

Using small groups is a good way to introduce active learning into one's teaching. But there are significantly different ways of using small groups. This essay offers a critical analysis of the benefits and challenges of three different ways of using of small groups: "casual use," cooperative learning, and team learning.

TEAM LEARNING: PUTTING "sTEAM" INTO LEARNING GROUPS

L. Dee Fink

During the last two decades, there has been a rapid growth in the use of small groups in college-level teaching. When I talk to professors these days, the majority say that they use small groups in one way or another in at least one of their classes. And the majority of students say that they have had a small group learning experience in at least one of their classes. What has led to this rise of interest in teaching with small groups?

Several factors had prompted teachers to explore this form of teaching. In part teachers are feeling pressure from both the younger TV generation of students who are not very tolerant of lectures and from older students who want a learning experience that consists of more than "information dumping." In addition, colleges are getting feedback from employers that they want college-educated employees who have valuable skills as well as content knowledge.

All of this is encouraging teachers to search for ways to make their classes more interesting and valuable, and that means making their classes more active. Of those teachers who reach this level of awareness, many discover that using small groups is not only a relatively easy way to achieve active learning but also one that can make a significant difference in the quality of student learning.

In a frequently cited essay some years ago, Finkel and Monk wrote about the value of learning groups for solving a common problem that teachers face. (1983, pp. 83-97) They called this problem the "Atlas Complex" because the traditional way of teaching requires the teacher to shoulder the entire responsibility for the learning process. They then noted that small groups provide a way of solving this problem by "dissolving the Atlas Complex." Later Jean MacGregor and others have noted the value of "shared inquiry" as a way changing both the teacher's role and the students' role in positive ways. (MacGregor, 1990)

Problem: Some Students are Having Negative Experiences

Although teaching with small groups obviously has great *potential*, some survey research (Feichtner and Davis, 1985) and my own conversations with students indicate that this potential is not always realized. While many students find small group learning to be very powerful, a significant percentage of students report negative experiences with small group learning. What is the problem?

As teachers experiment with different ways of using small groups and scholars study the reactions of both teachers and students, everyone is gradually realizing that there are good ways and bad ways of using small groups for educational purposes. As a result, teachers need to learn what the prescriptive norms are for the effective use of small groups in college level instruction.

The view that will be presented in this chapter is that there are currently three general ways of using small groups in higher education and that one of these, team learning, is significantly different from the other two. The relationships among these three ways of using small groups are much like the relationships among ice, liquid water and steam. All three substances are water, but they have radically different properties. Under the right conditions, water can be transformed into steam. And once that happens, steam has a very different

structure and significantly different properties than water. Hence it can do things that are simply not possible with liquid water.

For people who teach with small groups, the "casual use" is somewhat like "ice." Judiciously and selectively used, it can be very effective in "waking" students up. Cooperative learning, like liquid water, has considerable power to do important work, like the grain mills did in yesteryear and hydroelectric generating plants do today. Team learning is like the steam power used to drive the turbines in locomotives, ships, nuclear generating plants, etc. Like steam turbines, team learning can be used in a variety of locations, provide a high level of energy, and can be channeled to accomplish tasks that are challenging and complex.

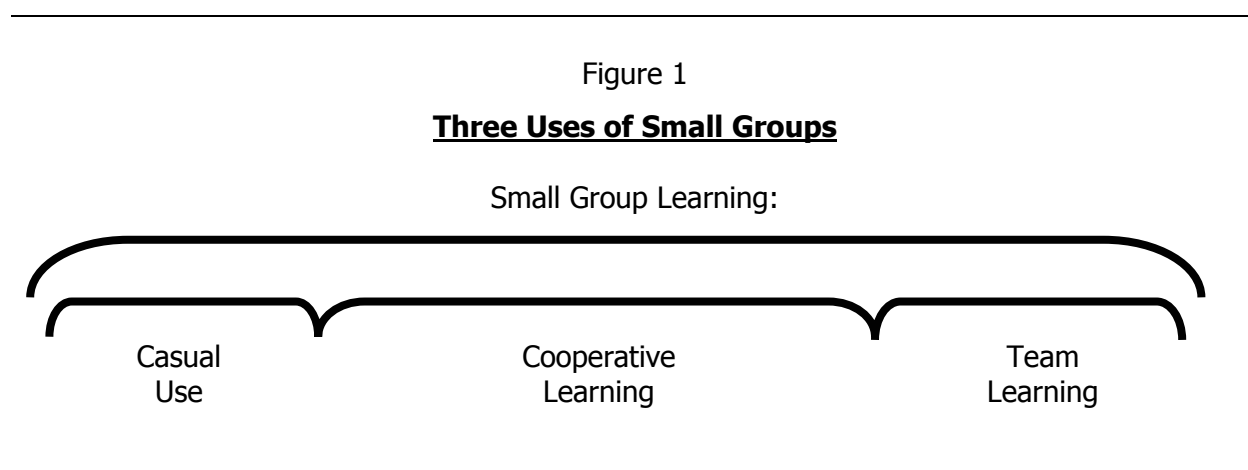
In this chapter I will briefly describe three general approaches to using small groups that are frequently found in higher education. Then I will compare the two more significant approaches, cooperative learning and team learning, in terms of how they recommend using small groups and the potential value of both approaches. The argument will be made (a) that there are significant differences between "groups" and "teams" and (b) that good teams have special capabilities that allow them to outperform good groups. Hence, a teacher who learns how to use team learning to transform "groups" into "teams" (like water into steam) will be able to create a learning experience for students that is extraordinarily powerful. The teachers who have written the essays in Part Two of this volume give strong testimony to this claim.

Three Different Ways of Using Small Groups

Different authors have used different terms when writing about small groups: learning groups (Bouton and Garth, 1983), collaborative learning (Hamilton, 1997; Bruffee, 1999), cooperative learning (Slavin, 1986; Johnson, Johnson and Smith, 1991; Millis and Cottell, 1998), and team learning (Michaelsen and Black, 1994). Despite the varying terminology, these

several authors are all referring to the same general idea: putting individual students in a class into small groups for the purpose of promoting more active and more effective learning.

The concept of "small group learning" then provides the "overall umbrella" that unites these various approaches, much like the concept of "water" unites the specific forms it can take. Then when one looks at the different ways teachers use small groups and the different ways described in the literature on small groups, three general patterns emerge: casual use, the use of carefully structured individual small group activities, and team learning. One can conceive of the relationship among these approaches as shown in Figure 1.



Casual use is flexible and easy to use because it does not have a lot of structure. Cooperative learning greatly enhances the capabilities of small group learning with its emphasis on carefully structured activities. Team learning in turn creates and uses a different course structure that enables a whole new level of educational capabilities.

Some authors (for example, Millis and Cottell, 1998) clearly have a different mental map of small group learning; in their mind "cooperative learning" is the big, umbrella concept with team learning being but one of several variations under that concept. In my view, this conceptualization ignores the fact that, as will be discussed later in this chapter, many of the procedures recommended by the proponents of cooperative learning are counter-productive

with respect to the transformation of groups into learning teams. Hence, as shown in Table 1 and the remaining comments in this chapter, I suggest that cooperative learning and team learning be seen as complementary but distinct approaches under the general concept of "small group learning."

Table 1

Three General Uses of Small Groups

I. **Casual Use**

- "Turn to the student next to you and talk about this."
- Uses relatively ad hoc exercises; therefore little or no advance planning required.
- No need to worry about grading, course structure, group composition, et cetera.

II. **Frequent Use of Structured Activities: Cooperative Learning**

- Frequent use of carefully planned and carefully structured group activities
- Small group activities are inserted into pre-existing course structure
- Calls for attention to: accountability issues, group formation, student roles, et cetera.
- Does not change the structure of the course.

III. **Transformative Use of Groups: Team Learning**

- Small group activities become the primary in-class activity.
 - Calls for procedures that support the transformation of newly formed "groups" into "high performance learning teams."
 - Takes advantage of the special capabilities of high performance learning teams.
 - Involves a change in the structure of the course
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Casual Use. The easiest and therefore often the initial use by a teacher is to employ small groups in a "casual" way. A typical situation would be for the teacher to lecture for 15-20 minutes and then have students pair up with a student seated next to them, to either discuss a

question or solve a problem. After giving the student pairs a few minutes to work together, the teacher then calls on a number of them to share their answers with the whole class, comment on their responses, and then proceed to introducing some new ideas or whatever.

This level of use offers the benefit of breaking up the potential tedium of non-stop lecturing, adds variety, and gets students into an active cognitive mode. It requires little or no advance planning and can be used in classes of any size. The problem with this level of use is that it generally does not generate a particularly powerful form of learning. It can provide a few minutes of practice in a narrowly defined exercise, but nothing much more significant than that.

Frequent Use of Structured Activities. During the 1980's and '90's, several writers began advocating the use of more structured small group activities under the name of collaborative or cooperative learning. This approach represents a significant step up from the casual use of small groups in terms of the potential for significant learning.

Although the particular recommendations vary depending on the perspective of the author, the general pattern of cooperative learning has several common features. Writers recommend using small groups activities frequently. They recommend advance planning in order to think through the issues associated with individual and group accountability, how to form groups, how long to leave the groups together, whether to assign roles, et cetera.

In general, though, this approach does not involve a substantial change in the overall structure of the course. Rather, it focuses on a series of group activities associated with particular lessons to be taught. If the course was basically a lecture or discussion course before, it can basically stay a lecture or discussion course afterwards. The planning is focused on a series of small group activities associated with a particular lesson. The small group

activities "fit into" the rest of the course; the other parts of the course are generally not changed to support the small group activity.

Transformative Use of Small Groups. Team learning represents an even more intense use of small groups in that it changes the structure of the course in order to develop and then take advantage of the special capabilities of high performance learning teams. Such teams have two features that offer major advantages in an educational situation. As members of a team, individual students become willing to commit to a very high level of effort in their learning, and learning teams are capable of solving problems that are beyond the capability of even their most talented members. As is well-known in the world of sports, for example, a team that plays well as a "team" is far better than a team that has one "star" but does not know how to play together well as a team. The same is true with effective learning teams. They do not need an "academic superstar" to do super work. Such teams help individual members of the team better understand the material, and the team becomes capable of solving very challenging and complex problems that are well beyond the capability of the best student in the class working alone.

Can team learning be used in a wide variety of courses? The answer is clearly yes. In order to use team learning, a course only needs to satisfy two conditions:

1. the course must contain a significant body of information and ideas that the teacher wants students to understand, and
2. one of the primary goals for the course is for students to learn how to apply or use the content by solving problems, answering questions, resolving issues, etc.

Although some college courses are focused on the development of special skills (e.g., learning a foreign language, how to use particular kinds of technology), most courses easily meet these two conditions for being able to use team learning.

Team learning is referred to here as being a "transformative" use of small groups because it drives three kinds of transformations:

- It transforms the structure of the course.
- It transforms "small groups" into "teams."
- It transforms the quality of student learning.

What is Distinctive about Team Learning?

Although Michaelsen will provide a more detailed description of team learning in the next chapter, a brief description will be provided here. By my definition, *"team learning" is a particular course structure that is designed to support the development of high performance learning teams and to provide opportunities for these teams to engage in significant learning tasks.*

There are two key ideas in this definition. The first is that team learning is a course structure, not a series of independent small group activities. Although teachers can and have borrowed "pieces" of team learning (usually the Readiness Assurance Process), team learning itself consists of a particular course structure, that is, a particular set and sequence of learning activities. The second key idea is that team learning revolves around the development of "teams," a kind of social unit that is quite distinct from a "group." At this time I will comment on each of these two key ideas.

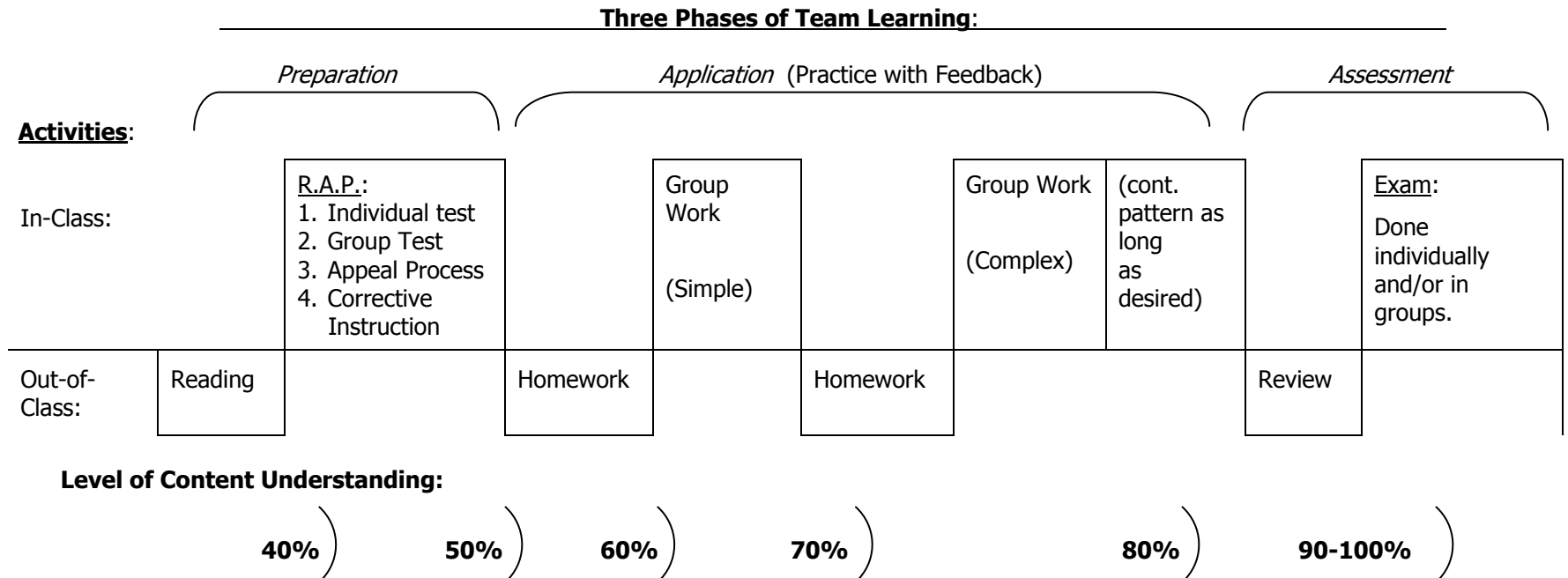
Course Structure for Team Learning. Although the particular structure can be and has been modified to fit particular teaching circumstances, the following description is what happens in a typical 15-week semester format. The whole course is divided into five to seven units focused on the major topics of the subject. This results in several units that are two to three weeks long. Within each of these topical units, the teacher then sets up the following three-phase sequence. (See Figure 2)

In the *preparation* phase, students do the reading assignments for the whole unit. The goal in this initial phase is not for the students to gain an in-depth mastery or full comprehension of all the readings but to get a good introduction to the information and ideas

Figure 2

The Sequence of Learning Activities in Team Learning

- Covering a 2-3 Week Block of Time
- Covering One Major Topic Within the Course



on this topic; in-depth understanding will come later. The Readiness Assurance Process is a four-step procedure. First, students take a test on the readings individually, preferably a relatively short test (often multiple choice in form) that can be graded in class. When finished, students turn in their individual answer sheets and then immediately take the same test as a group. Both tests are graded in class and both count as part of the course grade. The third step, which is optional, is an appeal process. If any of the groups think one or more of their answers should have been counted as correct, they can submit a written appeal, making reference to material in the reading assignment that supports their answer. The teacher later decides whether to grant credit for the appeal or not. If so, only the group(s) that made the appeal get(s) the credit. The fourth and final step is for the teacher to offer "corrective instruction." That is, after the students have shown what they can learn individually and in groups, the teacher can offer any additional comments that he/she feels are necessary for a correct understanding of the key concepts. The benefit of waiting until now is that the teacher can focus his/her comments only on those ideas that students were not able to understand on their own. And the students, having just struggled to "get a handle on this material," are more ready to listen closely to a set of brief, focused statements.

By the end of the preparation phase, students typically have a moderate level of understanding of the material and are thereby ready to start the *application phase*. In this phase they use the content to answer questions, solve problems, create explanations, make predictions, or doing whatever it is that constitutes "using" the content for this particular subject. The next several class sessions are devoted to a series of small group application exercises in which increasingly difficult questions and problems are given to the groups. The groups each formulate their own responses to the problems, the teacher leads a comparison of the different responses by the groups and offers feedback on the quality of their responses.

Chapter three of this volume has specific recommendations on how to generate questions and problems that simultaneously accomplish two goals: helping the groups learn how to use the material and helping them become more cohesive, that is, more committed to the success of the team.

Finally, after the teams have practiced applying the material for some time, they are ready for the *assessment* phase. Here the teacher in essence says: "You have been solving these problems several times. Now do it one more time and I will grade your responses as part of the course grade." Following this, the groups are ready to go on to the next unit and repeat the cycle. Only this time, they can start to integrate previous material with the new course material.

Special Characteristics of "Teams". The second distinguishing characteristic of team learning is the reliance on the special characteristics of "teams" to accomplish a special kind of learning. People who have not had the good fortune of having had a personal experience that allowed them to be a member of something that was a "team" rather than just a "group," may need an explanation of what the differences between the two entities are.

Groups and teams both consist of two or more people who interact in some common activity. What distinguishes teams from groups is that teams are *characterized by*:

- A high level of individual commitment to the welfare of the group, and
- A high level of trust among the members of the group.

The process of having a "group" of people become a "team" *requires*:

- Time interacting together.
- Resources (especially intellectual)
- A challenging task that becomes a common goal
- Frequent feedback on individual and group performance

When this happens, a "team" becomes *capable of*:

- Inspiring a very high level of individual effort,
- Challenging each other with a high tolerance for the "give and take" of honest communication without taking offense,
- Working together very effectively, and
- Successfully accomplishing very complex and challenging tasks.

Different Recommendations on *How to Use Small Groups*

The diagram presented earlier in this essay put cooperative learning and team learning as two sub-categories under the larger umbrella concept of "small group learning." Proponents of cooperative learning often see that concept as the large umbrella concept with team learning being simply one version of cooperative learning.

I believe it is important to see these two approaches as equivalent sub-categories because many of the prescriptive recommendations put forth for cooperative learning do not apply to team learning and in fact are often counter-productive to the process of building high performance learning teams. Why is this?

The fundamental difference between the two approaches lies in the relative time frame they are using and in the degree of integration they are striving for. Cooperative learning by and large views small groups as a *teaching technique* that is applied in a series of *independent* learning activities, each of which is aimed at accomplishing a specific set of learning objectives. In contrast, team learning views small groups as the basis of a semester-long *instructional strategy* in which a *sequence* of small group activities is designed and linked in such a way that they accomplish two purposes simultaneously: deepening student learning and enhancing team development. These two different perspectives lead to one clear similarity but several differences in terms of their recommendations for managing small groups.

Table 2 summarizes a list of common questions that faculty members have about using small groups, and shows the typical answers offered by the two perspectives. For each of these, I will try to explain the thinking behind the different answers offered by the two approaches.

Table 2

Recommendations for Using Small Groups

	Cooperative Learning	Team learning
AREA OF AGREEMENT:		
Groups: work in-class or out-of-class?	In-class	In-class
AREA OF DIFFERENT RELATIVE EMPHASIS:		
Time Spent Processing How Groups are Working	Important	Unnecessary
AREAS OF DIFFERENT BUT CRITICALLY IMPORTANT RECOMMENDATIONS:		
Duration of Groups?	Half-term (or so)	Whole term
Size of Groups?	4 or fewer students	5-7 students
Grade the group work?	Maybe; maybe not	Yes; critical
Use Peer Assessment?	Maybe	Yes; critical
How important is <i>prompt</i> feedback on individual and group performance?	Nice but not critical	Critically important
Use Assigned Roles?	Yes	No; counterproductive

Should Groups work "In-Class" or "Out-of-Class"? This is one area where both perspectives agree: Groups should be given time in class to do their work. Groups need all members to be present and this becomes difficult when students try to meet outside of class. When groups search for a time and place to meet, most but often not all of the members can be

present. This automatically creates an disadvantage for those students that are absent and for those groups with only some of their members present. Thus the teacher who asks groups to meet outside of class has created a problem that students cannot easily solve on their own.

A second, related reason is that, when groups are asked to meet outside of class, this increases their tendency to look for ways to divide up the work and do it separately, so they don't have to meet outside of class. Dividing up the work eliminates the group character of the assignment and changes it back to a collection of individual assignments.

Should the Groups Spend Time Discussing the Quality of Group Work? This is one area where cooperative learning and team learning have slightly different views, but the differences are not critical. In general, advocates of cooperative learning recommend that groups periodically spend some time examining the question of how well they are working together as a group. The idea is to help the groups identify any problems they are having so corrective action can be taken. For advocates of team learning, this is not seen as a bad activity at all, simply one that is usually not necessary. If the groups are given good assignments (for recommendations on this, see Chapter Four of this book) and prompt feedback, teams can figure out for themselves quite quickly whether they are working together well or not, and if not, why not. Hence it simply isn't necessary to spend additional class time on this topic.

How Long Should the Groups Stay Together? Proponents of cooperative learning offer several reasons why groups should be changed periodically. Changing the composition of the groups allows each student to get to know and work with more of the other students in the class. In classes with a diversity of students, working with other people who are significantly different from oneself can be an important learning achievement in itself. Changing students also moves any "free-loading" students around from group to group during the course of the semester, so that any one set of students doesn't have to "carry" them the whole semester.

Finally, students sometimes fall into predictable patterns in their relationships with one another. Changing students breaks up these patterns and allows the groups to be more dynamic and vital.

For teachers who use team learning, though, periodically changing the composition of the teams is absolutely the wrong thing to do. The reason is that it takes time for a group of students to get to know each other well enough to start functioning effectively as a team. Thus whenever you change the composition of a group, you move the group back to "square one" in terms of its becoming an effectively functioning team. In essence, you have made it virtually impossible for most groups to ever become a "team" and have significantly reduced the "payoff" time when they can work on challenging educational tasks effectively.

What about helping students get to know more of the other students in the class? This does have educational value and this happens with team learning somewhat during the whole class discussions. But the other view is that it is more important educationally to learn how to work together as a team, than it is to get acquainted with other students in the class. Students who keep changing groups never learn the difference between a newly formed group and a well-developed team, and hence never discover what a "real" team can do. That is a serious educational cost.

What about the problem of "free-loading" students? When team learning is used effectively, this problem seldom occurs. When groups start functioning as a team, individuals who might be inclined to be "free-loaders" become very uncomfortable in that role and tend to become contributing members. But even when there are individuals who persist in not contributing, the groups are large enough that they can work around the problem students. Then, at the end of the semester, each group assesses the contribution of all members through the process of peer assessment. This reduces the credit that non-productive students receive

for work done by the group. (See more on peer assessment below.) Hence "free-loading" students simply don't get to "free-load" in a team learning course.

How Big Should the Groups Be? Cooperative learning proponents tend to recommend relatively small groups, meaning four or fewer people per group, while team learning recommends larger groups, generally 5-7 students per group. Both agree that groups of 8 or more tend to be inefficient and ineffective.

Since small groups in cooperative learning are together for a shorter period of time, they need help in becoming semi-cohesive and organized as quickly as possible. To help the groups get started quickly, teachers using cooperative learning often assign roles, and this is easier to do with smaller groups than with larger groups. There are four roles that are usually assigned—reporter, recorder, spokesperson, folder monitor. Hence groups of 4 are ideal. More than this leaves some members without an assigned role.

For teachers trying to use team learning, this "quick fix" for group formation can generate problems over time. The smaller size and the assigning of roles limit the ability of the groups to evolve into effective teams. When groups are small (meaning four or fewer), they have fewer intellectual resources and perspectives at their disposal. Hence groups should be as large as possible until they become too large for all members to participate. This seems to happen when the groups have 8 or more members. Hence, a group of 5-7 people seems to be an optimum size. The problems created by assigned roles are discussed next.

Should Students Be Given Assigned Roles? As noted above, cooperative learning proponents often use assigned roles. Generally the teacher assigns these roles and then periodically changes the role for each person. Rotating the roles enables all group members to learn different skills and to contribute equitably.

Team learning, on the other hand, finds assigned roles to be unnecessary at best and counterproductive at worst. A lot of time ends up being spent on determining who has what role, what that role entails, what that person therefore needs to do, et cetera. And when the roles are rotated periodically, this just multiplies the time spent on "role issues."

The belief in team learning is that, as groups learn how to function effectively as teams, they naturally and automatically begin to manage the various functions themselves. Everyone makes sure that everyone gets heard, watches how much time is left, decides who will report out, et cetera. They do this quickly and easily, in a fraction of the time taken when roles are assigned. But more importantly, *it is the students themselves who learn how to handle roles and functions*. When the teacher takes over responsibility of assigning and distributing roles, this in fact prevents students from learning on their own what needs to be done and how to get that accomplished effectively and efficiently.

Should I Grade the Work of the Group? Advocates of cooperative learning seem to have mixed feelings on this topic. Some, like Kagan (1995), argue strongly against grading group work on the basis that grades should reflect individual work and nothing else. Others, like Millis and Cottell (1998), at times argue both ways. In one part of their book, they write that "Individual accountability precludes this practice [of group grades]." (p. 12) Yet in other parts of their book, they offer advice on how to grade group work. Eventually they qualify their opposition as being against "undifferentiated group grades," meaning they believe that all members of a group should not automatically receive the same grade for work performed by the group. That seems to be a more valid stance.

The reason for this ambivalence seems to be a concern that grading group work will result in unfairly raising or lowering the grades of some individuals within the group. The fear is that

hardworking students in a poor group may end up with a lower course grade because of poor group work, and poor students may be carried along by hard-working members.

The team learning perspective is that it is critically important for graded group work to constitute a significant percentage of the course grade, say 30-50%. Groups need an incentive for becoming an effective team and they need feedback on how well they are performing as a team. Graded group work meets both these needs. If a major part of the course grade depends on high quality team performance, the individual and the team have the necessary incentive to work hard, to do well. In addition, the feedback on team performance, both graded and ungraded, gives teams the information they need to monitor and improve their performance as a team. Hence, grading group work is critically important.

What about the unfairness issue? That is an important issue. Giving the same grade to all members in the group would result in grades that are unduly high or unduly low for many students in a class. But this potential problem is ameliorated by a number of different processes in team learning.

First, when individual students come under-prepared, the other members know it quickly and typically make their concern known to that individual, directly or subtly. This creates significant pressure from the team for each individual to be more prepared in the future. Hence there are fewer "under-contributing" members overall.

Second, the teams are also in a good position to recognize multiple and different kinds of contributions from individual members. One member may be able to contribute a wealth of creative ideas to consider, while others are stronger in analyzing and assessing those ideas. Hence teams have a rich and strong concept of what constitutes a valuable contribution to group performance.

Finally, in those rare cases where some individuals persist in not contributing, the other members will know that and will indicate that on their peer assessment at the end of the course. This ensures that those who do not contribute will not receive the same credit as everyone else for the quality of the group work.

Should I Have the Group Members Assess Each Other? The practice of having students assess how well each member of the group has contributed to the work of the group, is known as "peer assessment." Proponents of cooperative learning seem to have mixed feelings about this practice. IF a teacher decides to grade the group work, then peer assessment is appropriate. But even then, the process is recommended *only if* students are given proper training and the teacher monitors the process sufficiently (see, for example, Millis and Cottell, 1998, pp. 193-194).

In team learning, peer assessment is considered to be an essential component of the grading process. Team learning proponents would agree with most cooperative learning proponents, that "undifferentiated group grades" are potentially problematic. If the team is effective and everyone contributes evenly (which is often the case), then everyone in the group deserves the same credit for whatever grade the group receives for its work. But, in those teams where there is variation in the quantity and/or quality of individual contribution, then this needs to be recognized in the credit that is eventually awarded to individuals for the work done by the group. This is best accomplished by peer assessment. The students, not the teacher, have the best knowledge of who and how much each member contributed to the work of the group.

In general, the process of peer assessment works as follows. The group does its work and receives a grade for that work. Near the end of the semester the group engages in peer assessment where each member assesses the work of the other members of the group in terms

of how much each person contributed to the learning and the success of the group. This assessment is then used, either (a) as a component to be *added* to the group grade, or (b) as a component that is used as a *percentage multiplier* of all graded group work. When there is variation of individual contribution, this procedure results in variation in individual credit received for group work: individuals who contribute more receive more credit than individuals who contribute less. Doing this resolves the "fairness" issue in grading group work.

How Important is it to provide "prompt" feedback on individual and group work? There is little or no discussion of this issue in the general literature on cooperative learning. For team learning proponents, however, this is a critically important issue. Teams need frequent, prompt feedback in order to know (a) how well they are performing as a team and (b) whether they need to modify how they are operating. When there is a substantial delay, say a week or so, between when the groups do their work and when the assessment comes back, the typical reaction by groups is to see "what they got" and move on. However, when the teams receive immediate feedback, they instinctively engage in an analysis of the reasons for anything they got wrong. It is this latter response that teachers want to promote, if they want to help the teams improve the quality of their learning and performance.

Potential Impact on Student Learning

What are the possible educational benefits that teachers might expect to see if they move from using cooperative learning to using team learning? Since both ways of teaching are variations of teaching with small groups, this question will be addressed by looking at the four kinds of learning that are likely to be encouraged by any substantial use of small groups:

- Understanding the course content
- Applying the course content to problem solving, decision-making, et cetera.
- Developing the skills for working effectively on a team

- Valuing the team approach to solving complex intellectual tasks

Understanding the Course Content. All courses have a certain amount of content learning (for example, factual information, conceptual ideas, et cetera) that students need to "understand and remember." Team learning and cooperative learning are both capable of maintaining a high level of content learning while also promoting other kinds of learning. However the two approaches rely on different activities to accomplish this.

Cooperative learning activities are generally aimed at learning how to apply the course content rather than helping students acquire their initial understanding of the content itself. Hence it relies on the usual procedures for accomplishing content learning: in-class lectures, out-of-class readings, homework exercises, et cetera. Advocates of cooperative learning sometimes note the need for teachers to create "motivating" homework assignments and for students to do the homework responsibly. But the small group activities themselves are generally aimed at application learning, not the initial content learning.

Team learning, on the other hand, uses small group activities to directly support students' initial understanding of the content as well as their subsequent efforts to learn the content by applying it. The structure of the team learning sequence (see Figure 2) gives students three "passes" at increasing their understanding of the content, the first two occurring in the Readiness Assurance Process. The first pass is when the students study the material on their own before class, a task for which they are held individually accountable on the first test. Second, after taking an individual test, students interact with other students on the group test with questions designed to explore the meaning of the material. Third, following the Readiness Assurance Process, students get repeated opportunities to enhance their understanding of the content by working on problems where they apply it to a variety of problems, questions, etc.

As a result of students' going through these three stages, teachers generally report that students maintain a very high level of content learning (see the "Level of understanding of the content" in Figure 2). (Note: The authors of several of the chapters in Part Two of this book comment on the high level of content learning when they use team learning.)

Ability to Apply the Course Content. Application learning is where one can expect to see a major difference when using team learning. Cooperative learning and team learning both offer significant opportunities for students to learn how to apply course material. But, for a number of different reasons, team learning has the potential for both a quantitative and qualitative increase in application learning.

The *quantitative* increase happens because students spend a higher percentage of class time in application activities. Most cooperative learning exercises are application exercises, but the time spent on these exercises seldom exceeds 25-40% of total class time. With team learning, that percentage increases to 75-80%. The Readiness Assessment Procedure is so effective and efficient in providing students with a basic mastery of the course content, that students are left with substantially more time to spend on application exercises.

The *qualitative* increase results from students being able to take on more complex and more challenging problems. Several factors make this possible. First, having larger groups means each group has more intellectual resources at its disposal for addressing the application problems. Second, by spending more time together, the groups become more capable of working together effectively, i.e., they can operate as a "high performance team" rather than simply as a "group." Third, the fact that the group work is graded provides a direct incentive for the teams to invest substantial time and effort into high quality group work.

Developing Team Skills. Society at large as well as most professional organizations are increasingly recognizing the value of people who know how to work effectively in teams on

intellectual tasks, and are calling on colleges and universities to incorporate this kind of learning into the higher education curriculum. Any small group activity is potentially capable of supporting the development of team-working skills. But cooperative learning and team learning use very different strategies for accomplishing this.

Cooperative learning in general relies on (a) the use of assigned roles within groups, (b) having the teacher monitor the groups to see how they are handling the content and how well the groups are working, and (c) spending time after the small group exercise to "process" (i.e., review and analyze) the small group activity.

Team learning, by contrast, relies on the teams themselves to monitor individual and group performance and to improve performance as necessary. To do that, the teams only need prompt discriminating feedback on individual and team performance. This feedback is provided immediately in the Readiness Assessment Procedures and in the team application exercises. This feedback makes each team aware of both the absolute and relative quality of its performance, and thereby allows them to assess how well they are working together as a team. If they are not functioning well as a team, the problems are not difficult for them to diagnose:

- Is everyone coming prepared?
- Is everyone speaking up when he/she needs to?
- Is everyone listening carefully to everyone else?

Is there reason to believe that college students, working in teams, are capable of improving their teamworking skills without input from the instructor? Although we do not have data comparing cooperative learning and team learning, there is data clearly documenting that, when groups that are given the right conditions, they dramatically improve their ability to work together as a team and to solve complex problems. What are the "right conditions"? They

need (a) time to work together, (b) freedom to learn how to "manage their own affairs," and (c) feedback that tells them how well they are doing.

Why is team learning especially effective in helping individual students learn how to improve their team skills? In team learning, groups (a) have more time together, because they are left together for the whole semester, (b) are allowed to manage their own interactions, and (c) are given lots of prompt feedback that tells them how well they are doing and gives them incentives to do well.

Valuing the Team Approach to Intellectual Tasks. In addition to wanting people who know *how* to work in teams, society needs and is calling for people who understand the value of this approach to the challenging intellectual tasks of our time. Team learning seems especially well equipped to help students see the value of the team approach to complex problems. Students repeatedly see the data from the RAT's and this data essentially always shows that the teams outperform even the highest individual scores over time. (Michaelsen, Watson, and Black, 1989)

Then, in the application phase of team learning, teachers need to provide complex, challenging tasks for the teams to work on, and give them clear feedback on the relative quality of their performance. When this happens, it is crystal clear to everyone that an effective team approach is vastly superior to what could be accomplished by even a very bright individual, working alone.

The Value of Team Learning in Particularly Challenging Teaching Situations

Various teachers have found that team learning can be especially helpful in dealing with a number of situations that can be and often are particularly challenging for teachers. Four situations where this is true are when teachers are faced with: large classes, classes with a high

level of student diversity, courses with extended meeting times, and courses that emphasize "thinking" skills.

Large Classes. When teachers are faced with the responsibility of teaching large classes of 100 or more students and seek advice on how best to do this, they frequently get *technical* suggestions: get more organized, try to make your lectures lively, use more audio-visual materials, et cetera. But technical changes like these do not have the ability to make a significant impact on the two biggest problems with large classes from a learning perspective: student anonymity and passivity.

I would urge teachers with large classes to consider using team learning as a *strategic* response. By changing the structure of the course (that is, changing the primary type and sequence of learning activities), the teacher can make a large class operate like a small class and thereby directly impact these two key problems. Students no longer feel anonymous because they participate regularly in a group where everyone knows them and they know everyone else. Student passivity is obviously no longer a problem because essentially every class session consists of active learning. In the application phase of team learning, which constitutes the majority of class sessions, students are working on problems and getting feedback on how successful they are. Students in a team learning course may complain about being overworked, but they never complain about being passive or bored.

There are some adjustments that need to be made when using team learning in classes of 100 students or more. Michaelsen identifies these in Chapter ___ in this volume. But overall, these are relatively easy to make.

Back in the mid-1980's, Michaelsen and I made a "mistake" that allowed us to realize just how effective team learning is in making a large class to operate like a small class.

Michaelsen was using the IDEA course evaluation system to obtain student evaluations in a

large class with over 100 students in it. Since the IDEA system compares students' responses in a given course with other courses of *similar size*, we had to note the size of the class on the information sheet. Somehow the class size got recorded as "11" instead of "111" students. We were surprised when the results came back. His course was rated in the 90-95th percentile; in the past they had always been well above the 95th percentile. (Note: In the IDEA system, the overall evaluation is made on a scale of 1 (low) to 100 (high), with 50 being average.) When we finally figured out that the reason for the "drop" was that his course was being compared to other courses with 15 or fewer students, we realized the significance of our discovery. Most teachers of large classes would feel exceedingly successful if student ratings came even close to the average ratings in small class. But Michaelsen's class, with 100+ students in it, had been rated as two standards deviations ABOVE the average when compared to SMALL classes!

Classes with a High Level of Student Diversity. Teachers frequently have classes in which students are diverse, in terms of key factors such as prior preparation, age, related background experiences, ethnicity, attitudes toward the subject, etc.

Team learning creates the conditions in which people who are very different from one another learn that they *need* to work together and that they *can* work together. They find ways to make their differences an asset rather than a liability.

But again, the conditions necessary to make this happen are the same conditions that make groups evolve into teams: time together, freedom to find ways to work out their differences, feedback on their individual and group performance, and incentives, i.e., a reason to want to work together effectively.

Courses with Extended Meeting Times. I frequently get frantic calls for help from teachers who are facing the prospect of teaching weekend courses, intersession courses, or

condensed courses, where students meet for half-days or several whole days at a time. "What should I do? I can't lecture for three hours at a time!"

I frequently suggest that they consider using team learning. This allows the teacher to move some or most of students' initial exposure to the content to "out-of-class" reading time. And that leaves the teacher and students free to use some or most of the class sessions for learning how to use and apply the content. Once they have created a team learning structure for the course, they generally have little difficulty figuring out how to use extended class meeting time to engage students in learning how to apply and use the course material. This prospect is seen as attractive, not problematic.

Courses That Emphasize "Thinking" Skills. Team learning can be especially helpful to anyone who wants to emphasize the development of students' thinking skills in their courses. In contrast to memorization, thinking is an intellectual activity where the interaction between people--if properly structured--can be particularly valuable. Whether the thinking involves critical thinking (judging the value of something), practical thinking (problem solving and decision making), or creative thinking (imagining and creating new ideas, objects), learning how to incorporate the ideas and perspectives of several people and learning how to work through differences can greatly enhance each student's own ability to think effectively. The extended application phase of team learning supports this kind of learning very well. Students have multiple opportunities to exchange ideas with others, practice thinking, and get feedback on the quality of their thinking.

Team Learning and Problem-Based Learning

Before finishing this chapter, we should take time to examine the relationship between team learning and a similar teaching strategy: problem-based learning (PBL). Team learning and problem-based learning are quite similar in two important respects. They both involve a

great deal of in-class small group work and both give the groups challenging, decision-based assignments. (Wilkerson & Gijsselaers, 1996; PBL websites at the University of Delaware, Samford University, and San Diego State University)

There are, however, two important differences. One relates to the focus of the decision-based problems that form the basis of the group assignments. The problems in team learning generally aim at having students learn how to *apply* information and ideas that have been previously studied while PBL problems are designed to have students *learn how to learn* new material. That is, PBL aims at having students "learn how to learn" by having them complete assignments based on complex, unstructured problems that can only be solved by acquiring and using knowledge not yet studied. In practice, though, the distinction between given the problems given in team learning and PBL is not that great. Many PBL teachers in fact do have students study some content information first and then give the groups a problem to solve that requires this previously studied content plus more content that has not yet been studied. (University of Delaware, 1995-96)

The second difference between team learning and PBL is that, while PBL has its own specific ideas about the kinds of tasks given to learning group, it does not have distinct ideas on how to use small groups. Rather, it seems to be a "borrower of ideas" from the general literature and practice on this topic. Most PBL teachers seem to use small groups in a way that is more akin to cooperative learning than to team learning. As a result, instead of employing strategies that help newly-formed groups evolve quickly into high performance learning teams, they tend to rely on tutors to keep the groups functioning effectively and focused on completing their assigned tasks. As a result, there is sometimes a high cost in the form of the faculty or staff tutors needed to coach each group of students, especially in the model used by most medical schools.

Thus, it would seem that most PBL teachers could benefit from the prescriptions of team learning in two important ways. One is that, by developing high performance learning teams, they could eliminate the need for (and the cost of) providing tutors. The other is that they could increase the effectiveness and capabilities of the learning teams. For example, in a team learning version of PBL, instructors might 1) use the Readiness Assurance Process over assigned readings to ensure that students master a set of foundational concepts and to enhance the promotion of team development, 2) have students practice using this content, in teams, with one or more application problems, and then 3) assign additional problems that require the teams to identify, learn, and learn how to apply relevant new content on their own. The incorporation of team learning procedures in such a way would allow PBL teachers to strengthen the power of the student groups, reduce the tutoring costs, and still keep what is distinctive and exciting about PBL.

Concluding Comments

This chapter has presented team learning as an advanced form of teaching with small groups. Even as carefully structured group activities represent a major improvement beyond the "casual use" of small groups, team learning offers major educational benefits that go beyond the capability of the periodic use of individual small group activities.

By creating a course structure that involves small groups in the initial acquisition of course content, in learning how to apply that content, and in the assessment of student learning, the procedures of team learning offer teachers an extremely powerful tool for creating several kinds of higher level learning--just like steam turbines are able to drive powerful machines in modern society. The key to using this tool successfully lies in understanding a few key principles of team dynamics and then learning how to apply those principles with specific subject matter and in a variety of teaching situations.

The remaining chapters in this book explain those principles and illustrate how several teachers have used team learning with different kinds of subject matter and in different kinds of teaching situations.

People who have used team learning effectively, such as the authors of the chapters in Part II of this volume, testify to the transformational character of this approach to teaching:

- It transforms the structure of the course.
- It transforms small groups into teams.
- It transforms the quality of student learning (and the joy of teaching for many!).

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