



# Play Go and Grow!

By Roy Laird, Ph.D.  
roylaird@gmail.com

Why every school  
and library should  
have a go program



# PLAY IS SERIOUS BUSINESS

- \* Skill-building
- \* Adaptation/maturation
- \* Supports other learning
- \* Relevance of other learning
- \* Important throughout life



# US MIND SPORT ASSOCIATION

. . . is working with the Berkman Center for Internet and Society at Harvard and the MIT Media Lab to develop an **online toolbox that can be integrated into classroom studies** to teach go, chess and other games.



# GAME-BASED LEARNING

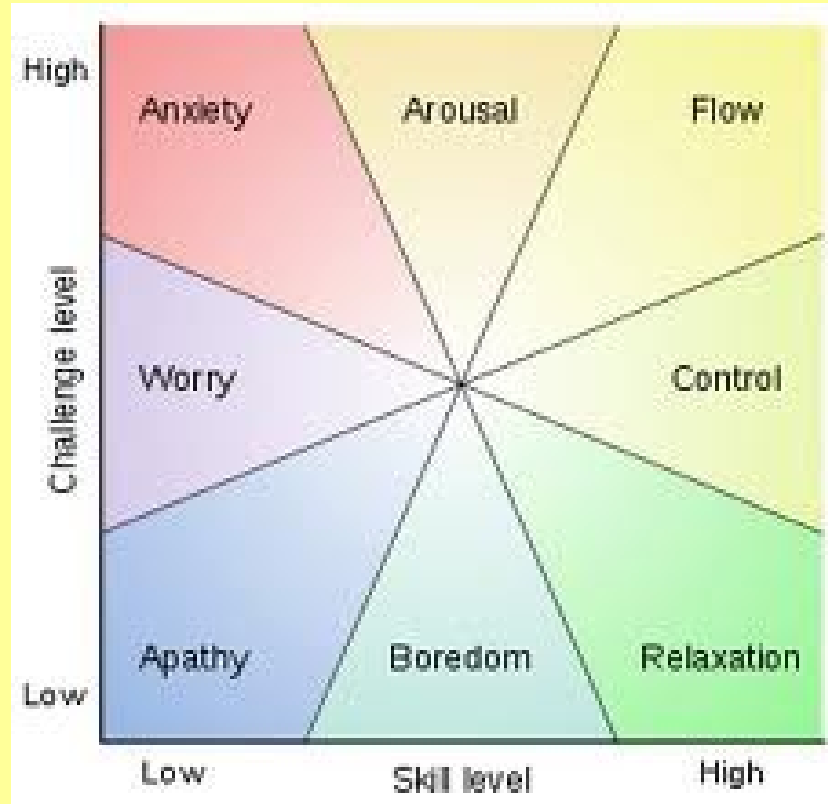
- \* Intrinsic motivation/reinforcement
- \* Relevant practice leads to improvement
- \* Timely feedback
- \* Timely recall

– <http://theknowledgeguru.com/game-based-learning-infographic/>



# THALAMIC ENGAGEMENT

Peak experience =  
Difficult challenge +  
Sufficient skill



# STRATEGY GAMES TEACH “THE FOUR C’S”

- ★ Critical thinking
- ★ Competition
- ★ Cooperation
- ★ Communication



# EUROPEAN PARLIAMENT ENDORSES CHESS IN SCHOOLS

Declaration 50/2011 passed with 60% of the vote on 3/13/12

- \* Calls on the Commission and the Member States to **encourage the introduction of the programme 'Chess in School'** in the educational systems of the Member States
- \* Calls on the Commission, in its forthcoming communication on sport, to pay the necessary attention to the program 'Chess in School' and to **ensure sufficient funding for it from 2012 onwards**



# BENEFITS OF CHESS IN EDUCATION

- \* Focusing
- \* Visualizing
- \* Thinking Ahead
- \* Weighing Options
- \* Analyzing Concretely
- \* Thinking Abstractly
- \* Planning
- \* Juggling Multiple Priorities





# CHESS IN THE SCHOOLS INC.

- \* New York City based
- \* \$3.3 million budget
- \* Taught 13,000 students in 51 NYC public schools in 2010
- \* Weekly one-hour lessons in grades 3 and 6
- \* After-school programs
- \* Teacher training



# CHESS-IN-SCHOOLS STUDY

Students who participate in Chess-In-The-Schools:

- \* Score higher on standardized tests
- \* Use their chess skills to achieve academic success
- \* Attend school on a more regular basis
- \* Resolve conflicts more peacefully
- \* Create lasting friendship during chess tournaments and after-school clubs





# GO VS. CHESS:

## Five Pluses



- Natural handicap system
- Cultural and historical links add other levels of interest
- Scalable – has short and long forms
- Progressive complexity
- Speaks to the challenges of modern life in a special way

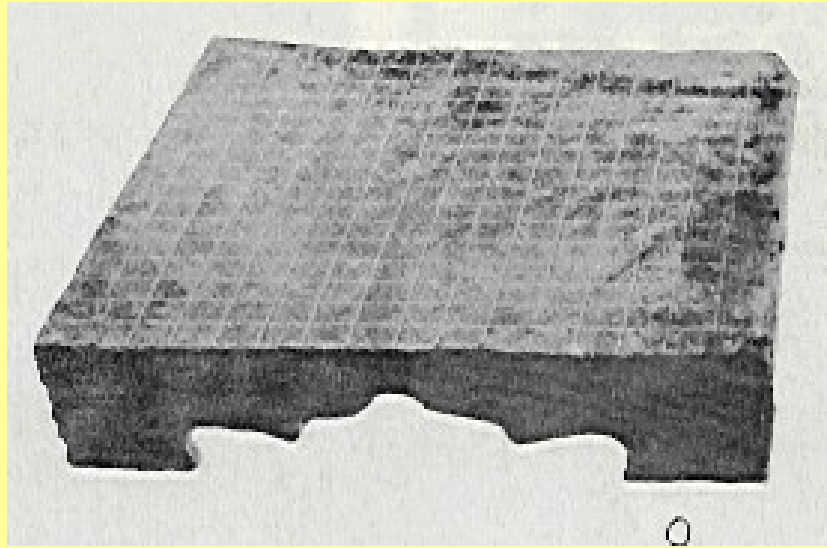




## UNIVERSAL RANKING SYSTEM

- Similar to martial arts, golf
- Inherent in the game's structure
- All serious players know their rank
- Honest players will lose half of their games
- The goal is self-improvement, not victory

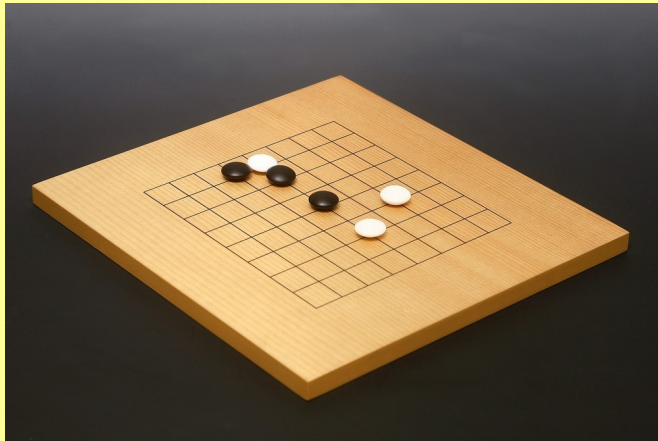




## CURRICULUM LINKS

- **Social Studies:** Historic and cultural aspects
- **Math:** Multiplication; using coordinates; etc.
- **The Arts:** Chinese/Japanese/Korean art
- The **STE@M** curriculum

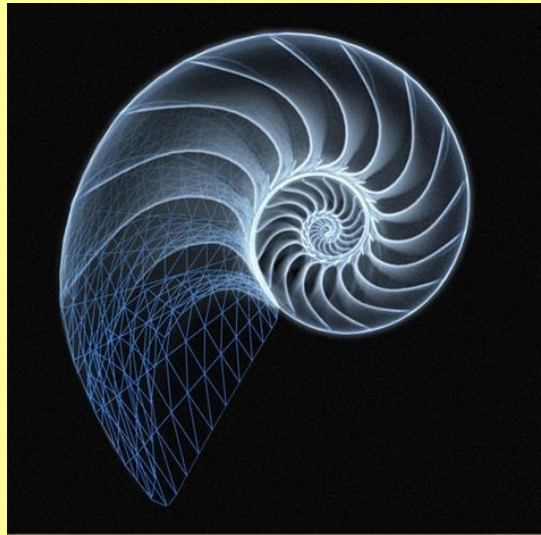




## SCALABLE

- \* 9x9 = “Short form” game suitable for classroom instruction
- \* 19x19 = “Long form” for after-school programs





## PROGRESSIVE COMPLEXITY

- \* >5x times the size of a chessboard
- \* More possible games than there are sub-atomic particles in the known universe ( $10^{761}$ : Omni, June 1991)
- \* All plays are actually possible
- \* Complexity increases with each play
- \* Each game becomes a record of itself
- \* Always a decisive result – no stalemate, draw etc.





# GO + CHESS

## The Benefits



- \* Overly tactical players learn to see the big picture
- \* Coaches relive the struggle of being a beginner at a difficult game
- \* “There are few things that let you appreciate the ‘nature’ of what you have learned as a chess player. Learning Go will make it obvious that you know stuff that transcends the chess board.”

-- noted Swedish grandmaster  
Tiger Hillarp Persson





# THREE BIG QUESTIONS

- \* What is the nature of the world around me and the universe I live in? Is there a greater power beyond my control? = *Man vs. Fate*
- \* How shall I manage conflict with others? = *Man vs. Man*
- \* Who am I? What do I want? = *Man vs. Self*



# THREE CLASSIC GAMES



## **BACKGAMMON: Man vs. Fate**

- Element of chance
- Few conflicts



## **CHESS: Man vs. Man**

- Hierarchical
- Strictly defined roles and powers
- Opponent must be destroyed



## **GO: Man vs. Self**

- All pieces are “created equal”
- Power depends on context
- Calibrated victory



“That we have these three shows that they answer **basic needs** in the human spirit. People everywhere are preoccupied with social structures, position and status; and everyone capable of reflection must sometimes speculate on his private relationship to fortune and fate. But go is the one game which turns all preoccupations and speculations back on their source. It says, in effect, that everyone starts out equal . . . And that what happens thereafter is not fate or . . . social position but only the quality of your own mind.”

*William Pinckard, “Go and the Three Games,”  
The Go Player’s Almanac 2001, p. 4-5*



# A PARADIGM FOR OUR TIME

- \* Complex, paradoxical  
Thick/thin, light/heavy (F. Lantz)
- \* A complex variable result
- \* The essence is building

“With its freedom from complicated rules, its simplicity of form, its fluidity and spaciousness, it comes remarkably close to being an ideal mirror for reflecting the basic processes of mentation.”

-- Pinckard *op. cit.*



**GO-RELATED  
RESEARCH:  
THREE RECENT STUDIES**



# FOUR AREAS OF IMPROVEMENT FOR YOUNG PLAYERS

- \* Baromi Kim's Ph.D. dissertation at Kyung Hee University
- \* 68 five-year-olds in Seoul, Korea – half learned baduk
- \* Tested and retested on the K-WPPSI
- \* Both groups made gains – baduk players gained 50% or more compared to non-players



# KIM Continued

## Findings in four areas

<b>SKILL</b>	<b>PRE-TEST</b>	<b>POST-TEST</b>	<b>CHANGE</b>
Intelligence (P)	103.1	118.8	+15.7
Intelligence (N)	99.8	109.4	+9.8
Concentration (P)	92.2	249.3	+157.1
Concentration (N)	96.9	186.9	+90.0
Problem solving (P)	36.6	52.7	+16.1
Problem solving (N)	34.97	42.41	+7.44
Patience (P)	555.3	664.3	+109.0
Patience (N)	566.4	488.0	-78.6



# GO USES THE WHOLE BRAIN

- \* Xiangchuan Chen et. al., Univ. of Science and Technology of China
- \* fMRI images of six go players
- \* Compared to seven chess players in a similar study
- \* Go players use more of their brains than chess players do

*Cognitive Brain Research 16 (2003) 32–37*





# PLAYING GO CAUSES PHYSICAL CHANGES IN THE BRAIN

- \* B. Lee et. al. Clinical Cognitive Neuroscience Institute, Seoul, Korea
- \* Voxel-based analyses of diffusion-tensor imaging (DTI) of experienced players vs. inexperienced controls
- \* “. . . Larger regions of white matter . . . Related to attentional control, working memory, executive regulation and problem-solving.”
- \* “Baduk experts tend to develop a task-specific template . . . [and] were less likely to use structures related to load-dependent memory capacity.”



## PHYSICAL CHANGES CONTD.

- \* “Long-term baduk training appears to cause structural brain changes. . . . [Understanding] such changes might be helpful for improving higher-order cognitive capacities, such as learning, abstract reasoning and self-control.”

*Lee et. Al., White matter neuroplastic changes in long-term trained players of the game of baduk [go]: a voxel-based diffusion tensor imaging study,” Neuroimage, 2010 Aug 1;52(1):9-19.*



# CONCLUSION

- ★ Mind sports are important media for growth, development and important social interaction
- ★ By its fundamental nature, go is an unsurpassed mind sport arena, with several unique and valuable qualities
- ★ Every community should have a go program

