GAME OF CHESS ENHANCES CRITICAL THINKING IN SCHOOL CHILDREN: NEW CHALLENGE FOR EDUCATORS AND PARENTS

Mefoh Philip C.
and
Ugwu Lawrence E.
Department of Psychology
University of Nigeria, Nsukka.

Abstract
The world is moving toward an emerging creative class that values conceptual knowledge and original thinking, but ironically the current educational system in Nigeria is going in the opposite direction as if teachers are educating children for the 19th instead of the 21st century. The educational system seems to have adopted the metaphor of the child as “empty vessel”, pour in the facts and the child will passively absorb the material. School children are educated to think that there is only one answer. The result: school children seldom use critical thinking skills to solve complex and real-world problems. This paper posits that the current educational system that pressure school children to cram academic curricula and to perceive play as a waste of time need to be revised. If educators and parents hope that school children will join the creative class in the 21st century, to take Nigeria to the forefront of ingenuity and innovation, then the school curricula should be revised to allow school children learn playfully to think outside the box or to colour outside the lines. This paper demonstrates through a robust review of literature that the game of chess possesses a developmentally appropriate pedagogical strategy that can systematically motivate school children into critical thinking.

Keywords: Creativity; Critical thinking; Curriculum; Game of chess; Pedagogical strategy

Introduction
The situations in Nigerian public schools especially primary and junior secondary schools, where school children are encouraged to recite answers, to fill in the blanks, and not to go beyond the facts undermine government’s efforts to address critical thinking skills in schools. Critical thinking is important to enable students deal effectively with social, scientific, and practical problems (Shakirova, 2007). Critical thinking may be compared to the scientific method; it is a systematic and procedural approach to the process of thinking. School children who are able to think critically tend to solve problems more effectively than those who lack the ability to use it. Scriven and Paul (2007) defined critical thinking as intellectually disciplined process by actively and skillfully conceptualizing, applying, analyzing, synthesizing, and/or evaluating information gathered from, or generated by observation, experience, reflection, reasoning, or communication as a guide to belief and action.

Many educators and parents do not seem to believe that children can learn as they play and that through play children are motivated to learn basic skills they will need for success in life. Thus, instead of encouraging creativity (thinking outside the box), teachers are requiring
school children to memorize information. The classroom that used to display children’s work and drawings are now devoting their walls to ‘testing tips’ designed to help children do well on standardized assessments. This current educational trend that increasingly structure and standardize school curricula and cut back on recess undermines critical thinking skills in school children. The game of chess for instance is not merely an idle amusement; rather playing the game can help sharpen a player’s wit, increases his/her foresight, and strengthens the player’s ability to solve problems and to interpret the actions of others (United States Chess Federation, 1998). This paper therefore proposes that playing the game of chess can facilitate critical thinking skills in school children (classes 4 – 6 of primary school and all secondary schools students). The paper confronts the prevailing popular assumption that play is a waste of time or immaterial to children’s development.

Global changes in recent times call for innovations in the school curriculum (Ogunkunle, 2009). Thus, this paper calls for the introduction of the game of chess in senior primary and secondary school curricula (perhaps as an elective to other creative curricula, such as music and art) to gear school children into thinking critical thoughts. The objective of this paper is to show through an extant review of literature that the skills involved the game of chess, such as the ability to analyze and deduce ideas from a set of general principles, could be transferred to schoolwork to help school children think critically.

Game of chess in socio-cognitive development of school children

Many educational theorists wrote about the utility of play for children’s development. Piaget (1951) and Vygotsky (1978) viewed play as an adaptive behaviour that is instrumental in furthering children’s thinking processes. Children might count sets of small objects over and over for example, because they apparently gained pleasure from consolidating and practicing this burgeoning skill. Piaget and Vygotsky saw play as an opportunity for children to learn more about their world, to stretch to accommodate new ideas, and to foster their imaginations. Guided plays such as playing the game of chess bridges the gap between real events in the changing world of a child and the imagination within the child’s head. The game of chess is an intrinsically fascinating game; chess is a rule-based game and children learn immeasurably from rule-based game to make decisions that could help them solve problems flexibly (Mefoh, 2007). This outcome seems to stem from the identical element theory which posits that transfer of learning/skills from one task to a similar one is a specifically human characteristic. That is, transfer of learning depends on the proportion to which a learning task and the transfer task are similar.

Studies (e.g., Dauvergne, 2000; Ferguson, 1986; Ferguson, 1995) demonstrate that there exist similarities in the attainment of success in playing chess game and in achievement of high scores in school work. The game of chess has been found to enhance concentration, patience, perseverance, as well as develop creativity, intuition, memory, and the ability to analyze and deduce ideas from a set of general principles (Dauvergne, 2000). Chess game may lead to self-regulation skills, and this is central to the individual’s choices and decisions that may lead to the mastery of higher cognitive processes. Nigerian teachers and parents require her school children to be able to solve problems and make effective decisions. Unfortunately there are four barriers that impede the integration of critical thinking in schools. They include: lack of
training, lack of information, preconceptions, and time constraints. Elementary/primary and secondary school teachers know their content and receive training in the methods of instruction, but little if any of their training is devoted specifically on how to teach critical thinking skills. Broadbear (2003) argued that teachers often are not trained in critical thinking methodology.

Studies (e.g., Hirsh-Pasek & Golinkoff, 2003; Hirsh-Pasek & Golinkoff, 2006) show that rather than teach school children how to think; the current school curricula teach students what to think. Treating children like empty vessels whose heads can be filled with knowledge leads to problems. Children who have not learned to learn (i.e., children who are programmed and structured on core academic curricula), often learn less academically than their peers who are being taught concepts directly but in a more playful manner. Hirsh-Pasek and Glinkoff (2003) demonstrated that when school children are in environments where they have choices, and where they are encouraged to follow their interests, learning takes place best. The game of chess provides this opportunity and more. The great Soviet encyclopaedia defined chess as an art appearing in the form of a game. Chess encourages the artist hiding within an individual to come out, which challenges the player to become inventive. Playing the game of chess also facilitate friendships and promote cooperative pro-social behaviours and attitudes (Scott & Panksepp, 2003). Playing chess can be important for building social competence and confidence in dealing with peers- a life skill that is essential for functioning in school, as well as in everyday life.

**What studies show about the game of chess**

There is a pressing need in the opinion of many educators and parents to teach young people how to engage in critical thinking. This is based on the assumption that the earlier people learn to think critically the better they are likely to handle challenges and solve problems in life. Does the game of chess enhance critical thinking? Research shows that it does; many research studies have demonstrated that critical and/or creative thinking and entrepreneurial skills can be taught using the game of chess as a vehicle. Celone (2001) examined the performance of 19 elementary school children, whose ages ranged between 7 and 14, and who were selected for a week-long program of 20 hours of chess instruction. A pre-test post-test paradigm was adapted to test if the school children’s creative ability would improve following a 20 hour chess instruction. Result showed a significant increase between pre-test and post-test scores in both intelligence and domain specific problem-solving ability, with school children who took the chess instruction performing better than children who did not. In a related study, Liptrap (1997) found a sample of 67 school children who participated in a school chess club to demonstrate twice improvement in reading and mathematics compared to their peers in third and fifth grade levels who were non-chess players.

The game of chess is not merely an idle amusement; it is one of the most powerful educational tools available to strengthen a child’s mind. Rifner and Feldhausen (1997) showed that the game of chess can help a player to develop skills that can be critical to school success and everyday living. In a study that sought to determine whether school students who learned a general problem solving skills in one domain could apply them in a different domain, the researchers observed that this was possible only if teaching for transfer was an instructional goal. The addition of chess instruction to mathematics curriculum showed increased gain in
mathematics problem-solving and comprehension proportionate to the amount of chess in the curriculum. Similarly, Ferguson (1995) asked sixth grade children, who have no prior knowledge of chess, to participate in a chess lesson. At the end of the exercise, result showed that the children significantly improved in memory and verbal reasoning, thus suggesting that transfer of skills fostered through chess lessons did occur. Earlier, Margulies (1993) selected two classes each from five elementary schools in New York City, then dividing the classes into groups, the research taught one group logic and the other basic education. Result showed that after a 2-year period, the group that received instruction in chess obtained significantly higher performance score on the test material than the group that were trained in basic education.

Frydman and Lynn (1992) studied the mental abilities of young Belgian chess players; their mean age was about 11 years old, using the French version of the Wechsler Intelligence Scale for Children (WISC), a widely used IQ test consisting of a verbal and a performance scale. The researchers found that their sample had a higher general IQ than the population mean, as well as a higher performance and a higher verbal IQ. In another study with children, Horgan and Morgan (1990) found that the best chess players in their sample (mean age around 11) scored higher than the age-relevant norms on the Raven’s Progressive Matrices (an intelligence test measuring reasoning and “pure” intelligence) and on the Piagetian plant task (a task aimed at measuring children’s ability to use combinatorial logic in formal operations). Indeed, many decades of chess research has consistently shown the same result: chess is potentially essential tools that can be utilized to teach young people how to think. The game is fairly easy to play, it is like learning a language or music, and an early start can help a child become proficient.

Utility of chess instruction in schools

The demand of the present world calls for innovations in the school curriculum (Ogunkunle, 2009), and this proposal for the introduction of chess instruction in senior primary (classes 4 – 6) and secondary schools is a reaction to this clarion call. Child development experts proposed that children should be active to enhance their physical and cognitive competence. However, to assume that only excitable or boisterous forms of play are necessary for child development is to take a rather limited approach (Bergen, 2002). When a child plays a game of chess, it is just as much playing as when it is running around and shouting. Quieter forms of play, such as a game of chess, may probably be more powerful in providing additional opportunities for children to learn than most people realized. Studies (Dauvergne, 2000; Mefoh, 2007) show that rule-based games, such as a game of chess, can be a powerful teaching tool that offers a road to learning. The sophistication of interaction which players share with one another tends to impact positively on children’s cognitive abilities. The game of chess facilitates cognitive engagement, and the skills required to comprehend or win the game are making children smarter.

Several researches (Celone, 2001; Ferguson, 1995; Frydman & Lynn, 1992; Liptrap, 1997) have shown that chess instruction leads to improved academic performance. Probably, this improvement is mediated through enhanced critical thinking involved in analyzing the game of chess. Chess is a fairly easy game to learn and play; anyone from ages seven or eight can play the game. Unlike many other sports, old age is not a barrier to the game of chess. In fact, a young person can play an older person, and vice versa. Chess promotes imagination and creativity, it encourages a player to be inventive, and because the game is solution-based, it has
a positive impact on children’s cognitive skills such as critical thinking. Playing the game of chess is like doing schoolwork, it demand intellectual labour which makes a player to think deeply on how to achieve or reach a checkmate (i.e., to cease the queen and win the game), and these processes sharpens a child’s cognitive skills.

In conclusion, incorporating chess instructions and encouraging children to learn to play the game from their early ages can help build their minds in problem solving and to think out of the box or colour outside the line. This way, the children can discover new ways of solving problems or of becoming creative and more entrepreneurial. When children learn to think critically, the condition breeds a thinking generation that can foster economic development of the nation. Chess is a required curriculum in nearly 30 countries (Ferguson, 1986). Chess instruction has been part of the curriculum in Russia for over 40 years. In Russia, adolescents are encouraged to play chess at a very early age, and this probably increases their problem-solving and reasoning skills (Milat, 1997). In recent times, chess instruction is gradually becoming popular in many privately owned primary and secondary schools in Abuja, Nigeria because of its usefulness in promoting the creation of creative and entrepreneurial skills.

Conclusion

The data are incontrovertible; they have been telling the same story throughout the many decades of chess research. Playing a game of chess promotes critical thinking skills, enhances concentration and perseverance, as well as develops the ability to invent creative solutions to problems (Dauvergne, 2000). Most children love to play, and guiding them to play a game of chess is a win-win exercise: chess entertains the child and motivates academic, artistic, and creative skills in the individual. These researchers condemn the popular opinion, which view play, such as a game of chess, as a waste of time or that try to eliminate recess periods in schools. Rule-based game (e.g., chess) can lead to cognitive engagement, which can have positive impact on children’s cognitive skills (Johnson, 2006). Recess is adaptive; after recess school children return to classrooms refreshed and ready to learn. In Finland, a country that exceeds the United States by far in academic achievement, school children are given a 15 minute break every hour (Alvarez, 2005). Thus, rather than eliminate recess or play in schools, educators and parents need to discern the purposes for and the conditions under which play is an optimally useful pedagogical strategy. The call for the inclusion of chess instruction into the school curriculum (or at least into extra curricula activities) is a clarion call that is likely to benefit school children of senior primary and secondary school age. With a pedagogically friendly approach, a game of chess encourages the player to be inventive. Today’s school children require critical thinking to excel in what Friedman (2005) referred to as ‘flat world’, where everyone has ready access to the facts.
References


