

MiniChess Awakening Mathematical Cognition

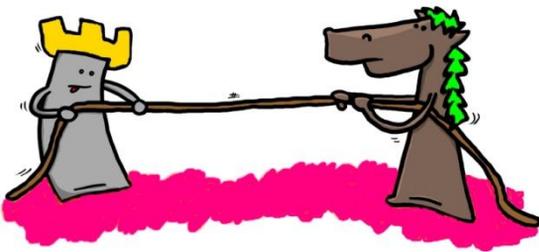


The Exploratory Study
by the University of Johannesburg

MINI**CHESS**

Vision & Goal

The **vision** is to allow every child to broadcast and share MiniChess with the community.



The **goal** of this study is to examine the correlation between mathematical cognition and playing chess.

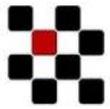
 The MiniChess program was developed over years of teaching chess to “entry phase” learners (5 to 9 years of age) as part of the school curriculum. It has already been used on a trial basis, with great success, at a number of schools in SA.

The learning process is broken down into small steps, building confidence while keeping it fun, and is in line with the skills level of the young child at that specific age)

<http://www.minichess.co.za/minichess/about-us/>.

 The goal of this study is to examine the correlation between mathematical cognition and playing chess. In doing so many children have an opportunity to learn how to play chess and ‘MiniChess’ program allows them to broadcast and share MiniChess with the community





Introduction & Background

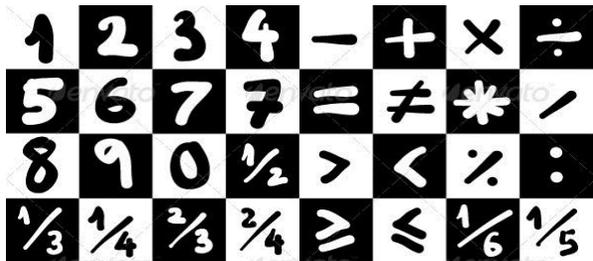


In South Africa the MiniChess programme (MCP) was introduced in some disadvantaged primary schools in Grades R to 3, having the backing of the Russian Grandmaster Gary Kasparov. In South Africa alone it has trained more than 1300

teachers since 2008 and it is active in more than 170 schools (MiniChess Programme. <http://www.minichess.co.za>). The University of Johannesburg in collaboration with MCP undertook to investigate the effects of chess on Mathematics for Grades R-3.



MiniChess as an Educational Tool

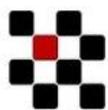


- Strengthen problem solving skills, teaching how to make difficult and abstract decisions independently,
 - Enhance reading, memory, language, and mathematical abilities,
 - Raise intelligence quotient (IQ) scores,
 - Foster critical, creative, and original thinking,
 - Provide practice at making accurate and fast decisions under time pressure, a skill that can help improve exam scores at school.
 - Teach how to think logically and efficiently, learning to select the 'best' choice from a large number of options
- Challenge gifted children while potentially helping underachieving gifted students learn how to study and strive for excellence
 - Demonstrate the importance of flexible planning, concentration, and the consequences of decisions
 - Reach boys and girls regardless of their natural abilities or socio-economic backgrounds. Taking into an account these educational benefits, chess is one of the most effective teaching tools to develop children.

(Dauvergne, P. , 2000

<http://www.auschess.org.au/articles/chessmind.htm>.)





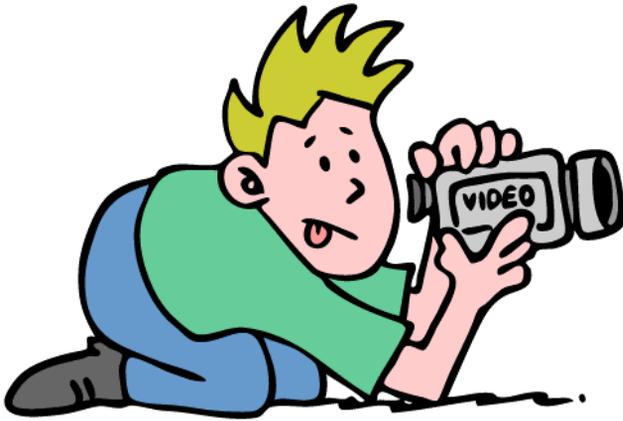
Analysis content by content

<u>Questions</u>	Math Abilities involved	Experiment (2016)		Control (2016)	
		Avg.	St. Dev.	Avg.	St. Dev.
No.1 & 8 (Gr.2)	Number sense	1.17 (7.34)	4.33	0.59	4.11
No.2 & 3 (Gr. 2)	Addition & Subtraction	2.06 (14.68)	7.93	0.29	8.51
No.11-14 (Gr. 2)	Recognizing shapes	0.00 (14.68)	3.82	0.00	3.96
No.15 (Gr. 2)	Patterns	5.36 (7.34)	4.77	0.15	4.26
No. 1 & 2 (Gr. 3)	Number sense	1.00 (8.34)	4.34	0.67	3.84
No. 4 (Gr. 3)	Addition & Subtraction	0.89 (5.56)	2.83	0.17	2.28
No. 7 (Gr. 3)	Fraction	0.00 (5.56)	2.50	-0.06	2.17
No. 9 (Gr. 9)	Reading graphs	1.39 (13.9)	9.04	-0.83	8.90





Video Analysis



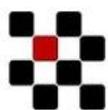
Time on task: The experimental learners were much calmer and spent time thinking about the problem before they could answer. The control group were quick to respond and guess the answers. When asked to explain what the problem meant, the learners in the experimental group had several alternatives to the meaning of the question.

The learners in the experimental group seemed comfortable to discuss and argue mathematics,

while the learners in the control group were more reserved and seemed to rush through their answers.

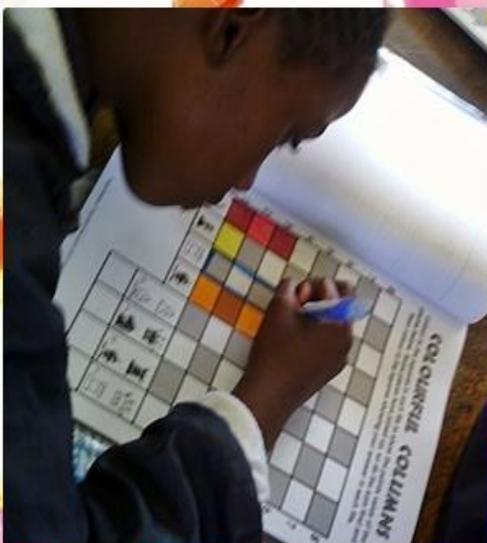
The level of analysis between the learners playing chess and those that were not playing chess was quite marked in difference. Those playing chess were relatively more analytical and engaged with the tasks at that level than the learners who were not playing chess.





HOW CHILDREN PARTICIPATE

Sportsmanship
Quiz
Colouring
Pieces Movements





Interview With Teachers



Teachers from the 6 experimental schools were interviewed at the end of the year.

- The teachers all agreed that learners loved MiniChess and were very enthusiastic and motivated about it;
- The teachers have noticed that learners seem to have improved in their attention span as they stay quiet longer than before;
- The teachers admitted that the learners social skills have improved;

- Almost all the teachers agreed that they do not see the link between chess and the curriculum;
- The teachers suggested that MiniChess must be part of the school curricula;
- The majority of the teacher confessed that they still cannot play chess and relied on the facilitators to instruct the learners.

