Lessons from Implementation of Systems Thinking and Dynamic Modeling in Schools

Greg Orpen- Innovation Academy Charter School (MA)
The Goal

Systems Thinking Capacity in Students

Learning
The Goal
Innovation Academy Charter School (MA)

- Teacher PD & Dissemination
- Student as Teacher
- Monitoring Performance
Innovation Academy Charter School (MA)

- **Teacher PD & Dissemination**
  - Supportive PD Schedule
  - Instructional Coaching & Mentoring
  - Dissemination Work
Team Learning

Combating Malaria in Tanzania

Teenage Texting Habits
Coaching & Mentoring Faculty
Dissemination by Faculty

Modeling Air-Powered Rockets
by Christopher DiCarlo

Students at Innovation Academy Charter School in Tyngsboro, Massachusetts, learn physics in the context of systems thinking and modeling tools. Each lesson becomes a more authentic and engaging experience when the classroom moves outside.

In this project, students learn about the forces acting on a paper rocket. Using Insight Maker, a free online stock-flow modeling program, they...

CLE Newsletters

World Climate Simulation
Student as Teacher
Student as Teacher: DynamiQueST
Student as Teacher: DynamiQueST

2018
Student as Teacher: 2018

Compassionate Systems Framework

Educators for Sustainable Development
Monitoring Performance

- School Accountability Plan
  - Dissemination Work
  - Student Portfolios
Student Portfolios

Portfolio Reflection
Neolithic Systems
Marissa Parshley

For this project, we were asked to create causal loop diagrams to help explain the patterns of behavior from class. One was supposed to be about the rising population and declining average lifespan, while the other focused on the impact of job specialization caused by food surpluses.

We started this project by reading about how the Sumerians created agriculture and how they created systems to advance agriculture. From there, we wrote a list of possible variables for our feedback loops as a class. Then we created our causal loop diagrams and wrote about what caused each event to happen. The requirements for this project were that I had to make five individual feedback loops for the rising population and declining longevity. Then I had to explain how they all connected. Next I had to make three feedback loops for the impact of job specialization. After that I had to explain how those three loops connect.

During this project, I learned how each action, no matter how small, can change the entire community. I also learned about how agriculture was developed and how it affected the Sumerian people. I met standards by making it clear how some processes work, and making sure that each variable is labelled as either same or opposite. I also made sure that my explanations made sense.

I overcame challenges by using my resources to figure out the problem and finding an appropriate solution. One of my challenges was figuring out what variable should lead to which variable. I solved this by talking to the teacher. Next time I would spend more time coming up with new variables for my feedback loops. I think that overall I did a good job. I would definitely spend more time on the variables.
# Tracking Student Work

<table>
<thead>
<tr>
<th>Name</th>
<th>Advisor</th>
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<td>Reflection</td>
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<td>Mission Malania</td>
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*Note: The table includes various student portfolio pieces and their scores.*
Back to the Model...
Expanding the Model

Professional Development Time
Expanding the Model

Instructional Coaching & Mentoring
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Today's presenters are tomorrow's coaches
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Students as Teachers
Expanding the Model

Who gain confidence and inspiration to grow
Expanding the Model

Capturing student learning in portfolios can help teacher development