


# Open Pedagogy, Renewable Assignments, and Course Content Creation in Economics

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## Abstract

This article provides an illustration of incorporating experimental economics within the classroom by creating renewable assignments and nurturing an open pedagogy. Open pedagogy is a method of teaching that welcomes and encourages the student to take part in the creation of content or structure of the lectures. This combination of using an open pedagogy perspective and classroom experiments is labeled an Open Content Experimental Approach. This article discusses a group assignment used in a Principle of Economics course that allows students to interact, replicate the theory, and be able to interpret and produce the relevant content for the course. This student, instructor, and content relationship and interaction may become the key to a successful course by creating high student engagement and a great environment to encourage creativity, critical thinking, and innovation.

## Keywords

Open Pedagogy, Student Centered Learning, OER, Student-Content Relationship, Renewable Assignment, Principles of Economics

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## 1. Introduction

In the effort to encourage creativity, critical thinking, and innovation, instructors have been exploring various pedagogical tools, such as interactive, randomized, and unlimited attempts of economic scenarios, used in introductory open-education microeconomics classes by Eremionkhale et al. (2023), by incorporating social media like Twitter (Al-Bahrani, Patel, & Sheridan, 2017; Harmon, Alpert, & Histon, 2014; Kassens, 2014) or Facebook and Instagram (Al-Bahrani & Patel, 2015), or computerized economic simulations (Porter, Riley, & Ruffer, 2004), student centered tools such as open pedagogy which allows learners to co-create and curate the course content (Wiley & Hilton, 2018), and the like. Within this

momentum, this article discusses the use of combination of open pedagogy and experimental economic games in the classroom. This paper provides a novel approach to open pedagogy by introducing a new pedagogical tool, referred to as the Open Content Experimental Approach, and shares an example of a constructive student-centered assignment that allows students to discover theory through first-hand experience and then write the findings. This assignment could be a renewable assignment, in contrast to the generally known disposable assignment by broadening its goal beyond the grade and extending its life beyond the semester. This assignment provides additional benefits because it nurtures student-centered instruction by asking students to actively participate in the curation of content. This curation of content starts in an unintentional way, and then unfolds into a reflection, creation, and sharing of the course content.

In the Open Content Experimental Approach, students are asked to participate in a classroom economic game that eventually unravels the economic theory very naturally and unconsciously. Among the various economic games, the double auction experiment is a successful and fun classroom activity. It is initially camouflaged as a simple group game, during which students learn the roles of the buyers and sellers. Then, by the end of the game, students learn the roles, apply them, and eventually interpret their individual actions, aggregate interactions, and market emergence through economic theory. The students live and learn their experience of market creation and explain how the economic equilibrium is reached through an explanation of their observations. They then compare the results with the findings from the economic theory and gain a better understanding of the material while creating it. Through this class assignment, students could be able to describe, derive, and interpret the law of demand and supply; calculate and interpret equilibrium, consumer surplus and producer surplus; and explain the market efficiency. Most importantly, the students learn to interact, replicate the theory, as well as interpret and produce relevant content for the course. Naturally, they also take part in the creation of content or structure of the lectures which is the foundation of open pedagogy. The interaction among students, instructor, and content becomes the key to a successful course with high student engagement and creates a great environment to encourage creativity, critical thinking, and innovation.

## 2. Open Pedagogy Literature

Open pedagogy has various definitions, but the common core is the encouragement of students to participate in the teaching process and co-creating the course content. Daniel (2004) considers the student and instructor as “intellectual equals” (p. 9), while DeRosa and Robinson (2017) refer to the students’ shift from the role of content consumer to content creator of open education resources (OER). This article will refer to open pedagogy in the context used by Wiley and Hilton (2018) as “OER-enabled pedagogy,” which refers to “...the set of teaching and learning practices that are only possible or practical in the context of the 5R permissions which are characteristic of OER” (p. 135). The 5Rs are

retain, reuse, revise, remix, and redistribute (Wiley, n.d.).

Many studies have been conducted by scholars investigating the impact of OER and open pedagogy on students' learning. Studies conducted in the last decade show that adopting OER material has either had no effect on student performance (Cummings-Clay, 2020, Engler & Shedlosky-Shoemaker, 2019; Lawrence & Lester, 2018; Lovett et al., 2008; Croteau, 2017; Hilton et al., 2020) or that OER adoption actually improved student performance (Griffiths et al., 2022; Wiley et al., 2017; Fischer et al., 2015; Gil et al., 2013; Feldstein et al., 2012; Hilton & Laman, 2012). Furthermore, survey data from students enrolled in at various colleges and/or community colleges at City University of New York (CUNY) before COVID and during COVID, Brandle et al. (2019), Tila (2023), Tila and Levy (2022), Levy and Tila (2022) have shown that students perceive OER material as beneficial. Based on the positive results and experience of students with OER, the next question is whether students would be able to take a more active role and become curator of OER course content. Scholars have conducted studies to explore the impact of this pedagogy, known as open pedagogy. For example, a study of 92 students, enrolled in English courses at a community college in 2016, showed no statistical difference in students' performance whether they were given disposable or open assignments (Bloom, 2019). Other studies have shown positive impact in students' experiences (Paskevicius & Irvine, 2019a) and faculty experience (Werth & Williams, 2021; Paskevicius & Irvine, 2019b). However, as a recent study from Hilton et al. (2020) suggest that the type of openness and student engagement is important and generalizations on their positive effects cannot be made. This study used two different approaches (e.g., multiple choice assignment questions or syllabus and corresponding assignments) in implementing open pedagogy, which delivered diverging results and requires more scrutiny and opens the discussion for further research in this area. The type of engagement and content curation is important in delivering desired results.

This article will show a group assignment during which students were able to experience the economic theory and then write about their findings, which paved the way for the content creation. As shown in **Table 1**, retrieved from Wiley and Hilton (2018), this assignment could be qualified as renewable assignment. Students are initially participating in a game which unravels economic theory. Students will interpret their individual actions and the aggregate actions that lead to the creation of a market. Then, students can publish their work in a public domain for a public audience as well as fellow students and build an iterative model where future students will add to the e-portfolio. Students will also be encouraged to set their content as openly licensed so others can access and build on that content. Armed with a sense of purpose and individual choice, students will feel empowered to become active curators of their own knowledge.

### 3. Methodology

The illustration of this economic experiment provides an example of an un-

**Table 1.** Assignment types and criteria.

|                             | Student creates an artifact | The artifact has value beyond supporting its creator's learning | The artifact is made public | The artifact is openly licensed |
|-----------------------------|-----------------------------|---|-----------------------------|---------------------------------|
| Disposable assignments      | X                           | X   |                             |                                 |
| Authentic assignments       | X                           | X   |                             |                                 |
| Constructionist assignments | X                           | X   | X                           |                                 |
| Renewable assignments       | X                           | X   | X                           | X                               |

Note: This is **Table 1** in “Defining OER-Enabled Pedagogy” by [Wiley and Hilton \(2018\)](#) and provides the various criteria added to a disposable assignment to achieve a renewable assignment.

intentional group curation of content through an experiment game implemented in the classroom. Learning about supply and demand is the foundation of any economics course. It is imperative for students to understand such content and be able to interpret it and apply it in daily examples. The goal of this renewable assignment is to engage students to become co-creators of content, share the content, and be able to learn from it. It first starts as an unintentional group curation of content using economic experiments. Several studies have provided directions about running classroom experiments, such as [Anderson and Holt \(1996\)](#), [Ball and Holt \(1998\)](#); [Coffey and Britton \(2017\)](#); [Finley et al. \(2019\)](#), and [Hampton and Johnson \(2020\)](#). These economic experiments such as double auctions and elasticities experiments have shown to positively impact students' academic performance and their attitude towards the subject ([Tila, 2021](#)). This assignment uses such class economic experiments to engage students in content creation and then encourages them to build and share content making students co-creators and intellectually equals.

These instructions provide a guide on how to design and run a double auction game in a classroom. Students are given the role of either the buyer or the seller. The students are split into eight groups. Four groups have the role of buyers 1 through 4 while the other four groups have the role of sellers 1 through 4. Then, students are provided with a short explanation of their induced values and costs. **Table 2** shows an example of a buyer's sheet which shows the induced values for three tickets. In this example, Buyer 1 would be willing to pay up to \$60 for the first concert ticket, but not for the 2<sup>nd</sup> ticket. This is in alignment with the law of demand, which dictates that consumers will be willing to pay less for each additional unit. If Buyer 1 purchases the 1<sup>st</sup> ticket for \$50, then he/she will make a gain for \$10 because the buyer was able to find it for a “bargain” price. But this buyer will not be willing to pay \$50 for the 2<sup>nd</sup> concert ticket, otherwise, he/she will incur a loss of \$10. Why pay a higher price than the maximum you are

**Table 2.** Example of a buyer sheet with induced maximum willingness to pay values.

| <b>You are BUYER 1</b>  |                            |                                   |                            |                                  |
|---|----------------------------|-----------------------------------|----------------------------|----------------------------------|
| Your maximum willingness to pay for a CONCERT TICKET is as follows: |                            |                                   |                            |                                  |
| Quantity of Tickets   | Maximum willingness to pay | Did you buy in this auction (Y/N) | What price did you buy at? | Maximum willingness to pay-Price |
| 1 <sup>st</sup> ticket  | \$60.00                    |                                   |                            |                                  |
| 2 <sup>nd</sup> ticket  | \$40.00                    |                                   |                            |                                  |
| 3 <sup>rd</sup> ticket  | \$20.00                    |                                   |                            |                                  |

**Table 3.** Example of a seller sheet with induced minimum willingness to sell costs.

| <b>You are SELLER 1</b>  |                             |                                    |                             |                                   |
|--|-----------------------------|------------------------------------|-----------------------------|-----------------------------------|
| Your minimum willingness to sell (or COST) for a CONCERT TICKET is as follows: |                             |                                    |                             |                                   |
| Quantity of Tickets  | Maximum willingness to sell | Did you sell in this auction (Y/N) | What price did you sell at? | Price-Maximum willingness to sell |
| 1 <sup>st</sup> ticket   | \$10.00                     |                                    |                             |                                   |
| 2 <sup>nd</sup> ticket   | \$30.00                     |                                    |                             |                                   |
| 3 <sup>rd</sup> ticket   | \$50.00                     |                                    |                             |                                   |

willing and able to pay? By the end of the auction, each buyer will complete buyer sheet shown in **Table 2**.

An example of a seller's sheet with their induced costs for three tickets is shown in **Table 3**. In this example, Seller 1 would be willing to sell the first concert ticket for any price above \$10, which is the minimum willingness to sell, also known as the cost. For the purposes of this auction, sellers are assumed to be able to recoup the cost if the item is not sold. The cost for the second ticket for Seller 1 is higher than \$10. This is in alignment with the law of supply, which dictates that suppliers will be willing to sell at a higher price for each additional unit. If Seller 1 sells the 1<sup>st</sup> ticket for 50, then he/she will make a gain of \$40 which is the remainder after cost is subtracted from the revenue. If Seller 1 disposes of all tickets for \$50 each, he/she will earn \$20 and 0 for the 2<sup>nd</sup> and 3<sup>rd</sup> ticket. By the end of the auction, each seller will complete a seller sheet, as shown in **Table 3**.

Each group has their own individual worksheet with respective induced values or costs that are private and not shared with other groups. Only at the end of the auction would students be able to share and observe each others' values and costs are. **Table 4** provides the induced values and costs for all participants. This information will turn to be valuable because it is known in this theoretical game but not in the real world. So, in this theoretical game, we would be able to derive the correct demand and supply for the market and compare it to the actual results of the auction. The theory will be tested and compared with practice and students will be able to do it on their own.

**Table 4.** Market induced values and costs.

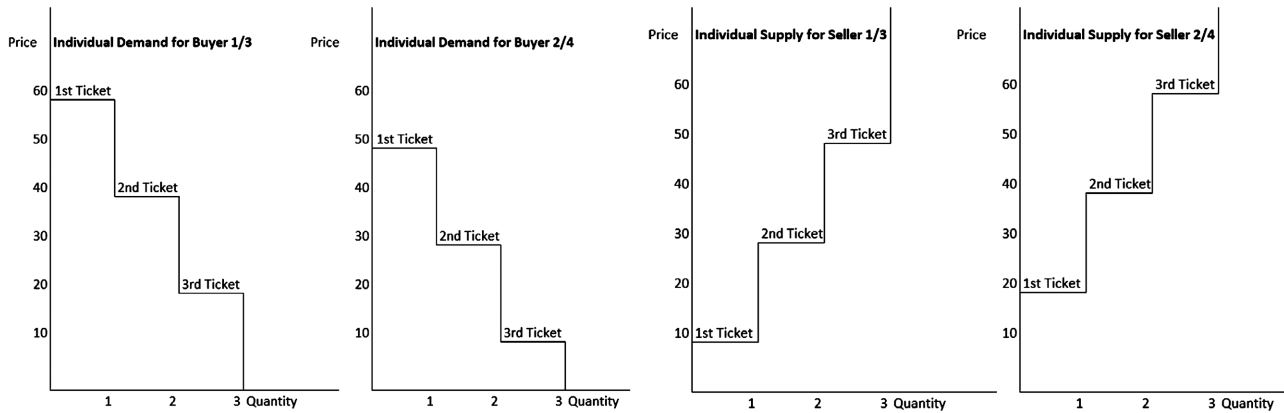
| Maximum Willingness to Pay     | Hypothetical | Minimum Willingness to Sell    | Hypothetical |
|--------------------------------|--------------|--------------------------------|--------------|
| Buyer 1/Buyer 3                |              | Seller 1/Seller 3              |              |
| 1 <sup>st</sup> concert ticket | \$60         | 1 <sup>st</sup> concert ticket | \$10         |
| 2 <sup>nd</sup> concert ticket | \$40         | 2 <sup>nd</sup> concert ticket | \$30         |
| 3 <sup>rd</sup> concert ticket | \$20         | 3 <sup>rd</sup> concert ticket | \$50         |
| Buyer 2/Buyer 4                |              | Seller 1/Seller 3              |              |
| 1 <sup>st</sup> concert ticket | \$50         | 1 <sup>st</sup> concert ticket | \$20         |
| 2 <sup>nd</sup> concert ticket | \$30         | 2 <sup>nd</sup> concert ticket | \$40         |
| 3 <sup>rd</sup> concert ticket | \$10         | 3 <sup>rd</sup> concert ticket | \$60         |

Note: Costs and values are induced, which allows for the establishment of theoretical demand and supply. For simplicity, the values and costs for certain buyers and sellers are the same, yet sufficiently different as to allow for a negatively sloped demand and positively sloped supply.

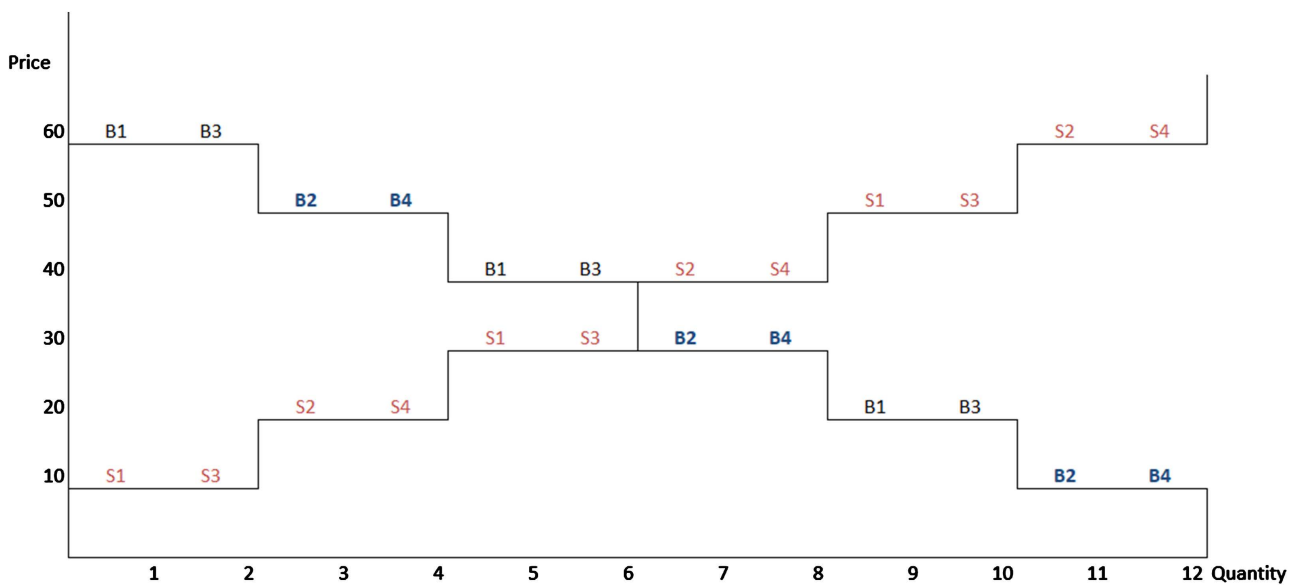
Once the students receive their induced values or costs, understand their meaning, and understand how to complete their transaction (seller or buyers) sheet, the auction will start. The instructor is the auctioneer who takes the bids and asks and records them in the whiteboard. Each participant (a buyer or a seller) will be allowed to make offers to buy (bids) and offers to sell (asks) through the double auction rules. Each concert ticket is sold individually and one at a time. When bids and asks are equal, the auctioneer records a transaction, meaning the ticket is bought and sold. Then, it moves to the sale of the next ticket. The auction will end when there are no more bids and asks to fill the bid-ask gap and, consequently, no transaction can be completed.

After the auction has ended, the students will derive the individual and market supply and demand. First, each buyer is asked to draw the individual demand using the induced values for each of the three tickets they hypothetically demand. Each seller is asked to draw the individual supply using the induced costs for each of the three tickets they hypothetically are willing to sell. **Figure 1** shows the graph for each buyer and seller. Note that for simplicity, participants (buyer or seller) 1 and 3, as well as participants 2 and 4 are symmetric.

Then, the students will derive the market demand and supply curve in the whiteboard. For example, the instructor will ask which buyers are willing to buy at price of \$60. Only Buyer 1 and 3 will raise their hand. Then, the instructor will ask who is willing to buy at price of \$50. While Buyers 1 and 3 still wish to buy their first tickets, now Buyers 2 and 4 are willing to buy their first ticket. So, at a price of \$50, there are four tickets demanded. Similarly, at the price of \$40, there will be six tickets demanded because Buyers 1 and 3 will also want to buy their second ticket. **Figure 2** shows how the market demand is derived, using a horizontal summation of the individual demands in **Figure 1**.



**Figure 1.** Individual demands and supplies derived using the induced values and costs.



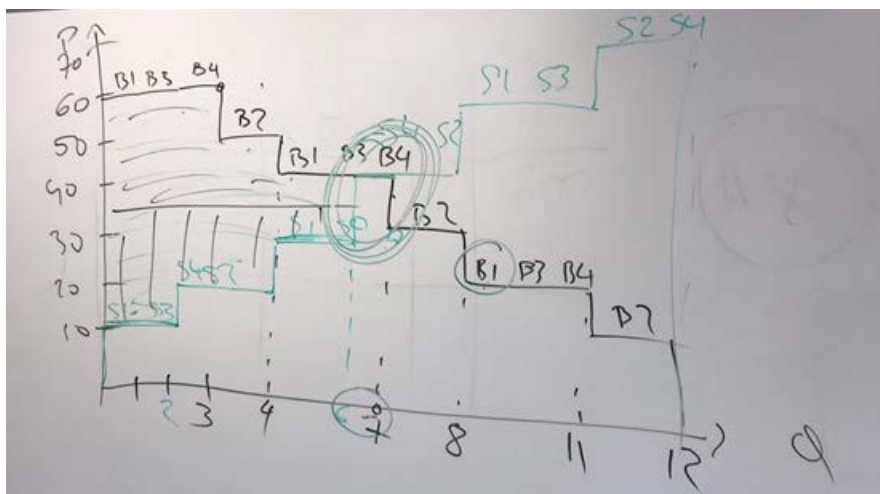
Note: Demand derived using the induced values of four buyers for three tickets each, totalling to 12 tickets demanded in all. Supply derived using the induced costs of four sellers who are supplying three tickets each, totalling to 12 tickets supplied in all.

**Figure 2.** Market supply and demand derived using the induced values and costs.

In a similar manner, the market supply is derived by horizontally summing the individual supplies in **Figure 1**. Instructor will start asking which seller is willing to sell the ticket for a price of \$10. Sellers 1 and 3 will offer their first tickets for sale. Then, at a price of \$20, while Sellers 1 and 3 will still be willing to sell, Sellers 2 and 4 are also willing to sell their first ticket. So, at a price of \$20, there are four tickets up for sale. At a price of 30, there will be six tickets up for sale. **Figure 2** shows the market supply and demand intersecting at an equilibrium. The next section will provide the results when such an experiment is ran in a classroom and whether it will deliver similar results to what is expected in theory as shown in **Figure 2**.

### 4. Results

**Figure 3** shows an example of how this is derived in the classroom. The students



**Figure 3.** Example of a class double auction supply and demand derived using the induced values and costs.

can compare the theoretical equilibrium and the actual prices unravelled during the double auction. At the end of this assignment, students were able to derive and interpret the law of demand and supply, the equilibrium, and explain how markets work. They can record their findings and interpretations of the auction. In this assignment they are the participants of the game, as well as the examiners who interpret the results and take active part in curating the content for this important section of the Economics. This assignment can be expanded even further by asking students to continue their interpretation and graphical explanation of taxation, subsidies, price floors and ceilings.

Then, students can publish their work in a public domain for a public audience as well as their fellow students and build an iterative model where future students add to the e-portfolio. Students are also encouraged to set their curated content as openly licensed so others can access and build on that content. Armed with a sense of purpose and individual choice, students will feel empowered to become active curators of their own knowledge.

## 5. Discussion and Conclusion

Open pedagogy is a method of teaching that welcomes and encourages students to take part in the creation of content or structure of the lectures. This article illustrated an example of a group assignment used in a Principle of Economics course that allows students to interact, replicate the theory, and be able to interpret and produce the relevant content for the course. Such student, instructor, and content relationship and interaction can become the key to a successful course with high student engagement. There are limitations to this renewable assignment because it is a very specific economic experiment that can be used in an Economics course. However, similar economic experiments can be implemented in the classroom or online in other social science subjects, such as trust games, public goods games, and other game theory examples, by asking students to al-



ways interpret the results, create, and share content. The goal of these types of renewable assignments is to empower students as co-creators of knowledge and to bring purpose and life beyond the classroom by creating a great environment that encourages creativity, critical thinking, and innovation.

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### Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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