

Lesson Study on Oligopoly in ECO308
Lisa Giddings and John Nunley
Spring 2015/Fall 2015

Title: Oligopoly Behavior

Authors: Lisa Giddings and John Nunley, University of Wisconsin-La Crosse

Contact: lgiddings@uwlax.edu, [jnnunley@uwlax.edu](mailto:jnunley@uwlax.edu)

Discipline: Economics

Submission Date: January 2016

PART I: BACKGROUND

Course Name: ECO308, Intermediate Microeconomic Theory

Course Description: ECO308 is a theory course on microeconomics. It is usually offered in conjunction with Intermediate Macroeconomic Theory and is a requirement for the economics major, usually taken by juniors and seniors. The course is difficult for students, requiring a good knowledge of and ability to use algebra and calculus. The course is offered twice per year through our department to 30-35 students each semester.

Why We Chose the Topic

To our knowledge there has never been a lesson study on any topic in ECO308. We chose to study the section on oligopoly because it is both difficult and important. It is a new concept for students in the sense that this is the first time they are exposed to firms or agents interacting strategically rather than acting alone and in one's own best interest. The topic requires an introduction to game theory and does not follow from what students have learned about perfectly competitive firms or even monopolies who do not have to consider other firms in their decisions. Having said this, the topic is extremely important for intermediate students to become acquainted. Oligopolies exist, and strategic thinking is common rather than rare. Instructors tend to get to this part of the material toward the end of the class, and the information embodies many of the concepts that have been presented thus far, so it can be somewhat of a capstone topic for students in the course. The topic requires at least two one-hour and 25-minute class periods, if not three to do it justice. Our lesson study project is covering the topic of Oligopoly and because the course is only taught in one section each semester, we will be studying this topic over the course of two semesters. The first study took place during the spring of 2015. Dr. John Nunley was teaching the course that semester and Dr. Lisa Giddings observed one lesson on 28 April 2015.

Abstract: Through the study of oligopolies, our learning objective is to improve student ability to compare and contrast the different models that economists use to explain oligopoly behavior and to be able to recognize where these models are applicable in the real world. These goals follow the broad learning goals of the Department of Economics that include improving critical thinking, and having students be able to apply economic models to the real world. We developed a lesson plan which included pre and post-assessments and participation in active learning in groups through problem solving. We found after one test of the lesson and one observation that students had a hard time connecting the oligopoly market structure to the other market structures they had learned in class already (perfect competition and monopoly) at least mathematically. As such, they were unable to evaluate the outcomes of the various market structures from a consumer's perspective. Students got bogged down in learning the mathematics of oligopoly and were subsequently unable to apply what they learned to the real world.

PART II: THE LESSON

Learning Goals

Broad Learning Goal:

- Improve critical thinking
- Be able to apply economic models in the real world

Narrow Lesson-Specific Goal

- Students will be able to understand, distinguish, and interpret three models of oligopoly
- Students will be able to compare and contrast the different models of oligopolies
- Students will be able to identify which model to use under various circumstances
- Students will be able to choose a real-world oligopoly and apply the correct model to understanding the strategic actions of agents in the oligopoly

In order to successfully foster broad learning goals such as improving critical thinking and applying models to the real world, instructors need to develop a culture of critical thinking in their classroom, and be reinforced with other such courses across the curriculum. As such, a single lesson cannot fully develop these goals in-and-of itself. However, as said, it is important to create strong lessons to contribute to the development of these goals. The Department of Economics has stated learning outcomes for the economics major that include critical thinking skills and problem solving skills. Specifically, we expect that the economics major can apply economic reasoning to explain social and economic events, predict the impact of private and public proposals and changing market conditions on social welfare using economic models, and compare the models' strengths and weaknesses in explaining outcomes. This lesson and our stated goals fall directly in line with the Department's goals for our majors.

Lesson Plan

The lesson occurred on a Tuesday/Thursday class period and as such, is one-hour and 25 minutes in length. We began the lesson with a short “low-stakes” pretest to assess the extent to which students a) and any knowledge of oligopoly and b) whether they could extend their existing knowledge of market structures (perfectly competitive and monopoly) to oligopoly (10 minutes). This was followed up by a short introduction to the topic as well as time to go over the answers to the pre-test and a class discussion. Dr. Nunley then moved on to a presentation about oligopoly and presenting the solution to a Cournot model of oligopoly, given abstract values for numbers. Students were then asked to solve a similar problem, but with numbers in small groups. See attached Dr. Nunley’s presentation as well as the pretest and problems students worked on while in their groups.

Rationale for Designing the Lesson

Students worked in groups in the pretest and were encouraged to discuss the questions with each other, refer to their notes and ask the instructor questions. The question was designed to get students to remember what they had learned in the prior two lessons on market structures and take the next step forward to see what would happen if only two firms competed. We hoped that the questions themselves would prompt students to consider one of the main differences between oligopolies and other market structures: that the firms are interdependent—their choices depend on each other’s choices.

Once presented with an abstract, theoretical problem, students were given the same problem but with actual numbers. We felt that students would be able to move from the abstract to the numeric easily and that an immediate follow-up problem would solidify the material in the student’s minds.

See the Appendix for the actual lesson plans for both the Spring and Fall Semesters.

PART III: THE STUDY

Approach: The first observed Lesson Study included a pretest in which the students took a “low stakes” quiz in groups of two to establish prior understanding (if any) of oligopoly. Lisa Giddings observed the course in which John Nunley presented the material on oligopolies and observed student actions during lecture and while working problems in groups. The students took a follow-up exam which consisted of one question to use as an assessment for the lesson.

We met and discussed the lesson afterwards and wrote the Lesson Study report while carefully considering the lesson itself and with a keen eye to how to change the lesson for the next time it is taught and observed in November/December of 2015.

Findings/Discussion

Overarching Issues

The overarching observation that we gathered in this first Lesson Study of oligopolies is that students had a hard time really placing the material in a context both within the class and within the greater world. Despite the fact that Dr. Nunley took a step-by-step approach in presenting this information as the next logical step following a discussion on Perfect Competition, and then Monopolies, students—perhaps because they had not yet mastered that material—did not take that cue and expand on what they already knew. Furthermore, students, once presented with the oligopoly model, could not remember how to work a Monopoly model given the same evidence. Students did not seem to ask the next natural questions – how do the oligopoly models compare to monopoly and perfectly competitive market structures? How are consumers affected? Etc. Rather, it seemed like students just wanted to understand the model itself rather than putting it into a larger, more applicable context. This may be because of the time of year this lesson is taught (toward the end of the semester) or because the models themselves are difficult and they are just attempting to grasp them, unable to expand their thinking to meta-questions.

Pre-test Assessments

Two pre-test questions were asked:

1. Consider three market structures:

A market with 10,000 producers

A market with only one producer

A market with two producers

In which market structure must a representative firm be concerned about rival behavior? Explain why or why not for each case.

Answer: The answer to the first one is that a representative firm in the market with two sellers must worry about the decisions of their rivals. If their rival produces more, for example, the market price—and therefore, the firm's profits—will fall. Firms in an oligopoly are *interdependent*.

2. Write the revenue functions for a representative firm in the following market structures:

A market with 10,000 producers

A market with only one producer

A market with two producers

Answer:

A market with 10,000 producers: $R = pq$

p is not a function of q and the firm is a price taker

A market with only one producer: $R = p(Q) \times Q$

p is a function of Q (market output) and the firm is a price maker

A market with two producers: $R_1 = p(q_1, q_0) \times q_1$

P is a function of $q_1 + q_2 = Q$

Each firm has market power but the two firms must compete with each other. The competition reduces market power.

Results

	Excellent	Adequate	Undeveloped	Inadequate
1	4	2	3	1
2a	6	1	1	2
2b	10			
2c			1 (showed some recognition of the firms splitting the market)	9

Post-Test Assessments

1. John Nunley asked very similar questions to those on the pretest about the revenue functions for a (a) competitive firm, (b) monopoly and (c) a firm in an duopoly. About 15% of students got all the revenue functions correct. For the others, it was a mixed bag, but over 30% of students wrote down the marginal revenue functions instead of the revenue functions. This suggests to me they were memorizing the solution technique, as one would use the marginal revenue function to find optimal quantities.

2. John Nunley also asked them to derive the Cournot/Stackelberg/Bertrand equilibria. With respect to the Cournot, only about 30% solved for the equilibrium correctly. Another 30% didn't even know how to get started, and the remaining share made math errors. The only factor that changed in the problem is the following. First, the demand function was $p=500-4Q$ (instead of $p=100-Q$). Second, the cost function was Q^2+15Q (instead of $C=40Q$). This resulted in mass confusion. So, slight changes in the demand and cost functions led to a disaster.

Discussion

First, the numerous models covered make it more confusing for them. As an example, when solving for the Stackelberg equilibrium, about 20% of students tried to solve the problem using Bertrand methodology (i.e. differentiate profit function with respect to price), which makes no sense because Stackelberg is a quantity setting equilibrium.

Second, an issue related to the first is the end of the semester. I think this is the most plausible explanation. Students are burned out. Their effort levels fall, and more effort is needed to practice the application of oligopoly models. I have no idea how to address this. You could put in more real world problems. I am not convinced this would solve the problem. The main issue with real world scenarios is that we don't know a lot about how oligopolies behave in the real world. That is unobserved to us. Moreover, it is difficult to distinguish an oligopoly from a monopolistically competitive market, especially when goods are differentiated. We try to bring in real-world scenarios. If nothing else, real world stuff makes them more engaged but we are not at all convinced that will result in better performance when solving oligopoly problems. They need to practice and practice some more. At the end of the semester, they are no longer willing to expend as much effort. Moreover, the incentives are not great for them either, as their grade is largely determined by that point. One strategy is to try to move the coverage up in the semester, but I am not sure how to do that.

Recommendations for Fall Semester LSP

Force students to see the “forest for the trees” earlier with pre and post-assessments. Ask the nitty-gritty questions as in above that force them to remember prior models and understand this one, but also force students to react to the real world. John’s gum example is a good one. Why are all of the gum prices the same? Which model is that?

The goal was to have students understand and apply an economic model given real world evidence. We need to force this and review to get them out of the details of the course.

APPENDIX

This Appendix includes the following materials in this order:

Lesson Materials

Spring 2015 Lesson Plan

Fall 2015 Lesson Plan

Observer Notes

Other materials are available upon request from the authors and/or are located at the following URL:

<http://www.lisagiddings.com/teaching-1.html>

Nunley Presentation

Nunley Pretest

Nunley In-class Questions

Nunley Exam Question

Giddings Presentation

Giddings Questions

Study Materials

Pencasts

Lesson Study Plan: Oligopoly, Spring 2015

Lisa Giddings and John Nunley

Intermediate Microeconomic Theory Lesson Study: Oligopolies

Note that this lesson plan is the first in a two-day series on the topic

Step 1: 15 minutes

- Break students into groups and notify students that they will be taking a “low-stakes pre-test”. They are expected to work together and turn it in for review.
- Describe the basic task: answer questions to the best of your knowledge, show your work, ask any questions you might have.

Step 2: 10 minutes

- Collect pre-test.
- Introduce the concept of *interdependence* and how it is what makes oligopolies unique
- Go over answers to the pre-test with a focus on how the answers show interdependence as opposed to the perfectly competitive or monopoly cases.

Step 3: 15 minutes

- PowerPoint Lecture

Step 4: 15 minutes

- Instructor solves abstract problem on the board for a Cournot Equilibrium

Step 5: 10 minutes

- Students are given a problem that mirrors the practice problem but with real numbers and can work in groups

Step 6: 5 Minutes

- Review problem and work out answers on the board
- Given the same basic demand structure, extend to prior market structures:
 - What would the Perfectly Competitive solution be?
 - What would the Monopoly solution be?
 - What would the Cartel solution be?
- In what ways can the Oligopoly Model be extended? Can you imagine other ways to model oligopoly behavior

Step 7: 15 Minutes

- Students are provided a real world example: the gum market. Discuss and explain the photograph that shows that all of the prices are the same. Does the Cournot model predict this? How would the model have to change to predict this outcome?
- Class discussion and reflection.
 - What is the significant difference between an oligopoly and all other market structures?
 - Why is the oligopoly good or bad for consumers?
 - What are some ways to model oligopoly behavior so we can make predictions?
 - What is still confusing?

Step 8: During Later Exam

- Students will see the problem again as a question in a higher stakes context.

PREDICTED STUDENT RESPONSES

Major Steps in the Lesson:

1. Students work on the initial oligopoly problems
 - Expect that students will have little prior knowledge of the concept of interdependence between firms either theoretically or practically, using math.
 - Students may be able to get close to the mathematical depiction of interdependence based on their knowledge of a perfectly competitive firm's demand curve and revenue as well as the monopolist's demand curve and revenue.
 - Expect that students will work together, talk, and ask questions during these first 15 minutes of class, engaging in the material.
2. Students review answers
 - Expect students to recognize what they have learned in studying perfectly competitive markets and monopoly markets in the answers.
3. Students are presented with the theory via PowerPoint lecture
 - Expect that students will pay attention to lecture and take notes.
4. Students see abstract problem presented on the board
 - Expect that students may have a difficult time with the abstract problem.
 - Expect that students take notes and ask questions
 - We are hoping to see some "light bulbs" during this step and the step where students do the problems with numbers. Are students connecting to prior market structures? Are students imagining how different models could be constructed?
5. Students are expected to perform the abstract problem but using numbers
 - Expect that students may have a difficult time making the jump from an abstract problem to the same problem with real numbers.
6. Students discuss the problem and extensions

- Students should be able to extend the problem to find answers assuming a perfectly competitive market and a monopoly market as they have seen these two market structures before
- Students should have an “ah ha” moment once they see the four different outcomes and be able to see immediately the results of oligopoly versus monopoly and perfect competition and how that affects consumers.
- Students may have a hard time moving from the “trees to the forest” to understand the big picture of market structures, given these problems.

7. Students are presented with a “real world” example

- Given that students have seen only one model of oligopoly, they may not be able to understand why the gum prices are all the same. This is a good way to precede the next lecture and to discuss the fact that oligopolists can set price or quantity.

By Lisa Giddings and John Nunley

University of Wisconsin-La Crosse

Lesson Study Plan: Oligopoly, Spring 2015

Lisa Giddings and John Nunley

Intermediate Microeconomic Theory Lesson Study: Oligopolies

Note that this lesson plan is the first in a two-day series on the topic

Step 1: (10 minutes) Pretest

Activity:

- Break students into groups and notify students that they will be taking a “low-stakes pre-test”. They are expected to work together and turn it in for review.
- Describe the basic task: answer questions to the best of your knowledge, show your work, ask any questions you might have.

Goal: To understand what they already know about oligopoly.

Step 2: (20 minutes) Background

Activity:

- Collect pre-test.
- Introduce the concept of *interdependence* and how it is what makes oligopolies unique
- Break students into groups again. Go over answers to the pre-test by beginning with a review of the perfectly competitive and monopoly outcomes. Next focus on how the answers change with 2-5 firms. Emphasize interdependence as opposed to the perfectly competitive or monopoly cases.
- Now start group discussion: What is the goal of the oligopoly? How do they get there? Students put themselves into the shoes of an economist and imagine all the dimensions in which one could model oligopoly behavior while at the same time imagine products/companies.

Prompt: “Perfectly competitive firms can only decide their quantity and all have the exact same good, monopoly firms can decide quantity or price and have a unique good in the market. What can an oligopoly do? Price? Quantity? Same product? Differentiated product?”

- Extend group discussion to class discussion.

Prompt: Can you imagine different products in oligopoly markets (maybe a list of markets that compete with 2-5 firms could be provided). Is one firm in a particular market HUGE (Apple)? Or do two firms really dominate (Pepsi/Coke)?

Goal: this gets students active, reviews what they already know about market structures (both in theory and with math), and gets them connecting the material to the real world.

Step 3: (20 minutes) Jack and Jill's Water Cartel

Activity:

- Group discussion leads to an organization of the material to be presented based on the dimensions of how an oligopoly could behave. Start with easiest situation: Cartel. Give background descriptively and open up to a discussion. What will the cartel do?
- Group discussion: The mathematics of a cartel. Present students with the Jack and Jill math.
 1. Describe the dimensions of Jack and Jill:
 - a. Is it a homogenous product?
 - b. Can Jack and Jill cooperate?
 - c. Are they playing once or many times? Why does this matter?
 - d. Do Jack and Jill face the same costs (marginal cost)?
 2. Find the perfectly competitive outcome.
 3. Find the monopoly outcome.
 4. Find the cooperative outcome (if Jack and Jill cooperated successfully).
- Introduce the prisoner's dilemma game.
 5. Use the prisoner's dilemma game to analyze what will really happen to Jack and Jill. What if Jack increases his output by one unit? Where will this stop? What is the actual oligopoly outcome.
 6. Compare the perfectly competitive outcome to the monopoly outcome to the cartel outcome. What do you see
- Show what happens in the real world with OPEC. Discuss

Goal: To start with the most basic notion of oligopoly, demonstrate interdependence, the difficulty of cooperation, and the consequences to consumers. End by relating to the real world.

Step 4: (15 minutes) The first Model

- Instructor solves abstract problem on the board for a Cournot Equilibrium

Step 5: 10 minutes

- Students are given a problem that mirrors the practice problem but with real numbers and can work in groups
- Review problem and work out answers on the board
- Given the same basic demand structure, extend to prior market structures:
 - What would the Perfectly Competitive solution be?
 - What would the Monopoly solution be?
 - What would the Cartel solution be?
- In what ways can the Oligopoly Model be extended? Can you imagine other ways to model oligopoly behavior?

End.

Lesson 2, Day 2:

- Present Bertrand, Cournot, Stackelberg and Bertrand (differentiated good) mathematics providing questions to students after each model is presented.

- Students are provided a real world example: the gum market. Discuss and explain the photograph that shows that all of the prices are the same. Does the Cournot model predict this? How would the model have to change to predict this outcome?

- Class discussion and reflection.

- What is the significant difference between an oligopoly and all other market structures?

- Why is the oligopoly good or bad for consumers?

- What are some ways to model oligopoly behavior so we can make predictions?

- What is still confusing?

Day 3: During Later Exam

- Students will see the problem again as a question in a higher stakes context.

PREDICTED STUDENT RESPONSES

Major Steps in the Lesson:

1. Students work on the initial oligopoly problems

- Expect that students will have little prior knowledge of the concept of interdependence between firms either theoretically or practically, using math.

- Students may be able to get close to the mathematical depiction of interdependence based on their knowledge of a perfectly competitive firm's demand curve and revenue as well as the monopolist's demand curve and revenue.

- Expect that students will work together, talk, and ask questions during these first 15 minutes of class, engaging in the material.

2. Students review answers

- Expect students to recognize what they have learned in studying perfectly competitive markets and monopoly markets in the answers.

3. Students are presented with the theory via Powerpoint lecture

- Expect that students will pay attention to lecture and take notes.

4. Students see abstract problem presented on the board

- Expect that students may have a difficult time with the abstract problem.

- Expect that students take notes and ask questions

- We are hoping to see some "light bulbs" during this step and the step where students do the problems with numbers. Are students connecting to prior market structures? Are students imagining how different models could be constructed?

5. Students are expected to perform the abstract problem but using numbers
 - Expect that students may have a difficult time making the jump from an abstract problem to the same problem with real numbers.

6. Students discuss the problem and extensions
 - Students should be able to extend the problem to find answers assuming a perfectly competitive market and a monopoly market as they have seen these two market structures before
 - Students should have an “ah ha” moment once they see the four different outcomes and be able to see immediately the results of oligopoly versus monopoly and perfect competition and how that affects consumers
 - Students may have a hard time moving from the “trees to the forest” to understand the big picture of market structures, given these problems.

7. Students are presented with a “real world” example
 - Given that students have seen only one model of oligopoly, they may not be able to understand why the gum prices are all the same. This is a good way to precede the next lecture and to discuss the fact that oligopolists can set price or quantity.

By Lisa Giddings and John Nunley

University of Wisconsin-La Crosse

Observations for LSP 2015: Oligopolies in ECO308

April 28, 2015

John passed around a sign-in sheet for attendance. His course has precedence in having in-class quizzes that count for low-stakes in grades, so students expect to work on problems during class, and work in groups.

John began by showing the two-question pre-test on a powerpoint. He announced that the quiz was “low stakes” and that he wanted students to work in groups of two and that they would be turning in their work.

OBSERVATION (Lisa): Students were very comfortable working in groups and working on problems. I observed lots of talking within the groups, students asking John questions. Students were active and working on the problems together. Students did make a connection in the second question on calculating the revenues across the market structures, recognizing that they had done this for monopolies and asked if they could refer to their notes.

QUESTION: what is the effect of announcing “low stakes” on effort in class?

Comments on the pre-quiz itself: it did a good job introducing the topic and showing the one-step-forward logic of learning in ECO308. It reviewed both perfectly competitive and monopoly outcomes and then went forward with oligopoly.

OBSERVATION (John): Students did have to look at their notes about the monopoly revenue function despite having gone over exact or similar questions several times last week.

John waited about 15 minutes for students to work on the two questions with the expectation that the questions were completed and would be turned in. Again, there is a precedence in this class that students work on problems in class that are then reviewed by the instructor and handed back. Students get participation credit for doing this and/or quiz credit.

John then went on to use the powerpoint to give background information on Oligopoly — the idea of interdependence. He went over the answers to the pre-quiz.

OBSERVATION: there was some recognition and understanding in students’ eyes when explaining the answers. John related some of the material back to what he had presented with monopoly — specifically the measure of market power which is P/MC or a measure of how much price is marked up over marginal cost.

IDEA: at this point it would be nice to give a range of oligopoly outcomes and related it back to the real world. Prompt a question like “what would a duopoly LIKE to do” after presenting the total revenue function.

OBSERVATION (Lisa): during the powerpoint presentation students waned in their listening. I was not sure what they were getting out of it.

Part of the problem with the lesson on oligopoly is that it is a) long, b) somewhat complicated and c) at the end of the semester.

It is also perhaps the most realistic of models presented and the most interesting.

OBSERVATION (Lisa): by 11:25 students are not actually participating or even seeming to be actively learning while John is going over the power point. At this point he is discussing Nash versus adam smith (again, super interesting stuff).

IDEA: show the portion of A Beautiful Mind where he discovers the Nash equilibrium (all of the guys in the bar go after the Blonde making the group worse off—noone gets a date). Then after going over the Cournot model, maybe relate back to this. Also introduce Prisoner's Dilemma game here (Question: John, had you introduced Prisoner's Dilemma formally in class yet?).

John starts to get students engaged here — what is the difference between an identical good and a differentiated good in terms of price and the demand curve.

IDEA: it might be nice to get some real world examples here.

Now moves into Cartel model.

IDEA: Jack and Jill example with numbers. What is Perfectly Competitive Outcome? What is Monopoly Outcome? What is a successful Cartel outcome? What is an unsuccessful Cartel outcome?

The Jack and Jill numbers outcomes shows how the cartel will end up producing more than the monopoly but less than the perfectly competitive outcome.

Relate to real world — OPEC.

Can also show this on a Prisoner's Dilemma game.

IDEA: give homework here. Apply Jack and Jill to PD game.

Now, why do we need models to describe Oligopolies.

IDEA: get table presenting all possible options.

IDEA: use real world examples to show problems.

John moves to working the Cournot model in the abstract on the board.

OBSERVATION (Lisa): all are taking notes.

John gives example to students to do with real numbers.

OBSERVATION (Lisa): students are completely lost and cannot do it.

OBSERVATION: given a simple demand function, at the end of it all, students were unable to even get started on how to find PC outcome, Monopoly Outcome, Cartel and Cournot outcome.

Need forest for the trees, and two things to get students to react: real world and idea of interdependence.

TOO LONG.

Overall Thoughts

I only understood after the fact that students were not getting the forest for the trees in the oligopoly lesson. We did not discuss this beforehand, but it seemed to me during the lesson that the students, even though they seemed engaged in the material, were not asking questions that should have naturally come up.

For example, in the Cournot example (both abstract and numerical), the firms split everything half and half. In the real world, what if one firm has a ton of market share? Could this model still work, but perhaps the result is in different fractions?

In fact, the students did not ask any questions along the lines of the real world – what do they see in practice? Both John and I have had students in prior semesters that ask practical questions when it comes to market structure lectures/classes.

The students absolutely could not go back to their prior market structure understandings (monopoly and perfect competition) given the problem at hand. They were prompted – given this demand curve, what would the perfectly competitive and monopoly outcome be? They were lost.

I am not disturbed by this but what is more disturbing is the lack of understanding or even impetus to put the oligopoly outcome in perspective: how does it compare to the monopoly outcome? How does it compare to the perfectly competitive outcome? Are consumers worse off?

I think for a future lesson it will be important to start with the forest for the trees approach and to regroup and get back to the “real world” as much as possible.

Possible Solutions

I think that it might help to start the class (after the pre-test or maybe while going over the pre-test) to review the perfectly competitive outcome and then to review the monopoly outcome and show the additional step of adding another firm.

It might be interesting to have a student activity in which, once the basic concept of oligopoly is introduced, students put themselves into the shoes of an economist and imagine all the dimensions in which one could model oligopoly behavior while at the same time imagine products/companies.

Of course this would take some prompting like – perfectly competitive firms can only decide their quantity and all have the exact same good, monopoly firms can decide quantity or price and have a unique good in the market. What can an oligopoly do? Price? Quantity? Same product? Differentiated product?

Once they get there they can imagine different products in oligopoly markets (maybe a list of markets that compete with 2-5 firms could be provided) in which they imagine what they do? Is one firm in a particular market HUGE (Apple)? Or do two firms really dominate (Pepsi/Coke)?

From there we could talk about what seems to make sense? What do we see in the “Real World”?

Here is a note from one of John’s old professors: “Essentially 99.9% of industries that we commonly think of compete in Bertrand price competition. As a dumb example, I often ask my class ‘when you walk into Best Buy, what is written on the tags under each product?’ The answer is the price. When Coke is considering a price reduction, they consider Pepsi’s current price... not Pepsi’s current output level (which they probably don’t observe). In the literature on mergers, papers often simulate the effect of the merger by determining post-merger prices... under the explicit assumption of Bertrand-Nash pricing. So the bottomline is that pretty much any product you can think of competes via price. A key comment is that this all refers to DIFFERENTIATED PRODUCTS Bertrand (not homogeneous products Bertrand).”

It might be useful to have a thought experiment/discussion that has students thinking about price versus quantity setting. What types of industries does it even make sense to model an oligopoly as a quantity setter (e.g. oil and OPEC)? A price setter (everything else)? Etc. Imagine the production processes. As an aside, I have students do this when we consider costs. What types of production processes have huge fixed costs and can experience decreasing average costs as quantity increases?

Such a discussion might get students more involved prior to going over the actual model and math.