

The Challenge of Teaching Freshmen

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Abstract

Professors usually adjust their teaching to the level of knowledge of their audience. However, we seldom aim our lectures at students with different levels of intellectual development within the same course. Empirical data shows that freshmen, a significant portion of the introductory economics sequence, show different learning abilities and behavior than upper-class students. Faculty need to recognize this fact and know the level of intellectual development of their students—particularly freshmen—so that they can guide them along the difficult journey of learning to think like an economist. This paper addresses these problems and suggests some solutions.

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Introductory economics is one of the most popular courses for undergraduates, drawing people from every discipline. Many students who take principles of economics have not chosen their major yet, and this class can greatly influence their decisions. This fact alone is reason enough to pay extra attention to this course. That is why departments of economics usually assign some of their best professors to perform this task.

Good professors are specially important because of another characteristic of introductory economics: the heterogeneity of its students and, particularly, the large number of freshmen that take this class. For example, at Stanford University in the last three years, freshmen constituted almost 29% of the elementary economics course.¹

Why should we care that so many freshmen take principles of economics? Several studies show that sophomores (and other upper-class students) generally learn more than freshmen.² In the case of introductory economics in particular, Bonello, Swartz and Davisson (1984) and Watts and Lynch (1989) estimated the influence of class standing on learning principles of economics, and they determined that sophomores have a significant advantage even during the second semester. Bonello et al. conclude that: “Thus, we should take warning

¹From 1991 to 1993, the composition of the introductory economics course by student class at Stanford University was: freshmen, 28.9%; sophomores, 34.3%; juniors, 19.0%; seniors, 15.9%; graduates, 1.9%.

²Attieyeh, Bach and Lumsden (1969), Kelley (1972).

and only mix these students when it is justified by other educational considerations.”

Unfortunately, few schools, if any, can afford teaching separate versions of introductory economics to each student class. Therefore, we have to learn how to deal effectively with a heterogeneous group of students, since educational objectives and teaching techniques are not suitable for every level of intellectual development. My study focuses on freshmen, the most disadvantaged undergraduates from the point of view of intellectual development. In the following pages, I will discuss the level of intellectual development of freshmen before taking introductory economics, where freshmen should be after the course, and how we can successfully guide them from one state to the other.

The Intellectual Development of Freshmen

I believe it is easier to talk about education if we have some kind of structure in mind. Even if it is not completely accurate, a framework can provide a common language to describe the problem and communicate ideas. In order to talk about intellectual development, I am going to use Perry’s classification of the intellectual development of undergraduates in *dualism*, *multiplicity*, *relativism*, and *commitment in relativism* (Erickson and Strommer, 1991).

Dualism is characterized by the belief that absolute truth exists and professors and textbooks are the authorities, the messengers of this

knowledge. Many freshmen lie in this category. Students in this group are passive, taking lecture notes and memorizing facts and theories. If the professor presents conflicting theories the traditional response is “why don’t we just learn the theory that is right?” A definite structure is very important to freshmen in this stage, and a lack of it at the beginning of the course may throw them off and cause a reaction that would negatively affect learning.

After a while students realize that some answers are uncertain and they start to believe that *every* piece of knowledge and information is subjective and matter of opinion. This is the multiplicity stage. Students believe that their opinions are as good as the professor’s, even if their opinions are unsupported by evidence. Most freshmen belong in one of the first two categories.

Once the professor demands that students provide arguments and evidence to support their claims, students gradually shift to relativism. Individuals in this category learn the methods of analysis of the discipline but they have not yet developed a sufficient level of abstraction. Students get mangled in the complexities of the problem, unable to reach conclusions.

Gradually students realize that they must make choices and draw conclusions, both in the classroom and in real world situations. This stage of intellectual development, commitment in relativism, is rarely achieved by freshmen.

At the beginning of the semester, then, we are faced with at least two different groups of students. On the one hand, freshmen are usually passive absorbers of information considered to be true. On the other hand, upper-class students already have entered a higher intellectual stage and demand more sophisticated information.

In my experience as trainer and evaluator of teaching assistants, one characteristic of an instructor may be simultaneously praised and hated by different students. Let's take a real life case in an introductory economics class as an example. A teaching assistant aims his section at the group of upper-class students. Their comments are: "I had a lot of fun in section and I think I learned a lot . . . and I feel my interest in economics has grown" and "our teaching assistant did very well regarding learning to help the class at a slow enough pace that enough people could catch on, but at a pace quick enough to cram a lot of good info in fifty minutes." However, the second group of students (here we cannot actually identify them as freshmen since the evaluations are anonymous) did not think the teaching was good: "Teach higher level classes so that your students can keep up with you," "the teaching assistant would be extremely helpful if [the student] had a basic background of economics."

The two groups of students may even perceive the attitude and personality of the instructor in very different ways. For example, the same teaching assistant was referred to as "very willing to help students when we don't understand something, and very sensitive to students' level of understanding" by a student in one group, and as ". . . arrogant and insulting. The atmosphere will be much more

enjoyable if [he isn't] so impatient with our lack of understanding” by a student in the second group. Other comments range from “he was very accessible” to “he was arrogant, which made me fear asking the more ‘simplistic’ questions that confused me.”

Remember that all these students are evaluating the same teaching assistant in the same class at the same time. This instructor displayed a unique behavior and way of teaching, but students reacted to it in completely opposite ways. This example should remind us of some of the dangers of treating all levels of intellectual development in the same way.

Besides, the freshman year is characterized by big life changes and emotional distress. Freshmen move out of their homes probably for the first time, they are confronted with unknown people in an unknown environment, and their position in the community changes dramatically—from being almighty seniors to almost nobodies in college. While this paper will not deal with the emotional problems of freshmen, we must be aware that we are not the only ones who subject undergraduates to new and challenging experiences. We are competing with other courses and the social life of students.

Objectives of Introductory Economics

Now that we have an idea of where freshmen are, let us talk about where we want them to be. This section will concentrate on the educational objectives that we want to achieve.

Bloom (1956, 1984) and Krathwohl, Bloom and Masia (1964) provide an excellent framework for educational objectives, both in the cognitive and affective domains. Bloom's taxonomy of the cognitive domain (figure 1) is well known and has been used to analyze introductory economics textbooks. For example, Karns, Burton and

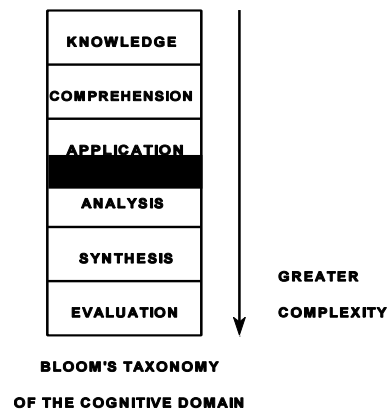


Figure 1

Martin (1983) analyzed six top-selling principles of economics textbooks. Independent judges determined the nature of the educational objectives of these books and classified them according to Bloom's taxonomy.

Knowledge is the basic stage of the cognitive domain. It just involves remembering information and ideas. Karns' study found that 42% to 60% of the educational objectives of the most popular principles of economics textbooks emphasized just knowledge.

The second level in Bloom's taxonomy, *comprehension*, involves the translation of concepts into other language, the interpretation of the relationships between concepts, and the extrapolation of trends. 28% to 45% of the educational objectives in Karns' study were aimed at this stage.

Overall, 85% to 97% (!) of the educational objectives in principles of economics textbooks covered knowledge and comprehension. This fact may lead us to believe that remembering information, translating it into one's own words, then interpreting the relationships among pieces of information and, finally, making predictions are all we want from students in introductory economics. I agree these stages are fundamental but I would argue that our classes should aim at higher stages in the intellectual development of students.

Let us relate Bloom's taxonomy to Perry's framework. We have already seen that many freshmen are characterized by dualism. If the educational objectives just emphasize knowledge and comprehension,

students will merely repeat information they believe to be absolutely true, thus reinforcing their pattern of passivity and their acceptance of one-sided communication. As a result, students will not advance in their intellectual development.

Freshmen that have already reached the stage of multiplicity will not accept the one-sided knowledge of introductory economics without applying the principles to new problems and analyzing the information further. These elements are mostly absent in principles of economics textbooks.

This brings us to *application* and *analysis*, the next two levels in Bloom's taxonomy of the cognitive domain. Application implies that the student can apply the appropriate principle to a new problem. The introduction of a new situation makes application different from extrapolation since the latter just involves understanding the trends described by the textbook or the professor. The fourth level, analysis, involves decomposing the material into its elements and finding out how these elements are structured. Just 2% to 19% of the educational objectives in Karns' study involved application or analysis.

Application is a necessary but not sufficient condition to jump from dualism to multiplicity. Students may discover alternative approaches when studying new situations, but they need a considerable amount of guidance. Otherwise, students would just be content with translating new problems into old problems and then literally applying the concepts and formulas found in the textbook to the transformed situation.

Analysis is the key to advancing to the multiplicity stage, and even to relativism. When students break down the material into its constituent parts, when they discover the major relationships between these parts and, above all, when they recognize how these elements are organized, then students are very close to understanding that there are several ways of organizing the same information, that no theory is absolutely true, and that some approaches yield better results than others. Amazingly, most economics textbooks in Karns' study do not include analysis within their educational objectives.

The two highest levels of Bloom's taxonomy are rarely present in principles of economics textbooks. Typically just 1% of the educational objectives involve *synthesis* and *evaluation*.³ Synthesis is the combination of the elements of the communication to form a new structure, while evaluation involves making value judgments using criteria given to the students or even determined by them.

Synthesis and evaluation in educational objectives are intimately tied to Perry's commitment in relativism, the highest level of intellectual development in college students. It might be argued that one semester is a short period to expect freshmen to move from dualism to commitment in relativism. In fact, I do not believe it is generally

³One of the six textbooks had four percent of its educational objectives dedicated to synthesis and evaluation, while another one had not even one!

possible to achieve this task in introductory economics, so I will not deal with these educational objectives in this paper.⁴

Until now we have worked with stages of intellectual development and educational objectives of the cognitive domain, and as we have seen, other economists have tried to communicate their ideas on education using these two frameworks. However, economists have not used, to the best of my knowledge, another important piece of the equation: the taxonomy of educational objectives of the affective domain developed by Krathwohl, Bloom, and Masia (1964) (figure 2). This omission may be understandable, since economics is a science, and, thus, we usually think of it as separate from emotions and subjective values. But in this case we are dealing with the *teaching* of economics, and emotional factors can play a big role in it.

In the first stage, *receiving*, the learners become aware of a situation and they are willing to tolerate some stimulus usually communicated by the professor. For example, the students may be presented with the phenomenon of inflation and not react—either negatively or positively—to the facts presented to them. This process includes awareness of what inflation is or what its consequences are, but does

⁴However, we must keep in mind that upper-class students also take this course, and their level of intellectual development may permit the intensive use of synthesis and evaluation. Evidently, the textbooks analyzed by Karns, Burton and Martin do not include these educational objectives, thus delaying the development of upper-class students. Small group work can be used as a way of aiming at different levels of intellectual development, as it is proposed later in this paper.

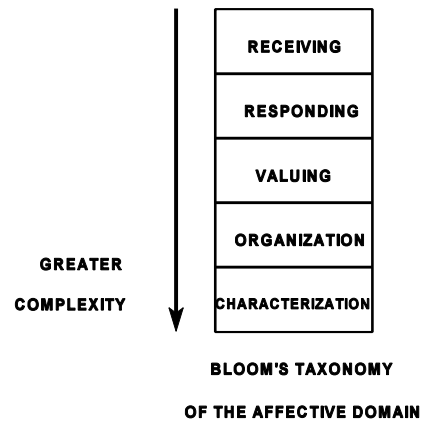


Figure 2

not imply the ability to recall information—as opposed to knowledge in the cognitive domain. For example, we do not require the students to remember the definition of inflation or a certain theory that explains inflation. At this point we are not concerned with whether the students understand the concepts or not. Receiving comes at a deeper level; it is closer to a “gut reaction.”

Even at this very basic level, we may find some students that do not easily accept the information we present to them. For example,

students in the multiplicity stage may reject the information as presented by the professor or the textbook. An effective teacher should be able to overcome these predictable negative reactions.

The second stage, *responding*, involves the students doing something with the phenomenon besides just perceiving it. For example, the students may read the newspaper to find out about the current rate of inflation in the United States. There are several subclasses within responding: a response may be induced by the professor (for example, students may be tested on their knowledge of the current rate of inflation); a response may be voluntary (students might be interested in knowing what is the rate of inflation in their own country); or a response may be even accompanied by some degree of satisfaction. As teachers we must pave the way for some kind of voluntary response from freshmen, a response that is necessary to get them out of the passiveness associated with dualism and into the opinionated stage of multiplicity.

In the third stage of the taxonomy of the affective domain, *valuing*, the students are driven by their commitment to a certain value. This commitment is tentative at first, but it gradually evolves to complete conviction. The value adopted by the student is not necessarily supported on adequate scientific grounds; instead, it is based on the emotional acceptance of a proposition. Therefore, I believe it is our job to introduce economics to students in a way such that they can develop their own values while we discourage excessive emotional investment in paths that have already been discarded by generations of economists. This task is extremely important since we want

freshmen to advance to the next stage in intellectual development, i.e., relativism. If the student commits to scientifically unsupported values, she will stay in the multiplicity stage. On the other hand, if we subtly guide the student toward scientific values, she will establish a strong emotional commitment toward the scientific theory, thus being self-motivated to learn more in the right direction. At this point students are ready for relativism.

I believe freshmen seldom achieve the last two classes of educational objectives of the taxonomy of the affective domain, *organization* and *characterization*, so I will just describe them briefly. The need for the organization of values into a system appears when the student discovers situations for which more than one value is relevant, and she has to decide how values are related and which are more important. Once the values are organized into a consistent system and the student behaves according to it, she has reached the last stage, characterization.

We have spent some time dealing with frameworks of intellectual development and educational objectives. Figure 3 shows the approximate correlation between the three classifications. If we read the chart horizontally, we can find the educational objectives in the cognitive and affective domains that correspond to a specific stage of intellectual development. Sometimes the same class of educational objectives may be associated with two different levels of intellectual development. For example, increasingly complex and original applications are needed to move from dualism to multiplicity. If we read the chart vertically, the most basic educational objectives and

stages of intellectual development are found at the top of the figure, and their complexity increases as we move down.

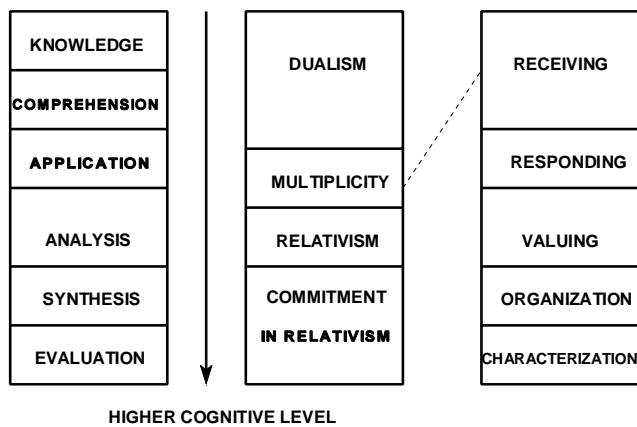


Figure 3

Now it is time to use these tools to discuss where we want freshmen to be by the end of a course in introductory economics. As mentioned earlier in the paper, freshmen usually start in the stage of dualism or, at best, multiplicity. Thus, I believe aiming at relativism by the end of the semester is a desirable and reasonable objective. This means that our educational objectives have to gradually move from knowledge and comprehension to application and analysis in the cognitive

domain, and from receiving to responding and valuing in the affective domain. Comparing this approach to the textbooks analyzed by Karns et al., we can recognize their inadequacy at bringing students out of the stage of dualism. The following section will deal with the techniques that can be used to facilitate the move to the stage of relativism.

Transition to Relativism

Throughout the following pages we must keep in mind that there is not one best way of teaching; I am just proposing a series of steps that seem to work better than other methods I have seen tried. First, I distinguish between *constant* concepts and *sequential* activities. Constant concepts apply to the whole semester of introductory economics, while the sequential activities change along with the evolution of freshmen.

Constant Concepts

Concentration of objectives. There may be countless bits of information and models we think are essential to learning economics. We always listen to arguments that go like “students must know” the Keynesian cross, or indifference curves, or rational expectations, or whatever concept you can possibly think of. However, the truth is that the only way to cram all this information in one semester or, even worse, in one quarter, is that students lose the possibility of really learning anything at all. Many economists have argued whether the

introductory economics course has any lasting effects in the minds and behavior of students (e.g., Stigler, 1963 and Saunders, 1980). In general, research shows that students can retain a great amount of information in the short run, but many of them soon forget much of it, and they cannot apply concepts outside the context in which they were taught (Ramsden, 1992). So, what good is it to pack such enormous number of ideas and facts if they will only serve to pass an examination and nothing else? I would argue that learning economics comes from dedicating more time to working on a few concepts in several different ways, and not from quickly going over as many concepts as possible. Therefore, we should first determine what we really want students to learn and then concentrate our efforts in those points.

Cooperation as a means of learning. I believe that a teaching system that encourages cooperation results in better learning than one that encourages competition. Competition prevents one major source of intellectual improvement, i.e., students interacting and learning from each other. For a long time, several studies have supported the idea that cooperative learning is usually better (e.g., see Stanford, 1977), but too many introductory economics courses are still plagued with two elements that discourage cooperation: grading on the curve and the lack of group work in the classroom.

Relative grading is harmful for at least two reasons. First, it definitely discourages students from sharing their knowledge and, most importantly, their thinking processes, their trials and errors, and their experiences. Secondly, we have already referred to several studies that

show that freshmen have a learning disadvantage compared with upper-class students. Therefore, I would argue that it is unfair to grade freshmen relative to students that possess a higher intellectual development just due to their age. It is very much like grouping sixth, seventh and eighth graders in the same biology class. Even if the content of the course is unknown to all of them, older students usually are more intellectually developed and can probably reach higher standards. Given that we usually cannot separate freshmen from other college students in introductory economics, I propose a system of absolute grading, where each student is evaluated against a set of educational objectives that are fit to the intellectual development that typically corresponds to their age group.

But eliminating relative grading is not enough. Students are not accustomed to working in groups and making good use of them. To take advantage of the benefits of cooperative learning, professors have to encourage group work in the classroom and guide students through this process.

Writing as a means of learning. The use of writing in introductory economics courses varies widely in different places. In my limited experience in the United States, I have observed that large classes—typical in large universities—do not usually engage in writing activities, probably because of the difficulty in grading many assignments. However, I believe the benefit from writing as a way of improving one’s thinking—and not just as a way of assessing knowledge—generally outweighs the costs involved with its application. I will propose different writing activities appropriate for

each level of intellectual development of freshmen and alternative ways of reviewing their work, so that this task is manageable even with large student enrollments.

Macro vs. Micro. Economists have different views on whether micro or macroeconomics should be taught first in an introductory course. I will not recommend always choosing one over the other, but I want to introduce two new criteria into this discussion: the structure of micro vs. macro, and the closeness of each field to the experience of students.

If we want freshmen to move out of dualism, we need to offer them different views on the same economic concepts. I would argue that macroeconomics is a more controversial field than microeconomics and it might be better for freshmen to learn it at the beginning of the semester.

Good teaching generally builds upon the experience of the learner, and I believe we must consider whether micro or macroeconomics is closer to the experience of students. This will certainly vary with the place where students live, their family and education, their socioeconomic class, previous jobs and so on. For example, freshmen in Argentina have a first hand experience on inflation and its effects, the exchange rate, and government spending. However, good examples of perfect competition may not be salient in their mind. In this case, macroeconomics is closer to their experience and we should consider teaching it first in the sequence. On the other hand, American students might have a much harder time understanding exchange rate

depreciation or hyperinflation and how it affects everyone's lives, and microeconomics might be closer to their childhood experience, setting up a booth to sell lemonade. Donald McCloskey (1992) wrote about the importance of experience in learning economics:

[...] I think economics, like philosophy, cannot be taught to nineteen-year olds. It is an old man's field. Nineteen-year olds are, most of them, capable of memorizing and emoting, but not capable of thinking coldly in the cost-and-benefit way. [...] A nineteen-year old has intimations of immortality, comes directly from a socialized economy (called a family), and has no feel on his pulse for those tragedies of adult life that economists call scarcity and choice. You can teach a nineteen-year old all the math he can grasp, all the history he can read, all the Latin he can stand. But you cannot teach him a philosophical subject. For that he has to be, say twenty-five, or better, forty-five.

Although I agree with McCloskey's point that true learning of economics is associated with experience, I disagree with his statement that we cannot teach economics to the typical college student. Instead, we should ask ourselves how we can transmit some experience in economic phenomena to students. And this brings us to the last constant concept, experiential learning.

Experiential Learning. Kolb (1984) devised an experiential model of learning that goes like this: we have a concrete experience, we think about it, we compare our empirical observations with existing theories and try to build new ones, and, finally, we test our generalizations with more experimentation. The important concept is that learning is better in terms of retention and application when we build upon experience instead of skipping this first step.

Given that the economic experience of freshmen is limited, what can we do? The answer is allowing them to experience economic phenomena while they learn the concepts. This objective can be achieved by playing economic games in the classroom, letting students run economic experiments, or going on a field trip to the stock market, the Federal Reserve, or Apple Computer. The introduction of specific activities has to match the intellectual development of students, and that will be the subject of the next section.

Sequential Steps

If we want to successfully guide freshmen from dualism to relativism, our way of teaching has to change along with their intellectual development. To facilitate this process, I have divided the semester into five periods with activities of increasing complexity (figure 4):

- 1 setup
- 2 dualism to multiplicity
- 3 multiplicity
- 4 multiplicity to relativism
- 5 relativism

1. Setup. The beginning of the course is a crucial stage. Not only will the five next periods build upon the structure laid down during the first day of classes, but also a clear structure is extremely important to freshmen.

The first step toward a clear structure is a complete *syllabus*. It should include an introduction to the subject matter, the course goals and policies, an outline of the class including a good description of the tasks, workload and evaluation procedures, and the bibliography. Keep in mind that the style of the syllabus will create a first impression on your students that may play for or against you later.

Group work should start the very first day to set the pace for the rest of the semester. During the setup stage you should explain to students what they can expect from the class, assign them to small groups (groups of four students seem to work well), and help them to get

acquainted with you and with one another. Seat arrangement is important to group dynamics. Try to choose a classroom where students can face each other and move their chairs around if necessary. If that is not possible due to student enrollment or space constraints, you can always do with a normal lecture room with fixed seats and have each group sit in contiguous chairs in two adjacent rows.

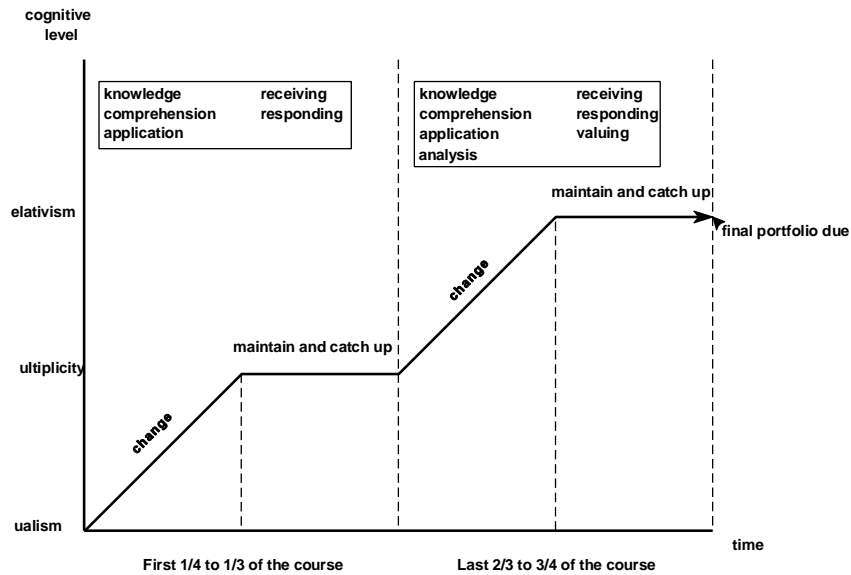


Figure 4

The assignment of students to groups is crucial. Since my premise is that the level of intellectual development of freshmen is lower than that of upper-class students, it follows that we should group freshmen with freshmen, sophomores with sophomores, and so on. If possible, we should make an additional distinction among freshmen who have taken economics in high school and those who have not. The separation of student classes is essential because it lets us aim introductory economics at different levels even within the same classroom. Once students have been assigned to a group, try to keep them there for the whole semester.

Another important part of the course is the use of *portfolios*. The idea is that students compile their written assignments in personal portfolios that must be presented at specified times. Thus, each assignment can be reviewed at its due date or any time thereafter. The student is allowed to revise his assignment given the reviewer's guidelines, and a substantial part of the grade depends on the final portfolio as well as on the original versions of the homework. Therefore, we can assess the students' level of learning when the assignment is due and at the end of the course.

Part of the individual portfolio may include a *journal* where students log their daily experiences and reactions to the material. I believe a journal is a valuable source of information to evaluate the progress of individual students and how they react to each day of classes and to specific assignments. Occasionally reading these journals may provide us with a means to fine-tune our classes to obtain better results while we learn more about our students and how they view us. Journals may

also be a source of data for research on teaching economics. Furthermore, recording daily tasks may help students manage their time and realize how they are using their resources.

Since much of the work is done in groups, *group portfolios* should also be required. Every member of the group is responsible for every assignment and the portfolio as a whole, and we should give the same grade to all the members of each group for their work as a team. We can differentiate among students with different capabilities according to their individual assignments, but never for their joint work because it would greatly diminish cooperation, and because we cannot determine the relative contribution of each member.

Freshmen usually expect a high degree of personal interaction with faculty that does not exist in many colleges and universities. Given the large student enrollment at some places, this level of interaction is not always possible. However, there are a few simple things that may show that you care for your students. First, learn their names. Student comments in evaluation forms show that they correlate learning their names with caring. Although learning names may be difficult in large classes, there are several methods that can help you link a face with a name (e.g., see Stanford, 1977). Second, make yourself available outside the classroom. Stay a few minutes after class, talking with students, and have enough office hours. Third, show that you are open to comments and questions from students. Even if you offer many office hours, students will not come to them if they do not feel comfortable with you. How students view your behavior is also essential for effective group work.

2. Dualism to multiplicity. Activities during this period should emphasize knowledge, comprehension and application in the cognitive domain, and receiving and responding in the affective domain. We will also try to build upon the experience freshmen bring to the classroom.

Let us start with a technical note. Each activity will be preceded by a table of educational objectives that can be targeted with that activity (figure 5). The first row corresponds to the cognitive domain (knowledge (K), comprehension (C), application (Ap), and analysis (An)), and the second row to the affective domain (receiving (Rc), responding (Rp), and valuing (V)).

K	C	Ap	An
Rc	Rp	V	

Figure 5

K	C	Ap	
Rc			

I believe teaching students how to think as an economist is our first priority. At this level, it involves showing them how we solve problems, thus revealing our internal mechanisms to them. This is not an easy task, particularly since we usually do not think about our own thought processes. Instructors usually present the “right” way to solve a problem, without analyzing alternative solutions. Instead, try thinking out loud in front of the students so that they see how you approach a problem, which aspects you highlight and which ones you do not, how you start

solving a problem in a certain way and then you back up because you realize you will reach a dead end. At this point we do not expect students to think as we do, but watching you working and thinking is the best example they can have.

K	c		
Rc			

A skill we have to teach students is how to connect economic concepts in networks of ideas. When students learn concepts loosely, unlinked to previously learned concepts, then students will find it extremely difficult to retrieve those ideas in the future. Thus we have to provide a sensible framework where students can attach new concepts. We should describe this framework in several ways to make it more salient in the minds of the students. One way is to verbally link the concepts. For example, we could describe the differences and similarities between perfect competition, monopolistic competition, oligopoly and monopoly. We could then reinforce the message by tabulating these characteristics, and drawing graphs with the different equilibria. Then we could draw a concept map⁵ showing, for example, the markets represented on a figure with the number of firms on one axis and their power to affect the price on the second axis. After establishing a framework, all the bits of information specific to each market will be much more comprehensible as a whole to students and it will be more probable that they have long-lasting effects.

K	C	Ap	
Rc	Rp		

Students can practice applying economic concepts to

⁵Concept maps are not necessarily the figures we are used to see in economics; a concept map is any graphical representation of ideas, such as the ones we see in all figures in this paper or the table at the beginning of this paragraph.

new problems using small groups. After you showed them how you solved a problem—complete with your internal thinking mechanism—let students try a different problem on their own. Have students record every step they follow, just as you did when you solved the first problem. Visit the groups while they are working to see how they are doing, helping them if necessary, but do not teach them the “right” way, let them realize their mistakes. After an appropriate period of time, let the groups compare and comment on each others’ answers.

It is almost certain that instructor and students will face some obstacles when working with groups. The problems can range from just not getting into the rhythm of working in teams to personal confrontations, including those that come from how students perceive each others' contributions to the group. There are a variety of group techniques that deal with these problems and I would recommend instructors that plan to use small groups read a book on this subject (e.g., Stanford, 1977), then practice in the classroom, observe the results, and revise their behavior next time.

K	C		
Rc	Rp		

Small groups can also be used to discuss economic concepts. Remember that at this stage the discussion has to be highly structured, so give clear instructions to the students at the beginning of the activity.

K	C		
Rc	Rp		

Reading selected articles from the newspaper is one step toward building on elements known to the students. Encourage that students bring their own

newspaper clips, but do not rely on them as the only source. You can find current articles that apply economic concepts to everyday situations. Once a week you could have your students discuss different clips in small groups, summarize them, and then share their findings with the whole class—if the number of groups is low enough—or with just one or two other groups—if the student enrollment is high.

K	C		
Rc	Rp		

Writing should be limited to short summaries on highly focused topics. Remember that freshmen may be taking Freshmen English concurrently with your course—so their writing skills are limited—and that structure and guidance are very important at this stage. Give clear instructions and provide sample summaries, assign different topics to different students, and try to balance individual and group assignments. More complex assignments are more suitable later in the semester.

K	C	Ap	
	Rp		

Problem sets should reinforce not only the concepts but also the techniques and the way of thinking learned in the classroom. I believe we should let students solve the problem sets in small groups, and let these assignments be part of their group portfolios. Do not spend time going over the problem sets in class unless there is a specific exercise that may be particularly important or difficult. Otherwise, hand in an answer sheet and encourage communication across student groups.

K	C	Ap	
Rc	Rp		

The final activity I will introduce in this section is the use of games in the classroom. A few universities, such as the California Institute of Technology, run one

instructional experiment in introductory economics every week to demonstrate the concepts learned in class. If you are teaching micro first, then games such as recreating a competitive market with a double-oral auction are very enlightening and freshmen usually like them. Unfortunately there are very few elementary macro experiments. My main advice at this level is: keep it simple. Designs that are excellent to test economic theories may not be suitable for teaching. If you want experiments proven to work in the classroom, see Brauer (1994). He presents a useful survey of most of the games in the literature. Personally, I am looking forward to the supplement with instructional experiments for introductory economics that Charles Plott of Caltech is writing.

A note on grading. When reading assignments and portfolios, be sure to include plenty of comments. Students need your constructive feedback, not just a grade or a "good job!" comment. Since it may be physically impossible to grade and comment on all assignments, let me suggest some alternative ways of grading.

One such way is *random grading*, where you only grade a portion of the assignment or the whole assignment of some students. Although this method reduces your workload, it has two major drawbacks: students may not receive feedback when they do need it, and the instructor may end up assigning too much homework.

Much better ways of evaluating assignments are using *teaching assistants* and *peer evaluation*. For example, a class on introduction to computer programming at Stanford University trains seniors and

graduate students to follow the progress of groups of eight people within a class of over 200. The small size of the groups lets teaching assistants read the computer programs carefully, provide numerous helpful comments, and meet with all students every week. Of course, the use of so many teaching assistants requires lots of coordination and training, and we must reward the TAs in some way, either by paying them or giving them credit, as is done in this particular class at Stanford.

Peer evaluation requires students to read and comment on each others' assignments. Given the group structure that we have designed, we should have students evaluate the work of peers from groups other than their own. Peer evaluation is appropriate for evaluating drafts and it may also be combined with random grading: first students review each others' work, then you check both the original work and the evaluation in a few cases, and finally you provide comments to both students. The use of peer evaluation is educational both for the student-writer and the student-reviewer: student-writers have a second audience besides the professor, so they must learn how to write for a less informed audience and they cannot assume the reader will fill the gaps in their assignments; student-reviewers learn how their classmates write and what they should look for in their own writing. However, in this first stage freshmen do not have the necessary experience to provide insightful comments. They first need you to model the correct behavior. Therefore, you and your teaching assistants should do most of the work during the first third of the semester, gradually moving toward a mixed system of grading.

3. Multiplicity. At this point some freshmen may have already been shaken out of dualism and many may not. We need a period where students can catch up before we move on to new educational objectives, so we will use a few activities that place more emphasis on application, but do not yet go into the territory of analysis and valuing. We will also introduce some controversial issues that should convey the message that there is not one absolute truth.

K	C		
Rc			

Let us start with the controversial issues. If we teach students that the demand curve is derived from the utility functions of consumers and their budget constraints, or that aggregate supply is upward sloping, we are reinforcing the dualistic belief of freshmen. Since we want students to move out of this intellectual stage, we have to show them that there are other views of how the economy works. For example, if we are teaching macro, we could introduce the debate between classical and Keynesian economists. In micro, we could show them a couple of different oligopoly models. It does not matter what example we choose, we must get across the idea that there are many ways to approach a problem. Analyze the different models, show their similarities and contrasts, and compare their predictions. Remember that students will learn how to analyze from your own way of analyzing, so be very explicit on why and how you decompose the models.

K	C	Ap	
Rc	Rp		

After you have introduced a controversial issue, have students discuss the opposing views in small groups. You might organize a debate in the classroom and have

students defend each position based on the information you have provided to them. At this point we should not expect that students will come up with an original analysis, but they may relate this discussion to previous economic concepts.

		Ap	
	Rp		

You may even encourage students to find different ways to explain real phenomena. See how many ways they can come up with, and have students compare them across groups. Do not discourage "wrong" ways; we are trying to get freshmen to be creative and abandon their belief that only one way is right.

K	C	Ap	
Rc	Rp		

Another related activity is to have students read the newspaper articles they have already summarized and come up with alternative explanations for the same situation. Let groups compare their answers and justify them.

K	C	Ap	
Rc	Rp		

For a more traditional approach, have students work in groups to apply economic concepts to new problems, but this time with no initial example from you. Students should record their thinking process and their answer, and share them with other groups as they did in the previous period.

K	C	Ap	
Rc	Rp		

Reading economic novels⁶ is a fun way to introduce students to economics. You could have different groups reading different novels, identifying the economic concepts they have learned in class, and observing how they have been applied to unusual situations.

K	C		
Rc	Rp		

During the transition from dualism to multiplicity, you showed students how certain economic concepts were connected and how you could describe those links using concept maps. Now let them design their own networks of ideas. Have students work in groups to design their concept maps and then compare them across groups.

The movement from dualism to multiplicity, including the catch-up period, should last about one third of the semester. This is only a rough idea; you should feel whether you are moving too fast or too slow. But before moving on to the next period, first you have to make sure that most of the students are still with you. You can always see their work in class, check their problem sets and read their portfolios. However, the moment right before the move to relativism is a major breakpoint that calls for an exam.

This "midterm" exam should test for the educational objectives that we have used until now. Some basic points to keep in mind:

⁶See *Murder at the Margin* (Jevons, 1993), *The Fatal Equilibrium* (Jevons, 1992), *In the Long Run We Are All Dead* (Wolfson and Buranelli, 1990), and *Death on Demand* (Hill and Dale, 1994)

- emphasize new problems where students have to apply old concepts.
- do not use multiple choice tests. Although they are easier to grade, they are not conducive toward the intellectual development of students.
- do not ask for definitions of concepts. Such questions reward memorizing, not understanding.

4. Multiplicity to Relativism. At this point students should be fairly convinced that there are many ways to approach a problem. However, they will probably not have a good idea on how to determine which approach is optimal. Our job is to organize activities that let freshmen learn and identify with a scientific method of analysis. Thus, we add analysis as an educational objective.

K	C	Ap	An
Rc	Rp		

Move from summary-writing to thesis-support microthemes, where students state a position and support it with evidence.⁷ At this stage you should provide groups with both a subject to analyze and a position to defend.

K	C	Ap	An
Rc	Rp		

Another interesting writing assignment is to present data to the students and ask them to draw conclusions. You should model this behavior first, and then ask students to write data-provided microthemes.

⁷Keep in mind that microthemes usually are no longer than 300 words.

K	C	Ap	An
Rc	Rp		

Use small groups to discuss alternative approaches. Have the students analyze two opposing views (for example, classical and Keynesian models) and then debate which one explains a specific situation better. You could even organize a debate in the classroom if the number of students is low enough.

K	C	Ap	An
Rc	Rp		

Your students have already read and summarized newspaper articles, and they have come up with alternative explanations to the same phenomena. Now have each group analyze the problem and write an alternative newspaper article from the viewpoint of one of the previously proposed explanations. Let students compare their results across groups in a class discussion.

K	C	Ap	An
Rc	Rp	V	

We should continue using games in the classroom to introduce new useful experiences. If you are teaching macro and you included expectations within your objectives, there is a game designed by Norris Peterson (1990) that I think you will find particularly useful.

5. Relativism. Once again students need to catch up, so we will introduce only small variations on the tasks they are already performing. Since students have already used analysis during the last period, we can effectively introduce the educational objective of valuing.

K	C	Ap	An
Rc	Rp	V	

A variation on the thesis-support microthemes is to let students choose the position they want to defend, thus bringing their values into play.

K	C	Ap	An
Rc	Rp	V	

A nice task that builds upon the newspaper activities in the previous periods is to have students write a newspaper on their own. Coordinate the groups so that their articles do not overlap and give them a couple of weeks to find a subject, analyze it, write an article, and print the newspaper. Keep track of their progress.

At the end of the semester we should assess students' performance through a final exam and the review of the individual and group portfolios. The six textbooks analyzed by Karns, Burton and Martin tended to evaluate knowledge and comprehension over other educational objectives they were supposedly trying to teach. Do not fall into the trap of teaching one objective while testing another: not only will you be unable to assess the true intellectual development of students, but also you will mislead students to overweigh the importance of knowledge and comprehension over application and analysis.

Conclusion

The purpose of this paper is to bring attention to the fact that we usually treat freshmen in the same way we treat other students, when in fact they are relatively underdeveloped. To solve this problem, I

proposed numerous activities that are targeted toward freshmen, but I want to emphasize the importance of the process as opposed to the specific tasks. However, there are a few points that I believe are very valuable and should be taken in consideration when planning an introductory economics course:

- set different educational objectives and different activities for different levels of intellectual development—in this case, for freshmen.
- work more actively on fewer concepts.
- use writing as a means of learning.
- build on the experience of students.
- use small groups to target subgroups within the class and to encourage cooperation among students.

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