1. Systems Thinking in K-12 Education in Taiwan
   —We are the His-Fu Cultural Foundation of Taiwan

2. A Learning Program for Grades 3-6

3. A Game of Systems Thinking Education for Grades 3-6

4. We need your help!

5. The Idea of a 1999 One-Month Systems Thinking Summer Camp
   for Grades 3-6 — Bringing Taiwan’s Students to American
   Elementary Schools.

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1. Systems Thinking in K-12 Education in Taiwan
   —We are the His-Fu Cultural Foundation of Taiwan

1.1 Our Organizational Learning History

The His-Fu Cultural Foundation is a part of the Megatop group of Taiwan. Since 1992, we have been in contact with Professor Showing Young, founder of the Systems Thinking and Organizational Learning Lab in Taiwan. From them we have learned about systems thinking, system dynamics, and how to become a learning organization. This paper outlines our program, about which we eagerly anticipate input from other systems educationists.


1993 completed a “Systems Thinking Training Course” for 60 future managers.

1995-1996 developed internal lecturers for introducing the five disciplines to the other members.

1996-1997 began building a learning infrastructure by developing the reading forum for all of the managers.
Reading assignment: The Fifth Discipline
The Fifth Discipline Fieldbook

1997 attended a system dynamics course designed by Professor Showing Young

1998 invited Professor Showing Young to design a course: “Systems Thinking: facilitate top managers to learn how to design a new corporation.”
## 1.2 Our Vision—To Become a Learning Organization

**Megatop Group in Taiwan**

**His-Fu Cultural Foundation**

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<th>Adult Education</th>
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| **Vision** | • To enhance personal and organizational learning ability for managers and employees, and to introduce same to the public.  
• To shape an outlook and perspective to fit the 21st century. | • To re-engineer our community to become a learning community with increased interconnectedness. | • To give students a more effective way of interpreting the world around them.  
• To help students gain a greater confidence for managing their lives. |
| **Practice** | • Developing the “Fifth Discipline Teaching Team” to help with organizational training and to promote the 5th discipline to other organizations.  
• Creating the 5th discipline course for adults to help them improve their learning ability  
• Communicating and interacting with other organizations to share this new management art and science. | • Developing the “Fifth Discipline Scouts Team” to integrate our efforts with the community and young college students.  
• Facilitating other communities to become learning communities. | • Developing the ST Winter Camps for K-12 kids.  
• Developing the ST Summer Camps for K-12 kids.  
• Developing the advanced ST courses for K-12 kids.  
• Facilitating kids to build a dynamic modeling ability.  
• Contacting other system education schools to promote the 1999 ST Summer Camp—bring Taiwan’s kids to the USA.  
• Developing our teachers’ ST&DM capabilities. |
1.3 Our Vision of K-12 Education

Our Vision of K-12 Education

“I believe we should give students a more effective way of interpreting the world around them. They should gain a greater and well-founded confidence for managing their lives and the situations they encounter.”

Dr. Jay Forrester, Keynote address
June 1994 Systems Thinking and Dynamic Modeling Conference

“Love to learn
Will to risk
Try it
Explore it”

Mary Scheetz
July 1996 Systems Thinking and Dynamic Modeling Conference

A happy learning experience by playing games.
To enhance their creating ability.
To enhance their presenting ability.
To enhance their analyzing ability,
To enhance their ability to understand interrelationships.

Thinking Education for K-12 in Taiwan
2. A Learning Program for Grades 3-6

2.1 Structure of Learning Arena

We followed Peter M. Senge’s idea of building learning organizations, and Tim Lucas’s concept of building a learning school by developing three core competencies. Thus, we designed the learning arena by building core competencies; understanding and practicing theory, method and tools; and developing innovative infrastructure.

**Building Core Competencies:**
- Aspirations—Goals of the soul
- Conversations—Talking the talk
- Dealing with complexity—Understanding interdependencies

**Infrastructure (Summer/Winter Camps):**
- Virtual World Games
- Experiment
- Role Playing
- Movie Discussion
- Case Study

**Theory, Method, and Tools:**
- Personal Mastery
- Mental Models
- Shared Vision
- Team Learning
- Systems Thinking—CLD’s, BOTG’s, Systems Principles, Systems Archetypes

2.2 Curriculum Structure

1. **Team Building**

   Purpose: By building a team, we lead individuals into a partnership. Students can feel that they are connected with one another.

2. **Find the Truth with an Open Mind**

   Purpose: After seeing some pictures and reading some stories, students will be interested to find the truth with an open mind. They will gain more confidence to explore the meaning behind events and open a new window for the real world.

3. **Systems in My Life**

   Purpose: Students will learn how to identify systems by finding the interrelationships among the parts of systems. By playing an interesting game, students will discover a reinforcing feedback loop. We will invite students to talk about their feelings and become aware of their behavior. Finally, we will ask students to reflect upon their life to find some similar examples.

4. **Understanding Cause and Effect**

   Purpose: Students will practice causal thinking, including short-term causality and long-term causality, helping them to widen their views of time and space. For example, students could begin a discussion of some social problems by writing down what happened, what caused the
problem to happen, and how this problem affected the environment or themselves. This shows students that we all are in systems.

5. Building Causal Feedback Thinking

Purpose: 1. Introducing the cause-effect relationship symbol (A=>B).
   2. Extending the cause and effect relationship. We begin to develop feedback loops by making an effect feedback to a cause. Thus, we can read the whole story with a circle symbol.

   ![Diagram of feedback loop](image)

   3. Recognizing single loop reinforcing or balancing feedback structure.
   4. Combining the reinforcing feedback loop or the balancing feedback loop with its behavior over time.
   5. Reading and telling the systems story by using CLD’s and BOTG’s.

6. System Delays

Purpose: When we start to have a problem, we always find some solution or action to fix it. Actually, it does ease the problem symptom in the short term, but we also begin to accumulate some unintended consequences which may make the problem more serious. It is very important to understand delays and be comfortable with them.

7. Case Study

Purpose: 1. To practice event-oriented ways to tell a systems story.
   2. To practice pattern-oriented ways to tell a systems story.
   3. To use causal loops and BOTG’s to understand systemic structure.
   4. To change the story by breaking the loop or adding some arrows.
   5. To find a better policy for some critical mistakes.
   6. To introduce the insightful meanings of systems archetypes.
   7. To practice drawing the CLD by using archetypes which reflect their own life.
3. A Game of Systems Thinking Education for Grades 3-6

3.1 Title: The Fish Pond Story

3.2 Purpose:

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

3.3 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 . .

3.4 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.

3.5 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.

3.6 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.
4. We Need Your Help! Please send me any suggestions you may have.

4.1 Please give us some suggestions for our implementation of the experimental course for 3-6 graders which is outlined in sections 2 and 3.

4.2 For the next step, we hope to design a Dynamic Modeling Course for grades 3-6. We want to use STELLA to help the students to learn. But there are some problems:
   a. We must enhance our teachers’ and students’ English reading and speaking abilities first. Please suggest some ideas or materials about how to teach an elementary dynamic modeling learner. (Example: story books, other books, teaching methods, materials, textbooks, computer-based simulation games, etc...)
   b. We need some teaching programs which have been used successfully to help us to develop a new course.
   c. We need some successful examples of K-12 education which have been recorded step by step in books or formal reports.
   d. We need some formal evaluation reports which have recorded some teaching experiments to help us research the results of our 3-6 grade teachers’ programs.
   e. Our teachers do not know enough about Systems Thinking and Dynamic Modeling. How can we utilize the systems teaching experience of American teachers? Can you introduce some teacher training programs which can help us find the right direction to go to train our teachers?

Thank you for your suggestions.

5. The Idea: 1999 1-Month Systems Thinking Summer Camp for Grades 3-6—Bringing Taiwan’s Students to American Elementary Schools

5.1 Purpose: To enhance Taiwan’s 3rd-6th graders global view and English ability, to learn systems thinking and dynamic modeling skills, and to develop a cultural exchange between the children of the 2 countries.

5.2 Description: In the summer of 1999, we hope to bring our teachers and students to visit an American systems education school. We want to create a 1999 Systems Thinking Summer Camp in the USA. In this tour, we would offer some English conversation classes, ST&DM classes, and sight-seeing.

5.3 Questions:

Is it possible for you/your school to accommodate this tour in the USA?

____________Yes, my school is interested.

My school is ____________________________.

Can your school offer classroom space for our planned activities?
Can you arrange some teachers to design and teach the ST&DM program for our kids?
Can you organize some interaction between American kids and our kids for playing and learning?

Please get in touch with me to continue to work on these exciting plans for next summer.

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