargsyanvahan@aspu.am)

**Vahan Sargsyan, PhD, Associate Professor, Scientific Supervisor of Chess Scientific Research Institute, Khachatur Abovyan Armenian State Pedagogical University, Republic of Armenia**

**Email:** [sargsyanvahan@aspu.am](mailto:sargsyanvahan@aspu.am)

### Abstract

According to the studies, reflection is a significant aspect of educational activities. Chess fosters constant analysis and reflection on different positions. It has also been revealed that students' reflective style is more prevalent during chess lessons. Current research aims to reveal chess learning difficulties and developmental trends based on elementary school students' reflective judgments. We combined qualitative and quantitative approaches in our study. A questionnaire was designed to evaluate the reflexive environment and the students' reflective skills based on the principles of reflective activity theory. The questionnaire included questions about likes and dislikes in chess class, self-sufficiency, success, challenges, need for help, praise received, and teacher support. An open-ended section was added for additional comments. Conducted in 2024, the study involved 107 students. Responses were scored using reflective activity theory, with points for overcoming difficulties, constructive feedback, independence, and engagement. Our research analysis reveals that chess teaching is seen positively, and the difficulty with subject complexity was common among students, potentially affecting learning effectiveness, especially with limited class time. The authors underline the necessity of future research by involving teachers in developing student reflection to share experiences and solutions for typical cases.

**Keywords:** reflection, reflective environment, self-analysis, chess, chess teaching process, elementary school students, learning difficulties, reflective judgments, educational activities, reflective activity theory.

### INTRODUCTION

In Armenia, chess has been integrated into the primary school curriculum since 2011. Researchers have conducted various studies to assess the effectiveness of this implementation. One critical issue in teaching chess to elementary students is the development of reflection skills.

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Reflection is a significant aspect of educational activities. Our research and observations suggest that chess fosters constant analysis and reflection on different positions. So, previously, we hypothesized that students' reflective style is more prevalent during chess lessons. Chess lessons provide valuable opportunities for students to develop deep and reflective learning styles (Sargsyan & Avetisyan, 2019). Reflective practices encourage more profound understanding, metacognition, and continuous improvement by prompting students to think critically about their learning experiences. (Dewey, 1933). It has also been revealed that there is a strong correlation (0.58) between chess grades and pupils' reflective style of Learning (Sargsyan&Avetisyan, 2019). Developing reflective skills is also mandatory in training chess teachers (Professional et al., 2020). Reflection of joint activity is one of the fundamental principles of applying a reflexive-active approach to teaching chess at school. (Glukhova et al, 2022).

Developing reflexive skills is also mandatory in training chess teachers (Professional et al., 2020). Reflection of joint activity is one of the fundamental principles of applying a reflexive-active approach to teaching chess at school. (Glukhova et al, 2022). The development of reflexive abilities in children 6-10 years old and the formation of their educational activities were defined as critical tasks in the developmental education system. (Davydov 1986; Slobodchikov, Cukerman,1990).

The problem of studying reflective processes in general education, particularly in elementary school, is strategically vital for children's socio-psychological maturity and solving a wide range of scientific and practical problems. Modern pedagogy and didactics have actualized the concepts of "reflectivity," "reflective environment," "professional reflection," and "student reflection," which encompass not only the objective possibilities, methods, organizational forms, and material possibilities of the teaching content but also the formation and development of students' reflexive abilities. A necessary condition for development. In this context, the agenda includes enhancing the quality of both the teacher's professional reflection and the students' reflexivity. To what extent does chess, as a subject, contribute to creating a reflexive environment in the lesson process, the reflexive activity of students, and the presence of reflexivity in the communication between the teacher and the students? In this article, we aim to address these questions and several others related to the manifestations of reflection. While there is a wealth of scientific and practical research on reflectivity, reflection, and reflective environments, there needs to be more materials related explicitly to chess subjects and reflection for the elementary school age group. From the theoretical justifications of reflection, we singled out G. P. Shchedrovitsky's (Shchedrovitsky, 2001, p. 47)

point of view, which rightly considers reflection as one of the most interesting, complex, and, to some extent, even mysterious processes of activity, considering it the most critical moment in the mechanisms of activity development. According to Feldstein, reflection occurs only under the influence of social conditions on the child, and the formation of reflexive processes connects the child and other children, the child and adults, and the child and society with the provision of events (Innovatsionnye forms, 2014, p. 208.). I. S. Kon (Kon, 1978, p. 37) identifies it with empathy, characterizing it as "putting oneself in someone else's place, perceiving the attitude of others towards oneself, the ability to identify, to attribute personal motives to others."

Discussing the connections between reflective skills and chess playing, researchers found that "Based on the findings of this current study, chess game playing is of great help in developing and enhancing the metacognitive skill of reflective thinking among adolescent students" (Anthony et al. G.C. Unachukwu, 2023, p. 142). Reflection is connected with the formation of educational actions and a person's critical thinking. Reflective skills are fundamental when analyzing a person's activity, formulating the results of this activity, defining problems and correcting actions, setting goals and tasks, and forecasting results. Assessment of students' reflective skills is necessary for the pedagogical process. On the other hand, the reflection of schoolchildren as active participants in the educational process can give valuable information for analyzing educational difficulties and identifying developing potential based on studying the possibilities of psychological-pedagogical assistance of students. According to the founder of the reflexive-active approach (RAA) (Zaretsky, 2023), filling out a reflexive table with the child, including the following questions, can be an example of such help.

- 1) What did the child do on his own? (*Zone of actual development*);
- 2) What could not be done? (What mistakes did he make with the help of an adult - presumably zone of proximal development):
- 3) What help did he receive from an adult (what exactly did an adult do in their joint activities)?;
- 4) What did this help do? (Did an adult help the child cope with difficulties, exactly);
- 5) What is the next step? (What should be meaningfully tried to do further so the learning and development process progresses? Ideally - at this point, the idea of the epicentre is formulated).

**Current research aims** to reveal chess learning difficulties and developmental trends based on elementary school students' reflexive judgments.

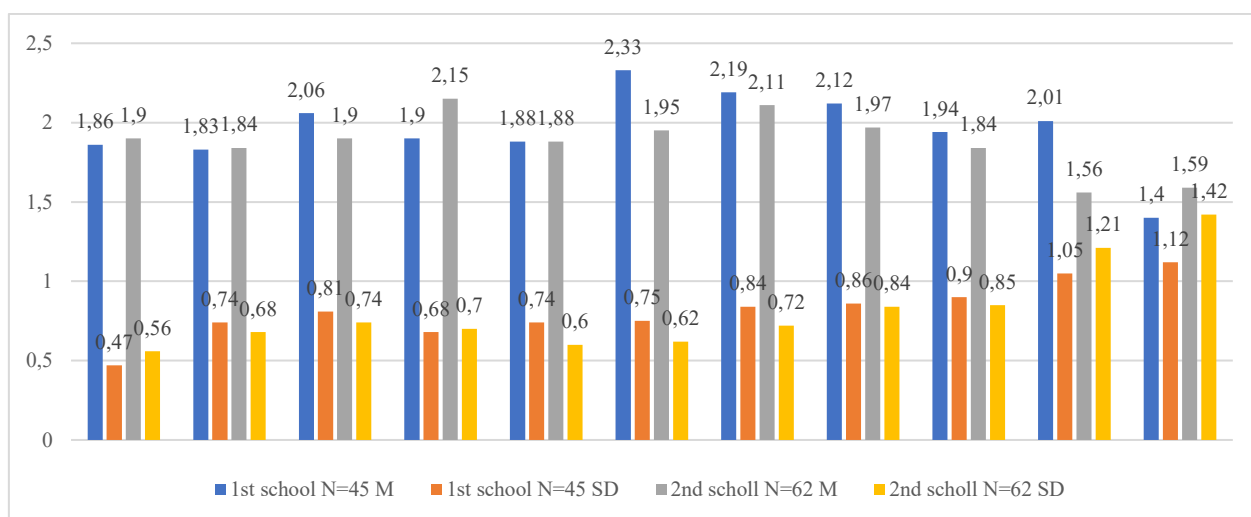
## METHODS AND METHODOLOGY

Integrating interdisciplinary methods and methodological support makes it possible to solve the problems we pose, particularly within the chess study framework. Therefore, we employed qualitative and quantitative methods in our research. We developed a questionnaire to understand the impact of chess on students' reflexivity in a general education school, the presence of a reflexive environment, and the reflective proficiency of a chess teacher. We created the questionnaire questions based on reflexive activity theory's basic ideas and principles. The questions were as follows: The first question had two sub-questions: a) What do I like about chess class? b) What do I dislike about chess class? The second question consisted of seven sub-questions. a) What can I accomplish independently in chess class? b) Am I successful in chess class? c) Do I encounter challenges in chess class? d) Do I require assistance in chess class? e) Do I typically receive praise in chess class? f) How does the teacher support me throughout the chess lesson? I will succeed in the chess lesson. We included a "Write down your other thoughts" line in the questionnaire to gather unsaid or other coded information and messages. In 2024, the research was organized. The research sample consisted of 62 students from the 3rd e, fourth d, and fourth f grades at Nikol Aghbalyan 19 primary school in Yerevan and 45 students from the fourth a and 3rd b grades at N122 primary school named after Aleksandr Blok. We developed a point scale for the questionnaire answers, drawing from Zaretsky's theory of reflective activity. The following point scale was defined for the first question: We assign 3 points for overcoming all difficulties, 2 points for attempting to highlight both positive and negative aspects of one's work, 1 point for non-constructive criticism, and 0 points for no criticism. "I need help in chess class because..." We have established the following unit system for this question: We award 3 points for mentioning contact with students and teachers, 2 points for posing constructive questions, 1 point for demonstrating independence, and 0 points for displaying apparent passivity. "I am usually praised because..." is an assertion that indicates a balanced attitude towards one's work, a constructive explanation of unsatisfactory educational results, and advice directed towards oneself (e.g., "I will take into account..."). The unit evaluation organized the question "How does the teacher help me?" into the following categories: He receives 3 points if he indicates that he only seeks help from the teacher when necessary, 2 points if he emphasizes the significance of the teacher's assistance, 1 point if he asserts that he cannot function without the teacher's assistance, and 0 points if he makes no mention of either the teacher or himself. We used the phrase "I will succeed in chess class if..." as an

assertion. Three points if there is a balanced attitude towards the results of one's work, a constructive explanation of the unsatisfactory educational results, and advice directed to oneself (e.g., "I will succeed if..."), 2 points if one can explain the weakness of one's chess knowledge and strengths, and 1 point if one exhibits an overvalued or undervalued approach to one's job success. A score of 0 points is awarded for expressing an opinion that lacks a critical element.

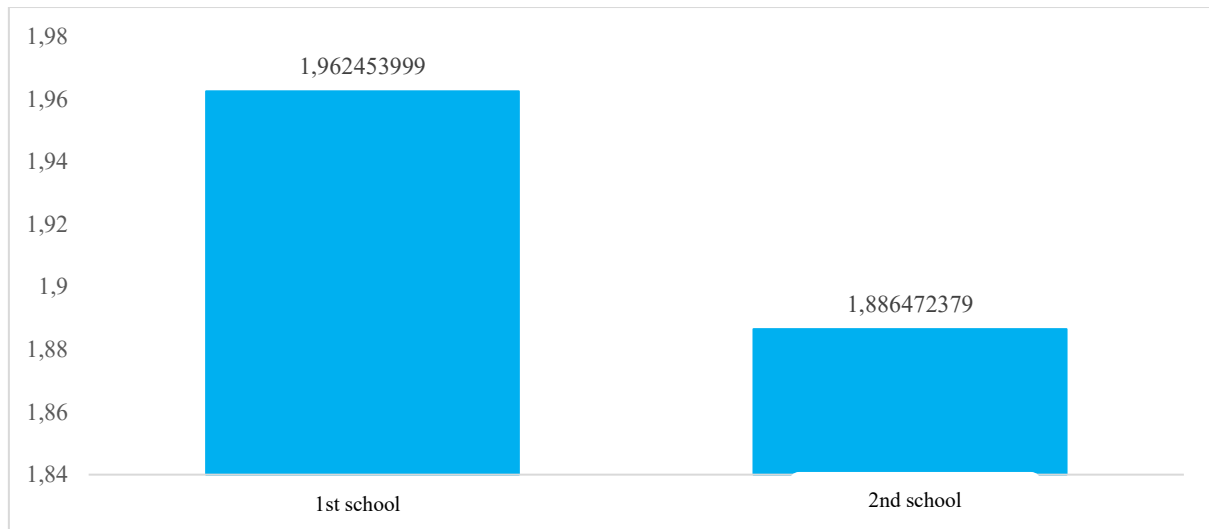
We have also implemented a case study to include more detailed empirical evidence demonstrating the effectiveness of reflective practices in improving chess learning outcomes.

## RESULTS



**Diagram 1. Comparison table of mean and standard deviation of reflection indices**

According to the research results in two schools, the image of reflectivity was expressed with the highest index in N19 primary school named after Nikol Aghbalyan (Diagram 2 ). The averages of the two groups were close enough. A high standard deviation indicates a large spread of data. This can mean that the data is varied and heterogeneous. Most likely, this is related to individual differences and may be due to the different abilities and characteristics of the participants. This is also evidenced by the qualitative results, where the needs and difficulties indicated by the children are very diverse and unequal.



**Diagram 2. Means of children's reflection in two schools**

The data in the charts show that students' reflectivity was slightly below the average. Moreover, the highest indicators were obtained from questions about difficulties in one group and needs in the other.

**Table 1.**

**Critical responses to reflective questions in both groups**

Basic: topics	Group A:	Group B:
<i>How is the chess lesson going on?</i>	Very well, interesting...	A lot is good, engaging, and developing.
<i>1. a) What do you like in chess lessons?</i>	Blackboard, letters discussing the problems, the queen's moves, teacher praising...	Chess playing, problem-solving, teacher kindness
<i>b) What do you dislike in chess lessons?</i>	The difficulty, the noise, the teacher got angry, the king's and soldier's moves...	Noise, not playing chess, challenging assignments...
<i>2. a) what can I</i>	<b>Playing chess, problem-</b>	Chess play, problem-solving,

<i>do independently during chess lessons?</i>	solving, solving impossible positions...	arranging the pieces
<i>2. b) It works for me during chess lessons</i>	to understand chess positions <b>to play, to solve the problems ...</b>	strategy, plan, play, maps, solve
<i>c) what is complicated for me in chess lessons.</i>	Moving the pieces, solving problems	Predicting the plan, listening to the teacher, finding the correct moves, solving the tasks, finding the strategy of the problem ...
<i>d) I need help in chess class</i>	<b>there are hard lessons</b> and <b>difficult postcards</b> ; it is also tricky to play, moving pieces  I do not understand chess	I am weak in chess; it is challenging to solve the chess problems...
<i>e) In chess class, I am usually praised</i>	for completing charts, playing well, being disciplined in class, answering questions, solving problems,	listening, being innovative, placing pieces correctly, answering the teacher's questions
<i>f) How does the teacher help me in the chess lesson?</i>	Explains unclear parts when solving problems and charts, guides give hints	Helps to play, play with opponent, corrects mistakes, gives advice, prompts
<i>g) I will succeed in the chess class</i>	If I study well, listen well, pay attention, if they help me, if I solve the cards well	If I study well, listen carefully, solve the cards correctly, play well, and work hard.

Based on the data in Table 1, most children can independently play chess and solve chess problems. However, for some respondents, chess is quite tricky and unclear. The mistakes are mostly made during problem-solving. The teacher mainly helps solve the problems and again explains unclear parts of the lesson. The teacher also helps the game pieces correct the steps in questions. Some children do not receive praise and support from the teacher.

**Case study.** A chess teacher has created a surprise box game that reinforces basic chess



concepts through a remarkable reflexive play process. A crown is taken out of the box and placed on the child's head, on which a specific wording of a chess concept or piece is written. The children look directly at the student wearing the crown and analyze and reveal the chess concept so that the student wearing the crown tries to guess it. For example, a student might comment, "You cannot leave the board." The student has to guess which piece it is about. The teacher encourages students' critical thinking and opinions. One of the surprise boxes also contains values. The students and the teacher create and frame those values over time. Every day, one of the students carries a value, and if there is a conflict, the value of "friendship" comes and "saves" the situation. In the third box, there is a mirror, with which the box cheers up the students who are sad, in a bad mood, or fail. For example, the teacher opens the box to the student who, for example, failed in solving a problem and says that the future champion is in the box. The student approaches and sees himself. The characteristics of chess pieces also create values, such as loyalty, self-sacrifice, agility, etc. The playbox takes on a reflexive character, prompting children to self-analyse.

## DISCUSSIONS

The analysis of the results of the conducted research allows us to highlight the following patterns:

- According to the children, the chess lesson is primarily positive; there is a pronounced positive attitude towards chess. Children especially like the various manifestations of active learning, mostly play and positive feedback from the teacher. Children especially or mostly dislike **the disciplinary problems that arise and the complexity of the subject**. Perhaps this is understandable and legitimate because, for many, the complexity becomes a reason for not participating in the class and for indiscipline. At the same time, the subject of chess is aimed initially at preventing unruly behaviour.

- The answers to "**What can I do independently in chess class?**" were grouped around playing and self-efficacy. We think there is an excellent potential for development here because it is possible and necessary to promote children's self-efficacy through the game, which the children are indirectly informed about. This is also evidenced by the answers to the next question, where the children indicate **the game as their most successful activity**.

- **The question of solving the problems** was huge, and it was also evident that the inequality of abilities was too great in both groups, which could negatively affect the quality of learning. This



is also evidenced by the answers to the need for help, where the children mainly pointed out the need for support from the teacher **in overcoming the complexity**. It is also noteworthy that according to the children, the teacher praises them primarily *for discipline*, sometimes for answering questions correctly, and rarely *for good play*.

▪ Children associate their success in chess with the teacher's help and efforts, but according to the same children, teachers help them by giving them *hints, additional explanations, and advice*. Perhaps it is straightforward and logical if we do not take into account the fact that at least sometimes this help is not perceived as enough to overcome the complexity of the subject, as well as the fact that the children's answers sometimes do not contain enough concreteness, especially from the point of view of the help provided. Therefore, it is desirable to take additional measures to make the provided support more targeted, personalize the educational process, and prevent educational inequality.

Recent studies (Schonert-Reichl, 2017.; Grossman & Kerr, 2020; **Hromek et al., 2009**) have outlined the importance of social awareness, self-regulation, reflection, establishing a positive learning environment, responsible decision-making in fostering a reflective and emotionally aware classroom environment, which encourages students to develop critical thinking and reflection, mainly through guided activities like chess. Within current research, we had the opportunity to observe several cases where, by encouraging joint play and discussion, teachers could guide learners to share their experiences and insights, developing critical thinking and reflection. Teachers helped learners consider their classmates' thoughts and feelings during play by promoting understanding of others' points of view. This created a positive learning environment where mistakes were seen as learning opportunities.

**Study limitations.** As the research undertaken is more pilot, one study limitation was the sample size of participants. A larger sample size or replication of the study in different settings could enhance the reliability of the findings. Also, detailed statistical analyses of the results would add rigour to the study. Thus, we expect to extend the research by implementing multivariate regression models to explain the interactions between students' reflections and chess knowledge.

## CONCLUSIONS AND FINDINGS

Summarizing the research, we reached the following conclusions:

1. Although students mainly perceive the teaching of chess positively, structuring the

lesson process and strengthening the reflexive environment are still problems.

2. As a result of the research, it became clear that most children found it challenging to identify specific issues that were causing them difficulty. However, some children did identify specific issues and topics or areas. Among the mentioned problems, the students' difficulties due to the complexity of the subject prevailed, which can hinder the complete learning of the subject. We also think that if there is a shortage of class time for the subject, this problem can become fatal and deprive children of the opportunity to learn chess effectively.

3. As a direction of further research, we think it would be adequate to involve teachers in developing students' reflections to identify typical case situations and solutions. Teachers would share their experiences in developing students' reflective abilities.

4. By integrating social-emotional competencies into chess lessons, teachers can create an environment that supports students' emotional and social development while enhancing their reflective skills in a game that requires strategic thinking and decision-making.

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