

Capstone Project

## ***Active Learning in Economics through Classroom Experiments***

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### **Introduction**

I strongly feel that economics is such a broad subject that any student ought to be able to find something interesting in it. That means that teaching is an art which consists not of articulating all the known facts, but of communicating the ones which are important and being able to explain why. In this sense, Faculty Teaching Certificate Program (FTCP) played an important role in having valuable opportunities to learn more about teaching itself and to develop and enhance my teaching skills. In particular, some of the main topics including 'Active Learning Strategies for the Classroom' and 'Classroom Assessment Techniques' had beneficial influences on my real classroom settings. In addition, 'Classroom Observation' by a peer faculty member provided me with some valuable information with which I can enhance my teaching skills.

The primary focus in this capstone project is on designing some learning activities in the real classroom settings. This objective is to diversify teaching portfolio by accumulating real life examples and applying those to the classroom experiments in a way that topics help stimulate and motivate students' interest within real-world relevance. Rather than having students memorize a list of economic or statistical theories, students should be taught critical thinking skills in learning to apply different techniques to different

situations and distinguish between appropriate uses. Below I give some classroom learning activities and experiments in Economics.

## **Learning through Classroom Activities**

Active learning may be particularly important in economic education where the overarching goal is to help students “think like economists” (Siegfried et al, 1991). Active learning helps students think like economists by providing structured opportunities where they apply economic ideas to answer questions and solve problems. Considering its potential and importance, I attempted to improve classroom learning activities to convey my own excitement about material and to make lectures as clear as possible so that students are challenged by the ideas being presented rather than the presentation itself. Below I describe four classroom activities experimented (or potentially executable) in the principle Economics courses and Business Statistics course. The detailed description for each classroom activity is attached.

- Principles of Macroeconomics (Econ 201):
  - Interdependence and Trade: “Getting Dressed in the Global Economy”
  - Keynesian Cross: A Macroeconomic Equilibrium
  
- Business Statistics (Econ 207)
  - Idea Sampling (Collecting Personal Opinions on Statistics)
  - Team Quiz

### *Interdependence and Trade: “Getting Dressed in the Global Economy”*

This activity helps students understand the importance of comparative advantages and specializations in the market. The advantage of specialization and division of labor is very clear in this example. The experiment can be conducted in any size class and no

materials are needed. At the beginning of the activity, each student is given the questionnaire. The questions are:

1. Where did your clothes come from?
2. Who worked to produce your clothes?
3. What things do you consider when buying a garment?
4. Where were your clothes produced (what countries)?

Students may have about two or three minutes to write an answer to each question, then the answers may be discussed before moving on to the next question. The first question can be answered with a brief phrase. The second question is the core of the assignment and takes several minutes. Therefore, students will be asked to list as many categories of workers as possible. The third question introduces demand concepts; most of the determinants of demand can be introduced during this discussion. The fourth question is to look at the country-of-origin tags sewn in their garments and to help student see the importance of comparative advantage and specialization.

### *Keynesian Cross: A Macroeconomic Equilibrium*

This experiment simulates the income determination process in a two-sector macro model.<sup>1</sup> Students are allocated a percentage of GDP and must decide what percentage of this income they will choose to spend in each of the following rounds. However, students realize the public good nature of their spending. When students save they receive all of the benefits, but increases in spending only help each individual student by increasing the overall level of GDP and therefore their allocation. Low levels of spending bring about unemployment problems and high levels of spending cause inflationary problems. There are several additional features that could be incorporated into this experiment. The experiment as originally conducted and some suggested additions are presented below.

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<sup>1</sup> This experiment was originally developed by Charles Scott Benson, Jr. and Tesa Stegner of Idaho State University, 1997.

The experiment can be conducted after the Keynesian multiplier had been discussed. Students were given an information sheet in the previous class period and a sheet on which to summarize the results on the day of the experiment. (Copies of these sheets are attached in Appendix)

The experiment has twenty players (groups) with larger classes having more than one student assigned to each decision-making unit. At the start of the experiment, each player is given an identifying letter. The income distribution is then revealed as a specified percentage of GDP and the actual dollar value; students do not have the option of choosing a letter with a high income. The spreadsheet program, including the initial distribution information, is projected on an overhead screen. Given the large number of calculations, this experiment can not be run without the aid of a computer.

The initial equilibrium level of GDP was set at \$400,000. The distribution used is presented below in Table 1. GDP for subsequent rounds is determined by summing the spending by each player (consumption spending) and adding a fixed amount for investment spending (set at 25% of initial GDP-- \$100,000). After any needed adjustments, this figure is allocated to the players based on the original distribution which forms the basis for decisions in the subsequent round.

**Table 1. Initial Distribution of GDP**

# of Players (Groups)	% of GDP	Income Level
7	2.5%	\$10,000
8	5.0%	\$20,000
3	7.5%	\$30,000
2	10.0%	\$40,000
20	100%	\$400,000

In each round of the experiment, students decide how much of their income to spend and how much to save. Each player in each round must spend at least \$3,000 (for food, shelter, and basic need), and may spend no more than their current income in each period in which they are employed.

After independent spending decisions are made the equilibrium level of GDP is calculated for that round by adding the class consumption spending and saving decisions each round. The equilibrium level of GDP is used to determine the income level of the participants for the next round. GDP is allocated to the players using the percentages in the original income distribution table shown above.

After the data are entered and equilibrium income is found, additional adjustments may be needed. If consumer spending falls below \$280,000 (or remains below this level), then one or more players must be randomly unemployed (or re-employed as the situation warrants). Individuals are equally likely to become unemployed; selection is by a random drawing. An unemployed player earns no income for that round, so total income must be divided only among the employed players to begin the next round. Unemployment can last up to two consecutive periods. If GDP remains low for more than two rounds, anyone who has been unemployed for two periods becomes re-employed and a different randomly selected player becomes unemployed. All of the information in each round should be entered into the spreadsheet program so that income can be accurately allocated for the next round.

If total spending greater than \$300,000, then inflationary pressure develops. This is modeled here by assuming that prices rise by enough to keep real GDP at \$400,000, and the distribution of income for the next round based on the real \$400,000 level. Thus, no player will ever earn more in any round than he or she earned in round one. This implicitly assumes that the aggregate supply curve has become vertical at a full employment real output level of \$400,000, so no additional output can be created and shared.

Two incentives are also built into the game that directly influence the amount saved. First, savings earn an interest payment of 5%. Second, the players' rankings at the end of the game are based on their increase in savings. Each player's percentage of the total savings

is compared to their initial allocation of GDP. Players are ranked and points earned based on the difference in these percentages.

High spending rewards can then be handed out while the players digest the information and make their decisions for the next spending round. It is advantageous to end the game before the end of the class period to avoid a last period problem - students changing their behavior in anticipation of the end of the game.

In order to increase the incentive to save by rewarding savings, the initial interest can be increased. Saving earns interest, but spending reduces the possibility of becoming unemployed. There is a public good problem inherent in this decision, since saving generates private value and spending reduces the unemployment odds for all participants. If incentives to save are strong you may see low spending and falling levels of equilibrium GDP and rising unemployment.

#### *Idea Sampling (Collecting Personal Opinions on Statistics)*

Since most of students, at the beginning of semesters, feel that Statistics is a very technical and purely math-oriented tool, many students are afraid of the course itself. Thanks to this understanding, I have found that one of the most important things is to have students dispel their fears for the seemingly complicated and technical but non-math-oriented and life-related topic, Statistics. In this sense, this activity is very effective to help students have better and more comfortable feeling on Statistics. Moreover, it is also helpful for an instructor to have some basic knowledge on students' statistical mindset.

This activity is to collect the students' fundamental ways of thinking on Statistics. Students are asked to write one or two metaphorical expressions for Statistics by using words like 'difficult', 'math', 'number', 'calculation', 'sample' and so on. Once all the students' metaphors have been collected, then instructor or any volunteered student

works on grouping all the collected words by similar expression. The sorted results can be used as a qualitative data for defining Statistics.

### Team Quiz

Students in teams can learn from one another in ways that are very different than in the usual instructor-teacher learning model. In particular, learning just statistical theories without relating those with the real world is somewhat useless when students are not interested in the topic itself. I have found that students feel comfortable with studying and preparing course materials and can focus on drawing a big picture of statistics which I think is important in a statistical way of thinking in their everyday life.

Team quiz in Statistics works well and gets positive student feedback, usually near the end of the semester. When most of theoretical parts are delivered to the students, this activity can be executed to get the maximum effectiveness.

I have prepared, in advance, two versions of a multiple choice quiz over all the material covered before the quiz time. Two versions are identical except for the directions at the top of the first page. In particular, all the questions are from real life examples and questions should require some statistical analysis or higher-level thinking. Quiz time consists of two parts. For Part I of the quiz, student work individually. When they finish, they turn Part I and pick up Part II. Part II is completed in teams after all students have finished Part I. Team members will all agree on some of the questions, and time will be spent on the few where differences of opinion arise.

## **Conclusion**

Economic classes should not be taught where students learn methods but failed to see how these methods are actually used in the real life. Teaching Economics and Statistics must be put in the context of real business problems. To develop active learning

techniques in Economics could be one of the most efficient ways to relate the theories with the real life.

In this capstone project, I have described four learning activities with real-world relevance. Active learning through classroom experiments is very important skills to be continuously acquired in learning Economics since one of my fundamental goals is to teach a better Economics class and students can learn more effectively.

## **Bibliography**

Benson C. Scott and Tesa Stegner, "An Aggregate Demand Driven Macroeconomic Equilibrium Experiment." *Classroom Experonomics*, 1997, V. 6(2) p.5-8.

Siegfried, John J. et al. "The Status and Prospects of the Economics Major." *Journal of Economics Education*, Summer 1991, 22(3), pp. 194-224