DO INTERPRETIVE ECONOMICS DISCUSSIONS IMPROVE LEARNING IN THE CLASSROOM?

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Abstract

This paper explores the academic outcome of using interpretive economic discussions in introductory microeconomics. Economics instructors often weigh the costs and benefits of using cooperative learning exercises in the classroom. The purpose for this study is to add to the literature another approach for cooperative learning and to determine if its use in the classroom improves the learning outcome. Our findings indicate that students participating in classroom interpretive economic discussions grasp a deeper understanding of the material, yielding higher exam scores compared to students participating in traditional lecture classes. This outcome suggests that an increased use of cooperative learning exercises might be warranted in economics classes.

Key Words: cooperative learning, interpretive discussion, and academic performance

JEL: Classification: A22

Introduction and Literature Review

There has been a trend in economics education toward increasing the use of cooperative and active learning exercises to enhance student learning and retention. The use of active learning in the classroom promotes teamwork, allowing students to combine expertise in solving complex real world economics questions (Salemi et al., 2001). Tombak and Altun (2016) noted that various forms of cooperative learning have been extensively implemented for years at primary and secondary schools. Millis (2023) documents examples of the use of cooperative learning in the classroom yielding higher student learning. However, due to costs, time constraints and other factors, cooperative exercises are rarely used in traditional higher education lecture classes. Nevertheless, these exercises can connect students to theories and concepts that were previously introduced via the more traditional chalk-and-talk teaching methodology. Cooperative methods can stimulate student participation and be an effective approach to improving the students' attitudes toward the subject matter. This can be important to economics departments seeking to increase student interest and their willingness to major in the subject.

When breaking a class into cooperative learning groups, mutual interdependence is formed where students learn from each other and the primary instructor. When used as a supplement to traditional lectures, Baumgardner (2015) found cooperative learning techniques can increase the students' critical thinking, participation, and communication skills. Bustillo (2010) found that a significant number of students prefer the use of active learning over traditional lectures. An active learning approach transforms the class away from being passive learners toward being dominantly engaged in the learning process. This can lead to a deeper understanding of the subject matter beyond the typical concepts being covered in a traditional lecture course. The results from active

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learning exercises can give students a greater understanding and a sense of ownership in the material being covered and discussed.

Cooperative learning in economics can be of multiple applications and forms. Vasquez and Chiang (2015) applied a flipped classroom approach to increase their use of active learning cooperative exercises. In flipped classes, students are expected to complete assignments and view brief lecture videos before class to free up class time for more group activities. Foldnes (2016) found that students participating in the flipped classroom approach scored significantly higher than their control group classes using traditional lectures.

The Jigsaw approach for cooperative learning, introduced by Elliot Aronson in the early 1970s, brings guest lecture experts into the classroom to share their expertise with students in small groups. Each group becomes informed and knowledgeable of one part of the overall learning objective. The small groups are merged into larger groups where the participants share and piece together what they learned with the goal of improving overall understanding of the subject material. Hakim and Sakti (2019) found that the Jigsaw method for cooperative learning significantly improved the test scores for students participating in these group discussions. Nolan, et. al. (2018) concluded that students performed better on exam questions related to their use of a Jigsaw approach in the classroom.

Even with considerable evidence that cooperative exercises improve learning and student interest in the subject, traditional lecture remains the most popular form of class structure being implemented in economics and higher education (Roberts, 2017, and Abrami, 2010). Efforts to increase the use of active learning cooperative exercises in teacher training for economics have been applied for many years. Active learning economics education workshops began at Indiana University in 1973 (Saunders et al., 1978). This pilot program led to the funding of additional workshops throughout the 1970s, 1980s and 1990s (Hansen et al., 1980, Lastrapes and Salemi, 1985, and Salemi et al., 1996).

The genesis of this study will focus on a cooperative learning methodology first introduced at Lilly Endowment, Inc. funded workshops between 1992 and 1994. These economics teacher training workshops included 236 participants from 180 different colleges and universities (Salemi et al., 1996). With the goal of spreading the use of active student classroom exercises, all participants agreed to present what they learned in the workshops later to their academic colleagues. One focus of these workshops was to introduce effective cooperative learning classroom applications that are time efficient and can be applied in a variety of class structures. The idea was to make effective use of class time while involving everyone in the group learning without the need to sacrifice important course materials.

One cooperative learning methodology introduced in the workshops involved the use of interpretive questions for the students to evaluate, discuss, and solve in small groups. The idea was to create and ask questions where the correct answers were not obvious, and reasonable students might disagree with each other before reaching a consensus for their answers. Developing and asking good interpretive questions is key for this approach to succeed. The questions need to stimulate interest and allow the students to process various aspects necessary to frame their agreed upon responses. This approach can begin with a short reading assignment that includes a variety of possibilities used to formulate an effective question. It is vital that the reading assignment and previously covered materials be sufficient to answer what is being asked. If not, the discussion could easily evolve into a traditional lecture. An interpretive question is not directly answered in the reading assignment's conclusions. The idea is for the students to think creatively to reach a

consensus solution. Often, the purpose is not to find the expected consequences but rather the unintended consequences of the actions being considered in the readings.

For this study, we implemented a class group discussion teaching method as illustrated in Salemi and Hansen's book (2005). In a traditional lecture setting, each class day, students were broken into groups and asked to discuss and reach a consensus to solve interpretive questions closely related to the major course concepts being introduced that week. To encourage participation and class attendance, we made the discussion assignments a significant grade for the course and awarded full credit for correct answers and generous partial credit when a group took their analysis in the wrong direction.

These activities comprise more than just putting students into groups. It is important for students to perceive mutual interdependence with individual accountability. The idea is to foster group work where everyone learns together with enough individual accountability to avoid students free riding on the work of others. Cooperative exercises promote the learning and understanding of course concepts while fostering teamwork via group activities. Each class session, we would briefly cover a short reading assignment. The students would then break into small groups we called "buzz groups" and discuss a specific interpretive question related to the readings. To foster interest and variety, on some occasions, in place of a reading assignment, we would show a brief video of a discussion, debate, or illustration for the groups to consider.

There were two primary objectives we considered important in these cooperative exercises. First, the questions needed to be pertinent to important concepts being covered and discussed during class. It was important that students discuss and synthesize questions related to major course concepts and class teaching objectives. If our goal of using cooperating methods was to improve the learning and understanding of economics, the group discussions needed to focus on actual course concepts with a goal of higher understanding and improved assignment and exam scores.

Our second objective was to ensure that the questions being asked were interpretive in nature, thus requiring more thought and analysis than a typical direct question that can be solved with the basic tools of economics. By organizing the discussion around interpretive questions, the group discussions can dig deeper than simply solving a more obvious and traditional economics question. For example, a direct question might ask students to consider what economic analysis might predict to happen to tax revenue collected in the market for cigarettes if government leaders significantly increase their per unit sales tax on cigarettes. Most students would draw demand and supply and illustrate the tax revenue as an area from the surplus. An interpretive analysis would be to read a story about a government seeking to reduce individual cigarette consumption for health benefits and to increase tax revenue by implementing a high per unit tax on cigarettes. Next, ask the students to explain how tax revenue fell while only a few consumers decreased their cigarette consumption. The resulting group discussions might consider how higher cigarette prices resulting from the tax could create illegal markets where smuggled cigarettes can be purchased tax free at a lower price. This real-world example happened in Canada, years ago. The Appendix below provides additional examples of interpretive questions used for discussions.

Methodology and Results

Since the early 1990s, many economics teachers have implemented Salemi's interpretive discussion approach to teaching economics. However, there has not been a published investigation illustrating if Salemi's approach improves student achievement as measured by significantly higher scores on major exams. This study fills this gap in the literature by comparing data from classes where this cooperative learning methodology was employed to similar data collected from

test group classes where only traditional lectures were implemented. Across the two test groups, the covered material, learning assignments, and graded assessments were identical. The data from the classes was collected and analyzed to determine if student performance significantly improved in the classes using the interpretive approach. Like other pedagogical studies over student learning and achievement (Bennett, McCarty, and Carter, 2020), this study was controlled for academic and demographic factors to determine if the interpretive questions and group discussions increased student learning.

Student learning was measured by using the average exam grade, denoted as Grade, for each student in the course. All students included in this study completed the same exams answering multiple-choice questions. The exam questions were typical of introductory microeconomics exams designed to assess a student's understanding of fundamental economic principles. The questions were not written to favor anyone with more experience answering interpretive economics questions. The exams included factual concept questions testing their basic comprehension of the subject matter and inferential problem-solving questions applying economic theory and logical reasoning to analyze given scenarios and predict outcomes. Some questions required critical thinking to evaluate the effects of government policies, externalities, and market failures. All students practiced answering these types of questions by completing assigned problems, discussion board questions, and practice quizzes.

Factors hypothesized to influence the exam grade were type of instruction using discussion or traditional lecture, gender, ethnicity, whether the student was an undergraduate business or non-business major, GPA, ACT, and age. To measure the effect of ethnicity, the authors divided the sample into non-minority students, who are white, and minority students, most of whom are African American, but which also includes some Hispanic and Asian American students. The students' ACT scores are indicators of their overall aptitude and ability. The GPA measures how much effort a student has put into his or her studies. Descriptive statistics for the variables used in this analysis of discussion versus traditional in-class instruction are indicated in Table 1.

Table 1. Student Characteristics (n=100)

Gender	
Male	61%
Female	39%
Ethnicity	
Minority	34%
White	66%
Major	
Business Major	53%
Non-business Major	47%
Discussion	
Participant	49%
Non-participant	51%
Averages	
Grade	64.29 (16.423)
GPA	2.70 (0.063)
ACT	20.5 (0.359)
Age	24.49 (2.77)

Values in parentheses are standard deviations.

Table 1 identifies the student characteristics. Our results found 61 percent of the students in the survey were male, while 39 percent were female. From our sample, 34 percent were minority students, which included African American, Hispanic, and Asian students. Undergraduate business majors made up 53 percent of our sample. For the analysis concerning this study, 40 percent of our sample participated in the cooperative discussion exercises. The average grade for all 100 students in principles of microeconomics was 64.29, and the average GPA was 2.7. The average ACT for the 100 students was 20.5. Most students take principles of microeconomics as college sophomores. The average age for our sample was 24.49 years.

Table 2. Student Characteristics by Gender

	Male n=61	**Female n=39**	**Significance (p-value)**
Grade	63.66 (16.700)	65.28 (16.113)	0.6289
ACT	20.33 (3.704)	20.77 (3.435)	0.5451
GPA	2.60 (0.624)	2.86 (0.574)	0.0307
Age	24.10 (2.556)	25.10 (16.113)	0.0892

Table 2 compares the overall means of the sample variables Grade, ACT, GPA and Age by gender. Our p-values indicate that our sample shows no statistically significant difference in comparing variables across gender.

Table 3. Student Characteristics by Ethnicity

	Minority n=34	**White n=66**	**Significance (p-value)**
Grade	55.44 (14.284)	68.85 (15.651)	0.000005
ACT	18.44 (2.623)	21.56 (3.584)	0.000035
GPA	2.456 (0.516)	2.829 (0.6301)	0.002
Age	24.53 (2.833)	24.47 (2.7574)	0.92

Table 3 compares the overall means of the sample variables Grade, ACT, GPA and Age by ethnicity. Our sample found Grade to be significantly lower for minorities compared to non-minorities. Similarly, minorities scored significantly lower on the ACT exam compared to non-minorities. Also, minority GPAs were found to be statistically lower than non-minority GPAs. We did not find a statistically different age among the student characteristics by ethnicity.

Table 4. Student Characteristics by Major

	Business Major n=53	**Non-business Major n=47**	**Significance (p-value)**
Grade	64.75 (16.125)	63.77 (16.912)	0.7662
ACT	20.38 (3.300)	20.64 (3.900)	0.7215
GPA	2.73 (0.581)	2.67 (0.660)	0.6384
Age	24 (2.718)	25.04 (2.750)	0.0601

Table 4 breaks down the means comparing Grade, ACT, GPA and Age by business major versus non-business major. From our sample, we did not find any statistically significant difference.

Table 5. Student Characteristics by Discussion Participation

	Participant n=49	**Non-participant n=51**	**Significance (p-value)**
Grade	70.96 (13.191)	57.88 (16.782)	0.000036
ACT	20.86 (3.680)	20.16 (3.506)	0.3327
GPA	2.59 (0.577)	2.51 (0.603)	0.2324
Age	23.47 (2.924)	25.47 (2.230)	0.00023

As shown in Table 5, a primary interest of this study was to compare students who participated in the classroom interpretive discussions to the students who attended a traditional classroom lecture. As a measure of overall aptitude for each class structure, the ACT scores and GPA were not significantly different. When we compared the means of the final course grades between students who participated in interpretive discussions compared to traditional lectures, we found the final course grades for participating students to be significantly higher than course grades for students who only saw traditional lectures.

Table 6. Multivariate Regression on Grade (n=100)

R-squared = 0.557	Coefficient	Std. Error	P-value
Discussion Participant = 1	7.083	2.542	0.0065
ACT	0.905	0.379	0.019
GPA	12.628	2.202	1.24E-07
Age	-0.171	0.466	0.715
Gender (m=1)	2.071	2.453	0.400
Ethnicity (w=1)	5.338	2.675	0.049
Business Major = 1	-0.571	2.336	0.807

While controlling for ACT, GPA, Age, Gender, Ethnicity and Business Major, we used a dummy variable of one if the student participated in interpretive discussions in a regression on Grades as our dependent variable. As shown in Table 6, for the entire sample of 100 students, the controls for ACT, GPA, and ethnicity were statistically significant, while the control variables for Age, Gender, and Business Major were not. Of interest to this study, we found that students participating in interpretive class discussions had a positive and statistically significant impact on final course grades. This supports comparable results found by Foldnes' (2016) cooperative exercises used in a flipped class setting and Hakim and Sakti's (2019) Jigsaw approach for cooperative learning.

Conclusion

The results of this study show a significant improvement in the exam grades for classes taught applying cooperative interpretive discussion exercises. Thus, we have illustrated one more approach and use of cooperative learning to yield improved test scores. Our results indicate that using these class discussions enhances the learning and the students' problem-solving application of economic analysis. While interpretive class discussions take class time away from traditional lectures, this learning approach has a positive benefit. Class instructors constantly weigh the costs in terms of limited class time and extra effort for them, versus the improved outcomes for the students. This study analyzed a different approach for cooperative learning, and the results encourage an increased use of cooperative learning interpretive discussions over traditional lectures.

These cooperative exercises can be applied in small and larger class sections and can be applicable to online learning. With the increased use of hybrid and online learning in economics in higher education, cooperative interpretive discussion exercises can easily be adapted and used effectively on LMS discussion boards. A future study might be to analyze learning outcomes using interpretive discussion in online classes.

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Appendix

Sample interpretive questions used for discussions.

1. Discuss why a saloon might give away peanuts while still charging for water.
2. Suppose a genie gifted you with unlimited wealth. Discuss what might happen to your various elasticities of demand.
3. Suppose an FDA-approved dementia drug is found to significantly enhance intelligence in 75 percent of users with no side effects—marking a groundbreaking pharmaceutical breakthrough. If you are not one of the 75 percent who benefit from this drug, discuss if its availability for everyone improves or worsens your wellbeing?
4. As a college student and environmentalist, you host a McDonald's car wash fundraiser for the Endangered Species Act. Spotting your economics professor in the drive-thru, you ask for support. He replies, "If you really want to save endangered species, you should eat them." Discuss the merits of your professor's comment.
5. Discuss how it might be cheaper to pay someone to cut your lawn than if you cut it yourself.
6. Discuss how the wealth of society decreases as the minimum wage destroys jobs while it increases as technology advancements eliminate jobs.
7. Suppose an elite university auctions off 10 percent of its admissions to the highest bidder while admitting the remaining exclusively on merit. Discuss the pros and cons of this admissions practice.
8. Suppose you pay a non-refundable $1000 to join your community recreation center. Discuss if this payment will motivate you to work out and get in better physical shape.
9. Suppose you read an article about high altitude mountaineering that concludes "safe mountaineering should always be your primary objective." Discuss what you would consider safe mountaineering.
10. In the US, it is currently not legal to pay someone for a donated organ. Yet, it is estimated that more than 5000 people die each year waiting on an organ for transplant. Discuss the merits of a legal market where living donors can receive compensation for organ donations.