THE FISH POND STORY

Richard Tu
Doctoral Student
National Sun Yat-sen University
Taiwan
email: young@cm.nsysu.edu.tw

and

Malcolm Brooks
Children's House Montessori School
205 West St.
Rockport, ME 04856 USA
Tel: 207-236-2911
mbrooks@chms.pvt.k12.me.us

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A Game of Systems Thinking Education for Grades 3-6

The Fish Pond Story

Purpose:

a. Understanding interdependence.
b. Discovering behavior over time.
c. Dealing with complexity—systems archetype of “The Tragedy of the Commons.”

Scenario:

Once upon a time, there was a fish pond. Everyone depended on the fish in the pond—for eating and to sell for profits. In this game we all play the role of the fishermen and begin to make use of the resources of this pond.

Every fisherman’s family has a fishing rod, which is made of bamboo, fish “bait” and a magnet. Every fish is made of paper with a metal staple. Every fisherman’s family can choose how many fish they wish to catch. Then we start to simulate the whole story.

But remember that if the number of fish in the pond drops to zero, everyone would starve. So be careful, and good luck…

Game Design:

a. The initial value of the fish stock is 200.
b. There are 8 fishermen’s families (8 teams).
c. The pond is open for one minute, and then closed and each team’s fish are counted. At the same time, we begin to hatch new fish. Then a new round begins.
d. The hatch rate is 10%.
e. The new fish would grow up immediately.

Result

At the beginning, kids always want to catch more and more fish. But after some time, the numbers of fish are decreasing, and finally drop to zero. After this game, we invite students to think about how their selfish goal causes damage to the environment, and how we can improve this situation to avoid the tragedy of the commons.

Meaningful Insights:

a. Discussing “Who makes this happen?”
b. Discovering and understanding the behavior over time graph (BOTG) of the stock (fish), and the teams’ performance BOTG.
c. Developing the causal loop diagram (CLD) to clarify the interdependence.
d. Discussing the systems archetype “Tragedy of the Commons.”
e. Thinking about what we should do if we play this game again.
f. Connecting the experiences of the real world with the game.
At Children’s House Montessori School in Rockport, Maine, fourth & fifth grade students have been studying ecosystems, and some have chosen to run simulations and chart the results. They are discovering how systems drive behaviors and cause events.

The simulations involve Montessori-like tactile activities, combined with computer applications of increasing complexity.

Here's what the children did with "The Fish Pond Story," a simulation proposed by Richard Tu of Taiwan in the Creative Learning Exchange, Volume 7, Number 4 - Fall 1998.

A group of 7 students gathered in a circle and made fishing poles out of pencils, strings, magnets and adhesive tape. They decided to start with a fish population of 20 fish (colored paper clips), a fishing season lasting 10 seconds, and a reproduction rate of 1 new fish per 10. They also decided that a "fisherperson" could survive only one season without catching a fish.

One child timed the 10-second seasons on his watch. Aggressively, the children competed to see who could catch the greatest number of fish.

Four times they depleted the pond, four times they started over with a greater number of fish but depleted the pond again.

Then the children decided to stop competing and to try collaborating. They reached an agreement that each fisherperson could catch 1 fish per season. In delight, the children then fished for 18 consecutive seasons (until lunchtime), adding increasing numbers of newborns to the pond.

Through "The Fish Pond Story," the children personally experienced the lesson of the "Tragedy of the Commons." At a later date, when they were working on a more complex simulation involving grassland, rabbits, hawks, and coyotes, the students discussed whether predators and prey should collaborate!