BEYOND SMALL GROUPS:

Harnessing the Extraordinary Power of Learning Teams[†]

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Abstract: *Using small groups is a good way to introduce active learning into one's teaching. There are, however, significantly different ways of using small groups. This chapter offers a critical analysis of the benefits and challenges of three different ways of using small groups: casual use, cooperative learning, and team-based learning.*

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. In addition, 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 have prompted teachers to explore this form of teaching. In part teachers are feeling pressure both from 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 important human interaction and problem solving skills as well as content knowledge.

All of this is encouraging teachers to search for ways to make their classes more interesting and worthwhile, and that means making their classes more active. Of those teachers who reach this level of awareness, many discover that using small groups is both an

[†] This is Chapter One in: Team-Based Learning: A Transformative Use of Small Groups, edited by Larry Michaelsen, Arletta Knight, and Dee Fink. Sterling, VA: Stylus Publishing, 2004.

obvious way of engaging students in active learning and a way that can make a significant difference in the quality of student learning.

My general purpose in this chapter is to give the big picture of teaching with small groups and the special place of team-based learning within this picture. First, I simply want to note that, despite the value of small groups for promoting active learning, some students and teachers have encountered significant problems. This implies that it is important for teachers to learn how to discriminate among different ways of using small groups. Second, I want to identify what I see as three general uses of small groups within higher education: casual use, cooperative learning, and team-based learning. And finally, I want to identify the similarities and differences among the two more sophisticated uses: cooperative learning and team-based learning. This will include a review of the different recommendations on *how* to use small groups put forth by the advocates of cooperative learning and team-based learning, as well as the special situations in which team-based learning is particularly valuable.

The Transformative Value of Team-Based Learning

In my view, "team-based learning" is a special approach to the use of small groups that takes both teaching and learning to a whole new level of educational significance. This is why the title of this book refers to it as being "transformative." When used properly, team-based learning drives four kinds of transformations:

- It transforms "small groups" into "teams."
- It transforms a technique into a strategy.
- It transforms the quality of student learning.
- For many teachers, it transforms (or re-stores) the joy of teaching.

These are large claims. What is the basis of claiming such unusual capabilities? The answer is that team-based learning has two special features that make it distinctive. The first is

the unusual capability that *teams* have, as compared to *groups*. The second is the relative power of a teaching *strategy*, compared to a teaching *technique*. More will be said about these two special features later in this chapter, but I have introduced them here for the following reason. These two features give team-based learning an educational capability that is so enormous that many people dismiss its claims when they first hear about it. However, as the chapters in Part II of this book illustrate dramatically, when teachers take time to learn about team-based learning and how to implement it properly, it solves several challenging teaching problems and takes student learning, in any discipline, to levels that teachers could barely imagine after years of teaching in more traditional ways.

Problem: Some Students are Having Negative Experiences

Although teaching with small groups obviously has great *potential*, some survey research (Feichtner & 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?

When I encounter students who have had courses where small groups were used in a substantial way, I ask them whether they felt the experience overall had been a positive or a negative one. Almost half the time they say it was a negative experience. When I ask why, they report a number of familiar problems. Perhaps the most common one is: "I had to do most of the work and yet all of us got the same grade" (i.e., it was unfair). Somewhat related but different is: "Several of the students in my group simply didn't care what grade they got (but I do), and they therefore didn't put much time in on the project." Also frequently heard is the lament: "We were supposed to meet outside of class, but our group never found a good time to do that. So we didn't have many meetings where most of the group was there."

What these conversations and the literature on this topic are increasingly showing is that there are good and bad ways of using small groups for educational purposes. As a result, teachers need to 1) learn about the different ways of using small groups in their teaching, and 2) learn how to assess the different recommendations that will be found in this literature on how to use groups properly.

Three Different Ways of Using Small Groups

The view that will be presented in this chapter is that despite the many different terms and descriptions of how to use small groups, these variations can be described under three general headings: casual use, cooperative learning, and team-based learning.

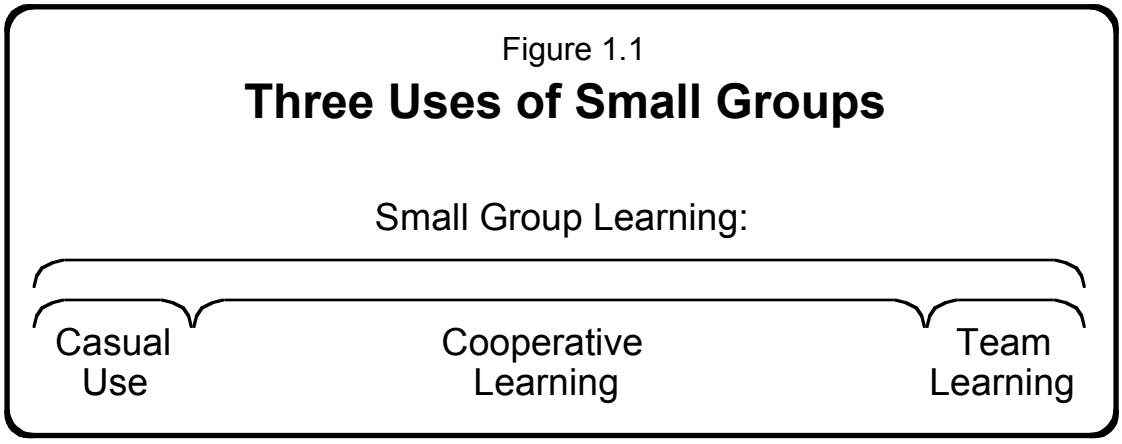
Different authors have used different terms when writing about small groups: learning groups (Bouton & Garth, 1983), collaborative learning (Hamilton, 1997; Bruffee, 1999), cooperative learning (Slavin, 1983; Johnson, Johnson & Smith, 1991; Millis & Cottell, 1998), and team-based learning (Michaelsen, 1983; Michaelsen & Black, 1994; Michaelsen, Black, and Fink, 1996). 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" is the overall "umbrella" that unites these various approaches, much like the concept of "water" unites the multiple forms it can take, of ice, liquid water, and steam. 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, cooperative learning (the use of carefully structured individual small group activities), and team-based learning. One can conceive of the relationship among these approaches as shown in Figure 1.1.

Casual use is flexible and easy to use because it is a relatively *unstructured* activity. Cooperative learning greatly enhances the capabilities of small group learning with its emphasis on carefully *structured activities*.[1] Team-based learning in turn creates and uses a different *course structure* that enables a whole new level of educational capabilities.

Figure 1.1

Three Uses of Small Groups



Some authors (for example, Millis & Cottell, 1998) clearly have a different mental map of small group learning. In their minds, "cooperative learning" is the umbrella concept with team-based learning being but one of several variations under that concept. In my view, this conceptualization overlooks 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 to transforming newly-formed groups into learning teams. An alternative perspective, one that will be developed in the remainder of this chapter, is that cooperative learning and team-based learning be seen as complementary but distinct approaches under the general concept of "small group learning".

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

[1] For the purposes of this essay, I am putting ideas about "collaborative learning" and "cooperative learning" under the same heading because they both

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, comments on their responses, and then proceeds 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. Psychologically it also makes the class less of an isolated and isolating experience by adding a degree of social interaction. The casual use of groups 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 group activities frequently. They recommend advance planning in order to think through a variety of issues, e.g., how to achieve individual and group accountability, how to form groups, how long to leave the groups together, whether to assign roles, etc.

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

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advocate the use of carefully structured small group activities that can be inserted into a variety of existing course structures.

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-based 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 (Michaelsen, Watson and Black, 1989)

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

1. The course contains a significant body of information and ideas (i.e., the content) that students need to understand, and
2. One of the primary goals for the course is for students to learn how to apply or use this 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-based learning.

Relationship Among the Three Uses of Small Groups. Each of these three uses of groups is different from the other two and has its own kind of value. The distinctive characteristics of each use are summarized in Table 1.1.

Table 1.1

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 not advance planning required.
- No need to worry about grading, course structure, group composition, etc.

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

- Frequent use of carefully planned and carefully structured group activities.
- Inserts small group activities into preexisting course materials.
- Calls for attention to: accountability issues, group formation, student roles, etc.
- Does not change the structure of the course.

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

- Makes small group work 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.
- Often requires a change in the structure of the course.

However each use in this sequence becomes more sophisticated and more powerful in terms of its impact on student learning (see Figure 1.2, top of next page). The casual use of small groups improves on traditional teaching by adding variety to the daily rhythm of classroom activities and adding a degree of active learning. But the impact on generating more sophisticated learning such as critical thinking or interdisciplinary thinking is limited. The more carefully structured activities that exemplify cooperative learning raise the quality of student learning considerably. If the activity has been designed so that it presents students with a significant challenge and gives them adequate feedback, the depth and extent of student learning will be significantly increased. Team-based learning takes small group learning to an even greater level of effectiveness. When the groups are properly formed, remain intact long enough to become cohesive teams, are repeatedly given challenging tasks with prompt and clear feedback, students then learn the content, they learn how to use the content, they learn about themselves and how to interact with others on major tasks, and they learn how to keep on learning after the course is over.

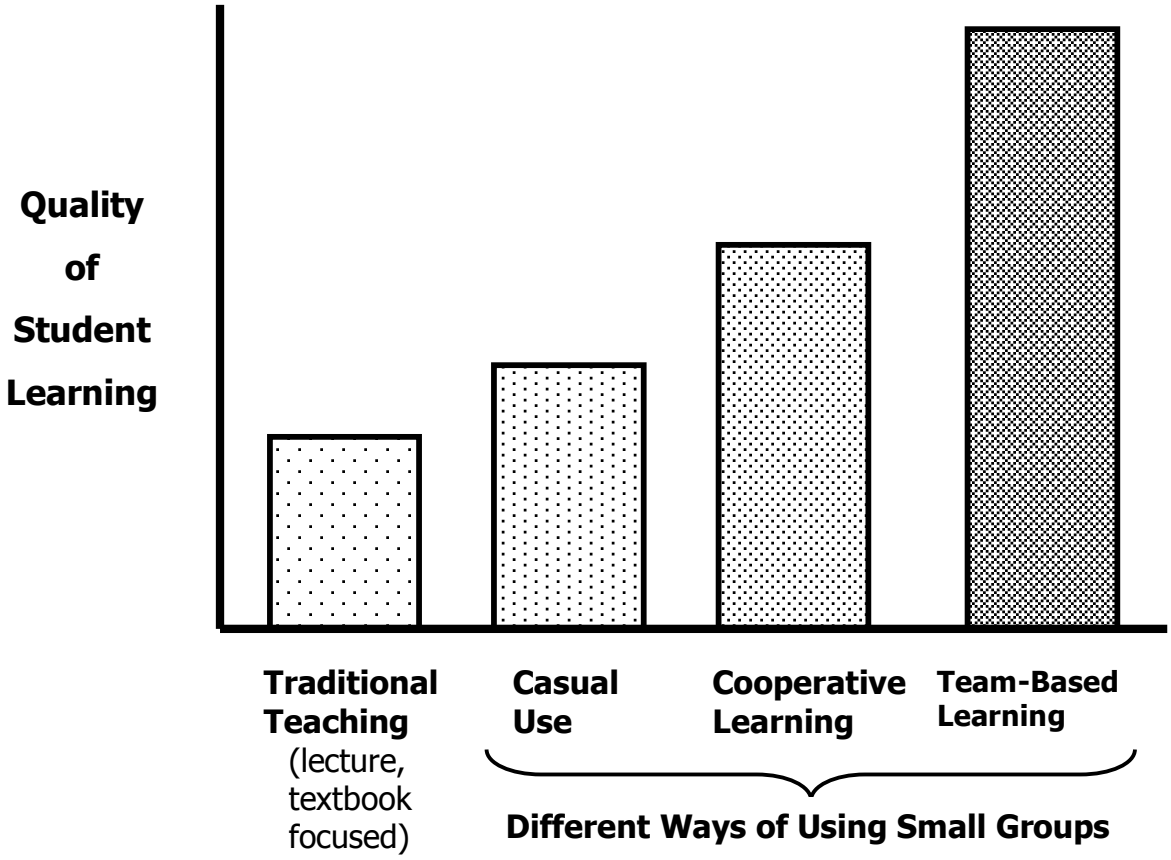
What is Distinctive about Team-Based Learning?

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

There are two key ideas in this definition. The first is that team-based learning is a particular instructional strategy, not a series of independent small group activities. Although teachers can and have borrowed "pieces" of team-based learning (usually the "individual-small group" sequence for testing), team-based learning itself consists of a particular instructional

Figure 1.2

The Impact of Three Ways of Using Small Groups on Student Learning



strategy, that is, a particular combination and sequence of learning activities. Using such a strategy will often involve the task of re-structuring the course. The second key idea is that team-based learning revolves around the development of *teams*, a kind of social unit that is quite distinct from *groups*. At this time I will comment on each of these two key ideas.

Team-Based Learning as an Instructional Strategy. The key point here is that team-based learning is an instructional *strategy*, not just a teaching *technique.* It is a set of learning activities in a particular sequence, not just an individual activity or teaching technique that can be plugged in more or less wherever. This is an important distinction to understand

because a strategy is more effective than an individual activity. A strategy uses a set of activities that work together synergistically to create a high level of energy on the part of the students that can then be applied to the task of learning. When implemented properly, a good strategy can generate a very powerful level of educational energy. And team-based learning has the potential to do exactly this.[2]

Although the particular sequence of activities can be and has been modified to fit particular teaching circumstances, the following is a description of what typically happens in a 15-week semester format. The whole course is re-structured by dividing it up 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 a three-phase sequence: preparation, application, and assessment (Figure 1.3).

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 on this topic; in-depth understanding will come later. The first thing that happens is that students are assigned to read the primary content material for this topic outside of class. Then, when they come to class, they engage in the Readiness Assurance Process, or "RAP." The purpose of the RAP is to assure that students are ready for the next phase of the sequence which is when they learn how to apply or use the content. In the Readiness Assurance Process, students begin by taking 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

[2] The significance of an instructional strategy is developed more extensively in Chapter Four of another book of mine, *Designing Courses for Higher Level*

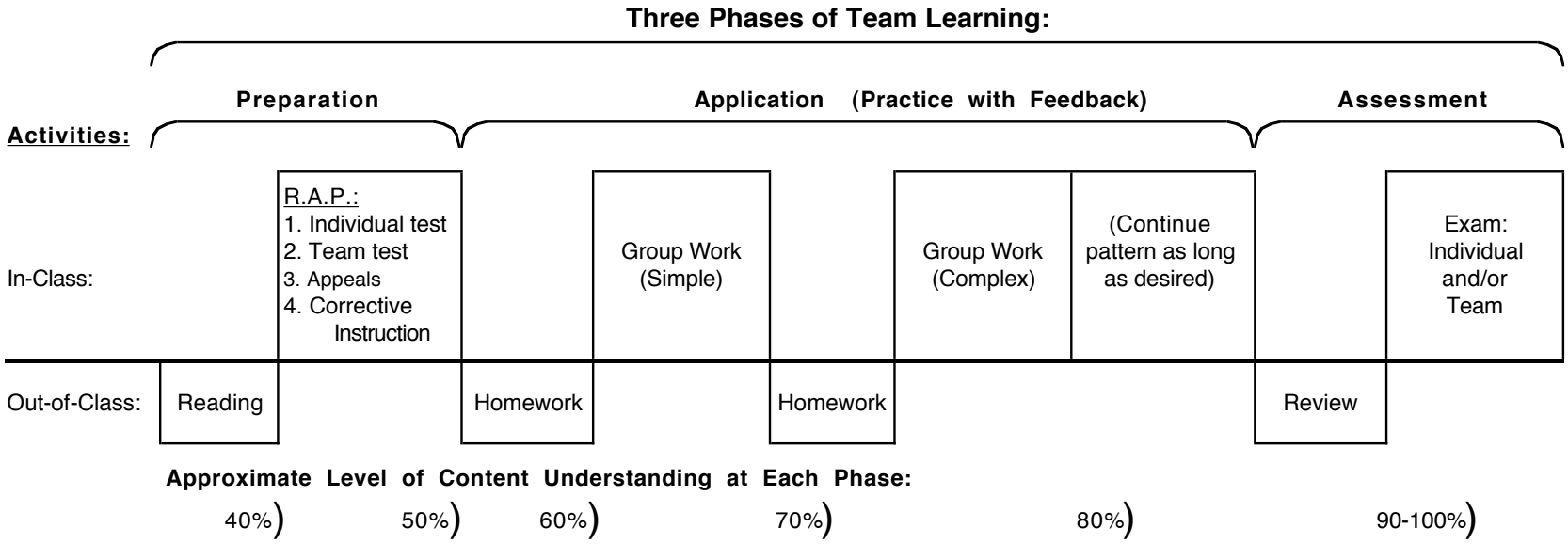
optional, is an appeals process. If any of the groups think one or more of their answers should have been counted as correct, they can submit a written appeal, making reference to material in the reading assignment that supports their answer. The teacher later decides whether to grant credit for the 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 knows what ideas the students were *not* able to understand on their own and 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 do 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.

Learning, which will be published by Jossey-Bass in 2002.

Figure 1.2

The Sequence of Learning Activities in Team Learning

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



New title for Figure 1.3:

Team-Based Learning: The Sequence of Learning Activities for Each Major Topical Unit

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.

This interdependent sequence of in-class and out-of-class activities that moves through the preparation, application, and assessment phases, is what constitutes the distinctive instructional strategy of team-based learning.

Special Characteristics of Teams. The second distinguishing characteristic of team-based 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
- 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, "teams" 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
- Successfully accomplishing very complex and challenging tasks.

Different Recommendations on *How* to Use Small Groups

Figure 1.1 shows cooperative learning and team-based learning as two sub-categories under the larger umbrella concept of "small group learning." Proponents of cooperative learning often see that concept (i.e., "cooperative learning") as the large umbrella concept with team-based learning being simply one version of cooperative learning. I believe it is important to see team-based learning and cooperative learning as equivalent sub-categories under the larger concept of "small group learning." The reason is that many of the prescriptive recommendations put forth for cooperative learning do not apply to team-based 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-based 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.

There are eight questions that faculty members frequently have about using small groups, as well as the answers typically offered by these two perspectives. In this section, I will try to explain the thinking behind the different answers offered by the two approaches to these eight questions.

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, frequently not all of the members will be able to be present. This automatically creates a disadvantage for those students who 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 because they want to avoid the need to meet outside of class, if possible. But letting them divide up the work eliminates the group character of the assignment and changes it back to a collection of individual assignments.

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-based 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-based 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-based 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 students simply don't get to free-load in a team-based 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-based learning recommends larger groups, generally 5-7 students per group. Both agree that groups of 8 or more tend to be inefficient and ineffective.

The small group size is also a primary reason that cooperative learning advocates recommend assigning roles to individual students within groups. 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-based 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. This is why 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. The belief here is that rotating the roles enables all group members to learn different skills and to contribute equitably.

Team-based 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, etc. And when the roles are rotated periodically, this just multiplies the time spent on role issues.

The belief in team-based 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, etc. 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 the 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 clarify their opposition by stating that they are 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-based learning perspective is that it is critically important for graded group work to constitute a significant percentage of the course grade, say 30-40%. 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-based 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. Some contribute a wealth of creative ideas for the team to consider; others are stronger in analyzing and assessing those ideas; and yet other students are very helpful in managing the group work. Hence the team members develop a

clear understanding of the varied ways in which individual members contribute to the work of the group.

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 Spend Class Time Teaching and Analyzing Group Process Skills? In general, advocates of cooperative learning strongly recommend that instructors spend class time: 1) teaching students how to analyze group processes and, 2) periodically having groups examine the question of how well they are working together as a group (e.g., Johnson, Johnson, and Smith, 1991, pp. 22-24). The idea is to help the groups identify any problems they are having so corrective action can be taken. For advocates of team-based learning, teaching about group processes is not seen as bad other than the fact that it is usually not necessary. They strongly believe that good assignments (for recommendations on this, see Chapter Three of this book) and prompt feedback do much more to help teams to improve their functioning than does teaching them about group interaction and having them discuss how they think they did at the conclusion of each assignment. Hence it simply isn't necessary to spend a significant amount of class time teaching about group process issues.

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-based learning proponents, however, prompt feedback is essential to both learning and team development. In their view, even if students are taught to use some sort of group process framework, they are reluctant to engage in the difficult task of engaging in serious evaluation of how their group is functioning. When there is a delay, even a day or two,

between when the groups do their work and when the assessment comes back, the typical reaction is to see "what they got" and move on. By contrast, when the teams receive *immediate* feedback on individual and team performance, they instinctively and inevitably engage in an analysis of what went wrong when they still have a clear enough recollection of their experience to make the necessary corrections. Teachers only need to support and encourage this process by providing immediate feedback. When they do this, most teams will quickly and effectively improve the quality of their learning and performance. Thus, in most cases, providing immediate feedback is all that is required for teams to quickly and effectively improve the quality of their learning and performance.

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 & Cottell, 1998, pp. 193-194).

In team-based learning, peer assessment is considered to be an essential component of the grading process. Team-based learning proponents would agree with most cooperative learning proponents, that undifferentiated group grades are potentially problematic. If the team is effective and everyone contributes in important ways to the group (which is often the case), then everyone in the group deserves the same credit for whatever grade the group receives for its work. However, in those teams where there is variation in the quantity and/or quality of individual contribution, then this needs to be reflected in the way the course grade is calculated. This is best accomplished by peer assessment. The students, not the teacher, have

the best knowledge of the quantity and quality of each member's contribution 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 1) as a component to be *added* to the group grade, or 2) as a component that is used as a *percentage multiplier* of all graded group work. When there is variation in 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. (For more information on Peer Assessment, see Appendix B.)

To summarize this discussion of the different ways cooperative learning and team-based learning use small groups, both recommend allocating class time for group work. But the goal of team-based learning - to produce highly cohesive teams, leads to different recommendations on several other issues. These include leaving the groups together for the whole term and making them slightly larger. When proper procedures are followed, it is not necessary for members to have assigned roles or for the teacher to spend a significant amount of time instructing the groups about group process skills. But the teacher should definitely grade the group work, provide for prompt feedback to the groups on the quality of their work, and use peer assessments at the end of the term. These differences are summarized in Table 1.2 (top of next page).

Table 1.2

Recommendations for Using Small Groups

	Recommendations of:	
	Cooperative Learning	**Team-Based Learning**
AREA OF AGREEMENT:		
Groups: work in-class or out-of-class?	In-class	In-class
AREAS WHERE RECOMMENDATIONS DIFFER:		
Duration of groups?	Half-term (or so)	Whole term
Size of groups?	4 or fewer students	5-7 students
Use assigned roles?	Yes	No; counterproductive
Spend class time teaching and analyzing group process skills?	Critically Important	Nice but not critical
Grade the group work?	Maybe; maybe not	Critically important
Ensure *prompt* feedback on individual and group performance?	Nice but not critical	Critically important
Use peer assessment?	Maybe	Critically important

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-based 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, etc.
- 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 (factual information, conceptual ideas, etc) that students need to understand and remember. Team-based 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 cooperative learning relies on the usual procedures for accomplishing the initial learning of the content: in-class lectures, out-of-class readings, homework exercises, etc. 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-based learning, on the other hand, uses small group activities to directly support the students' initial understanding of the content as well as their subsequent efforts to learn the content by applying it. The structure of the team-based learning sequence (Figure 1.3) gives students several "passes" at increasing their understanding of the content. 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. Then, during the four steps of the Readiness Assurance Process, students increase their understanding by trying to answer questions individually and through group discussion, reviewing the assigned readings to make appeals, and receiving additional focused input from the professor. Following this, students get repeated opportunities to enhance their understanding of the content by working on assignments where they apply their knowledge to a variety of problems, questions, etc.

As a result of students' going through these three phases of the Team-based learning process, teachers generally report that students maintain a very high level of content learning (see the "Level of understanding of the content" in Figure 1.3). (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-based learning.)

Ability to Apply the Course Content. Application learning is where one can expect to see a major difference when using team-based learning. Cooperative learning and team-based learning both offer significant opportunities for students to learn how to apply course material. However, for a number of different reasons which are described below, team-based 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-based 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, is increasingly recognizing the value of people who know how to work effectively in teams on intellectual tasks, and they 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-based learning use very different strategies for accomplishing this.

Cooperative learning in general relies on 1) using assigned roles within groups, 2) having the teacher monitor the groups to see how they are handling the content and how well the groups are working, and 3) spending time after the small group exercise to "process" (i.e., review and analyze) the small group activity.

Team-based 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-based learning, there are 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 1) time to work together, 2) freedom to learn how to manage their own affairs, and 3) feedback that tells them how well they are doing.

Why is team-based learning especially effective in helping individual students learn how to improve their team skills? In team-based learning, groups 1) have more time together, because they are left together for the whole semester; 2) are allowed to manage their own interactions; and 3) 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 in dealing with the challenging intellectual tasks of our time. Team-based 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 Readiness Assurance Process and this data essentially always shows that the teams outperform even the highest individual scores over time. (Michaelsen, Watson, & Black, 1989)

Then, in the application phase of team-based 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 produces results superior to what could be accomplished by even a very bright individual, working alone.

The Value of Team-based learning in Particularly Challenging Teaching Situations

Various teachers have found that team-based 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, etc. 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-based 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-based 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-based 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-based learning in classes of 100 students or more. Michaelsen identifies these in his chapter "Team-based learning in Large Classes" in this volume. One key adjustment involves finding a way for group members to be physically close to each other, even in auditorium-style classrooms. In this latter situation, the problem can usually be solved by having three group members sit in the row in front of the other three; when they want to work in groups, the three in front simply

turn around and face the others. A second important challenge is finding a way to get materials to and from the groups quickly. Having folders for each group and then setting up a system for efficiently distributing and collecting the folders can usually accomplish this. Overall, though, the adjustments to large class conditions are not overly difficult to make.

Back in the mid-1980's, Michaelsen and I made a mistake that allowed us to realize just how effective team-based 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 team-based learning class with over 100 students in it. In the IDEA system, the overall evaluation is made on a percentile scale of 1 (low) to 100 (high), with 50 being average. But it compares students' responses in a given course with other courses of *similar size*. So we had to note the size of the class on the initial information sheet. Somehow the class size got recorded as having "11" students instead of "111" students. We were surprised when the results came back. His course was rated in the 90-95th percentile whereas in the past they had always been well above the 95th percentile. 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 in the 90-95th percentile, two standards deviations ABOVE the average when compared to SMALL classes! Seeing these results made us realize how enormously successful team-based learning had been in a large class setting.

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-based learning creates 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. When teachers can create these conditions, students who are very different from one another have 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-based learning. This allows the teacher to move some or most of students' initial exposure to the content to out-of-class reading time. 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-based learning structure for the course, they generally have little difficulty figuring out how to use the 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-based 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 in which the interaction between people -- if properly structured -- can be particularly valuable. Whether the skill is critical thinking (judging the value of something), practical thinking (problem solving and

decision making), or creative thinking (imagining and creating new ideas or 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-based 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-based learning and Problem-Based Learning

Before finishing this chapter, we should take time to examine the relationship between team-based learning and problem-based learning (PBL). These two approaches to teaching are quite similar in three important respects. First, they are both clearly teaching strategies and not just teaching techniques. Each involves a specific course structure. Second, they both involve a great deal of in-class small group work, and third, both give the groups challenging, decision-based assignments (Wilkerson & Gijselaers, 1996; Duch et al., 2001; 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-based 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 the problems given in team-based learning and in 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 learned (University of Delaware, 1995-96).

The second difference between team-based learning and PBL is that, while PBL has its own specific ideas about the kinds of *tasks* given to learning groups, it does not have distinct ideas on how to *use* small groups. Rather, it seems to borrow 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-based 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-based learning in two important ways. One is that, by using the procedures that promote high performance learning teams, they could eliminate the costly need to provide tutors. The other is that they could increase the effectiveness and capabilities of the learning teams. For example, in a team-based 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-based learning procedures in this 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-based 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-based learning offers major educational benefits that go beyond the capability of the periodic use of individual small group activities.

By creating an instructional strategy and a course structure that involve 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-based learning offer teachers an extremely powerful tool for creating several kinds of higher level learning. 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 of this book address these principles and describe how they can be applied in multiple situations.

People who have used team-based 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 small groups into teams.
- It transforms a technique into a strategy.
- It transforms the quality of student learning.
- And, for many, it transforms the joy of teaching!

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