

THINKING OUTSIDE
THE BOX-
ENHANCING
CREATIVITY WITH
CHESS
INSTRUCTION



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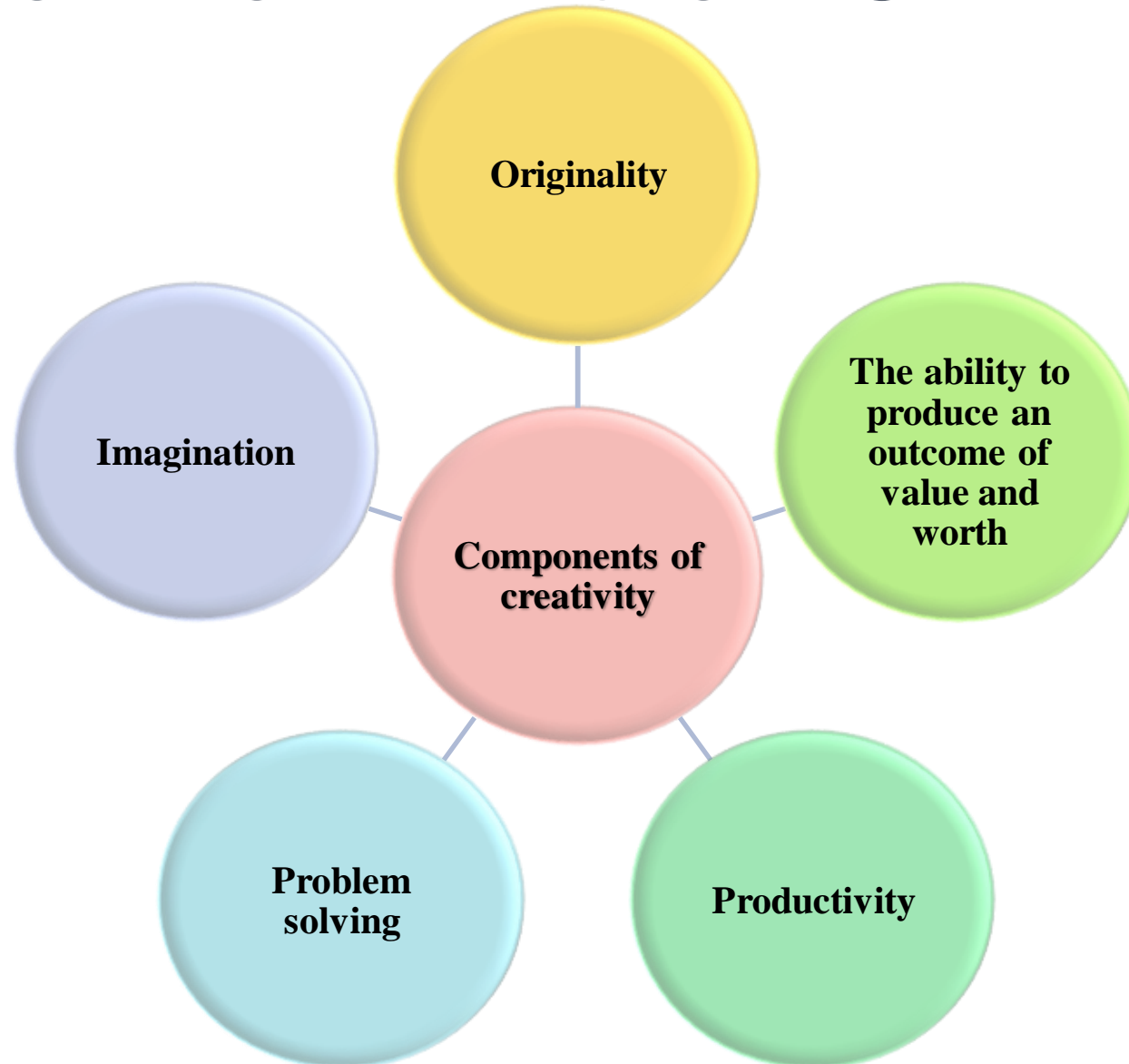


CREATIVITY

- Creativity is defined as the tendency to generate or recognize ideas, alternatives, or possibilities that may be useful in solving problems, communicating with others, and entertaining ourselves and others (Franken, 1982)
- Creativity is the ability to produce work that is both novel (i.e. original, unexpected) and appropriate (i.e. adaptive concerning task constraints) (Sternberg 1999: 3)



COMPONENTS OF CREATIVITY



CREATIVITY AND DIVERGENT THINKING

- Divergent thinker is a person who pushes the boundaries of ability and knowledge, and able to reconsider the problem to find a different perspective and solution and ignore distractions that can negatively affect his/her productivity (Saccardi, 2014).
- Divergent thinking allows individuals to create testable hypotheses, and make reliable evaluation of creative thoughts



CHILDREN AND CREATIVITY



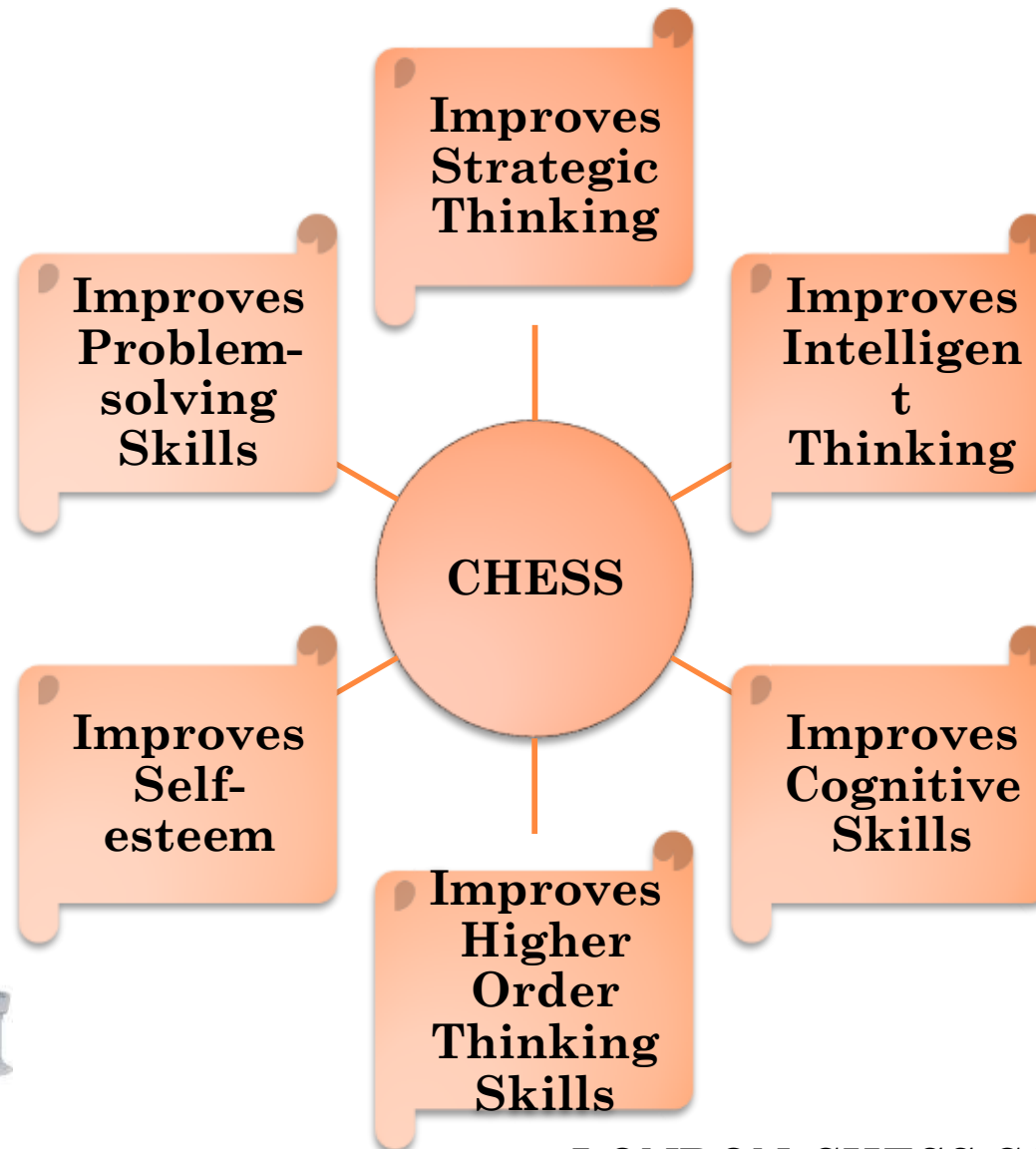
- In children, most creativity comes to light through their main activity – play.
- Creative play seems to fuel curiosity, flexibility, and improvisation and promotes problem-solving behavior that leads to learning, imitation, and adaptation to change
- Children as young as four -four and a half years old, master a variety of learning skills through questioning, inquiring, searching, manipulating, experimenting, and playing ([Torrance, 1969](#)). During this period, they seem to display creative behavior. This creativeness among children reemerges gradually between grades one to three (Torrance, 1964).
- Play has been shown to stimulate creativity ([Baggerly, 1999](#); Howard, Taylor, & Sutton, 2002; Mellou, 1995; Price-Coffee, 1995; Russ, 1996;)

INCREASE IN CREATIVITY

- There is a fairly common belief that creativity can be developed through training.
- Various recent studies that have assessed the effects of programs for stimulating creativity confirm this belief (Antonietti, 2000; Baer, 1996; Caf, Kroflic, & Tancing, 1997; Curnow & Turner, 1992; Fleith, Renzulli, & Westberg, 2002; Komarik & Brutenicova, 2003; Kurtzberg & Reale, 1999; Parker, 1998; Saxon, Treffinger, Young, & Wittig, 2003).



CHESS AND CREATIVITY



CREATIVE CHESS BY AVNI (1998)

According to *Avni (1998)*, an intelligent process consists of four different steps which can be used for a creative process that could also work in some other areas (Bushinsky, 2009)

SYNTHESIS

- Opinion forming and plan shaping

GATHERING

- Collecting the raw materials during position evaluation

ENLIGHTENMENT

- A sudden observation of an idea

REALIZATION

- Translating the idea into practical lines of play

NEED FOR THE STUDY

- In India, there are only a few studies on chess as a strategy to increase cognitive abilities. Further there are no studies assessing the impact of chess intervention on the creativity of children.
- If research can establish that creativity can be facilitated by playing chess, it can significantly impact educational programs to increase creative thinking.



OBJECTIVES AND HYPOTHESIS

- To analyze the effect of one year chess training program on the creativity of school-going children of both genders
- To assess its effect on the verbal and non verbal components of creativity.
- It was hypothesized that chess training would significantly increase creativity in children.



METHODOLOGY

Research
design

Pre-test
post-test
with
control
group
design.

Independent
Variable

Chess
training
program

Dependent
Variable

Creativity
of
children

METHODOLOGY

SAMPLE

- 64 children (32 in the experimental group and 32 in the control group)
- Both genders

EXPERIMENTAL GROUP

- Children selected purposively
- 10 girls and 22 boys
- Mean age-11.86 years SD 1.44

CONTROL GROUP

- Children were randomly selected using random numbers generated online
- 7 girls and 25 boys
- Mean age-12.03 years SD 1.14

TOOLS

- Creativity was assessed by Indian adaptation of Wallach-Kogan Creativity Test which focuses on divergent thinking and assesses both visual and verbal content.
- It is scored for fluency and uniqueness.
- In the present administration, a time limit of 3 minutes was given for each subtest.



VERBAL TESTS

INSTANCES

- Ability to name object which have common properties involving abstraction ability
- e.g., name all the round things you can think of),

ALTERNATE USES

- Ability to identify multiple uses for common objects which involves divergent thinking
- e.g., for a newspaper

SIMILARITIES

- Ability to perceive similarities between two different objects utilizing generalizing and abstracting ability
- e.g., How are a cat and mouse similar

VISUAL TESTS

LINE DRAWING

- Interpreting abstract lines

PATTERN MEANING

- Interpreting abstract patterns



CHESS TRAINING METHODOLOGY

- The training methodology comprised of Winning Moves Chess DVD Episodes 1–22, lectures with the demonstration board, on-the-board playing and training, chess exercise through workbooks (Chess school 1A, Chess school 2, and tactics) and working with chess software's.
- Further students games were mapped using chess base software and the brain patterns of the child were understood.
- They were taught the ideas behind chess openings and exposure to classical games were also given. The children participated in mock as well as regular tournaments.



PROCEDURE

Baseline creativity assessment was done after obtaining informed consent



The chess training consisted of once a week chess classes conducted for one hour during school hours at the end of the day.



Reassessment was carried after an average duration of one year.

STATISTICS

- The analysis was carried out using SPSS.
- Independent t test was used to assess between group differences in the mean creativity scores of total creativity scores and subtest scores.



TABLE 1: SHOWING THE SIGNIFICANCE OF THE DIFFERENCE BETWEEN THE MEANS OF THE EXPERIMENTAL AND CONTROL GROUPS ON THE CREATIVITY TEST USING THE INDEPENDENT T TEST

SUBTEST		MEAN AND STANDARD DEVIATION		t
		EXP	CONT	
TOTAL CREATIVITY	PRE	54.34 (16.73)	53.93(12.38)	0.11
	POST	61.22(18.87)	52.40(17.12)	1.95*
INSTANCES	PRE	13.81(6.25)	15.81(5.26)	-1.38
	POST	17.22(6.78)	16.78(5.92)	0.27
ALTERNATE USES	PRE	9.18(3.64)	10.09(3.03)	-1.08
	POST	10.87(3.6)	9.46(4.22)	1.43
SIMILARITIES	PRE	7.75(3.45)	7.96(3.52)	-0.25
	POST	8.93(4.42)	7.93(3.74)	0.97
LINE DRAWING	PRE	11.72(4.91)	9.96(3.99)	1.56
	POST	11.91(4.43)	8.65(4.04)	3.11**
PATTERN MEANING	PRE	11.88(4.61)	10.09(3.74)	1.69*
	POST	12.59(4.89)	9.87(4.11)	2.40**

*p< .05 **p< .01

TABLE 1

- Table 1 indicates that there was a significant difference between the means of the post-intervention total creativity scores ($p < .05$) indicating that chess training had significantly increased creativity.
- Significant differences between the post-intervention means were observed on the Line Drawing subtest and the Pattern Meaning subtest indicating that chess training had significantly increased the scores on these two subtests.
- For the Pattern Drawing subtest, the significance of the difference between the means had increased from $p < .05$ (pre-intervention) to $p < .01$ (post-intervention). No significant differences were observed on any other subtest.

DISCUSSION

- Results have established that systematic chess intervention increases creativity in children
- The children in the experimental group have shown increases in all the post- intervention scores, though not all increments have reached significance for the verbal subtests (Instances, Similarities and Alternate Uses)
- The children were taught chess systematically, strongly encouraged to challenge their own standards and also to play competitively.
- They analyzed their own games, identified their strengths and understood their mistakes. They were also given opportunities to pit their skills against others as they played in tournaments.
- It is clear that the outcome of this rigorous, yet enjoyable, training methodology was the increased creativity score.

DISCUSSION

- The Wallach-Kogan Test requires the child to think divergently, quickly and fluently, generating as many responses as possible on the different tasks. Similar abilities are utilized in playing chess where innovativeness and accuracy and both broad-based and precise thinking are required.
- The game of chess uses primarily visuo-spatial strategies. Systematic chess training inculcates in the child the ability to think divergently, visualizing the pros and cons of the various chess moves.



IMPLICATIONS

- Systematic chess training inculcates in the child the ability to think divergently, visualizing the pros and cons of various chess moves.
- It allows the child to conceptualize all the possible options and outcomes available to him/her.
- Increase in the creativity of children has far-reaching benefits for academic performance and generally for life skills.
- Systematically learning chess as part of school activities appears to have a broad spectrum of outcomes.
- The child who develops the ability to think in creative ways in playing chess is likely to transfer this learning to dealing with life challenges creatively.

THANK YOU

