

## **A Game Approach to Learning and Retaining Microeconomics: Using the Production Possibilities Frontier**

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Among the many challenges of teaching Principles of Microeconomics is encouraging students to retain information as well as how to use that new knowledge to develop higher level thinking skills. Active learning techniques are well-documented as to their effectiveness over the traditional “chalk-and-talk” method; however, the trade-off is the use of limited class time. This presentation will share a short but effective active learning activity using the production possibilities frontier to show that the application of theory is much more than just memorizing definitions and assumptions.

Using a quiz game format presented by Barbara Millis, co-author of *Cooperative Learning for Higher Education Faculty*, I developed a ten question true/false quiz for the production possibilities frontier using Microsoft PowerPoint. Although some faculty members are moving toward individual response systems, I have found that a simple presentation accomplishes the objectives just as well. In addition, my colleagues’ experiences have shown that the individual response systems can be unreliable.

The class self-selects into groups of three to four students. One student records their scores and another is the responder. A sample graph with specific points marked with letters is distributed or put on the board. Once the true-false statement is on the screen, the students have 30 to 60 seconds to collectively decide whether the answer is true or false, and if it is false, why. When time is called, the responder holds up a card showing a picture of a thumb up (for true) or the thumb down (for false). For each false answer one student from the group must summarize its rationale. (This responsibility is rotated for subsequent questions.) They are warned that if it is indeed false, the incorrect justification will nullify their answer. So students are encouraged not to “piggy-back” on earlier groups’ responses. Once the correct answer is shown, we discuss how and why the answer is correct. At the end of the exercise, the team with the highest number of correct answers wins an award—typically some candy.

The PowerPoint quiz will be shown at the poster session and will be shared with all who would like a copy. A sample graph is included. Samples of the statements include:

1. Point A represents the amounts of cars and bicycles that will be sold.
2. As you move from point F to point G, the price of bicycles increases.
3. Movement along the curve from point C to point A shows us the opportunity cost of producing more bicycles.
4. The optimal combination of cars and bicycles is at point A.
5. The law of increasing opportunity costs does not apply if the frontier is a straight line (with constant slope).
6. If our population decreases due to an epidemic, the curve shifts in.
7. If we have high unemployment due to a recession, the curve shifts in.

8. If an improved process for manufacturing cars is introduced, the entire curve will shift out.
9. If our educational system improves, the frontier will shift out.
10. If we produce cars and bicycles efficiently, the frontier shifts out.

There are several objectives achieved with this format. First, as shown by Alexander Astin, Robert Slavin, Thomas Angelo, and K. Patricia Cross, using collaborative or active learning keeps students engaged and deepens learning. R. J. Light indicates that student satisfaction is also increased. Further, Angelo stressed the value in using alternate forms of assessment such as formative assessment to give feedback to student learning prior to exams. McKeachie stresses the importance of helping students develop critical thinking skills beyond mere memorization.

Second, group work tends to decrease the intimidation that students feel in responding to questions individually. There is comfort in a group response. However, one of the problems with group work is getting all the students engaged in the process. In this exercise, I have found the students become quite out-spoken if they feel that the others are not correct in their analysis. The level of competition with the other groups stimulates their participation.

Several objectives are more broadly drawn. One is to help students develop those skills that they will need as they move into their careers--skills such as communication (both written and oral), reading, and thinking. Sometimes students will read the statements superficially and miss critical words. This gives me an opportunity to talk about the importance of reading skills in test-taking. Many mistakes on multiple choice exams are due not to lack of knowledge but rather to careless reading. And of course, reading the textbook does more than prepare the student for class, it helps to improve those vital reading skills. Another objective is to improve communication skills. By making different students take turns explaining why false answers are false, the more introspective students have a chance to practice their answers before being called upon. This teaching moment allows me to encourage my students to "develop their voice" and to stress the respect it shows for the other students when all are able to hear.

Students must understand that learning is more than just memorizing some definitions and lists. To make this point, I introduce my classes to Bloom's Taxonomy of Thinking Skills on our first meeting. I stress that each level of thinking skills (remembering, comprehension, application, analysis, synthesis, and evaluation) is dependent upon the previous level and that mastery of each level enhances the others. A quiz is given on the class day following the presentation of the possibilities frontier, during which I strongly encourage them to learn as they go. As we go over the answers, I tie the logic back to the taxonomy showing them that they must learn, but they must also understand the material in order to effectively apply it. The modeling of the logic involved in reaching a conclusion is an important step in preparing for exams.

In summary, this activity does not take much time but is highly productive in showing students the level of learning that will be required for the class. It is engaging and makes learning fun, which for economics is a valuable asset!

(On request, I will e-mail both the PowerPoint presentation and supporting documents.)

## References

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# Graph for Production Possibilities Quiz





