Observations on Cooperative-Learning Group Assignments

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Abstract:

Good cooperative-learning lessons are naturally appropriate in philosophy classes, and can be productive and fun. Careful attention to the formation of groups can facilitate good cooperative lessons. In this article, I distinguish methods of dividing a class into groups from the resultant distributions of students in those groups. I defend uses of random assignments of students to groups.

Introduction

Cooperative learning, known more colloquially as group work, plays an uneasy role in the undergraduate classroom.[1] It can seem inefficient to the instructor who is pressed to complete a syllabus. It can seem insufficiently sophisticated to students who are reminded of elementary-school lessons. And, it can be seen as an excuse for not preparing a proper lecture. Yet, students in all disciplines, at all levels, benefit from learning to present their work orally, and to their peers. Cooperative-learning exercises require not only discussing one's own ideas, but listening to those of others. They demand active engagement in class.

Both presenting one's ideas and listening to those of others are essential to philosophical practice. What other academic discipline, outside of the arts, has so much of its canon written in dialogue? While there is very little written about how to teach cooperative-learning philosophy classes, many philosophy instructors integrate such lessons into their courses. Those who use group work quickly discover that it is hard work to design a successful cooperative lesson. Such lessons require significantly more preparation than ordinary lectures. I use cooperative-learning exercises in a range of undergraduate philosophy classes, including Logic as well as classes in which discussion comes more naturally.[2]

Well-constructed cooperative-learning exercises may be distinguished from simple group work by attention to four factors: 1. Careful distribution of students into groups; 2. Assignments of specific roles and responsibilities to each member of the group; 3. Specific and attainable objectives; and 4. A balance of emphasis on both group dynamic and individual accountability. This article explores the first factor. Dividing students into groups is an area in which instructors are liable to make the most deleterious errors. Careful consideration of some subtle factors can facilitate successful lessons. In

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[1] 'Cooperative learning' has become a term of art in education, referring to exercises in which a class is partitioned into groups. By using the term, I do not mean to imply that traditional lecture-and-discussion classrooms are uncooperative, nor that students engaged in cooperative-learning exercises will always be cooperative!

[2] See Marcus 1998, 2010, and In Preparation.

dividing a class into groups, there are two main factors to consider: the method by which students are assigned to groups and the range of ability levels in each resultant group. I discuss both, starting with the latter. In the end, I defend uses of random assignments of students to groups.

Group Types

All groups of students will be heterogeneous according to many factors, some of which are likely to be irrelevant to any philosophy lesson (e.g. students' heights), others of which may be salient (e.g. their reading abilities). Typical research on cooperative learning tends to focus on grouping according to characteristics like gender and race. Indeed, many cooperative-learning techniques were developed in order to facilitate interactions among children of different backgrounds, using heterogeneous groupings. Elliot Aronson's jigsaw classroom, developed around Austin TX in the early 1970s to facilitate racial integration, is notable in this regard. A jigsaw lesson is one in which students, as members of base groups assigned a task with multiple discrete components, each contribute distinct elements to the larger task, fitting the pieces together like a puzzle. Prior to convening the base groups, students master their separate tasks individually or in distinct sets of work groups. Jigsaw lessons thus emphasize interdependence among students.[3]

While factors like race and gender may be considered in designing a cooperative lesson in philosophy, for the purposes of this article, I will mainly consider groupings only according to student abilities. I will not specify measures of these abilities, leaving them to the instructor.

There are three types of groupings of students by ability: heterogeneous, homogeneous, and random. Heterogeneous groupings are those in which each group has students with a range of abilities. Most obviously, one can group academically strong, middle, and weak students together. Less obviously, one can group students according to their ability to negotiate social interactions, distributing the most

[3] See Aronson et al. 1978 and Aronson 2000-9. For a jigsaw lesson in symbolic logic, see Marcus, In preparation.

gregarious and the most reticent students among the different groups. Note that to form heterogeneous groups, the instructor must know the abilities of her/his students in advance. The same holds for forming homogeneous groups. As I will discuss, this is one factor which leads me frequently to dispense with such prescribed groupings.

Here is a simple method for assigning heterogeneous groups. First, determine the desired size of each group. Optimal group sizes depend on the lesson, but are best kept small, since the number of interpersonal interactions in a group grows quickly with the size of the group. The number of groups will be approximately the number of students in the class divided by the desired number of students in each group. (The quotient will often not come out evenly, and the instructor must decide between an extra, small group and a small number of slightly larger groups.) Let's consider an example in which there are eight groups, of three students each, in a class of twenty-four students. To form heterogeneous groups, assign each of the eight strongest students (however one defines 'strongest') to a different group and each of the eight weakest students to a different group. Lastly, distribute the remaining eight, medium-ability students to different groups. Each group of three will then have a strong, medium, and weak student. These group assignments are best done before class, so that when class begins, the group assignments are easily announced.

Heterogeneous groupings facilitate productivity throughout the class. Consider a cooperative-learning exercise which involves group discussions of students' pre-theoretic views on the moral permissibility of torture. Such a lesson would require extensive and delicate interpersonal interactions. It would be helpful to have a student in each group who could start discussions and elicit participation from other students without letting the discussion become too highly charged. In this lesson, grouping students heterogeneously according to their social skills could be useful. In a more technical exercise, e.g. a collaborative analysis of Gettier-style cases, groups will be more productive if each one has at least one student who has a good grasp of the questions going in. In such a lesson, grouping students heterogeneously according to their philosophical abilities may be more advantageous.

Still, heterogeneous groupings suffer from some significant failings. Stronger students can become frustrated with weaker students, and take over the work. When faced with a task to be completed in a short class period, stronger students often become impatient: "Class is almost over. Just let me write it up, OK?" Defenders of heterogeneous groupings point out that stronger students can learn by teaching weaker students. Some teachers even explicitly give some of their stronger students roles like group leader, or student instructor. While stronger students may learn some content by adopting an instructional role, one must sincerely ask whether such students are well-served in this role, or whether such procedures substitute the learning of social skills for course content. Strong students in heterogeneous groups can feel slighted by the undeserved pressure to adopt a pedagogical role, or to carry the brunt of the group's work. Indeed, I had to overcome memories of my own such feelings when I started using cooperative learning in my classes.

Conversely, weaker students, when grouped with stronger students, often become frustrated with themselves and embarrassed, and, feeling that they have little to contribute, turn off. In classes with heterogeneous groups, I always find some students feeling excluded from their groups, having little to contribute. In a lecture class, weaker students can quietly pay attention and take notes. In a cooperative-learning exercise, their weaknesses are made evident, to themselves and their peers.[4]

Homogeneous groupings, in which students in each group are evenly matched, avoid some of the difficulties of heterogeneous groupings. To assign homogeneous groups of size n, assign the n strongest students to one group, the next n strongest students to another group, and so on until all of the students are grouped. Again, one may organize according to students' strengths in various areas including

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[4] In contrast to some of my experience, Johnson and Johnson 1985's broad survey of cooperative, competitive, and individual styles concludes, "There can be little doubt that the low- and medium-ability students, especially, benefit from working collaboratively with peers from the full range of ability differences. There is also evidence that the high-ability students are better off academically when they collaborate with medium- and low-ability peers than when they work alone; at the worst, it may be argued that high-ability students are not hurt by interacting collaboratively with their medium- and low-ability classmates" (p 118). Some of the evidence in their survey came from college classes.

philosophical ability and social adeptness. Again, group assignments are best determined beforehand, and merely announced in class.

Assigning groups of homogeneous ability avoids the problem of having some students naturally take over a group, excluding their weaker peers. Groups of stronger students are usually highly productive. Students in weaker groups find that they can not rely on someone else to do the work and are forced to get involved. The instructor, moving around the classroom, can easily work with many of her/his weakest students at the same time.

Assigning groups of homogeneous inter-personal skills can also protect the quieter student, who is not stampeded by more extroverted partners. I have encouraged boisterous groups to work elsewhere, in a nearby lounge or empty room, in order to reduce the noise that inevitably arises in the classroom during a cooperative-learning exercise. Indeed, I usually extend the offer to work elsewhere to all groups, and find that some students feel empowered by the freedom to work independently for a while.

While homogeneous groupings avoid some of the problems of heterogeneous groupings, they lead to other difficulties. I have found it tempting, especially in classes with homogeneous groups, to admire the work done by stronger students. Such groups can serve as models to the other students. For some students, watching the stronger students engaging in serious debate, or working out a difficult problem, can be as exciting as it is for the instructor. But, I have found that many students are intimidated by their stronger peers, and dismiss their work as irrelevant to their own.

Weaker groups have difficulty getting started on an assigned task. Low-achieving groups tend to drop out of the lesson. The instructor who wants to circulate and work a bit with all the students finds her/himself spending most of the class time with the weaker groups, ignoring the stronger students who could benefit from further challenges. Also, if the tasks for each group are roughly the same level of difficulty, the stronger groups will complete their work quickly, while the weaker groups struggle, and lag. Often, a weaker group will abandon all hope of completing an assigned task, and attempt to use the time for remedial instruction.

Furthermore, as I mentioned, for the instructor to establish either homogeneous or heterogeneous groups, s/he must have a pretty good sense of the students in advance. If s/he wants to conduct a cooperative-learning exercise early in the term, or in a large class, the instructor generally lacks relevant information about the students. Such a deficit is especially problematic if one wants to establish long-term groups, for projects like setting up a course wiki or blog. If groups are assigned early in the term, they are likely to need re-evaluation along the way, disrupting the often-delicate social arrangements that have already been established among the students.

Both heterogeneous and homogeneous groupings have advantages. They allow the instructor to manipulate groups to ensure a desired distribution, which can be useful, depending on the goals of the instructor and the specific assignment.[5] In contrast, random groupings, which are often the default option for instructors who do not take the time to prepare groupings of either other sort, seem to have little besides spontaneity in their favor. If students are grouped randomly, some groups will be more homogeneous and some will be more homogeneous. The instructor of a cooperative lesson with random groupings is faced with a confusing assortment of group types and must manage the problems of both kinds of groups, without being able to ensure the benefits of either.

Still, both heterogeneous and homogeneous groupings have significant disadvantages, too. Furthermore, there are factors favoring the method in which random groupings can be assigned that often outweigh concerns about the mixture of group types. I discuss these factors in the next section.

Assignment methods

Call a method for partitioning a class top-down when an instructor assigns students to groups.

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[5] Schullery and Schullery 2006 found positive outcomes associated with both group heterogeneity and group homogeneity, but they were controlling for personality types, using analogs of Meyer-Briggs Type Indicators, rather than for academic ability levels. Heterogeneous groups correlated with student reports of improvements in speaking up, arguing a point, and organizing and presenting thoughts (for females), among others. Homogeneous groups were correlated with student reports of improvements in shyness among males, and with higher grades.

Call a method for partitioning bottom-up when students choose their own groups. Lastly, call a method independent when groups are chosen neither by students nor an instructor. Independent methods naturally lead to random groupings, though random groupings can be made by top-down, bottom-up, or independent methods.[6] In contrast, despite the differences between heterogeneous and homogeneous groupings, both are normally the result of top-down assignments.

There are many independent methods of grouping. The easiest one involves counting-off by the number of students in the class divided by the number in each resulting group. For example, if we wanted three-membered groups in a class of twenty-four students, we would count-off by eights. After counting-off, all the ones form a group, all the twos, all the threes, etc. Classes of twenty-five and twenty-six students can also count by eights; one or two groups will have four members.[7]

It is important to note that counting-off is sharply different from having students form groups according to whom is sitting nearby (e.g. "Just turn your desk to the person next to you") unless the seating assignments themselves are independent. Students often sit with their friends, so forming groups with the students closest to them is likely to lead to a bottom-up grouping.

For a cooperative lesson using the *Objections and Replies* to Descartes's *Meditations*, I use the following independent method of assigning students to groups. I have printed and laminated pictures of Descartes and his objectors. I cut some of these pictures into three pieces, and two of them into four pieces (for classes with a number of students not divisible by three). In class, I mix the pieces into a basket which I have the students pass around, each drawing a piece, while I introduce the lesson. Groups are formed by the students finding the puzzle pieces that fit with their own. Students find their groups quickly, and they tend to enjoy the short exercise. I use a similar technique for a logic lesson, using

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[6] Actually, bottom-up methods for assigning groups may undermine an intended random grouping, since students tend to gravitate toward peers of similar ability levels..

[7] See Johnson, Johnson and Smith 1998: 2-8 for other interesting independent methods of assigning members to groups.

pictures of logicians.

In the remainder of this section, I argue that independent methods of assigning groups, especially for single-lesson cooperative-learning exercises, are often preferable to both top-down and bottom-up methods. In many cases, the advantages of independent methods outweigh the advantages of either homogenous or heterogeneous groupings, given the problems of top-down methods that I will discuss. My evidence is mainly anecdotal, from twenty years of using cooperative learning in high schools, colleges, and universities.

While the instructor in any cooperative-learning lesson is focused on organizing the class and on the content of the lesson, students are also anxious about interpersonal social issues. To many students, especially at the start of a cooperative lesson, the composition of their group seems as important as the work they will be doing. Cooperative lessons can bring out problems of social hierarchies and cliques, as students are required to interact with each other. As a teacher, I tend to be nearly oblivious to all but the most obvious manifestations of the social strata in my classroom, to who is the star athlete, the cool musician, the geek. I often have little idea who will be eager or reluctant to work with whom. In contrast, I have found that students are adept at signalling their differences to each other. Even in classes in which students do not know each other at the beginning of the term, their clothes, the ways they talk in class and ask questions, and where and how they sit reveal a lot to one other.

When students are grouped by top-down methods, they often spend a bit of distracted time wondering about the reasons for their placements: “Why am I in this group, rather than that one, with these people rather than those?” Students placed in weak homogeneous groups tend to realize this demoralizing fact quickly. I have seen strong students in heterogeneous groups express disappointment when groups are revealed, anticipating a waste of their time. When I have used top-down methods, I have had students ask to change groups; now I dissuade such requests in advance: “These will be your groups; please do not ask for a change.”

Some students interpret top-down group assignments, especially if they are not grouped with

friends, as punishments or manipulations. These problems are not ameliorated by top-down random groupings, since students still wonder why they are being grouped the way that they are. These distractions lead to an unproductive beginning to any group activity. Further, and practically, both heterogeneous and homogeneous groupings require advance planning; classes with any level of absenteeism require rapid, last-minute adjustments.

Problems of social hierarchies and cliques are even more prominent in bottom-up group assignments. If left to choose their own groups, students will almost invariably choose to work with their closest friends in the class. Some students have lots of friends in the class, others have few friends. The instructor is likely to have to facilitate some groupings: "Jon, why don't you work with Alysha and Noah? And, we'll put Laura with Daniel and Pedro." Placing students in groups is often awkward and embarrassing, especially for the lonely students who have to be added to groups which have quickly formed. For long-term group projects, especially ones for which the students must meet outside of the classroom when the instructor is not available to facilitate interactions, bottom-up methods may be useful. For in-class exercises, especially ones in which time is short, I find that bottom-up methods are difficult to manage smoothly.[8]

Independent methods for random groupings avoid having students wondering about manipulation from the instructor: every student starts the task on equal ground. Independent group assignments made transparently in class presume and display no preference among students, and can minimize the harmful effects of students' concerns about how groups are formed. I have never had students ask to change their groups when they are assigned independently, though I usually only use independent methods for single-class exercises.

Working with the random groups that tend to result from independent methods of assigning

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[8] Johnson, Johnson, and Smith 1998 also discourage bottom-up assignments. "The least recommended procedure is to have students select their own groups" (p 2:10). As justifications, they cite a tendency toward homogeneity (in ability and race), as well as an increase in off-task behavior.

groups requires a bit more agility on the part of the instructor than working with uniformly homogeneous or heterogeneous groups. Classes run using cooperative-learning techniques tend to be active and noisy, and it is impossible for the instructor to follow all of the interactions. When using a cooperative lesson, I pick particular traits on which to focus, when walking around the classroom. If each group has at least one academically strong student, I focus on facilitating social interactions, looking for students who are not facing their other group members, or who are reading instead of interacting with their groups. I ask the more reticent students to take social roles within the group, like note-taker. In contrast, if each group has at least one socially adept student, I pay closer attention to the content of the groups' interactions. When I know that there will be homogeneously strong and weak groups, I prepare assignments with different levels of difficulty, or I prepare extra questions for the strong groups. With random groups, the instructor must be prepared to perform any and all of those tasks, and to glide smoothly among them.

In any cooperative-learning lesson, some students will work well with others, and some students will not. Some groups will be more productive than others. For long-term group assignments, exercises which span several classes or the whole term, the instructor might be well-served to assign groups, or even to let students choose their own, as the advantages of the instructor's reflective intervention or the students' desires to work with their friends might outweigh the disadvantages I have mentioned.

Conclusion

My claims in this paper, especially those in defense of independent methods of assigning students to groups, draw in large part on my experiences with a variety of cooperative-learning exercises. Most research on cooperative learning is done in elementary and secondary classrooms. I have found that the results from younger classes typically transfer quite naturally to undergraduate university classrooms. But more research, especially in philosophy classes, and on interactions between social dynamics and group composition, would be welcome.

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