

# The Implementation of Chess into the Community College Curriculum

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# Background

- Class A Member of United States Chess Federation for the last 10 years
- 2007 Catonsville Chess Champion
- Mathematics Instructor at Howard Community College
- Created a Game Theory Course infusing Chess, Spades, and Monopoly into the mathematics content
- Created a Two and Three Player Spades Game which was used in the course
- Chess Club Advisor for Two Years

# Overview

- In some welfare-to-work programs, community colleges emphasize basic skills education because 45 percent of welfare recipients do not have a high-school diploma or general equivalency diploma (Kienzl, 1999).

# Overview

“The basic skills to function in the workplace today are decision making, problem-solving, critical thinking and deductive and inductive reasoning along with the ability to make judgments and good estimates” (Russell, 2005, para 1)

# Community College Mission Statements

- One of the expectations within these mission statements are to prepare students for the workforce.

# Community College Curriculum

- “Effective community college curricula are characterized by adherence to core educational values coupled with responsiveness to the communities they serve” (Dever & Templin, 1994, p.3).

# Human Capital

- Human capital is the attributes of a person that are productive in some economic context. Often refers to formal educational attainment, with the implication that education is investment whose returns are in the form of wage, salary, or other compensation (About.com, para 1)

# Human Capital

- Eighty percent of the market value in today's Standard and Poor's 500 index is allocated to intangible assets. Increasingly, that value is a measure of human capital in the form of strategic knowledge, versatility, creativity and execution ability in your workforce. To achieve lasting competitive advantage, organizations must implement measurable processes for acquiring, advancing and retaining the best and brightest contributors in their markets (Human Capital Institute, 2006, para. 1).

# Human Capital

- “Another rapidly emerging challenge is the high-performance workplace, characterized by more broadly educated, flexible, and thinking front-line workers who earn part of their living by being learners” (Dever & Templin, 1994, p. 32)

# Mathematics and the Workforce

- “We need to emphasize to students the importance of mathematics in everyday life in addition to pointing out how hard it is today to get a good-paying job in a high paying industry without a solid grounding in the subject” (Roman, 2004, p.16).

# Mathematics and the Workforce

- “Mathematics gives our work purpose, pointing us in new directions, opening new avenues for exploration and understanding. The more we understand, the better we can compute and the more elegant our designs, products, and services will be” (Roman, 2004, p.18).

# Mathematics and Chess

- Graph Theory
- Probability
- Symmetry
- Slope
- Mapping and the Coordinate Plane
- Counting

# Mathematics and Chess

- Time
- Planning
- Problem Solving
- Ruling out irrelevant information
- Decision Making
- Memory
- Accuplacer and USCF Rating System

# Chess Research and Results

- The first study summarized by Dr. Ferguson was in Zaire and conducted by Dr. Albert Frank. The study included 92 students, 16-18 years of age, equally distributed at random into a control and experimental group. Students were chosen from a humanities class. The result of the study was that “chess significantly improved spatial aptitude, perceptive speed, reasoning, creativity, and general intelligence (Ferguson, 1995, p.2).

# Chess Research and Results

- A second study in the summary by Ferguson (1995), used 40 fifth grade students who were equally divided randomly into an experimental and control group. The experimental group received 42 one-hour lessons using a chess textbook for youths. The study, directed by Johan Christiaen in Belgium, wanted to use chess to test Jean Piaget's theory about cognitive development.

# Chess Research and Results

- Christiaen queried if chess playing can accelerate students from the concrete level to the formal level where students hypothesize and deduce. ANOVA was used to compare the trial and control groups. The results showed significant differences in favor of the chessplayers. The results of the tests (chess does improve intellectual maturation) at the end of the 5<sup>th</sup> grade were significant at the .01 level (there is only a 1% probability that the effects observed are due to chance). The results of the tests at the end of the 6<sup>th</sup> grade were significant at the .05 level

# Chess Research and Results

- Ferguson wanted to prove that memory can improve through chess instruction. The dependent variables in this study were the Test of Cognitive Skills(TCS) and the Verbal Reasoning subtest from the California Achievement Tests Battery. The differences from the pre and posttests were measured significantly using the t test of significance. All but one student showed an increase from the pre to the posttest after chess instruction. The line graph (post-test) indicates that students have improved on the TCS memory test since the pre-test (bar graph). The graph and descriptive results show that chess does improve memory.

# Chess Courses and Implementation of Chess into School Curriculums

- According to the article by Peterson (2002), one of the Standards of the Mathematical Content Standards is sequencing and prioritizing information and observing patterns.
- These chess players prioritize information by choosing from a set of familiar openings learned from watching other chess games, reading chess books, or watching instructional videos.

# Chess Courses and Implementation of Chess into School Curriculums

- The mission of Chess-in-the-Schools (2001) is to improve academic performance and build self-esteem for inner city school children. Each third-grade classroom and sixth-grade classroom in participating elementary and junior high schools is assigned a Chess-in-the-Schools trained instructor.

# Chess Courses and Implementation of Chess into School Curriculums

- The instructor teaches an hour-long chess lesson once a week in five classrooms during the school day in the fall semester, and in five different classrooms in the spring semester.

# Chess Courses and Implementation of Chess into School Curriculums

- The Daviess County Public School's Graduation 2010 is a 13 year program whose purpose is to help children excel in the learning process.
- The game of chess was to be used each year to improve the critical thinking skills of these students. These critical thinking skills will likely improve the math skills of these students.

# Chess Courses and Implementation of Chess into School Curriculums

- “Teaching a child to play chess at an early age engages the neurons in the portion of the brain responsible for Math/Logic” (Englehardt & Hauser, 1999, para 8)

# Chess Courses and Implementation of Chess into School Curriculums

- The University of Texas at Dallas offers several chess courses for graduate and undergraduate students. The courses are taught by Dr. Alexey Root, author of *Children and Chess: A Guide for Educators*. The University of Texas at Dallas is one of the top universities known for chess. High school students who excel at chess are eligible to receive full scholarships to attend school at the university.

# Chess Courses and Implementation of Chess into School Curriculums

- The University of Maryland at Baltimore County is also one of the top universities for chess. This university offers a computer chess course as well as several continuing education courses. In the future, a three-credit honors course called Problem-Solving and Critical Thinking through Intellectual Sports will be offered for graduate students.

# Chess Courses and Implementation of Chess into School Curriculums

- Although there have been no statistical methods or tests used, the New York City Schools Chess Program (founded in 1986 by Faneuil Adams Jr. and Bruce Pandolfini) has motivated young people in poor neighborhoods of the city.

# Chess Courses and Implementation of Chess into School Curriculums

- Salome Thomas-El, an award-winning principal in the inner city of Philadelphia, strongly contributed by helping African-Americans succeed in chess also. He led the Vaux chess team, consisting of all African-Americans, to eight national championships while at the same time emphasizing the importance of education.

# Chess Courses and Implementation of Chess into School Curriculums

- Chess encourages discipline and critical thinking and was a source of pride for his underprivileged students (Yaussi, 2004).
- He knew that the game would improve math skills and self-esteem (Yaussi, 2004).

# Benefits of Chess

- Chess improves patience.
- Chess is an inexpensive game that gives more people of all ages opportunities to learn.
- Opportunities for learning chess are easily accessible through books or the Internet.
- Its accessibility also is shown because of its implementation in other disciplines.
- The algebraic notation used in chess allows chess players to go back to their previous games and learn from their mistakes.

# Conclusion

- Chess not only can be fun, but can serve as a valuable educational tool.
- Chess can equip community colleges with students who can obtain vital skills necessary to be productive citizens. These skills include, but are not limited to, critical thinking skills, problem-solving skills, decision-making skills, skills to strengthen conceptual understanding in mathematics, and skills which improve memory.

# Challenges

- In terms of community colleges, chess may not be included as a course because it is not a course that transfers to a four-year college or university.
- A second concern is to determine if chess falls within a particular discipline.

# Challenges

- Another concern is determining a clear and concise curriculum.
- Once a curriculum is established, it would have to be determined as to who would be qualified to teach the chess course.
- It also needs to be shown that the way that a chess player analyzes a particular position has similarities to how a mathematician attempts to solve a problem.

# Challenges

- There still needs to be further research done in the fields of chess and mathematics.
- Finally, for administrators, we must decide whether it is more important for students to learn these skills or is it more important that a course transfers to a university.

Questions???