Simulating Society
Designing, Writing and Trying to Get Approval for an Interdisciplinary High School Credit Course based on System Dynamics

by Gordon Kubanek
@ K-12 ST & Dynamic Modeling Conference 2002

The Journey

A. Genesis of an Idea
B. Finding out the Rules
C. Partners
D. Research
E. Writing the Course
F. Edu-jargon
G. Seeking approval
H. Trying again
I. Lessons Learned
### A. Genesis of an Idea

- Driving back from Dynamique 2001 a student asked:

- “Why can’t we get credit for all this work?”

- I decided to find an answer.

### B. Finding out the Rules

<table>
<thead>
<tr>
<th>Political Context</th>
</tr>
</thead>
<tbody>
<tr>
<td>- A top-down/very centralized control structure was being put in place</td>
</tr>
<tr>
<td>- A new curriculum was being introduced</td>
</tr>
<tr>
<td>- The funding formula was a mess</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>I went</th>
</tr>
</thead>
<tbody>
<tr>
<td>- my Principal</td>
</tr>
<tr>
<td>- to my School District: Program Division</td>
</tr>
<tr>
<td>- then to the MOET local representative</td>
</tr>
</tbody>
</table>

- It was possible to get approval for a locally designed course...under certain conditions.

- **The course has to meet a local need not met by any standard course**
C. Partners

- I had to work with a post secondary Institution
- a contact at the University of Ottawa’s Department of Economics helped
- I worked with Professors from:
  - Department of Economics
  - Systems Science
  - Center for Governance

D. Research: Course Concept

- **Simulating Society:**
  - A Mathematica Toolkit for Modeling Socioeconomic Behavior

Computer simulations provide a laboratory in which qualitative ideas about social and economic interactions can be tested. This brings a new dimension to the social sciences where 'explanations' abound, but are rarely subject to much experimental testing.

- My partners were Economists
- HS social science teachers were looking for a way to attract better students
- I wanted an Interdisciplinary course that was NOT perceived as a computer ‘geek’ course
E. Writing the Course

<table>
<thead>
<tr>
<th>Module Title</th>
<th>Subject Area</th>
<th>Skill or Tool to Learn</th>
<th>Case Study</th>
<th>Game</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.1 Why Systems Thinking</td>
<td>Economics</td>
<td>the whole is more than the sum of its parts</td>
<td>The Collapse of the Eastern Cod Fishery in Newfoundland</td>
<td>The Commons Game</td>
</tr>
</tbody>
</table>

• I spent the summer
  – finding problems in various subject domains,
  – building/using models,
  – writing/using papers, and
  – developing a logical but FUN sequence of activities/games to add emotional punch
  – checked my work with my University partners and students on a regular basis

F. Edu-jargon

• Understanding and Managing Change = Systems Thinking

• Methods of Social Inquiry = SD Computer Simulations

• Changing Social Structures = Group Model Building

  **MOET Design Structure**

• Overall Expectations

• Specific Expectations
  – Understanding Concepts
  – Developing Skills
  – Learning Through Applications
Submission Documentation

- Rationale for the Course
- Origin of the Course
- Involvement of post-secondary partners
- Links to other courses
- Curriculum expectations
- Curriculum Overlap
- Assessment and Evaluation of student achievement
- Textbooks and resources
- Appendix: Letters of Support from University partners

Section A – The Systems Thinking Worldview

<table>
<thead>
<tr>
<th>Knowledge /Understanding</th>
<th>Coaching Rubric</th>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>-Systems Thinking</td>
<td>-I can explain why systems thinking is needed for complex dynamic issues</td>
<td>-recognizes the need for systems thinking</td>
<td>-demonstrates some knowledge of when systems thinking is needed</td>
<td>-frequently relates systems concepts to problems assigned</td>
<td>-thoroughly understands how &amp; why systems thinking is applied to real world issues</td>
</tr>
<tr>
<td>-qualitative data</td>
<td>-I recognize the limits to logical thought processes &amp; make decisions including qualitative data, emotions &amp; societal values</td>
<td>-is aware that emotions play a role in decision making</td>
<td></td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>-mental models</td>
<td>- I can explain how all interpretations of the world are based upon implicit mental models which are simplifications of a complex world</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
G. Seeking approval

- By September I had all the forms filled
- the Program Division began to write their submission
- then a new memorandum came from the Ministry
- and the District people changed
- and new initiatives to have all courses on a master list

That I was told that they could not submit to the MOET at this time.

H. Trying again

- This Spring I am submitting again as there are now interdisciplinary guidelines
- the District now has the capability to run on-line courses via blackboard so perhaps it can run as an On-line course
## I. Lessons Learned

- You need friends on the inside
- Bureaucracies have their own agendas
- Working with Universities is not so tough
- Students are your strongest allies
- A centralized educational system stifles initiative
- Quality control can really mean dumbing down
- Be flexible
- And never give up!