

An Integral Approach to Teaching Economics

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Abstract

We sometimes fall in the trap of teaching our students the way we were taught, although this method usually is not optimal. This paper suggests an approach to design and teach an economics course and then assess its results to improve the class. Although we draw examples from principles of economics, this method is applicable to any subject.

Introduction

The first time I taught a course, I basically imitated the teaching pattern that I had been subjected to during college: lecturing, problem sets, exams, individual student work. Although the class turned out quite well by short term standards, something was not right: I felt that many students were not really interested in the subject and they attended class just to fulfill a degree requirement and get out of college. I bet most of my students in that first course forgot almost all I told them.

Through the years I have learned more about teaching and I have experimented using alternative techniques. This paper shows the approach I currently use to teach a course. There is nothing magical or amazing about it, and I am sure I will change it dozens of times through my teaching career, but it is very useful to me now and I wanted to share it with you.

Figure 1 shows the basic structure:

- (1) determine the course objectives
- (2) design and implement activities to reach the objectives
- (3) assess the success of the activities
- (4) use the feedback to improve the objectives and activities

Given the space limitations, in the following sections I will just briefly discuss the determination of course objectives and I will concentrate on the last two steps, with a description of the tools I use.

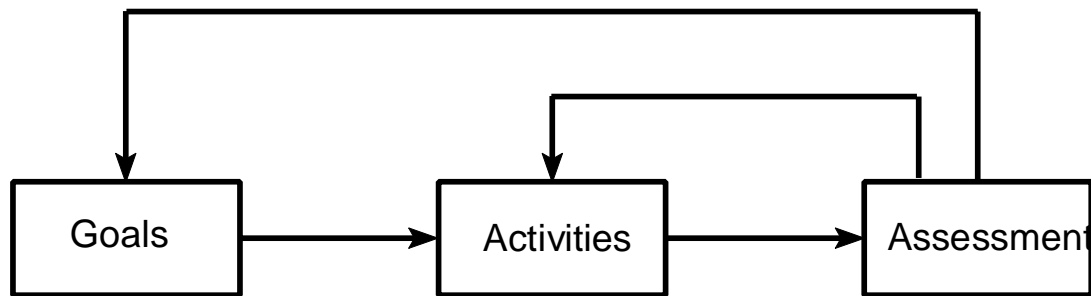


Figure 1

Course Objectives

Three frameworks are useful when determining course objectives: (1) Perry's classification of the intellectual development of undergraduates, (2) Bloom's taxonomy of the cognitive domain, and (3) Bloom's taxonomy of the affective domain. The first two classifications are particularly well suited for economics courses, but even the third framework may be used in some courses. Figure 2 shows how the three frameworks fit together.¹

¹For an explanation of the three frameworks and how they approximately correspond to each other, see Clerici-Arias (1994)

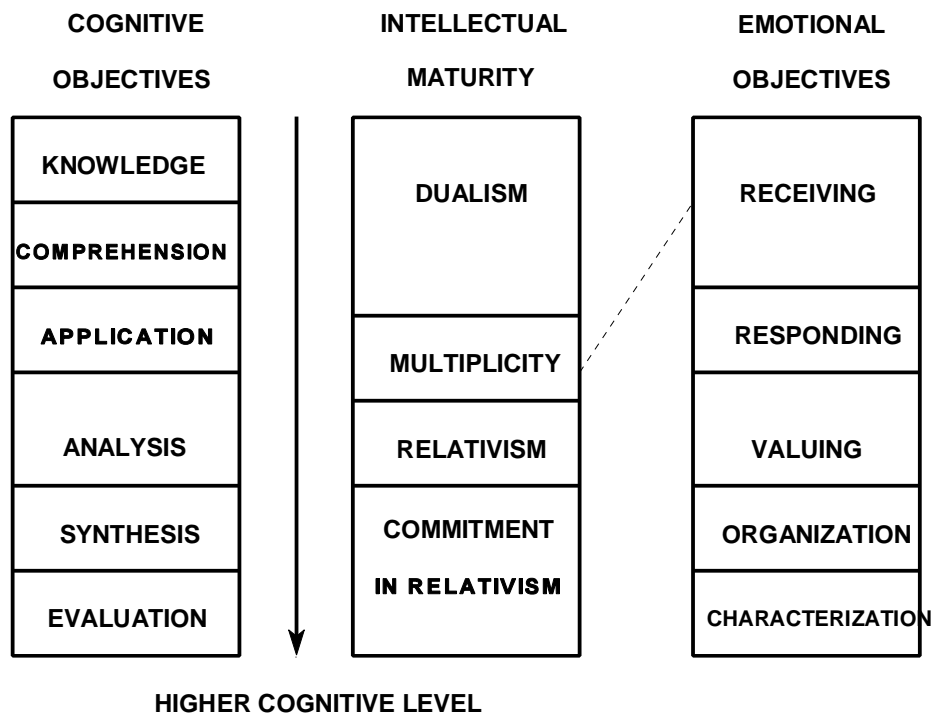


Figure 2

The idea is to approximately determine the different levels of intellectual development of your students, and then set up your specific objectives and activities in terms of the corresponding cognitive objectives—gradually increasing the cognitive level of the activities (see figure 3 for an example). Since I do not want to make the determination of objectives the heart of this paper, I refer interested readers to Bloom (1956), Krathwohl, Bloom and Masia (1964), Saunders and Walstad (1990) and Clerici-Arias (1994).

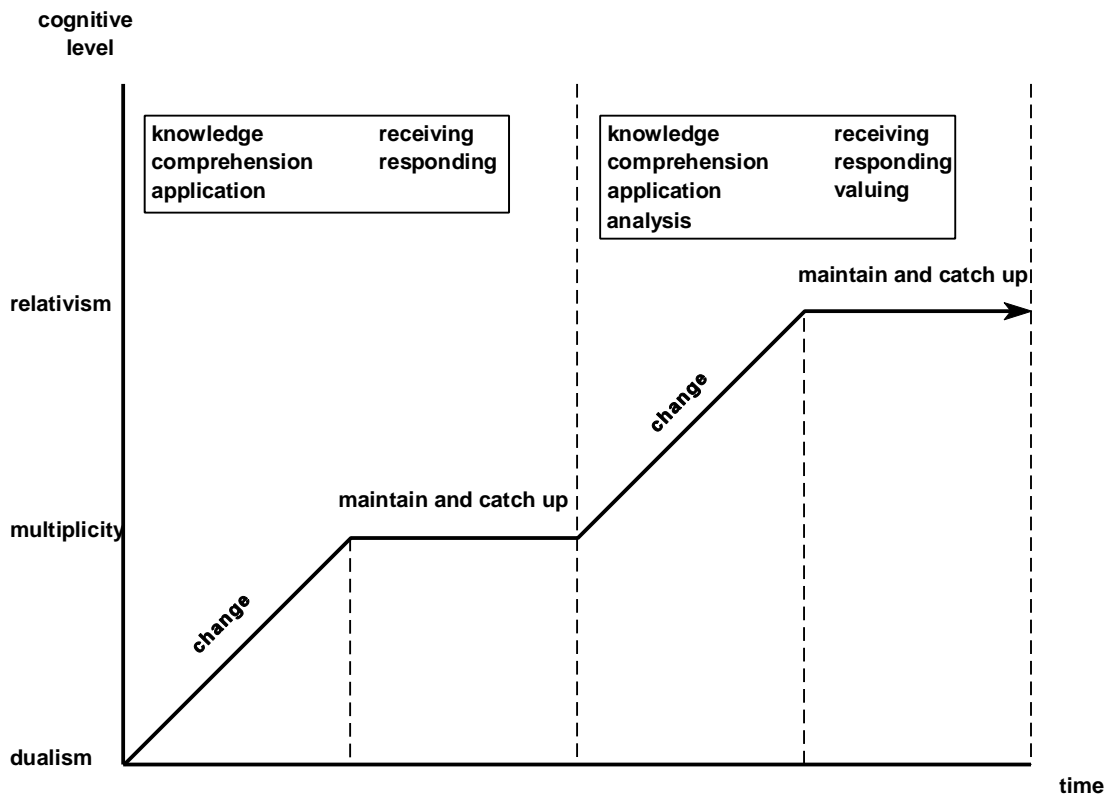


Figure 3

Activities

Once we have determined our objectives, we need to choose the right activities to achieve them. Educational research has shown the importance of active learning (Davis, 1993; McKeachie, 1994), particularly the use of techniques that complement lecturing. Table 1 shows a classification of activities according to:

- (1) the cognitive objectives they develop or test.
- (2) whether they are group or individual activities.
- (3) whether the activities work better inside or outside the classroom.

	Activities inside the classroom		Activities outside the classroom	
Cognitive objectives	Group	Individual	Group	Individual
Knowledge	<ul style="list-style-type: none"> • empty outlines • memory matrix • one-sentence summary • RSQC2 	<ul style="list-style-type: none"> • minute paper • muddiest point • one-sentence summary • RSQC2 • written exam (multiple choice or essay) 	<ul style="list-style-type: none"> • reading and summarizing news • one-sentence summary 	<ul style="list-style-type: none"> • short summaries • reading and summarizing news • one-sentence summary
Comprehension	<ul style="list-style-type: none"> • muddiest point • one-sentence summary • student-generated test questions 	<ul style="list-style-type: none"> • minute paper • muddiest point • one-sentence summary • student-generated test questions • written exam (multiple choice or essay) 	<ul style="list-style-type: none"> • problem sets • student-generated test questions 	<ul style="list-style-type: none"> • problem sets • student-generated test questions

Application	<ul style="list-style-type: none"> • application cards • student-generated test questions • documented problem solutions • debates • games/experiments 	<ul style="list-style-type: none"> • application cards • student-generated test questions • documented problem solutions • written exam (multiple choice or essay) 	<ul style="list-style-type: none"> • data-provided microthemes • documented problem solutions • student-generated test questions • problem sets • economic novels • connect news to principles • writing a newspaper • finding data in library, newspapers, and internet • games/experiments 	<ul style="list-style-type: none"> • data-provided microthemes • thesis-support microthemes • documented problem solutions • student-generated test questions • problem sets • economic novels • connect news to principles • writing a newspaper • finding data in library and internet
Analysis	<ul style="list-style-type: none"> • RSQC2 • documented problem solutions • debates 	<ul style="list-style-type: none"> • RSQC2 • documented problem solutions • written exam (essay) 	<ul style="list-style-type: none"> • thesis-support microthemes • analytic memo • documented problem solutions 	<ul style="list-style-type: none"> • thesis-support microthemes • analytic memo • documented problem solutions
Synthesis	<ul style="list-style-type: none"> • one-sentence summary • concept maps • RSQC2 • oral exam • debates 	<ul style="list-style-type: none"> • minute paper • one-sentence summary • concept maps • RSQC2 • written exam (essay) • oral exam 	<ul style="list-style-type: none"> • concept maps • written exam (essay) 	<ul style="list-style-type: none"> • thesis-support microthemes • concept maps • written exam (essay)
Evaluation	<ul style="list-style-type: none"> • RSQC2 • oral exam • debates 	<ul style="list-style-type: none"> • minute paper • RSQC2 • written exam (essay) • oral exam 	<ul style="list-style-type: none"> • written exam (essay) • writing a newspaper • peer review • forecasting 	<ul style="list-style-type: none"> • paper • written exam (essay) • writing a newspaper • peer review • thesis-support microthemes • forecasting

Table 1

With so many techniques to choose from, the obvious question is: how do we determine what combination of activities will work for our course? We can use tables 2 and 3 for this purpose.

First, we write the concepts we want the students to learn within one broad category (for example, demand and supply) in the first column of table 2, in the same order we are planning on

teaching them. For each economic idea, we choose an activity that corresponds to the level of intellectual development of the students and is suitable for the concept. Then we check for some balance of activities within the same class period—doing the same activity over and over or combining non-complementary techniques may reduce their contribution or even make it negative. Finally, we summarize the results of table 2 in table 3, that shows broad categories of concepts, and we check for balance across categories and that the cognitive objectives are increasingly complex through time.

A brief summary of each activity follows, including a graphical summary of the objectives they are best suited for. Figure 4 shows the complete matrix: the first six cells show the cognitive objectives and the last two indicate whether the activity can be done inside or outside the classroom and by groups or individual students. For example, the *empty outlines* technique is best suited to develop and assess knowledge in the classroom by groups or individuals. Interested readers are referred to Angelo and Cross (1993), Erickson and Strommer (1991), Davis (1993), and McKeachie (1994).

K	C	Ap	C/O
An	S	E	G/I

Figure 4

Course: Econ 1

Title: Demand and supply

Date: 6/27/94

Concepts	Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation	Assessm
Excess demand, excess supply, and equilibrium		lecture with class interaction	small group work				
Changes in equilibrium			small group work (in class) based on homework	homework: assignment 4(news analysis)		peer review of assignment 4	
Consequences in other markets			small group work combined with lecture (assignment 2)		homework: assignment 2 (news synthesis)	peer review of assignment 2	muddiest point via email (assignment 5)

Table 2

Course: Econ 1, Summer 1994, Stanford University

Concepts	Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation	A
Introduction to economics	1 (5')	3 (25')	3 (25')				
Demand and supply		4 (40')	8 (115') 1 HW (90')	1 HW (30')	1 HW (30')	1 (5')	1 H
...							

Table 3

K			C
			G/I

Empty outlines. The instructor creates an outline of the material and provides the students with only part of that information during class. Then

students have to fill the blanks with words or brief sentences. Empty outlines help students categorize the material they have just learned, but they are constrained by the hierarchy chosen by the instructor. Therefore, this technique is more suitable at the beginning of the course and should be later replaced by an activity that requires higher-order thinking (e.g., the concept maps).

K			C
			G/I

Memory matrix. The instructor provides the students with a blank matrix that only contains some useful categorizing variables in the row and column

headings. Students should then fill the cells with the appropriate answers. Similarly to the empty outlines, the memory matrix provides a way of organizing the material but precludes higher-order thinking. The advantage of the memory matrix over empty outlines is mostly visual, though not all material is suitable for the matrix form.

			C
	S	E	I

Minute paper. After a lecture, a reading, or a homework assignment, students are asked two basic questions (or some variation of them): (1) what was the most important thing you learned in class?, and (2) what important

question remains unanswered? Not only does the minute paper help students focus their attention to the most important points we want to convey, but it also is an excellent tool to get feedback on how well we are communicating concepts to the students. The minute paper provides a means of testing the students knowledge and comprehension of the material, plus it requires synthesis and

evaluation in choosing the most important concept among all those they have learned. Another advantage of the minute paper is that it requires little time to prepare and analyze.

K	C		C
			G/I

Muddiest point. Students are just asked one question: what is the muddiest point in this lecture (or reading, assignment, etc.)? This technique causes students to think over the material and provides the instructor with

information on individual student problems and the overall success of the lecture or assignment.

			C/O
An		E	

Analytic memos. Students are required to write a one- or two-page analysis of a specific problem from the point of view of, for example, a consultant writing a memo to a client. This activity uses higher-order thinking skills, but

it is quite time consuming for both students and faculty. Peer review can be used both to increase the students' understanding and to reduce the instructor's workload.

K	C		C/O
	S		G/I

One-sentence summary. The instructor selects an important topic that students should summarize in one sentence using the pattern who did what to whom, when, where, how, and why.

K	C	Ap	C/O
An	S	E	G/I

RSQC2 (Recall, Summarize, Question, Connect, and Comment).

RSQC2 is a modular technique that can be used selectively or as a whole. At the beginning of the class, students list what they **recall** as the three most

important ideas from the previous class (duration: 2 minutes), which should then be **summarized**

into one sentence (1-2 minutes). Students are asked to write one or two **questions** that remained unanswered in the previous class (1-2 minutes), and to **connect** the main points with the objectives of the course (3 minutes). In the last module, the students **comment** on that specific class (2 minutes).

			C/O
	S		G/I

Concept maps. The traditional figures we use in economics (demand and supply, etc.) are an example of this technique, but the concept is much wider, including any graphical representation of ideas and their relationships. The

instructor should help students to gradually develop the ability to create their own concept maps.

		Ap	C/O
An			G/I

Documented problem solutions. Students record all the steps they go through to solve a problem. This activity helps students and faculty to better understand and correct problem-solving methods.

		Ap	C
			G/I

Application cards. This simple technique requires students to provide one real-world application for a principle they have just learned. Students have to

think about possible applications and, therefore, they can attach the new concept to their existing mental framework.

K	C	Ap	C/O
			G/I

Student-generated test questions. Students have to provide questions for an exam—and the corresponding answers. While the students practice and

think over what they have learned, this technique lets the instructor evaluate what students consider important concepts and fair questions, and the quality of their answers.

		Ap	O
An	S	E	I

Papers. There are different kinds of papers for different purposes. I refer the interested reader to Palmini (1994), Cohen and Spencer (1993), and Petr (1990).

		Ap	C/O
			G

Games and experiments. These activities involve the students in the observation of economic principles at work under controlled conditions. Brauer (1994) shows a survey of some of the most popular games.

		Ap	O
An			G/I

Economic novels. Reading and analyzing economic novels is a fun way to introduce students to economics. Student groups can read different novels, identifying the economic concepts they have learned in class, and observing how they have been applied to unusual situations. Some novels the instructor could try are Jevons (1992 and 1993), Hill and Dale (1994), and Wolfson and Buranelli (1990).

		Ap	O
An	S	E	I

Thesis-support microthemes. These short writing assignments (not more than 300 words) asks students to state a position and support it with evidence, requiring the use of higher-order thinking skills. Alternatively, the instructor can provide students with the thesis.

		Ap	O
			I

Data-provided microthemes. Similar to the thesis-support microthemes, these activities require the students to draw conclusions from data provided by the instructor.

Assessment of Activities

The previous section describes a wide range of activities that can be used in our courses. Which activities work better depends on the subject, the audience, and the personality of the instructor. Thus, we need a set of tools that let us evaluate the efficacy and efficiency of our way of teaching. Table 4 shows techniques that can be used to assess the success of the activities, followed by a brief description.

	Inside the classroom	Outside the classroom
Students	<ul style="list-style-type: none"> • minute paper • muddiest point • punctuated lectures • standardized evaluation forms • instructor-designed feedback forms • RSQC2 • group-work evaluations • self-confidence surveys 	<ul style="list-style-type: none"> • productive study-time logs • diagnostic learning logs • process analysis • email feedback • quality circles • reading rating sheets
Observer	<ul style="list-style-type: none"> • small group evaluations • videotaping • personal evaluations 	

Table 4

Punctuated lectures. The purpose of this activity is to assess the effectiveness of a given lecture. The lecture is divided into segments, and at the end of each section the instructor asks the

students to reflect on their own behavior during the presentation and to answer a few questions (e.g., how are you connecting this new information with what you already know?, did you get distracted at any point of the lecture?, how did you record the information?).

Instructor-designed feedback forms. The instructor asks the students a few questions about his or her own teaching, very much like the standardized evaluation forms we are accustomed to use. The advantage of having your own forms is that instructors can tailor them to their specific needs, even to assess a specific activity instead of their teaching as a whole.

Group-work evaluations. If the instructor is using small groups, then group-work evaluations are a must. They consist of a few questions on participation, preparation, effectiveness, and usefulness of the group.

Self-confidence surveys. This technique helps the instructor learn about the students' confidence in their own abilities. The anonymous surveys ask students to indicate their degree of self-confidence for a number of skills that relate to economics.

Productive study-time logs. PSTLs are records of how students spend their study time, and they serve two purposes: (1) students learn about their study patterns and then they can correct their mistakes, and (2) instructors can aggregate the data and look for patterns. The degree of detail of PSTLs can be adjusted according to the objectives of the instructor.

Process analysis/Diagnostic learning logs. These techniques are similar to the productive study-time logs, but they do not concentrate on how much time students spend working on it: process analysis focuses on how students go through each step of a given assignment, and the diagnostic learning logs provide a form with specific questions regarding an assignment, class, or another activity. All three techniques are very time consuming.

Email feedback. Electronic mail is a fast, two-way channel of communication between students and faculty that does not require too much time. Student feedback can be spontaneous or solicited by the instructor with specific questions.

Quality circles. These offsprings of the Japanese quality control circles focus on involving groups of students in the assessment and improvement of the course. See Angelo and Cross (1993) for a complete description.

Reading rating sheets. This technique is particularly useful when supplementary readings are assigned and the instructor wants feedback on their effectiveness.

Small group evaluations. An observer divides the class in small groups and asks them to answer three questions: (1) what would you like about the class?, (2) what would you improve?, and (3) how would you improve it? After a few minutes, each group is asked to share their answers with the whole class while the observer takes notes. Once all groups are done, the observer summarizes the answers. The whole process takes about twenty minutes, and gives the instructor

the chance to learn the students' opinions and make any necessary change before the semester is over.

Videotaping. This technique provides the instructor with the possibility of watching him or herself in action, usually in the company of a teaching consultant who can suggest ways of improving the class. See Salemi (1990) for a complete treatment of videotaping.

Personal evaluations. A fellow instructor or a teaching consultant observes the class in action and later meets with the instructor to discuss his or her teaching.

Conclusion

This paper provides a framework to choose course objectives and activities, to assess their success, and then improve them. I hope these ideas will draw some fruitful discussion and I welcome your comments and suggestions.

Appendix

Assignment 1

What: send an email message to Marcelo (send a copy to Shailly too) with the following information:

- name
- class (freshman, sophomore, ...)
- major
- whether you are a visiting student or a regular Stanford student
- phone number
- email address
- your expectations about this course
- 10 specific hours you can dedicate to econ 1, besides class time (e.g., M 2-4 pm, T 5-6 pm, etc.)
- some random, outstanding bit of information about you

When: You should send your email by 4pm on Thursday, June 23 (so you'd better open your accounts today!)

Why: (1) to get to know you a little better.
(2) to compile a list of email addresses
(3) to know your expectations about the course
(4) to ensure that you know how to use elm

Points: 5

Assignment 2

What: On Tuesday, June 21, 1994 (yesterday!), the Commerce Department released the numbers of the U.S. trade balance. You'll find the news in clari.biz.economy using trn (articles 5468 and 5472). You should send an email message to Shailly containing the following items:

- (1) a copy of article 5472
- (2) a one-sentence description of the chain of events that resulted from the unexpected increase in the trade deficit.
- (3) suppose investors had already expected the 22% increase in the trade deficit. What do you think would have happened to the dollar then?

When: You should send your email by 4pm on Thursday, June 23

Why:

- (1) to get you thinking about how economic theory can be applied in real life (we'll discuss the assignment once everybody has finished it)
- (2) to get you writing about economics
- (3) to ensure that you know how to use trn
- (4) to ensure that you read the news

Points: 10

Assignment 3

What: Solve the following exercises:

(1) Illustrate the following with supply and demand curves:

a. Before economic reforms were implemented in Poland, the price of meat was held substantially below equilibrium by law. When reforms were implemented, prices rose dramatically, the quantity demanded fell, and the quantity supplied rose. **(5 points)**

b. Suppose that the government imposes a regulation that sharply decreases the number of trees available for lumber production in the United States to protect two endangered species. Illustrate the effects on the lumber market and on the housing market. **(5 points)**

(2) In August of 1991, the Boston Red Sox were battling it out with the Toronto Blue Jays for first place in the American League East. On August 2, the Red Sox played the Blue Jays in Boston. All tickets to the Blue Jays game were sold out a month in advance, and many people who wanted to get tickets could not. The following week the Sox traveled to Ohio to play the Cleveland Indians (a team in last place). The Cleveland game broke records for low attendance. In fact, only 1,600 went to that game in a stadium that seats 80,000! Fenway Park in Boston holds 36,000 people. Cleveland Stadium holds 80,000. Assume for simplicity that tickets to all regular season games are priced at \$10.

a. Draw supply and demand curves for tickets to each of the two games. Draw one graph for each game. (*Hint:* Supply is fixed. It does not change with price.) **(5 points)**

b. Is there a pricing policy that would have filled the ball park for the Cleveland game? **(3 points)**

c. The price system was not allowed to work to ration the Blue Jays tickets. How do you know? How do you suppose the tickets were rationed? **(4 points)**

(3) In 1999, a rare disease hits the U.S. cattle herd, causing a 20% decrease in U.S. beef production. As a result chicken prices rise. Illustrate this situation with supply and demand curves (draw diagrams for both markets). **(6 points)**

When: You should hand in your assignment by 10 am on Tuesday, June 28 (you can hand it in at the beginning of class).

Why: (1) To analyze complex problems in its basic components.
(2) To apply the concepts of demand and supply to real life situations.

Note: You can work individually or in groups, as you see fit (though I suggest you work in groups). Each of you must, however, hand in individual copies.

Points: 28

Assignment 4

What: On Wednesday, June 22, there was an article in clari.biz.features that shows the effect of government regulation on markets. You should:

- (1) Find the article and write its title and number at the top of your answer.
- (2) Show how the new regulation would affect the market mentioned in the news (draw a demand and supply figure).

When: You should bring your answer to class on Monday, June 27.

Why:

- (1) To analyze complex problems in its basic components.
- (2) To apply the concepts of demand and supply to real life situations.
- (3) To get you to read the news ☺

Note: You can work individually or in groups, as you see fit (though I suggest you work in groups). Each of you must, however, hand in individual copies.

Points: 10

Assignment 5

What: Answer the following question in one sentence: For you, what is the muddiest (most confusing) point about demand and supply?

When: Send an email message containing your answer to Shailly no earlier than 11am on Monday, June 27, and not later than 5pm on Monday, June 27.

Why: To know what you think is most confusing about demand and supply and then try to explain it better before the quiz.

Points: 3

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