Can the Feedback Method be used to teach International Trade Theories?

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Abstract

International trade theories have an important place in the education of economists. To improve teaching about international trade, Roufagala examined three theories--Ricardian, Hecksher-Ohlin, and Economies of Scale--and demonstrated how they can be combined for purposes of instruction by means of a framework that focuses on average costs. His synthesis is a promising step, but its effectiveness has not been tested. In addition, it still provides students with only a static theory of trade. Wheat introduces students to dynamics with his Feedback Method of teaching economics. I propose conducting a controlled education experiment to test the effectiveness of three ways of teaching international trade. One group of students will work with the three separate theories, the second group with the static combination, and the third will use the feedback method. My hypothesis is that the second group will learn more than the first group, but that the third group will learn even more.

Key words: economics education, international trade, system dynamics, feedback method, experiments, Ricardian theory, Hecksher-Ohlin theory, and Economies of Scale.

Introduction

Half a century ago, Forrester (1958) called for a new kind of economics education based on system dynamics, a call that he has renewed in the K-12 education setting in recent years (Forrester, 1994). In that spirit, the feedback method of teaching economics has been developed to help undergraduates discover dynamics even when they lack the mathematical tools that advanced students use.

At the undergraduate level, most economics instructors rely on static graphs to explain and demonstrate economic models (Kennedy, 2000). Cohn et al. (2001) found that graphs in modern textbooks outnumber graphs in "old fashion" texts about ten to one. However, the dependence on graphs could be problematic, one of the reason is that the instructional value added by graphical representation of economic behavior appears to be low (Cohn et al., 2001). Even if students interpret that graph correctly, they can get a misleading view of dynamic behavior in the economy (Colander 1991, 1995). The traditional justification for the static graphical approach is that learning economic dynamics requires a level of mathematical sophistication that most undergraduates do not have. The feedback method, however, does not require students to manipulate equations or engage in complex mathematical reasoning; it uses causal loop diagramming and computer simulation to demonstrate how behavior emerges from structure (Wheat, 2007). The other hand International Trade theories have an important place in the education of economists because they believe that all trade is good for the economy. To improve teaching about international trade and make it easier for students to learn, Roufagala examined three theories--Ricardian, Hecksher-Ohlin, and Economies of Scale--and demonstrated how they can be combined for purposes of instruction by means of a framework that focuses on average costs. It highlights the set of assumptions that is sufficient in order to obtain the important results of each theory (Roufagalas, 2008). His argument is that students can see all the theories but they don't see how they fit together, his synthesis is a

promising step but its effectiveness has not been tested. In addition, it still provides students with only a static theory of trade. Base on this, it is important first compare his method of teaching with the traditional way where each theory is separate, but at the same time test Roufagalas examination with Wheat's Feedback Method of teaching economics. I will test during this paper through system dynamics experiment.

Hypothesis

If students have a realistic situation within which to compare the feedback method and traditional methods of teaching economic dynamics, the expectation is that they will prefer the feedback method. Moreover, students taught with the feedback method are expected to demonstrate greater understanding of economic dynamics than students taught with traditional methods. Wheat introduces students to dynamics with his Feedback Method of teaching economics. The expected experimental outcomes would substantiate the view that the feedback method of using causal loop diagrams to reveal the *structure* of an economy, accompanied by a user friendly computer model that can simulate the *behavior* of that structure, is a promising method of teaching International trade theories. Such findings would contribute to the dialogue begun by Colander and Cohn by presenting more evidence of the pedagogical problems of static graphs. The most appropriate publishing outlets for this research are the *Journal of Economic Education*, the *International Review of Economics Education*, and the *System Dynamics Review*. The pedagogical potential of the feedback method was suggested by Forrester's (1994) description of system dynamics as a "*framework* into which facts can be placed and learning becomes more relevant and meaningful." That echoed educational psychologist Jerome Bruner's (1960) conclusion that "the most basic thing that can be said about human memory . . . is that unless detail is placed into a *structured pattern*, it is rapidly forgotten." The feedback method aims to provide an improved *learning*

structure for students, what cognitive psychologists call mental models. With the Roufagalas proposal the students will learn more than the traditional theories, but that the students that have the opportunity to learn with feedback method will learn even more than the two ways explained before. Future research should include efforts to better understand how students learn from a simulator.

Research method

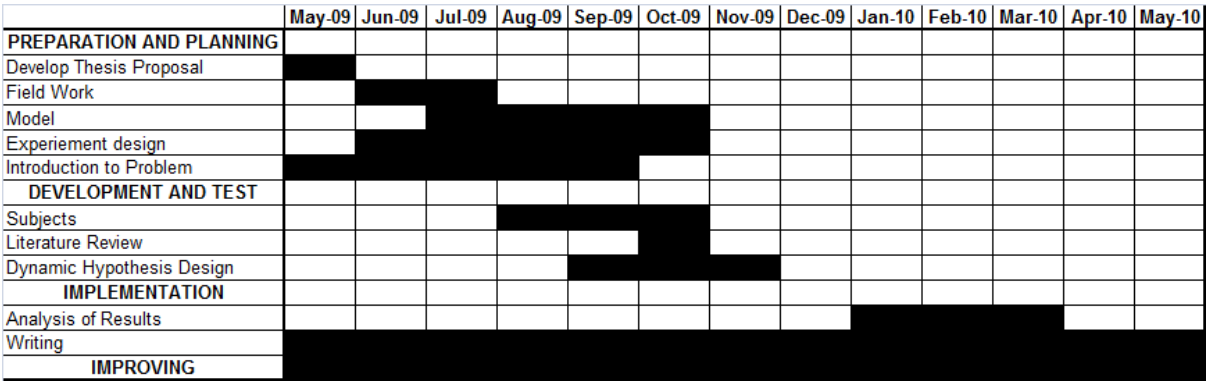
Coming for a background en management engineer and system dynamics, I find that there is some potential to connect the systemic/numerical approach of system dynamics with the strict focus of the economy theory for feedback method. Still, the basic methodology for the research will be system dynamics experiment. The model should be a realistic representation of the three most popular models of international trade, the Ricardian theory, the Hecksher-Ohlin, and the Economies of Scale Trade, the focus on differences in per unit costs of production as determinants of trade patterns and the links between these three theories. A series of experiments will be conducted to provide answers to the researches questions, with the assessment criteria being student preference and student performance. There is not easy to get results of how the people learn about economy just a simple course, a more feasible plan is to design controlled experiments that enable testing the effectiveness of "samples" of the feedback method of teaching macroeconomics (Wheat, 2007). Statistical analysis will determine whether the experimental results could be generalized to an entire course. Three experiments are planned. The first will focus on theories of international trade separately, the second in statics combination of the three theories base on Roufagalas examination, while the third experiments will address the performance issue with feedback method. Students in the experiments should be undergraduates, preferably with no prior training in either economics or system dynamics and the experiment is going to be based in pre-test for check what are the

previous knowledge and post-test for see the effectiveness of the method. Most likely, the model will be built with Vensim or Powersim Studio software.

1 GROUP WORKING WITH THREE SEPARTE THEORIES	2 GROUP WORKING WITH THE STATIC COMBINATION	3 GROUP WORKING WITH THE DYNAMIC COMBINATION

Work Plan

In addition to model construction, experiment design and analysis, a major part of the project entails data collection. Fieldwork in Colombia during the summer of 2009 will be devoted to preliminary data collection and try to see what can be the weakness or the problem of the experiment. Make an introduction of the problem is the process of understand the research question and how I can approach it through the experiment. Three different groups with 25 people each for statistical control. All of them Students of the University will volunteer for participation in the experiments, and some incentive to do so will be necessary (e.g., the opportunity to earn "extra credit" in the course). Each experiment will require about two months to design and field test, making the total development time approximately six months. That will also be a time for continuing the literature review. Beginning to write Master's thesis, at least that is possible without having the experiment results ready. Writing will continue until delivery. Incorporate the results into the thesis. The table below outlines the work plan that is designed to enable completion of the thesis.



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