

ORIGINAL ARTICLE



Effects of the Lateral- and Double-Thinking Strategies on the Chess Positions Solving and Performance Time

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ABSTRACT

Background. The game of chess, which is viewed as a symbol of intellectual prowess, is a valuable educational tool which can improve cognitive behavior such as thinking models, etc.; but the effects of thinking strategy such as double thinking strategies (DTS) and lateral thinking strategies (LTS) on the chess performance is not investigated. **Objectives.** This study aimed to measure the effects of the LTS and DTS on the chess positions and their performance time. **Methods.** Fifty-six university students selected 91 volunteer participants and divided randomly into two equal groups ($n = 28$) of LTS and DTS. Two educational training sessions per week conducted for eight weeks (16 sessions for each strategy totally). Training sessions held to educate consisted of four and three steps for LTS and DTS, respectively. **Results.** Both LTS and DTS increased the chess position significantly, but DTS could improve it substantially more than LTS ($p < 0.001$). Also, LTS and DTS decreased performance time significantly, but DTS could more reduce it significantly ($p < 0.001$). **Conclusions.** However, both strategies improved both the chess position and performance time of the players, but DTS could improve it more than LTS.

KEYWORDS: *Lateral Thinking Strategy, Double Thinking Strategy, Chess Positions, Performance Time*

INTRODUCTION

The game of chess, today, is considered as a useful educational tool. It was able to improve some academic skills and general cognitive abilities such as intelligence and concentration (1). The chess is one of the intellectual games that require high mental effort in analyzing the multiple positions and abundance of the parts contained in this game, and diversity movements of each piece in addition to it requires speed in performance. The chess, like an art, mostly fascinates psychologists because it maybe has produced displays of expertise sometimes viewed as the peak of human achievement (2). In this line, chess has recently started to become a part of the school curriculum (as an optional subject) in several countries. Chess-related research and

educational projects are currently ongoing in the United Kingdom, Spain, Turkey, Germany, and Italy, among other countries (3). It is also one of the games approved in the curriculum of the Ministry of Higher Education in Iraq from during establishment of sports championships in Iraqi universities.

On the one hand, Thinking is defined as the general human ability to problem-solving. In other words, it is a process in which one tries to identify the problem that he/she is facing and to solve it using his/her previous experiences (4). Today, the changes and the complexity of the world make difficult our thoughts not only to future but also to tomorrow. And this question is considered that do the people capable to challenge

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with, and problem-solving in, this changeable future? (5). High level, complicated and active Thinking does not achievable by chance. Long-lasting intellectual development needs the necessary elements to come together (6). Underling the processes of expert decision making is one of the critical challenges for cognitive science (7). It is showed that there is two most commonly process for expert decision making: fast and slow process (8). On the other hand, the ability to play chess generally depends on two types of methods: slow processes such as search, and fast processes such as pattern recognition (7). So, this game is one such activity that helps to teach general strategies, such as problem-solving, learning, and reasoning heuristics (3, 9).

Besides, the more skilled the chess player, the higher his or her level of cognitive ability (3). In other words, the players of chess need to improve their skills and their related processes. There are thoughts that improvement of the lateral Thinking and double thinking strategy of players in solving the chess positions is to enable them to develop their potential in this game. Lateral Thinking is a style of problem-solving taking indirect and creative strategies via reasoning that is not instantly obvious (10). The focus of lateral Thinking is on what could be rather than what is possible, and it centers around the following instructions: a) Distinguish the premier ideas that polarize the problem perception, b) Searching the different ways to pay attention to things, c) Use flexibility in Thinking, and d) Use the chance to support other ideas (11).

Double Thinking is irrational thinking to distort reality in the word meaning. So, thinking "double thoughts" and living "dual lives" are experienced widely among cultures (12). But in another context, it can be a test of top-quality intelligence to hold two contrary ideas in mind at the same time and still maintain the ability to function (13). However, the role of lateral thinking strategy is sowed in creative Thinking and problem-solving and so the cognitive behaviors (3-5), or the role of chess playing on the lateral Thinking (3, 14). But there are not any facts about the training of oblique thinking strategy on chess playing performance. Besides, it is found only one study about the effect of mini-game training on double Thinking (15), but there are not any reports about the practice of dual thinking strategy on chess playing performance.

So the aim of this study was the effects of the lateral- and double- thinking policies on the chess positions and their performance time.

MATERIALS AND METHODS

Research Models. Two approaches were used: 1. the descriptive approach of the survey to determine the chess positions, its tests, and identification of the chess players in the different faculties, and 2. the experimental method of two equal groups using lateral and double thinking strategies for solving the chess positions with the pre- and post-tests model.

Participants. All students of Sciences and Humanities faculties (Engineering, Materials Engineering, Information Technology, Science, Pure Science Education, Basic Education, Physical Education, Arts, and Education for Human Studies, Law, and Islamic Studies) of the University of Babylon were called for participation and 91 students, who knew chess game, volunteered to participate in this study. Sixty-four students reached their readiness to develop this game; they divided into two equal groups ($n = 32$) of lateral thinking strategy (LTS) and double thinking strategy (DTS). The two groups were matched through the training history, the time and number of steps to resolve the chess positions. Finally, 8 (from both LTS and DTS = 4) students excluded from the study because of at least three sessions absent from their strategy training.

Procedures. The surveys were conducted for two days on 25 students who did not know the main experiment, and its purpose is to determine the scientific basic, knowledge ease, difficulty of the procedures of the research and the number of students who can solve the tests, time testing and efficiency the assistant work team (four trainers and referees in chess), and that the difficulty faced by researchers is weakness of students' knowledge of the method of registration of transfers, and this was addressed by clarifying some information about the listing by researchers and the assistant work team.

Scientific Foundations. Based on sincerity of the experts and specialists in the chess game, it has been introduced 15 test in the chess position on 10 of the international coaches from the unions and clubs in the chess game and was agreed on 14 posts obtained the value of chi-square (X^2) is 10 and 6.4 were more than the table value of 3.84 at the significance level of 0.05 and degree of freedom of 1, and one position was rejected.

Procedures. Based on the midterm retail of tests of the chess positions, the first half carries the individual tests, and the second half marital tests and the correlation coefficient value (Spearman-Brown) were extracted between half the number of chess position tests reached 0.71. To obtain the value of the total stability of the tests, use a correlation coefficient (Pearson) is 0.83, which is a high stability value instability test to solve chess positions. The objective was determined by knowing the number of those who reached to solve the positions on those who did not reach to resolve the areas, and the ratio was 0.84 where 21 students explained all chess positions tests, and four students did not reach the complete solution. The answer time was determined on all checks from 19 to 28, with a rate of 23.5 minutes distributed on the 32 shift as a result of 44 seconds per turn.

Essential to correcting tests of the chess positions: The experiments carried out by the experts were distributed in 14 tests distributed on 32 shifts giving 0 for the wrong turn and 1 for the correct change, thus the lowest value obtained by the student in the experiment 0 and the highest degree of 32 degrees.

The Steps of LTS (16). 1. Generating new perceptions: to be a learner understanding or aware of things by thinking about them through

decision-making, solving problems, judging things, or doing something. 2. Generating new concepts: includes scientific theories related to what the learner tries to achieve ideas to describe the amount of impact that will result from a work and valuable concepts that indicate how the work gets through the value. 3. Generating new ideas: They are the real ways to apply concepts through optimism towards improving and building the concept rather than the quick rejection of ideas. 4. Generating new alternatives: by rearranging and organizing available information and creating new solutions instead of walking in a straight line.

The Steps of the DTS (17). 1. A kind of Thinking gives the person a more excellent vision, clearer meanings, and more possibilities for anything, whether negative or positive, to clarify the right were to be in the end. 2. An excellent way to discover things around us is simply a comprehensive view of what must be exploited and developed skills, from the possibility of the individual to carry the idea and the opposite and consider them valid at the same time. 3. The power to be convinced of two contradictory beliefs at one time and one mind and to accept each other. The dual thinking rule allows the individual to escape from his Thinking and save him from coercion and fear of freedom when he adopts two divergent views.

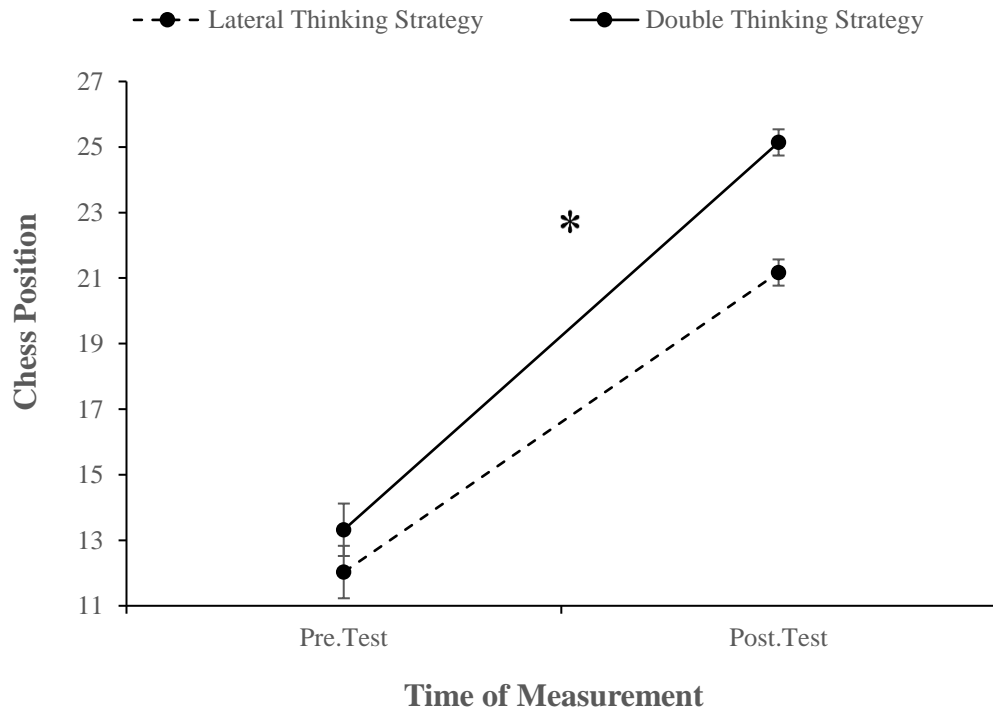


Figure 1. The Effects of Lateral Thinking Strategy and Double Thinking Strategy on chess Position.
*Significant difference (interaction effect of GROUP \times time) at $p < 0.001$.

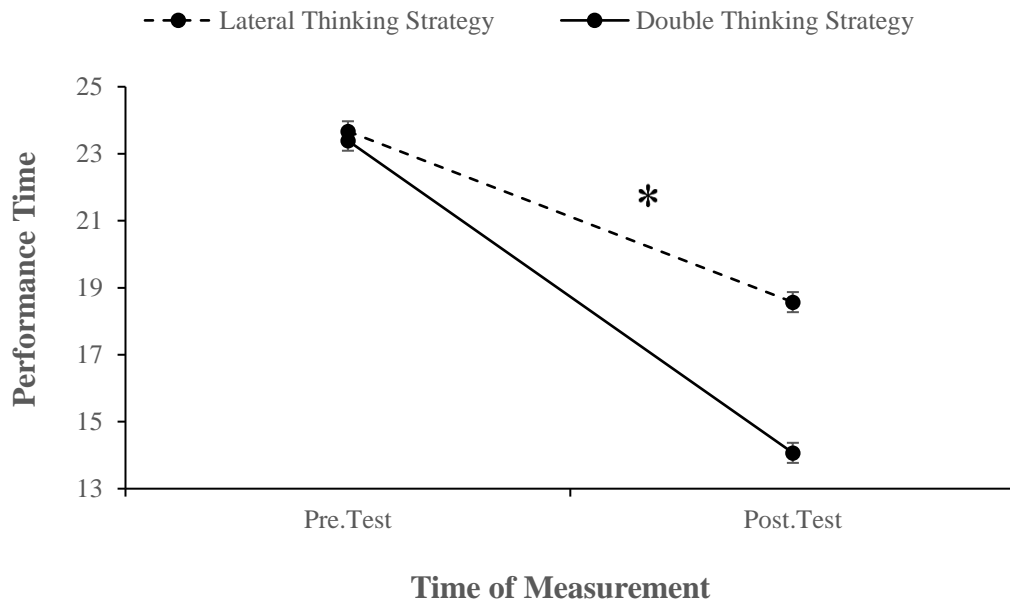


Figure 2. The effects of Lateral Thinking Strategy and Double Thinking Strategy on Performance Time.
*Significant difference (interaction effect of GROUP \times time) at $p < 0.001$.

The Main Experiment. The primary analysis was conducted for eight weeks in 32 training sessions. There were four educational training sessions per week: each strategy had two educational training sessions; so, each plan had 16 educational training sessions. The sample was divided into two groups, each group consisting of 28 male and female students. The first group depends on the LTS, the most significant number of solutions for each shift without analyzing the role with the colleague. The second group is done through the player alone for a minute to two minutes to a specific position and then cooperates with another player in analyzing the shifts to reach the best solutions and then discuss these solutions from other players in the same position solution. After the end of the period of application of the main experiment by relying on LTS and DTS, post-tests were conducted for the sample with the same test the chess position.

Statistical Analysis. The arithmetic means, the standard errors, and repeated measure ANOVA was used for a significant level of $p < 0.05$.

RESULTS

The repeated measures-ANOVA revealed that, however, both strategies improved the chess position of the players significantly, but DTS could improve it substantially more than LTS ($f_{1, 54} = 381.2$, $p < 0.001$, $\eta^2 = 0.27$). The repeated measures-ANOVA revealed that, however, both strategies improved the performance time of the

players significantly, but DTS could improve it substantially more than LTS ($f_{1, 54} = 1050.1$, $p < 0.001$, $\eta^2 = 0.95$).

DISCUSSION

With the aim of the effects of the LTS and DTS in solving the chess positions and their performance time, 64 students who know how to play chess participated in 8 weeks learning of LTS and DTS. It is found that both strategies improved both the chess position and performance time of the players significantly. LTS is a mode of Thinking which considered by Eduard de Bono, referred to the problem-solving by unconventional ways does not rely on logic with specific and classic form to distinguish it from other types of the Thinking such as vertical Thinking, which depends on the logical context between introductions and results (18), in other word, lateral Thinking is an excellent tool for presenting prevailing ideas in another side of the issue. The LTS includes new ideas, problem-solving, periodic re-evaluation, reduction of rigorous evaluation and polarization by opening for paths and other alternatives (10, 11). It seems that the practice of lateral thinking skills enabled the learner to think beyond the limits of traditional Thinking, and faces problems with better ideas for get immediate results, generate an idea through other approaches, design ways to solve the issues, develop new ideas, develop practices and turns the problems into opportunities for the invention (19).

Double Thinking is possibility of the expressing about the same concepts or ideas in different ways and recognizing the ideas or concepts contained in the answers of their colleagues with language of the learner, not in the style of the teacher and this way of Thinking contributed in rapid performance of tests by stimulating the thinking processes for students; students have the opportunity to be active in the process of learning which helps to keep the impact of education, (18, 20). Jabr (2018) concluded that football players have to train mini-games to help them reduce double Thinking (15), but they didn't investigate the effect of DTS on football performance.

Besides, DTS could improve both the chess position and performance time of the players significantly more than LTS in this study. This indicates that DTS has a prominent role in enhancing the capabilities of the player. The main feature of the Double-Thinking is its emphasis on the "divergent thinking" and "convergent thinking," where first many ideas are created, before refining and narrowing down to the best idea. This is happening twice in this model once to confirm the problem definition and once to create the solution. Once double-thinking is normalized at the level of society, it helps people to cope with the cognitive dissonance they experience in circumstances where it is difficult to change attitude and behavior. It also affects the organization of society by making different arrangements appear normal (12). Yas and Altimeme (2013) suggested a relationship between self-efficacy and the double Thinking, the self-sufficient in the capability on managing the positions of the convulsive nature, the more efficient on use of the double Thinking with high efficiency, and the self-inefficient in the ability on managing the situations, indicated the use of the double Thinking with less knowledge between university students (18).

All studies reported that the chess as an instructional strategy for reinforcing skills such as concentration, problem identification, problem-solving, planning strategies, creativity, and lucid Thinking (21) and the intellectual side requires more extended periods and more units learning. The clear-cut rules and well-defined environment of chess provide a model for investigations of

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1. Costa AL, Kallick B. Learning and leading with habits of mind: 16 essential characteristics for success: ASCD; 2008.

basic cognitive processes, such as perception, memory, and problem solving (22). The game of chess, which is viewed as a symbol of intellectual prowess (23), is a valuable educational tool (7, 21, 23) which can improve cognitive behavior such as thinking models and etc.; but the effects of thinking strategy such as DTS and LTS on the chess performance is not investigated. Doublethink is the recognition by all self-respecting scientists, at any one time scientists make do with the best they have. They hope to make progress with as much awareness of the limitations of their methodology as possible (24), and the lateral Thinking is a description of the lengthy intellectual process (25). This has led to the DTS has achieved better results in solving the chess positions and performance time. Therefore, the practice of intellectual activities, including a chess game, has an essential role in developing awareness of the students who participate. This is what distinguishes the chess player in the precise Thinking and speed of performance, as the speed in production without good Thinking leads to loss of play in the playing positions, and useful game without gear in performance of the shifts leads to decline the player in end of the playing time limit by the Organizing Committee in the competitions. Thus, the two strategies, especially the DTS, have contributed in development of the thinking capability and speed in performance of the game.

CONCLUSION

In this study, the effects of the LTS and DTS on the chess positions solving and performance time were investigated during eight weeks, in which two educational training sessions per week conducted (16 sessions totally) for each strategy. It is found that LTS and DTS increased the chess position significantly, but DTS could more increase it significantly. Also, both approaches decreased performance time significantly, but DTS could more reduce it significantly. So, however, both strategies improved both the chess position and performance time of the players, but DTS could improve it more than LTS.

APPLICABLE REMARKS

Training of the double thinking strategy can be proper for developing the abilities of the chess player, such as improvement of Chess Position and decreasing the performance time.

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