

Lesson Week 13 – Flight Simulators and Other Learning Tools

The course material this week offers exposure to more examples of problems that the authors have addressed using the methods you have learned in this course. They graph problem behavior over time. They model the system of influence they think is causing a problem, using causal loop diagrams and sometimes simulation models. They draw insights from their increased understanding as to what solutions might work. Keep in mind that the insights and understanding of these problems are only as good as the models are an accurate conception of the system of influence. Remember the maxim: “All models are wrong; some models are useful”.

The intent of these examples is to provide at least vicarious experience in tackling problems in the context of the full system of influence that reveals the important feedbacks that can explain problem behavior over time. Some of these examples are presented in a form called a **flight simulator** because they provide sliders to change the variables in a model to learn how that changes system behavior over time. Flight simulators are so named because an effective pioneering use of the idea was to create a virtual cockpit to train pilots to fly airlines. Simulation allows pilots to learn to fly planes and make mistakes without crashing planes and killing passengers. In the same way, simulation models permit trials of different policies in complex physical, social or ecological systems without putting at risk anything in the real world.

Behind Closed Gates
Potential dynamics when one group or individual is given complete authority over another

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Control Room

1. Set the variables according to the Journal instructions.
2. Make predictions on the "Predictions" screen.
3. "Simulate" to see what happens over two weeks.

The graphs will show what actually happens in blue and your predictions in red.

Guards

Tendency to distrust: Distrust slider (1.0)

Tendency to repress: Repression slider (1.0)

Prisoners

Tendency to stand together: Solidarity slider (1.0)

Tendency to fear: Fear slider (1.0)

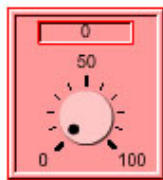
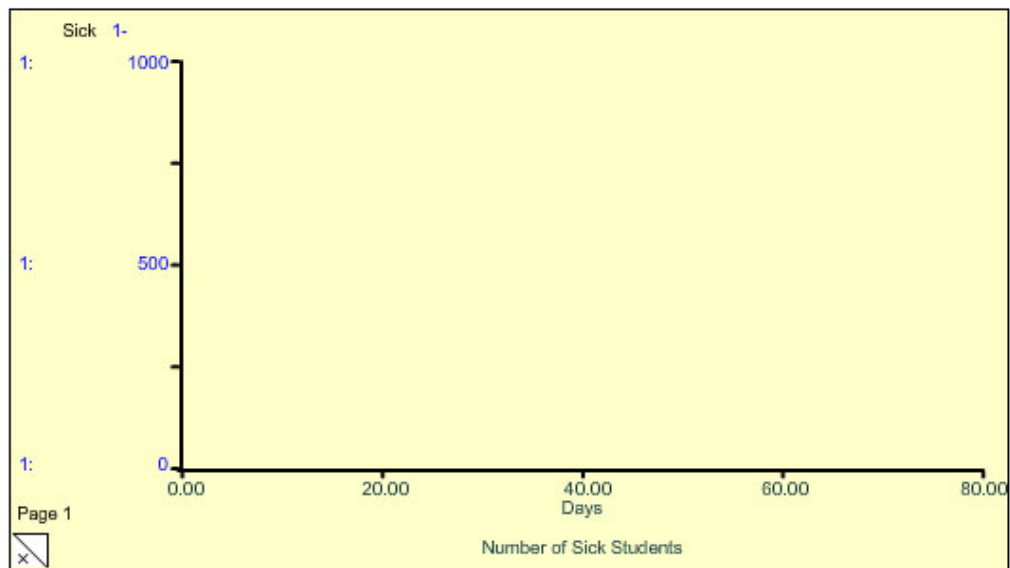
Willingness to resist: Resistance slider (1.0)

Simulate

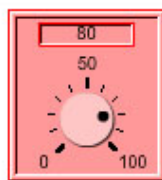
H1N1 Flu Outbreak

A Learning Laboratory created with STELLA

 [Back to Intro](#)



% vaccinated



% effectiveness of vaccine



days sick students



[How does this simulation work?](#)

Explore as many of the situations as interest you. Be sure to trace the causal relations around the loops in the models to understand how the feedback loops affect system behavior. These examples will help you learn to think systemically, but there is no substitute for practice of these methods on problem situations that you encounter daily in your life. Therefore I encourage repeated use of the methods, so that the systems thinking approach will become second nature, just as conventional problem solving is for us now.

Some of the problems are presented using the Kumu interface. Remember that in Kumu the model and the story are unfolded by clicking on the arrow at the right edge of the screen. The unfolding is reversed by clicking on the arrow at the left edge. Explore the additional resources listed in the problems that are of particular interest to you. Some of them are simulation models of the problem in a user interface mode that you can manipulate to discover how changes to model parameters can change behavior over time of the problem. An example is [Credit Never Happened Simulation](#) that expands on the CLD model.

Cash for Clunkers



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[Background](#)

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Investigating a Systems Thinking-Based Alternative



Image credit: www.cristyli.com

On July 24th, 2009 the Car Allowance Rebate System (CARS), commonly known as "Cash for Clunkers," began processing rebate claims. The \$1 billion appropriated for the system was exhausted just SIX days later.

This simulation explores an alternative program that is self-sustaining AND reduces automobile emissions.

Using a combination of fees and rebates this program can finance itself (no emergency appropriations from Congress), reduce gasoline consumption (putting cash back in consumer's pockets), AND contribute to cleaner air for us all!

[Next](#)

Assigned Resources

[Ways Humans Create Poverty](#)

[Why Nations Fail](#)

[Sustainable Capitalism](#)

[We Have A Problem](#)

[Credit Never Happened](#)

[Project Schedule Challenge](#)

[Teacher Cheating Epidemic](#)

[Making Homelessness Worse by Helping](#)

[The Boy Who Cried Wolf](#)

Simulation Models

Behind Closed Gates: What happens when one group or individual is given complete authority over another.

H1N1 Flu Outbreak.

Housing Supply and Demand: Investigating the housing crisis.

Cash for Clunkers: Does it work?