

# CHAPTER 6

## Classroom Discussion

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An inquiry-based or structured discussion (SD) is an instructional strategy where students meet in class to respond to questions about a text that the instructor has prepared and distributed in advance. Discussion questions are of three types. Interpretive questions ask participants to interpret the author’s meaning. Factual questions ask about relevant and important facts in the reading. Evaluative questions ask for participant opinions about the reading.

In SD, the classroom instructor organizes questions into clusters that target important concepts in the reading and important learning objectives in the course. The typical question cluster begins with an interpretive question that prompts participants to investigate an important theme in the reading, continues with supporting questions that help participants consider aspects of the theme, and concludes with a question that invites participants to wrap up inquiry before moving on to another activity or to judge the importance of the text author’s ideas.

During a structured discussion, participants are responsible for the quality of responses to posed questions. The instructor functions more like a facilitator and less like an expert. The instructor probes the responses of participants by asking follow-up questions and asks respondents how their contributions relate to contributions made earlier in the discussion. The

instructor does not correct mistaken contributions or provide an ideal response to any question. Instead, the instructor gently but firmly raises awareness of flaws in responses and invites all participants to help repair those flaws. The instructor, in sum, oversees a process whereby participants refine their answers to the posed questions.

A structured discussion is very different from strategies most instructors have in mind when they use the term “discussion.” Structured discussion is described in detail by Hansen and Salemi (1998) and Salemi and Hansen (2005). Salemi (2005) compares SD and unstructured discussion (UD).

In this chapter, three TIP participants who completed the TIP instructional module on structured discussion explain how they implemented and extended SD and document the reactions of their students. Kirsten Madden reports on her implementation of SD in a principles of macroeconomics course at Millersville University. She finds that while students typically preferred other instructional activities, they appeared to better retain and more deeply understand concepts they learned through SD. Roisin O’Sullivan compares the performance of three separate ways of allowing students to engage in a reading in an Intermediate Macroeconomic Theory course at Smith College. She finds that students participated more actively in structured than in unstructured discussions and perceived that they learned more when they did so. Prathibha Joshi explains how she implemented SD at Gordon College, an open-enrollment college, and how her students judged the relative merits of SD in comparison to several other learning strategies.

## **I. COMPARISON OF STRUCTURED DISCUSSION OF ADAM SMITH WITH OTHER ACTIVE LEARNING STRATEGIES**

**Kirsten Madden**

During spring semester of 2007, I led five structured discussions in an upper level History of Economic Thought course at Millersville University. In May, the students completed an opinion survey concerning SD and other learning techniques used in the course. Although SD causes some confusion and leaves some questions unresolved, Madden (2010) concludes that SD has a positive impact on student interest, learning, and retention. In my contribution to this chapter, I investigate whether principles students also benefit from structured discussion.

I led structured discussion of Adam Smith’s *The Wealth of Nations* on the third day of class in fall 2009 in two sections of macroeconomics principles at Millersville University. Over the next few weeks, I employed

a variety of other learning techniques. At the midpoint of the semester, students completed an opinion survey similar to that completed by students in the History of Economic Thought class. My principles students did not like SD as well as several other strategies I employed and did not rate SD as highly as did my history of thought students. However, I found that SD better promoted retention and depth of understanding for principles students than the techniques they enjoyed more.

On the first day of class, I provided my students with written and verbal instructions for SD and warned them that I would spot check their pre-discussion preparation work. I also explained that I would evaluate the quality of their responses to discussion questions by having them submit their responses in essay form after the discussion. Finally, I provided them with a copy of the assigned reading and a “contract for discussion” that explained their responsibilities.

Prior to discussion, students read the first three chapters of *The Wealth of Nations* and prepared written preliminary responses to the cluster of questions displayed in Figure 1.

**Figure 1**

Question Cluster for Chapters 1–3 of *The Wealth of Nations*

1. Why, according to Adam Smith, is the division of labor limited by the extent of the market?
  2. What does Smith mean by “division of labor”? By “extent of the market”?
  3. How, according to Smith, does a comparison of a farmer in the Scottish Highlands and a porter in London illustrate that division of labor is limited by the extent of the market?
  4. How does Smith’s discussion of dogs and humans relate to his argument about division of labor being limited by the extent of the market?
  5. How, according to Smith, are the Rhine and the Ganges different from the rivers of southern Africa and Siberia?
  6. What, according to Smith, is the connection between the development of water transportation and the extent of markets?
  7. What is the practical importance of Smith’s principle that the division of labor is limited by the extent of the market?
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My principles students also learned through a variety of other techniques including my lectures, my use of physical “props” to illustrate a point

during lecture, my use of cause-and-effect diagrams, three experiential learning activities<sup>1</sup>, quizzes and an exam conducted the period before the survey.

Sixty-seven students completed the half-hour survey<sup>2</sup> during the sixth week of classes. The typical respondent was a sophomore who had earned 32 hours of college credit. Of the 67, 39 students were humanities and social science majors, 13 were education majors, 11 were math and science majors and 4 had yet to declare a major. Thirty-seven respondents are male, and 30 are female. About 70 percent of the respondents indicated that they were motivated to do the course work to complete a graduation requirement and about 30 percent reported that their motivation was a desire to learn the subject matter.

After describing and providing examples of each learning technique, the survey asks students to estimate the amount of out-of-class time they spent completing tasks associated with each technique. The survey asks students to evaluate how well the technique contributed to their learning. In particular, it asks them to use a scale of 1 (low) to 10 (high) to judge: (1) the clarity and depth of understanding of the content derived from the technique; (2) their retention of the content targeted by the technique; (3) the level of confusion they experienced during application of the technique; and (4) the extent to which unresolved questions remained after use of the technique. Finally, the survey asks students to recommend future use of the technique using a scale of 1 (most recommended) to 8 (least recommended).

Table 1 reports sample averages and standard deviations for the survey responses. On average, students spent 38 minutes preparing for the Adam Smith discussion and 37 minutes reviewing their discussion notes and revising the post-discussion essays that they submitted as a graded homework assignment. Discussion ranked third among the seven techniques in terms of student out-of-class time—requiring less time than quizzes and exams and more time than the other four techniques.

On average, principles students preferred other learning strategies to discussion. When asked to compare discussion to lecture and textbook study, 22 percent responded that discussion was “worse,” 48 percent responded “just as good,” and only 28 percent responded “better.” Discussion has the lowest average score for clarity and depth of understanding and retention of learned concepts. With the exception of exams, it had the highest average score for confusion and the presence of unresolved questions. Students report that all four of the other nonexam strategies stimulated their interest more than discussion. Only 37 percent

indicated that discussion increased their interest in economics relative to their pre-course interest level. It is not a surprise then that, on average, students recommended discussion less enthusiastically than any other learning strategy except examinations.

Table 1: Student Opinion Survey Results

Technique	Pre-Class Time <sup>a</sup>	Post-Class Time <sup>a</sup>	Clarity-Depth <sup>b</sup>	Retention <sup>b</sup>	Confusion <sup>b</sup>	Unresolved Questions <sup>b</sup>	Interest <sup>b</sup>	Recommend Technique <sup>c</sup>
Lecture	21 (28)	38 (34)	6.9 (1.9)	6.7 (2.0)	3.5 (1.9)	2.8 (1.8)	5.8 (2.2)	3.4 (2.1)
Instructor "Props"	10 (17)	20 (21)	7.7 (1.7)	7.6 (1.9)	2.6 (2.0)	2.1 (1.7)	7.4 (2.0)	3.0 (2.3)
Cause-Effect Diagrams	25 (20)	30 (23)	6.6 (2.0)	6.5 (2.0)	3.8 (2.0)	3.2 (2.1)	5.8 (2.1)	4.3 (1.9)
Experiential Learning	23 (26)	31 (24)	7.3 (2.0)	6.8 (2.0)	3.2 (1.7)	3.0 (2.0)	6.9 (2.3)	3.3 (2.1)
Discussion	38 (30)	37 (27)	6.2 (2.1)	6.1 (2.0)	4.4 (2.1)	3.5 (2.1)	5.5 (2.2)	5.0 (1.8)
Quizzes	42 (32)	35 (29)	6.2 (2.0)	6.3 (2.0)	4.3 (2.5)	3.5 (2.4)	5.2 (2.4)	4.7 (1.8)
Exam	131 (69)	53 <sup>c</sup> (43)	6.3 (2.2)	6.5 (2.1)	4.5 (2.5)	4.1 <sup>c</sup> (2.8)	5.1 (2.6)	5.9 (1.7)

Note: The table reports the mean and standard deviation (parentheses) of student responses to survey questions described in the text.

<sup>a</sup>The number of minutes spent by students completing tasks associated with the learning technique.

<sup>b</sup>Student assessment of the quality of the learning experience associated with the use of the technique with 1 designating the lowest value experience and 10 the highest. Students assess the clarity and depth associated with learning, their retention of the covered concepts, the level of confusion they experienced, the degree to which conclusion of the technique left students with unanswered questions, and the level of their interest stimulated by the technique.

<sup>c</sup>Student ranking of the seven learning techniques used in the course with 1 designating the most preferred technique and 7 the least preferred.

<sup>d</sup>Estimated.

It is interesting to compare the survey results for my principles course with those for my history of thought course. Like my principles students, my history of thought students spent more out-of-class time completing tasks associated with discussion than they spent on tasks associated with any other technique except examinations. My history of thought students also reported that discussion resulted in more unresolved questions than did other learning techniques.

In other dimensions, the survey results diverge. On average, history of thought students gave discussion the highest score for clarity and depth of understanding, retention of concepts, and stimulation of interest. They also recommended future use of discussion more highly than every other learning technique used in the course. Only 5 percent of principles students, but 56 percent of history of thought students described discussion as a “particularly good technique.”

The comments that principles students volunteered on their surveys provide additional insights. One student wrote: “Adam Smith, I get the concept, but it was confusing and hard to understand.” A second student listed discussion as particularly bad “... because it did not clear up many questions I had.” A third student disliked discussion of new material because “... (I) can’t discuss accurately if I don’t understand fully myself.”

When invited to explain their recommendations for the future use of the various learning techniques, several students raised similar points. One wrote “You can really remember the seat auction with no problem.” Another explains that “experiments stick in memory easier.” A third, who favored instructor use of “props” writes, “Even though lectures have to happen, they are boring and it’s hard to retain all the info presented. Having physical props helps to apply the issues discussed.” A fourth suggests that the use of “props” provides “...something to visualize when taking the exam.” Many students did not like discussion because they prefer direct answers. Some students were concerned that during discussion the “entire class could’ve been persuaded to believe false information was true.” They complained that they could not know “...if what we were saying was correct without the prof. moderating discussion w/ input.”

The reader should keep in mind that my principles students reported their views after experiencing only one discussion on difficult reading material during the first week of the semester. In contrast, my history of thought students participated in several discussions before reporting their views. Even though principles students report disliking the technique relative to others, it would be surprising to learn that they were immune to the educational benefits of discussion reported by my history of thought students. Additional evidence suggests that they were not and that discussion better promoted retention and depth of understanding than instructional strategies that the students rated more highly.

A second part of the survey asks students to “list the main economic idea” learned in association with each of the employed instructional techniques. The survey provides 134 responses associated with the use of

props in two different classes, 134 observations associated with two uses of cause-and-effect diagrams, 201 observations on three experiential learning activities, and 67 observations on discussion.

I assigned student descriptions of what they learned to one of three hierarchical categories: accurate explanation using a relevant concept, accurate statement using a relevant concept, or other. I assigned a student description to the “accurate explanation” category if the response included either a correct explanation of the concept or a correct explanation of how the concept relates to another relevant concept. For example, I assigned the following description of what one student learned from the *Wealth of Nations* discussion to the “accurate explanation” category: “...division of labor increase production → limited by market reach affected by geography.” Such accurate explanations are evidence of more complex learning from a technique than simply listing a concept.

I assigned a student description to the “concept accurate” category if the responses correctly identified the economic concept associated with the learning activity, provided that the student used words different from those used in the survey cue to describe the learning technique. For example, if a student responded that they learned about “auctions” from the classroom-seat auction, I assigned their response to the “other” category. If they responded that they learned about markets, I assigned the response to the “accurate concept” category. Two examples of student responses to the discussion prompt that I assigned to the “accurate concept” category are “division of labor” and “humans have the want/ability to trade.”

I assigned responses to the “other” category when they incorrectly identified a target concept of the exercise, were too general to suggest substantive learning, reported noneconomic concepts or indicated a lack of recall. By way of example for the Smith discussion prompt, I assigned the response “goals of macro” into the “other” category because it does not reflect any learning derived from the Smith discussion. Similarly, I assigned “How different examples supported Smith’s views” to the other category because it was too general. And I assigned “Different people’s perspectives” and “I learned how to think more deeply into the reading” to the other category because neither describes an economic concept.

In summary, I assigned a student’s response to the “accurate explanation” category when it indicated that the student had higher-than-recall mastery of concepts. I assigned a response to the “accurate concept” category when it indicated that the student had recall mastery of the concept. And, I assigned the response to the “other” category when the response indicated no mastery of an economic concept.

Table 2 describes the distribution of survey responses into three depth-of-learning categories by learning technique.

*Table 2: Percentage of Student Responses about Concepts Learned Assigned to Three Depth-of-Learning Categories for Each of Four Learning Techniques*

<b>Learning Technique</b>	<b>Number of Observations</b>	<b>Accurate Explanation</b>	<b>Accurate Concept</b>	<b>Other</b>
Instructor Props	144	27.6	3.7	67.2
Cause-Effect Diagrams	144	29.1	20.1	50.0
Experiential Learning	201	38.1	17.9	39.6
Discussion	67	34.3	17.9	46.3

*Note:* The survey prompts students to write “missed class” if they did not attend the class period in which a learning technique was used. The observations for “missed class” are not reported in this table with the result that row sums are less than 100.

The table reveals interesting differences in the learning reported for each technique. Use of props was the technique that received the highest average student recommendation for future use. However, 67.2 percent of responses to the survey invitation to identify the economic idea learned with the aid of props contained no reference to a valid economic concept. Discussion received the lowest average student ranking after exams for clarity and depth of understanding, but 17.9 percent of responses to the survey’s request for students to identify economic ideas indicate that the responding student recalled a relevant concept. Moreover, 34.3 percent of student responses to the invitation indicate higher-than-recall mastery of a relevant concept—second only to experiential learning. The near-equal performance of discussion and experiential learning is noteworthy because students experienced only one discussion in week one but three experiential activities (seat auction, ultimatum game, and supply of naked bodies) in weeks two through four.

In summary, the survey reveals an interesting contradiction. Of the seven instructional techniques, students assign to the use of props the highest scores for clarity and depth of understanding and retention and the lowest scores for confusion. In contrast, they assign to discussion low scores for clarity and retention and a high score for confusion. But the results are reversed when considering student reports of what they learned. Principles students may like it when the instructor uses props, but the evidence suggests that they do not remember the target concept. Students may dislike some features of discussion, but the evidence suggests that they

learn the target concept better than they do with all other techniques save experiential learning strategies.

Through their survey comments, my principles students recognized some of the same benefits of discussion as my history of thought students. One appreciated that discussion “helped to see different people’s standpoints on ideas.” Another wrote: “I was confused and got to hear other people’s problems I hadn’t thought about.” Still another appreciated that members of the class “...can see what everyone else is thinking” and that discussion “allowed ideas to be thrown around, clarification to be made, and allowed us to articulate ideas in our heads by verbalizing.” One female student liked having to respond to the basic discussion question because doing so “...had me think outside the box and bring ideas outside economics in.” This latter quote appears in nearly identical form in a 2007 history of thought student survey. The discussion encouraged one principles student to “...sit down longer and focus more and re-read to understand. This helped me to get a better grade & understanding on Adam Smith.” Another simply sums up that the “...Adam Smith thing was very interesting.”

A number of reasons can explain why the survey results differed between my principles and history of thought students. First, the history of thought students completed five structured discussions whereas the principles students completed only one. Second, the history of thought class met at 11:00 a.m. and the two principles classes met at 8:00 a.m. and 9:00 a.m. Third, the *Wealth of Nations* is a more advanced reading than others in the principles course, but is similar in difficulty to the other readings in the history of thought course. Because the reading requirements were known in advance, the history of thought course may select students with advanced reading skills. Finally, I did not use experiential learning strategies in the history of thought course.

Mixed results may be the best we can hope for when a captive audience of teenagers participate in discussion for the first time at 8:00 a.m. and 9:00 a.m. Direct evidence of what students learn indicates that discussion promotes learning better than other more popular strategies. And three fourths of my principles students did agree that discussion was “as good” or a “better” use of their time than traditional learning methods.

## II. STUDENT PARTICIPATION DURING UNSTRUCTURED DISCUSSION, STRUCTURED DISCUSSION, AND LECTURE

**Roisin O'Sullivan**

Does the potential for higher-order learning through inquiry-based discussion stem primarily from the opportunities it creates for student participation or is the way in which the technique formats the discussion also important? To investigate this question, I compare the in-class experiences for sub-groups of students from the intermediate macroeconomic theory classes taught at Smith College during the spring and fall semesters, 2008. In each semester, I used three different techniques for discussing Mankiw's article, "The Macroeconomist as Scientist and Engineer," from the *Journal of Economic Perspectives* (Mankiw 2006). In one section, the discussion focused around interpretive question clusters, following the inquiry-based structured discussion technique (SD) suggested by Hansen and Salemi (1998). In a second section, the discussion was somewhat unstructured (UD), where the students were provided with three general questions to guide their reading. The final section consisted of a lecture where the material was presented in a formal manner to the students using PowerPoint.

Comparing the experiences of each sub-group of students, the study finds that, in addition to differences between those receiving one of the discussion treatments versus the PowerPoint lecture treatment, there were interesting differences attributable to the discussion format. The SD technique not only resulted in a greater degree of participation by students, it influenced the nature of the participation. In SD, the instructor functions as a facilitator rather than as a content expert with the result that students responded directly to each other more frequently and to the instructor less frequently. This study suggests that inquiry-based discussion has benefits beyond those associated with a less-structured discussion format.

### **Implementation**

The intermediate macroeconomic theory course at Smith College includes both lecture meetings and three smaller section meetings each week. The smaller weekly meetings provided an opportunity to examine the impact of different section formats on the learning of students who had been exposed to the same material in lectures. The number of students exposed to each treatment was increased by implementing the experiment in both spring and

fall semester classes where enrollment was 42 and 50 students, respectively.

The choice of article for the project was guided by the criteria that the reading should contain a sufficient number of ideas to warrant discussion, be self-contained and well-written, and be interesting to both the instructor and the students. Mankiw's article pulls together the main developments in macroeconomics since the Great Depression and looks at these developments from both a theoretical and a policy perspective. Therefore, it focuses on ideas that are at the absolute core of any course on intermediate macroeconomic theory. Given some background in macroeconomics that all intermediate-level students should have, the article is self-contained and is certainly well-written, and, given the centrality of the themes covered to a course in macroeconomics, the article should be of major interest to both the students and the instructor.

Each of the three formats shared certain elements. For example, the instructor knew students individually and regularly called on them by name. In most of the sessions, students sat in a circular or semi-circular arrangement and all students were informed in advance that there would be a short quiz at the end of the session. The major differences between the sessions were that different preparation materials were distributed in advance and, for the SD format, learning objectives were specified. It should be borne in mind that the students were familiar with the UD format, as it was used weekly throughout the semester. The format of each session is described in more detail below.

**Inquiry-Based Structured Discussion Format** Preparation for the SD format involved specifying learning objectives for the session and developing a set of three question clusters based on the reading (Figure 2). Students were also provided with a contract for effective discussion in advance.<sup>3</sup> Following the method of Hansen and Salemi (1998), each question cluster began with an interpretative basic question that was supported by factual and evaluative questions. Each cluster ended with an evaluative question, where students were asked to form a judgment based on evidence from the reading. As the discussion progressed, the instructor supplemented these pre-circulated questions with follow-up questions.

**Figure 2**

Question Clusters for Mankiw, N. Gregory,  
 “The Macroeconomist as Scientist and Engineer”, *Journal of Economic Perspectives*, 20 (4), Fall 2006, 29–46”

1. According to Mankiw, what potential contributions can macroeconomists make?
    - a) How does Mankiw distinguish between a macroeconomist fulfilling the role of scientist versus that of engineer?
    - b) According to the author, what contributions were made by “Keynesian Revolution” economists to clarify and elaborate on Keynes’ *General Theory*?
    - c) According to Mankiw, was the Keynesian revolution a scientific/engineering success?
    - d) Do you think the distinction between “scientist” and “engineer” is an appropriate one for macroeconomists? Why?
    - e) Can you think of an example of a macroeconomic engineer in today’s economy? Explain why you think they fit the bill.
  2. Why, according to the author, did the Keynesian consensus breakdown after a couple of decades?
    - a) What were the main elements of the three waves of New Classical economics?
    - b) What were the key elements of the three waves of New-Keynesian research?
    - c) What was the main goal of the New Classical economists? Do you think they achieved that goal? Why?
    - d) Do you think the New Keynesian developments were successful i) as a matter of science ii) as a matter of engineering? Support your answer with evidence from the reading.
  3. According to Mankiw, how have elements of both the New Classical and the New Keynesian research paths contributed to the new neo-classical consensus that emerged in the 1990s?
    - a) What are the main elements of the new neoclassical synthesis and which school of thought (early Keynesian, New Keynesian, New Classical) do they most reflect?
    - b) What evidence does the author present on how theoretical developments since the 1970s have/have not altered how monetary and fiscal policy is conducted in practice?
    - c) How would you grade the development of macroeconomics since the 1970s? Justify your grade using material from the reading.
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**Unstructured Discussion Format** Preparation for the UD section comprised the circulation of three very general questions about the reading that were developed without taking account of question type or role (Figure 3).

**Figure 3**

General Questions for Unstructured Discussion of Mankiw, N. Gregory,  
 “The Macroeconomist as Scientist and Engineer,” *Journal of Economic Perspectives*, 20 (4), Fall 2006, 29-46”

1. What is a macroeconomic scientist? What is a macroeconomic engineer?
  2. What were the major developments in macroeconomics discussed in the article?
  3. What are the main elements of the new neo-classical synthesis?
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The instructor played a leadership role, providing context and motivation for the discussion. There were some follow-up questions to each of the questions in Figure 3, but these tended to be factual in nature, prompting relatively short and “dead-end” responses. The instructor wrote a very brief summary of the student responses on the board, including a timeline of the developments from the Keynesian revolution onwards.

**Lecture Format** During the lecture sessions, the instructor dominated, presenting the material from the reading using a PowerPoint presentation. At the beginning of the session, students were encouraged to intervene with questions or comments at any time during the presentation. A handout of the PowerPoint slides was distributed at the beginning of the session but no preparation materials other than the article to be read were distributed in advance. As expected, these sessions (both in the spring and fall semesters) were far less interactive than either of the other two formats.

### Student Participation during the Sessions

Table 3 documents the extent and nature of student participation for each of the session formats for the spring and fall semesters, 2008.<sup>4</sup> Clearly, the format of the session influenced the behavior of both the students and the instructor. Unsurprisingly, the lecture format resulted in the lowest level of student participation with only twelve interventions over the two semesters. The infrequency of interventions reflected both the behavior of the instructor, who asked far fewer questions of the students compared with the other formats, and the more passive behavior of students.

*Table 3: Student Participation in Discussion Sections*

	<b>Structured Discussion</b>	<b>Unstructured Discussion</b>	<b>Lecture</b>
Number of students in the Section	30 (13, 17)	31 (19, 12)	31 (10, 21)
Number of Student Interventions <i>Comprising</i>	<b>152 (77, 75)</b>	<b>83 (43, 40)</b>	<b>12 (8, 4)</b>
Student responses to instructor questions	126 (61, 65)	74 (37, 37)	9 (6, 3)
Student to student interaction	20 (13, 7)	1 (1, 0)	0 (0, 0)
Student questions to instructor	6 (3, 3)	8 (5, 3)	3 (2, 1)

*Note:* Figures in parenthesis refer to the spring and fall semesters, respectively.

The more interesting comparison is between the two discussion formats—SD and UD. In both semesters, students intervened almost twice as frequently in the SD sessions than in the UD sessions.<sup>5</sup> The nature of the interventions was also different, with a greater degree of student-to-student interaction in the SD sessions. An intervention is classified as student-to-student when a student intervention is followed immediately by a contribution by another student without the intervention of the instructor, either building on the answer of the first student or reacting directly to what that student said. On a few occasions during the SD sessions, there was a string of several student interventions, something that didn't happen during the sessions using the other formats.

Instructor behavior also differed across the SD and UD sessions. In the UD sessions, the instructor acted as a leader, providing a summary of what the discussion would be about and motivation for why the topic was important at the beginning of the session, answering student questions directly and drawing together issues on the board. The instructor was in “sheep-dog” mode for much of these sessions, shepherding the students towards the main issues in the reading and working to ensure the quality of the information stream was accurate.<sup>6</sup> More questions asked by the instructor were factual in nature compared with the SD sessions and the instructor provided information when students failed to identify a salient point. When students asked questions directly of the instructor, the instructor provided an answer.

In contrast, during the SD sessions, the instructor played the role of facilitator rather than leader. At the beginning of these sessions, the instructor made it clear to students that they were responsible for coming up with answers or identifying different viewpoints on a certain topic: The instructor would not provide answers but would direct the discussion or act as a “traffic cop” rather than a “sheep dog.” When students did ask questions directly of the instructor, the instructor either referred to a point made earlier by another student, helping the questioner answer her own question, or asked other students to weigh in on the issue. On several occasions in both the SD sessions (seven and five times in the spring and fall sessions, respectively), the instructor referenced points made by students earlier in the discussion. In both these sessions, student interventions accounted for a far greater percentage of the “air time” compared with the other two formats and there was participation across a wider range of students.<sup>7</sup> Overall, the evidence indicates that students took greater responsibility for the outcome of discussion under the SD format.

### Students' Reactions to the Discussion Formats

A day after the discussion sessions, the instructor distributed a feedback form to students that asked them to compare the new section formats to the UD structure usually employed. Completion of the form was voluntary and students had the option to keep their responses anonymous.

Table 4 contains the questions asked on the brief survey and summarizes student responses. The first question revealed that 20 of 27 respondents exposed to the SD format either preferred it or liked it as well as the usual UD format while only 12 of 27 respondents who received the lecture treatment felt that way. All respondents but three reported that they spent as long or longer preparing for the Mankiw discussion<sup>8</sup> and only students expecting the lecture format responded that they spent less time preparing.

The students also were invited to share any general comments about their discussion experience with the alternative formats. In response to the PowerPoint lecture format instead of the usual unstructured discussion, students said:

“I find regular discussions more helpful because I am learning more actively”

“In lectures, I need to go over my notes to understand the material. During our usual discussions, talking about the material helps me understand/remember more.”

“The lecture format was okay, but I prefer the discussion format because it is easier to absorb new information”

“I prefer classes that are more discussion-based because the interaction in class helps me to learn more effectively. Being involved in the discussion usually allows me to master the material better.”

“Just to clarify, I think the reason I did not like the Mankiw discussion as much as our normal discussions was because we covered so much material and there was a lot less time for participation. It was also less interactive.”

“I feel like the power point teaching method is inhibiting. I don't think you need it, especially not during a discussion, although it also wouldn't be good for our lectures. I think the way we usually did discussions worked well.”

These responses are consistent with the education literature that states discussion promotes more active learning. It also indicates clearly that students value the opportunity to participate in class and are less likely to

Table 4: Student Responses to the Different Discussion Formats

	Lecture	Structured Discussion
<b>Total Number of Responses</b>	<b>27 (8, 19)</b>	<b>27 (12, 15)</b>
1. Compared with the usual discussion format (UD), what did you think of the format you experienced for the Mankiw discussion?		
I <b>much preferred</b> the Mankiw discussion format.	1 (1, 0)	4 (2, 2)
I <b>preferred</b> the Mankiw discussion format – <b>but not by a big margin</b> .	5 (1, 4)	6 (4, 2)
I <b>liked</b> the usual format and the Mankiw discussion format <b>equally</b> .	6 (1, 5)	10 (4, 6)
I liked the Mankiw discussion format <b>less</b> – <b>but not by a big margin</b> .	8 (2, 6)	5 (2, 3)
I like the Mankiw discussion format <b>a lot less</b> .	7 (3, 4)	2 (0, 2)
2. How did the amount of time you spent preparing for the Mankiw discussion compare with your usual preparation time for discussion?		
I spent a <b>lot longer</b> preparing for the Mankiw discussion.	5 (1, 4)	15 (5, 10)
I spent a <b>bit longer</b> preparing for the Mankiw discussion.	16 (6, 10)	9 (7, 2)
I spent about <b>the same</b> amount of time preparing for the Mankiw discussion.	3 (1, 2)	3 (0, 3)
I spent a <b>bit less time</b> preparing for the Mankiw discussion.	3 (0, 3)	0 (0, 0)
I spent a <b>lot less time</b> preparing for the Mankiw discussion.	0 (0, 0)	0 (0, 0)
3. Did the anticipated format of the Mankiw discussion (rather than the length of the reading) influence your decision about the matter of time you spent preparing?		
Yes, I spent a longer time preparing because of the discussion section format.	11 (2, 9)	17 (8, 9)
Yes, I spent a shorter time preparing because of the discussion section format.	1 (0, 1)	0 (0, 0)
No, the format of the discussion session did not influence my preparation time.	15 (6, 9)	10 (4, 6)

*Note:* Figures in parenthesis refer to the spring and fall semesters, respectively from written additional comments that students were factoring in the length of the reading as well as the discussion format when answering the question.

participate when the format of the class is not structured deliberately to encourage that participation.

In response to the SD format instead of the usual unstructured discussion, students volunteered the following comments:

“I really liked this new kind of discussion set up. I felt like the prompting questions effectively engaged students and gave us more opportunity to speak. Also, having question clusters enabled me to read with more direction. I felt like I had a better idea of what we would be discussing and was more prepared to answer questions in class. I would also like to note that my response to number 3 is attributed to the fact that the article was much longer than other articles and we had more questions to consider. Because there were more questions, I feel like I did more preparation outside of class and was better prepared for the discussion.”

“Although open discussion isn't usually my favorite format, I found today's discussion useful. Advantages of this format: 1. Clear structure lets students know what to expect and how to prepare. 2. Student learning was more collaborative. Disadvantages of this format: 1. Preparation level would probably fall off quickly as the semester went on 2. A lot of regurgitation of the text took place”

“I really liked the student-led discussion style with you just as facilitator. I think it was great that we sat in a circle and I wished we would have done a similar activity for the other discussions. Perhaps you should use a seminar room with one big table for the discussion groups next year?”

“The fear of a quiz did induce me to study a little more. Also, though, I did prefer the discussion-style session and you did an extraordinary job facilitating in one or two situations, it would have been nice if you said - here is the answer. Example, I said one thing (I forget what) someone else said the opposite, we evaluated each side (good so far) but after doing so there was no conclusion. An eventual conclusion would be nice.”

Again, these comments show that students are motivated by opportunities to participate actively in class and to take more responsibility for their own learning when given sufficient structure.<sup>9</sup> The comments also point to the importance of the preparation materials and the expectations set for students before the discussion. It is interesting to note, however, the observation made in the final student comment above about the lack of an instructor-provided conclusion. While students welcome the additional responsibility this format gives them, there is still a tendency to look to the instructor to tie everything up neatly for the students. Perhaps repeated exposure to the SD technique would change that.

This study investigated whether the format of discussion sessions impacts the extent and nature of student participation by using three different formats for sub-groups of students from an intermediate macroeconomic theory course. The evidence reveals that the format of the discussion does matter. In a structured discussion, students engage more fully than they do in lecture and in unstructured discussion.

Students participated more actively when expectations were made explicit about their role and responsibilities. The nature of students' participation was also influenced by the format of the discussion. When the role of the instructor was clearly defined as that of facilitator, students were more inclined to respond directly to each other's contributions. They intervened more often in class when the SD format was utilized although the level of intervention for the UD format was also significantly higher than during the PowerPoint lecture sessions. Students responded positively to the more interactive session formats and their comments indicate that they perceived they learned more when they were more active participants in the process.

### **III. EVALUATING DISCUSSION AS A LEARNING TECHNIQUE IN A PRINCIPLES OF MACROECONOMICS CLASS**

**Prathibha Joshi**

How effective is structured discussion (SD) technique in an open enrollment institution? My experience in teaching principles of macroeconomics in the spring, summer and fall semesters of 2009 at Gordon College in Barnesville, Georgia is instructive.

Gordon College is a two-year residential college. It admits students regardless of SAT and ACT results, requires on-site computerized placement testing of any applicant with deficient preparatory classes or low standardized test scores (SAT Verbal below 430, SAT Math below 400, ACT English or ACT Math below 17), and provides learning support to enable students to repair deficiencies before enrolling in regular college classes. Most graduates earn an Associate's degree. Many then go on to complete four-year degrees elsewhere; Gordon Core Curriculum courses are transferable to all other University of Georgia System institutions without loss of credit. The college currently has four-year programs in Early Childhood Education, Nursing, and Biology that award a Bachelor of Science degree.

Gordon offers two economics classes, both at the introductory level: macroeconomics and microeconomics. Students in these courses are

usually business majors; the majority are traditional students in their late teens and early twenties, with only a few older students. Some summer session enrollees are transient students who attend other institutions and enroll at Gordon during summer break to earn credits towards their degrees.

In 2009, 20 to 24 students enrolled in each of the spring and fall sections of principles of macroeconomics and 13 enrolled in the summer section. These class sizes are typical of Gordon. The atmosphere was friendly and personal. Students quickly became acquainted and addressed each other by name. The two spring classes met at 11:00 am and 2:00 pm, the summer class at 10:00 am, and the fall class at 2:00 pm, all during the hours when students seem most alert and most willing to pay attention. Class periods lasted 75 minutes.

For the most part, I taught the class through lectures, writing key concepts and problems on the whiteboard for emphasis and easy reference. Each student made a required individual oral presentation to the class with PowerPoint slides once during the semester. Regular in-class problem-solving exercises demanded both individual and collaborative effort. Students also had three in-class exams throughout the semester. The SD exercise was scheduled for a full class period once in each class, in the middle of the semester after students had some exposure to economic concepts and their applications.

### **Discussion Technique Description**

The discussion exercise used in the 2009 classes is modeled on the *Wealth of Nations* example in Salemi and Hansen (2005, Chapter 6). To allow students ample time to prepare, I distributed Chapters 1–3 and the discussion questions two to three weeks in advance. At that time, I warned the students that the English language had changed a great deal since the 1776 publication of Adam Smith's book. I suggested ways to make sense of strange words, phrases, and sentence structures. I also explained the SD procedure in full detail so the students would know what to expect during the discussion itself.

I posed five discussion questions. The first was an interpretive question, the next three were factual questions, and the final question was evaluative.

In response to the interpretive question, "What, according to Smith, is the connection between trade, specialization, and division of labor?," students in every class explained the ways in which Smith's pin factory exemplified the concepts of division of labor and specialization. Students also discussed the impact of waterways on trade and specialization. In most

classes, discussion contrasted the generalist approach to labor in rural areas and labor specialization in urban areas and towns (e.g., manufacturing work and porters). Students were told to refer only to the selected readings from *Wealth of Nations*. It seemed to me that this forced them to, first, try and figure out what Smith meant for themselves and, second, reexamine their comprehension of Smith's ideas during a discussion with other students with different viewpoints.

**Figure 4**

Structured Discussion Questions used at Gordon College

<i>Interpretive</i>	What, according to Smith, is the connection between trade, specialization, and division of labor?
<i>Factual</i>	Explain, according to Smith, the meaning of division of labor and extent of market.
<i>Factual</i>	What evidence does Smith provide on the relationship between division of labor and extent of market?
<i>Factual</i>	Illustrate further by providing geographical examples provided by Smith.
<i>Evaluative</i>	What is the relevance of Smith's argument connecting the principles of specialization, division of labor, and the extent of market in today's global economy?

The three factual questions required that the students express a clear understanding of Smith's arguments, definitions, and evidence. Unlike the interpretive and evaluative questions, these questions had clear answers. Keeping these questions in mind may have focused the students' attention on key concepts as they studied the Smith selections. During the class discussion, hearing other students answer these factual questions helped students who had failed to do the reading or had trouble understanding the selections to begin to comprehend the concepts.

The evaluative question prompted students to use their own experiences as further evidence for their arguments and to apply their knowledge of Smith to today's global businesses and international trade. This served as a conclusion to the discussion.

#### **Discussion Technique Evaluation<sup>10</sup>**

Near the end of the semester, I asked the students to complete a voluntary survey to judge the comparative effectiveness of the learning techniques used in the course: discussion (the Adam Smith SD exercise), lecture, presentation, report on an *Economist* article, in-class activities, quiz, and

exams. Surveys varied by session because certain techniques were only used in a single session (the *Economist* article report in the spring and a quiz in the fall). Sixty out of 91 students chose to turn in survey responses. The survey asked students to evaluate each learning technique on a 1–10 scale corresponding to the “level of interest stimulated in the content material through use of the technique” (Table 5). It prompted respondents

Table 5: Reported Interest in Learning Techniques by Session

Learning technique	Low Interest	Medium Interest	High Interest
<b>SPRING 2009</b>			
Lecture	3.33%	40%	56.7%
Presentation	3.33	46.7	50
Economist article	6.67	53.33	40
Discussion	6.67	23.33	66.7
In-class activity	0	10	90
Exams	10	63.33	26.66
30 responses from 51 students.			
<b>SUMMER 2009</b>			
Lecture	0%	63.6%	36.36%
Presentation	0	27.3	72.7
Discussion	9.09	36.36	54.54
In-class activity	0	9.09	90.91
Exams	18.18	54.54	27.27
11 responses from 13 students.			
<b>FALL 2009</b>			
Lecture	0%	57.9%	42.1%
Presentation	5.3	26.3	47.36
Quiz	21	47	31.6
Discussion	10.5	57.9	31.6
In-class activity	0	21.05	78.95
Exams	21.05	47.37	31.57
19 responses from 27 students.			

*Notes:* Students in principles of macroeconomics classes were asked to report the level of interest stimulated by each learning technique on a 1–10 scale. Responses in the range 1–3 are reported as Low, 4–7 as Medium, 8–10 as High. All responses are reported as percentages. Responses from two sections taught in spring 2009 are combined. In fall 2009, only one of two sections used the SD technique, and only that section was surveyed.

to rank on a 1–10 scale how strongly they would recommend the different techniques for use in future classes or with other topics (Table 6). Finally, it asked two open-ended questions: “Which technique did you like the best and why?”; and “Which technique did you learn from the most and why?”

Student responses to the survey questions are important because instructional techniques that stimulate interest lead students to greater engagement and more learning. Combining student views as revealed by the survey and instructor observations yields a clearer picture of the usefulness of the SD technique.

In Table 5, evaluation responses are reported separately for the spring, summer, and fall terms, with responses from the two spring classes combined. Evaluations are categorized as low interest (1–3), medium interest (4–7), and high interest (8–10). The percentage of response in each category is shown. In the following discussion, the evaluations and selected answers to the open-ended questions are discussed separately for each term.

In the spring term, 3.33 percent of the student sample indicated a low level of interest in the lecture component of the course, 40 percent medium interest, and 56.7 percent were highly interested. Overall, the in-class activities earned the highest level of interest from 90 percent of the students. The popularity of this technique is not hard to explain. The weekly activity was a small group problem-solving exercise. Even though group work may raise free-rider concerns, students found this technique relatively nonthreatening, particularly engaging, and fun. The discussion generated the highest level of interest for the second largest group of students, 66.7 percent. Exams interested the fewest students, with 26.66 percent at the highest level and 10 percent at the lowest.

Here are a few of the spring students’ responses to the survey questions:

**1. Which technique did you like the best and why?**

- (a) “Class discussion of Smith article. Some of the lecture in this format would in my opinion help students prepare for exam and understanding of macroeconomics.”
- (b) “I really enjoyed the Adam Smith article because it gave some very interesting and historical background to the subject.”
- (c) “I like in-class activities. It allows for more practice and helps me better understand.”

**2. Which technique did you learn from the most and why?**

- (a) “Smith article—the Wealth of Nations laid the foundation for the capitalist society. Since it was econ class I enjoyed it.”

- (b) “In-class activities because its hands on and you actually have to try to figure the problems out.”
- (c) “I learned the most from both lectures and the in-class activities.”

The summer term lasted one month. Class met every weekday. Nearly every student expressed moderate or high interest in all the learning techniques. Almost 91 percent (90.91%) indicated a high level of interest in the in-class activity. This response may be due in part to familiarity, since the technique was used every day. Approximately three fourths (72.7%) were highly interested by the presentation exercise. Discussion, though, was among the techniques that stimulated less interest: 36.36 percent ranked it medium range and 54.54 percent in the high range. Students reported the least interest in exams, with 18.18 percent giving them a low ranking and 27.27 percent ranking them high.

Here are a few of the summer students’ responses to the survey questions:

**1. Which technique did you like the best and why?**

- (a) “I love in-class activities because it gives us an opportunity to apply what we learned and to get help (if needed).”
- (b) “In-class exercises and presentations because I enjoy formulas and making myself a better/more confident speaker.”

**2. Which technique did you learn from the most and why?**

- (a) “Most real world knowledge was learned from presentation and Smith’s article because it connected written facts to current events to increase retainable knowledge.”
- (b) “I liked Smith’s article it gave a good look at why there would be movement in the market.”
- (c) “In-class exercises we got to help each other understand the material.”
- (d) “I learned the most from the in-class exercises because we actually put the formulas to use and were able to understand the concept better.”

In the fall term, one of the two sections of principles of macroeconomics included structured discussion (SD) as a learning technique while the other acted as a control group. Compared with the spring and summer, students in the fall reported less interest: 57.9 percent ranked the technique in the medium range, and 31.6 percent ranked it high. Students preferred discussion to the quiz and exams as learning experiences.

Here are a few of the fall students' responses to the survey questions:

**1. Which technique did you like the best and why?**

- (a) "Adam Smith, because we get a chance to discuss with our classmates."
- (b) "In-class exercises because I got to talk out each problem."
- (c) "Probably Smith's article because it really helped me learn about trade, division of labor and specialization."

**2. Which technique did you learn from the most and why?**

- (a) "Probably Smith's article because it really helped me learn about trade, division of labor, and specialization."
- (b) "In-class assignments, being able to talk to peers."

Table 6 shows how responding students in each session ranked the different techniques to recommend for or against their use for future classes or topics on a 1–10 scale. The rankings are calculated on an average with a lower rank indicating a highly recommended technique and the highest rank meaning it was the least recommended technique. Comparisons among the techniques were done within individual semesters, not across semesters.

Table 6: Rank Recommendation of Learning Techniques

Learning techniques	Spring 2009 Ranking	Summer 2009 Ranking	Fall 2009 Ranking
Lecture	5.5 (3.56)	4.91 (3.65)	4.11 (2.33)
Presentation	5.87** (2.96)	4.82 (2.96)	3.63* (2.79)
Economist article, Quiz	5.8 (2.75)	-----	4.84 (2.38)
Discussion	4.87* (3.94)	4.0 (2.32)	4.32 (3.38)
In-class activity	5.33 (3.92)	3.09* (3.08)	4.11 (2.85)
Exams	5.03 (2.8)	5.91** (3.39)	5.21** (2.59)
Number of responses	30 of 51	11 of 13	19 of 27

Notes: \*denotes most recommended technique. \*\*denotes least recommended technique. The rank is based on the average calculation. Standard deviations are shown in parentheses. The spring classes included an *Economist* article as an additional learning technique; the fall class included a quiz.

In the spring, the discussion exercise was most highly recommended for future use; presentation was least recommended. In the summer, the in-class activity was most recommended and exams were least recommended. The summer class gave discussion the second highest recommendation with an average ranking of 4.0. Although the presentation technique created higher levels of interest among students than did discussion, discussion was more highly recommended for future use. In fall 2009, presentation was the most recommended technique, although students had yet to engage in this activity. Such a result probably stemmed from the students' expectations about the presentation based on information provided to the students through class instructions. Again, exams were least recommended. For this semester, discussion was the fourth highly recommended technique with a ranking of 4.32, indicating that the students were ambivalent about using this technique in comparison to the other techniques that had higher recommendations.

This study sought to determine whether a SD technique could enhance student learning about course materials. Students reported that the technique stimulated their interest in the topic being discussed. As the students participated more fully in their own learning by sharing their thoughts and their interpretations of Smith's *Wealth of Nations*, they invested more of themselves into their education. They took on the responsibility to master the class topic, evaluate it through critical thinking, and share their perspectives with the other students in the class. Most of these students also did recommend the structured discussion technique for future classes.

#### IV. CONCLUSIONS

What do we, as instructors, learn from these three studies? Three conclusions are warranted. First, taken together, the studies suggest that structured discussion, while not necessarily popular with students who first encounter it, does promote higher-order mastery of economic concepts. Second, it appears that students may adapt better to structured discussion when it is used several times during a course than when it is used only once or twice. Finally, it may be important to explain the benefits of structured discussion more energetically to first-year students than to third and fourth year students. Less-experienced students may be more uncomfortable with the absence of instructor-sanctioned answers to discussion questions. More-experienced students may more readily buy into the challenge of

taking responsibility for the creation and revision of responses to interpretive questions.

**NOTES**

- \* The authors thank participants at the Final TIP Conference held in Atlanta on January 5–6, 2010, for their helpful comments and Patrick Inman for his very helpful suggestions on word craft.
1. The three activities were a seat auction, the ultimatum game and the supply of naked bodies. In the seat auction, pioneered by Dirk Mateer (1997), students bid to obtain their preferred class seat for the semester and pay their winning bids into a classroom snack fund. In the ultimatum game (Dickinson 2002), one student proposes a way to split \$10 and a second student either accepts or rejects the proposal. If the responder accepts, the two students split the \$10 as proposed. If the responder rejects, both receive nothing. In the supply of naked bodies, also designed by Dirk Mateer, students trace out a positively sloped supply schedule without ever actually disrobing.
  2. A copy of the 2007 student opinion survey is available online through a link under “sample publications” on my Millersville University faculty webpage: [http://www.millersville.edu/economics/faculty/madden\\_k/index.php](http://www.millersville.edu/economics/faculty/madden_k/index.php). The 2009 version may be obtained by contacting me via email at [kirsten.madden@millersville.edu](mailto:kirsten.madden@millersville.edu).
  3. See Figure 14-7 in Hansen and Salemi (1998) for an example.
  4. The discussion sessions were recorded with the consent of the students in order to keep track of interventions.
  5. The seemingly large number of interventions for a 50-minute period reflects the fact that responses as short as a single phrase or sentence were counted as interventions.
  6. The terms “sheep dog” and “traffic cop” used to describe instructor behavior are attributed to Michael Salemi.
  7. Whether this outcome would have occurred by simply designating the role of the instructor as that of facilitator without providing the structure of the question clusters is an interesting question for future investigation.
  8. No doubt, the expected quiz at the end of each section influenced preparation time for many students.
  9. Whether students actually learned more by being exposed to a particular format is obviously a question of major interest. Results of the post-discussion quiz are somewhat mixed, with students doing better relative to their performance in the course as a whole when they received either the SD or UD treatment versus the lecture treatment. In the spring semester, however, it was the SD students who dominated, whereas in the fall, the UD students performed relatively better. Interestingly in both semesters, it was the smallest nonlecture group that showed the largest performance improvement. This is an area that

warrants further investigation and calls for the development of a better way to assess learning outcomes.

<sup>10</sup> I would like to thank Kirsten Madden for the survey format used in this study.

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