

Conference

Importance of critical thinking in the school chess context

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Some educational systems are not educating children capable of facing the challenges of society at the beginning of the 21st century. Such is the case of nations like Nigeria and others, whose education systems are producing school-aged children who rarely use critical thinking skills to solve complex, real-world problems (Mefoh and Ugwu, 2013).

To address such a situation, these authors propose that "curricula should be revised to enable school children to learn to think playfully". In their study, they demonstrated that the game of chess is an appropriate pedagogical strategy that can systematically stimulate critical thinking in school children.

When we speak of critical thinking, we are referring - precisely - to one of the most valued skills in education. In general terms, "critical thinking" implies the exercise of permanent doubting and questioning; of expressing uncertainty about judgments, dogmas, stereotypes, assertions, and absolute axioms, which are present in our environment, such as, for example, stereotypes and so-called "fakes news". With a critical stance, the individual tries to have a justified idea of reality and not to blindly accept what others tell him or her or what he or she is informed about.

Regarding "critical thinking", Sternberg indicated that "it is the processes, strategies and representations that people use to solve problems, make decisions and learn new concepts" (Robert Sternberg 1986). It is for this and other qualities that critical thinking is a widely accepted the educational objective in most educational systems, based on respect for the dignity, autonomy, and preparation of students for successful citizenship.

Based on this reality, we consider that the research problem focuses on "The need for the elaboration of a pedagogical strategy that, associated with systematic chess instruction stimulates the emergence and development of critical thinking in school-age children". Among the purposes of education are: intellectual formation, the appreciation of science, art, sport, work, and philosophical thought. Education seeks human excellence and happiness from a very early age, and it does not end. It is permanent (León, A. 2012; ULA).

Several important constructs appear in this definition: intelligence, discipline, philosophical thinking and sport. In relation to these, it is pertinent to point out that in the work "**Chess teaching system**" (Blanco, U./ FIDE Edit. 2000), it is stated that the inclusion of chess in school is justified because chess "stimulates the development of cognitive skills such as attention, memory, intelligence, critical thinking, logical-mathematical thinking, etc.; fundamental capacities for the evolution of the individual. In chess, we are interested in students identifying information present in positions produced throughout a game, analyzing this information based on general positional principles and evaluating them in order to

apply the necessary knowledge and understanding in the development of action plans and decision-making.

Thus, the general objective is "To outline a set of pedagogical strategies - using a specific methodology for teaching chess - that stimulates the development of critical thinking in school-age children". A true educational objective is the recognition, adoption and application by students of criteria and standards that contribute to the acquisition of the knowledge, skills, and dispositions characteristic of a critical thinker. From this training, the skills acquired will lead them to think critically when appropriate. In the classroom, critical thinking is expressed when students analyze, evaluate, interpret or synthesize information and apply creative thinking to form an argument, solve a problem or reach a conclusion. It involves a methodical and thorough type of thinking aimed at achieving a goal.

In the aforementioned "System" we find that is based on the formulation of instructional objectives based on Bloom's Taxonomy, B. (1971), who established a categorization by levels for the cognitive domain, namely: knowledge, comprehension, application, analysis, synthesis and evaluation. This taxonomy used the phrase "intellectual abilities and skills" for what some had called "critical thinking", "reflective thinking" or "problem solving" (Bloom et al. 1956).

Thus, the so-called "higher-order thinking skills" at the higher levels of analysis, synthesis and evaluation of the taxonomy are only critical thinking skills (Ennis 1981b). Later, the revised version of Bloom's taxonomy (Anderson et al. 2001) similarly treats critical thinking as something that cuts across those types of cognitive processes that involve more than remembering (Anderson et al. 2001: 269-270).

As for creative thinking, it overlaps with critical thinking (Bailin 1987, 1988). That is why thinking about the explanation of experiences such as, for example, the unfolding of a game of chess demands creative imagination to construct explanatory hypotheses and to pose alternatives for new courses of action. So, in its most basic expression, critical thinking occurs when students analyze, evaluate, interpret synthesize information and apply creative thinking to form an argument, solve a problem or reach a conclusion.

Also, devising creative ways to solve unfamiliar or complex problems. Here it is pertinent to point out that a valid pedagogical strategy for the stimulation of critical thinking in students participating in chess courses in schools could be referred to in the aforementioned "**Chess teaching system**".

For example, in relation to the content of the Level III program, it is structured in three units, namely: Positional Analysis, Positional Evaluation, and Variation Planning and Calculation.

The purpose of this level is to introduce the student to the processes of positional analysis and evaluation, planning, and calculation of concrete variations that respond reliably to the demands of the resulting positions on the board. It is believed that mastery of the processes mentioned above will allow the student to go deeper into the chess event, to appreciate more objectively the spirit of the positions, to develop his analytical capacity, to confront with a greater possibility of success the problems posed in the different phases of the game and to make decisions based on reliable criteria. For this reason, it is hoped that the development of this course will allow the following goals to be achieved:

Unit I to appreciate positional analysis as the basis of the chess player's critical thinking.

Unit II Recognize that the processes of analysis and synthesis complement each other in the precise evaluation of a given position.

Unit III Judge the process of game planning as an expression of the chess player's creative thinking.

As an example of Unit I, corresponding to "Positional Analysis" is the specific objective No. 7: To specify tactical-combinatory motives, which generate positional advantage. Content: Positional combination: concepts and types.

For the evaluation of this objective, the teacher will consider the objective to have been achieved when the students:

- Formulate, in writing, a concept of positional combination.
- Name, at least, five types of positional tactical-combinatory motifs.
- Solve at least three out of five exercises in which positional combinatorial methods are used.

Unit II, on "Positional valuation", contains instructional objective No. 21: Deduce the strategic implications of the presence of open lines in given positions.

Content: Open columns, ranks and diagonals: rook, bishop, and queen activity.

Here, the teacher will consider the objective achieved when the students:

- State, at least three reasons, why they consider it important to master the open column, in particular through the action of the rook(s).
- Identify attacking procedures on the enemy castling, based on the use of open horizontals.
- Recognize the importance of the domination of open diagonals, by the bishop(s), aiming at the enemy castle.

While in Unit III, referring to "Planning and calculation of variants" we can find the instructional objective No. 32: To organize attacking procedures, which allow the vulnerability of the castling to be exploited.

Content: Attacks on the castling: conditions. Vulnerable castling: characteristics; counter castling. On this occasion, the teacher will consider the objective to have been achieved when the students:

- Establish the necessary conditions, for a successful attack on the castle.
- Point out weaknesses present in the castling of given positions.
- Identify typical attacking procedures against the castling.
- Arrange at least two distributions of pieces and pawns on the board that allow a successful attack on the castling.

To play chess well, the player must attend to and understand chess positions and deduce models or patterns of relationships between the pieces. In addition, he/she must formulate and evaluate possible moves, which implies the presence of executive functions and critical thinking. Based on this criterion, it is hoped that, at the end of the third level of the "**Chess teaching system**", the student will be able to exhibit the minimum necessary skills and abilities that will enable him/her to participate with a greater probability of success in performance chess, i.e. in tournament practice. It is estimated that their basic training will have already been completed in order to begin with the training and consolidation of concepts, principles, and techniques, which will initiate them on the arid path of the practice of experience, leading to chess mastery. In this sense, we can conclude that the

importance of critical thinking in the context of school chess is derived from various studies that suggest the educational benefits of teaching chess in schools. (Christiaen and Verholfstadt, 1978; Liptrap, 1998; Bart and Atherton, 2004).

Other research (Celone,2001; Ferguson, 1995; Frydman & Lynn, 1992; Liptrap, 1997) has shown that chess instruction leads to improved academic performance. This improvement is likely to be mediated by pervasive critical thinking involved in the analysis of the game of chess.

Thus, playing a game of chess promotes critical thinking skills, increases concentration and perseverance, as well as the ability to invent solutions to problems (Dauvergne, 2000). Also, a rule-based game such as chess can lead to cognitive engagement that can have a positive impact on children's cognitive skills (Johnson, 2006). Chess instruction significantly improves the mathematical skills and metacognitive abilities of school-age students (Kazemi et al., 2012).

Other studies support the view that chess training has positive cognitive effects on regular school-age students. This includes students with disabilities (Trincherro, 2013). Storey (2000, p. 47) recommended that teachers consider "chess as an instructional strategy to reinforce skills such as concentration, problem identification and solving, planning strategies, creativity and fluid thinking".

Finally, a set of pedagogical strategies - using specific methodology for teaching chess - such as the one proposed in the "**Chess teaching system**" could favor the development of critical thinking in school children, probably the most important skill to be developed by our educational systems.

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