

## CHESS AND THINKING

## Abstract

This article defines the chess impact on the formulation and development of thinking. Children's thinking development is taken into consideration through the chess tasks and resolution of the problems with one and two moves. We consider the understanding scheme of problem solving through the simple chess tasks' discussion.

We consider the mate creation by the Queen and Knight, in order to solve the problem. The possible move of the piece is pointed to show the mate. The task's solution is simplified through the analysis.

To understand the solution of the mate problem in two moves, once again we applied schematic thinking.

*Keywords:* chess, field, chessboard, horizontal, vertical, diagonal, king, queen, pawn, move, stalemate, checkmate.

Chess is the very game that can be taught at any age. It stands out among the sports as it may give a chance to a 10-year old player to win over an experienced opponent. There are plenty of studies evidencing that chess is not only interesting but also rather useful: it improves a number of qualities which are necessary for further achievements in both studies and work. The following mental qualities ap-

pear to boost through chess: memory, concentration, critical thinking, logic, imagination, creative thinking, etc. The chess assignments introduced below are to illustrate the ways that thinking functions at a chess game.

In this example, it's whites' turn to move; mate in three steps (Tumanyan, 2015b, p. 31).



Diagram 1.

In their attempt to solve a chess problem, children begin to concentrate which helps them to visualise the assignment more vividly, thus, gaining the picture of possible solutions in mind. In order to solve this problem, the player might think this way: if we remove h4 pawn from the board, the whites will not be able to win, eventually, resulting in a “dead-heat”. Consequently, the whites win over the blacks with the help of h4 pawn, i.e. the whites

will be obliged to give the black a chance as in case the blacks take a step, the play would result in stalemate. If the white queen is able to appear on c1 field, the game would result in checkmate, but the queen would be enabled to move onto the square c1 in two moves which subsequently might assume that the white king is obliged to give a chance to the black pawn on h4 square to move. And this is possible to realise through 1.K3-g4 move (see Diagram 2).

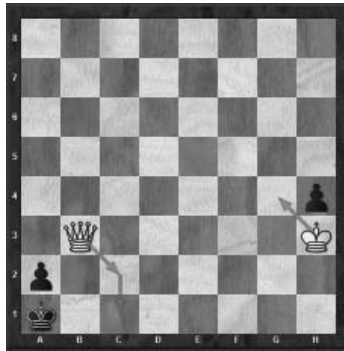


Diagram 2.

The blacks’ move 1...h4-h3 is followed by 2.Qb3-c2 h3-h2 3.Qc2-c1#.

The analysis of the task makes us infer that the chess assignment boosts children’s concentration. According to some experts, thanks to chess, the children’s brain activity gets certain stimulation. As it has been proven, chess improves children’s analytical and critical thinking, sight, particularly, at the second and third grades which contributes to the speed of children’s mental development. Chess stimulates the intellectual capacity. As claimed by the results of some researches carried out in Venezuela, the

improvement of intellectual capacity of children who dedicated to chess in the course of 4 months is obvious. In 2003, Dr. Murray Thompson arrived at similar conclusion. During his research, those participants who played chess showed an obviously higher level of intellect. Thompson attributed this to the respective degree of concentration and logical thinking fomented via chess.

In the game introduced below, it’s white’s turn: checkmate in one move (see Diagram 3) (Tumanyan, 2015a, p 73):

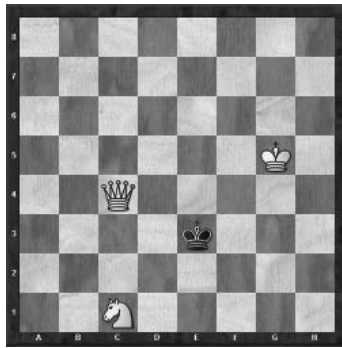


Diagram 3.

If we remove from the board the white queen, and grant the blacks with the right to move, the black king might take the respective moves onto d4, d2, e4, f3, and f2 squares. Consequently, the white queen must

move onto a field from where it would be possible to set a control over the squares mentioned above. The field under search might be found on diagonals d, f and on the crossing with the 4 horizontal line (see Diagram 4).

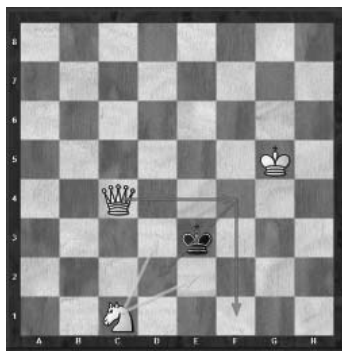


Diagram 4.

Chess develops also the mathematical abilities.

In 1998, James Smith and Robert Cage carried out a research titled “The Effects of Chess Instruction on the Mathematics Achievement”. The researchers showed that chess might contribute to the development of mathematical capacities among children. The participants of the experiment were the school-children of African-American origin who were

taught chess during 120 hours. After the chess course, the results of the math tests taken were particularly high among those children in comparison with those who had not covered the course of chess. Dr. Erik Gotieb thinks that the ability to anticipate several moves ahead is the major guarantee for the success in math among chess players.

In the position given (see Diagram 5) it’s whites turn to move: checkmate in two moves.

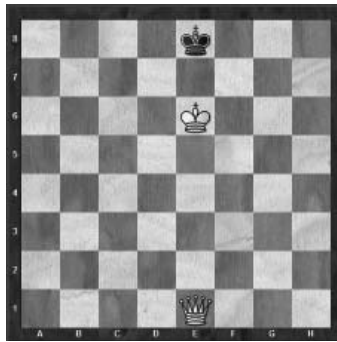


Diagram 5.

This chess problem may have three solutions. In order to find at least one of the solutions it is necessary to imagine the checkmate position, after observing the blacks moves. For example, if the blacks' king move onto d8 square, the white queen may cause checkmate from b8 or d7squares, and if the king move onto f8 square, it might result in checkmate from h8 or f7 squares. However, the white queen cannot move onto the 7<sup>th</sup> horizontal,

consequently, we are not going to observe checkmate from d7 and f7squares. We'll observe the checkmates from b8 and h8 squares , namely, our task is to move the queen from e1 square onto the field from where we might simultaneously control b8 and h8 squares, while the square required is possible through the crossing among e diagonal, b8 and h8 line which, in fact, is e5square (see Diagram 6).

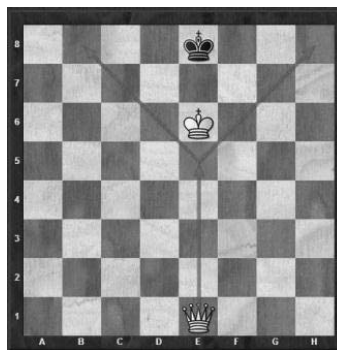


Diagram 6.

The solution found can be considered as the basic one with the help of which we may find the other two solutions. Let's make the black king move from b8 or h8 fields in one direction. Thus, what is the field that we must move our queen onto so that the black king appears in a position with only one possible direction to move? At the same time, the

queen must also keep the control over squares b8 and h8. The fields under search might also be found through the line crossing, the lines going through the fields h8 , d8 and e1 will cross on square h4, whilst, the lines through squares b8, f8 and e1 cross on b4 square. This is more vividly shown on diagrams 7 and 8 below.

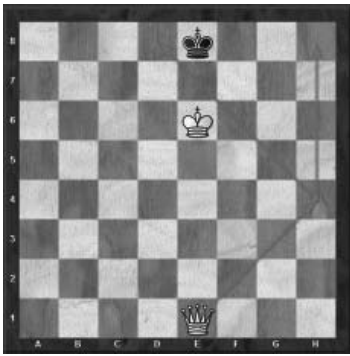


Diagram 7.

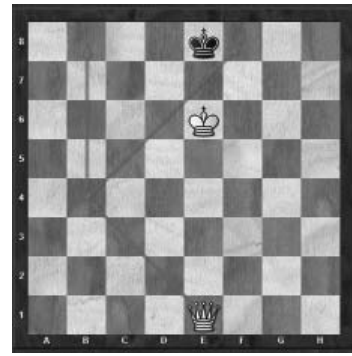


Diagram 8.

The judgements detailed above are based on imaginative and logical thinking. Therefore, if these kinds of thinking appear less developed among children, the respective chess assignments might contribute to their development creating the relevant bases for imaginative and logical thinking.

Chess might also contribute to the development of verbal capacity.

Wechsler's intelligence scale is one of the IQ test designed to measure intelligence and cognitive ability in adults and older adolescents.

Wechsler's intelligence scale comprises the respective verbal and non-verbal performance scale tests. The verbal performance scale test is designed to reveal the following intelligence components (indexes):

- General information,
- Comprehension,
- Perceptual organization,
- Working memory,
- Ability to trace similarities and that of contrasting,
- Digit span,
- Ability to classify,
- Matrix reasoning.

In the years 1973 and 1974, Dr. Albert Frank, a school headmaster in Zaire, conducted

a study on the impact of chess on the children who had two-hour per week chess course. Later the results of the research were published in the book "Chess and Aptitude" that evidenced unique results. After the chess course, he came to the conclusion that the children who had been involved in chess lessons, had improved their verbal and arithmetic abilities. How can chess boost the verbal skills? Frank claims that while playing chess, under no actual verbal interaction, chess, however, foments the deep individual potential of verbal intercourse.

### Conclusion

The facts introduced above may infer that chess plays a great role in the process of developing child's mentality. Chess, in particular, improves concentration, imagination, logic, creative thinking, memory, critical thinking and planning. Certainly it is a great means to improve volitional qualities of children, particularly, the ones of objective evaluation, the ability to lose with dignity, righteous judgment, philanthropy and the ability to orientate.

Finally, it should be noted that learning to play the game of chess is useful regardless of age; however, it becomes more productive when learned at an early age.

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