

Getting Started with Team Learning

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Abstract: In order to start using team learning, teachers need to understand the key principles involved and the desired sequence of events in a team learning class. In this essay, after explaining what it is that gives learning teams their unusual and special capability for promoting significant learning, Michaelsen identifies the four key principles that govern the effective use of learning teams (Part I) and then describe what happens from start to finish in a team learning course (Part II). At the end of the chapter, he also has a few comments about why he believes team learning is such an attractive option for teachers in a variety of teaching situations.

The tremendous power of team learning is derived from a single factor: the high level of cohesiveness that can be developed within student learning groups. In other words, the effectiveness of team learning as an instructional strategy is based on the fact that it nurtures the development of high levels of group cohesiveness which, in turn, results in a wide variety of other positive outcomes.

It clearly takes a transformation process to evolve a small group into a powerful, cohesive learning team. The paragraphs that follow will outline a set of principles and practices that are critical to this transformation process. Part I of this essay presents four key principles for implementing team learning and outlines why they must be followed. Part II provides a discussion of the steps involved in actually implementing team learning. Part III describes the benefits of team learning, especially its adaptability across a variety of teaching/learning situations

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Part I – The Four Essential Principles of Team Learning

Teachers who try to shift from traditional forms of teaching to a team learning approach will find that this requires three important changes. First, the primary learning objectives of the course will shift. Instead of being primarily focused on familiarizing students with key concepts, the course goals will also include ensuring that students learn how to use those concepts. Second, the role and function of the teacher will also change. Instead of just being someone who dispenses information and concepts, the teacher will need to design and manage the overall instructional process. Third, there will also be a change in the role and function of students in the course. Instead of being passive recipients of information and content, students will need to be responsible for the initial acquisition of the content and for working collaboratively with other students to learn how to use the content.

Changes of this magnitude do not just happen automatically. They happen when the teacher is able to implement the four essential principles of team learning. The essential principles are: 1) groups must be properly formed and managed, 2) students must be made accountable for their individual and group work, 3) group assignments must promote both learning and team development, and 4) students must have frequent and timely feedback. When these principles are in place, groups of students evolve into cohesive learning teams.

Principle 1 – Groups Must Be Properly Formed and Managed

Groups need to be formed in a way that enables them to do the work that they will be asked to do. This involves minimizing barriers to group cohesiveness and then giving them the resources they need (in terms of talent, time, etc.).

Minimizing barriers to group cohesiveness. Probably the greatest inhibitors to the development of group cohesiveness are either a previously established relationship between a subset of members in the group (e.g. boyfriend/girlfriend, fraternity brothers, etc.) or the potential for a cohesive subgroup based on background factors such as nationality, culture or native language. Thus, teachers should use a group formation process that mixes students up in a way that forces the groups to build themselves into teams “from the ground up”.

Distributing member resources. In order to function as effectively as possible, each group should have access to whatever assets exist within the whole class and not carry more than a “fair share” of the liabilities. Member assets might include such things as: full-time work experience, previous relevant course work, access to perspectives from other cultures, etc. Member liabilities may be in the form of negative attitudes towards the course, limited fluency in English, no previous relevant course work, etc. When relevant member assets, liabilities, and characteristics are evenly distributed, learning teams will work more effectively. Generally, students do not intuitively have enough information nor the inclination to wisely form

groups; therefore the teacher should be the one who determines how the groups will be formed.

Learning teams should be fairly large and diverse. Because team learning assignments involve highly challenging intellectual tasks, teams must be large enough to maximize their intellectual resources, as heterogeneous as possible, and yet so large as to prevent full participation by all team members. In general, this means the teams should be comprised of 5-7 members.

Groups should be permanent. It takes time for groups to evolve into effectively functioning teams. And each time groups are re-formed, the team development process must begin all over. Therefore, teachers should leave the groups or teams intact as long as possible, i.e., meaning for the duration of the whole term in an educational setting.

In newly formed groups, members typically begin the testing process by engaging in "small-talk" and by carefully avoiding disagreements; even though doing so (i.e., avoiding disagreements) inevitably limits their ability to work productively. As a result, newly formed groups tend to rely heavily on their most competent member and have a limited ability to tap the resources of the rest of the group.

As groups develop into teams, communication becomes more open and, as long as members have information relevant to the issues at hand, is far more conducive to learning. In part, this occurs because trust and understanding build to the point that members are willing and able to engage in intense give-and-take interactions without having to worry about being offensive or misunderstood. In addition (and in contrast to temporary groups), team members are willing to risk challenging each other because they see their own success as being integrally tied to the success of their team. Thus, over time, members' initial concerns about creating a bad impression by being "wrong" are outweighed by their motivation to ensure that their team is successful. When this occurs, studies have shown that 98% of teams will outperform their own best member on learning-related tasks (Michaelsen, Watson & Black, 1989).

Principle 2 - Students Must be Made Accountable

In traditional classes, since there is no real need for students to be accountable to anyone other than the instructor, it is possible to establish a reasonable degree of accountability by simply assigning grades to students' work. By contrast, developing groups into cohesive learning teams requires assessing and rewarding a number of different kinds of student behavior. Students must be accountable for (a) individually preparing for group work, (b) devoting time and effort to completing group assignments, and (c) interacting with each other in productive ways. Fortunately, team learning offers opportunities for establish each of these three forms of accountability.

Accountability for individual pre-class preparation. This is critical. If individual students fail to complete pre-class assignments, they will be unable to contribute to the efforts of their team. Lack of "preparedness" hinders the development of group cohesiveness better students better students resent

having to carry their less willing and/or less able peers.

In team learning, the basic mechanism that ensures individual accountability for pre-class preparation is the Readiness Assurance Process (see below and in Michaelsen & Black, 1994) that occurs at the beginning of each major unit of instruction. The first step in the process is an individual Readiness Assessment Test (RAT) that typically consists of 18-20 multiple-choice questions over a set of pre-assigned readings. Next, students turn in their answers and are given an additional answer sheet so that groups can re-take the same test and turn in their consensus answers for immediate scoring. This process promotes students' accountability to both the instructor and to each other. Students are responsible to the instructor because the individual scores count as part of the course grade (discussed in detail below). In addition, during the group test, each member is invariably asked to voice and defend their choice on every question. As a result, students are clearly and explicitly accountable to their peers for not only completing their assigned readings but for being able to explain the concepts to each other as well.

Accountability for contributing to their team. Once students have developed responsibility for coming to class prepared, the next step is to ensure that they are ready to contribute to the overall work of the team. To do this, it is imperative that instructors involve the students themselves in the assessment process. An excellent tool for this kind of evaluation is peer assessment. That is, members are given the opportunity to evaluate one another's contributions to the activities of the team. Contributions to the team include activities such as: individual preparation for team work, reliable class attendance, attendance at team meetings that may have occurred outside of class, positive contributions to team discussions, valuing and encouraging input from fellow team members, etc. Peer assessment is essential because team members are typically the only ones who have enough information to accurately assess one another's contributions.

Accountability for high quality team performance. The third significant factor in the ensuring accountability is developing an effective system to assess the performance of the teams. To do this, the teacher needs to have the teams to create a "product" that can be readily compared across teams and with "expert" opinions (including those of the instructor—see below). Then these products need to be assessed and compared in a frequent and timely manner.

Grading System. It is essential that we use an overall assessment system for the course that encourages the kind of student behavior that will promote learning in and from group interaction.

To do this, the teacher must develop a grading system that includes students' preparation for group work, their contribution to the group, and the effectiveness of the group work.

Principle 3 – Team Assignments Must Promote Both Learning and Team Development.

The development of appropriate group assignments is a critical aspect of

successfully implementing team learning. In fact, most of the reported “problems” with learning groups (free-riders, member conflict, etc.) are the direct result of inappropriate group assignments.

The most fundamental aspect of designing effective team assignments is ensuring that they truly require group interaction. Assignments that require groups to make decisions and enable them to report their decisions in a simple form, will usually generate high levels of group interaction.

However, assignments that involve complex output such as a lengthy document or an oral presentation are likely to lead to groups dividing up the work and having individually complete their part of the total task. Such assignments therefore limit intra-group interaction and limit interaction among groups by making it difficult to compare performance amongst teams.

Principle 4 – Students Must Receive Frequent and Immediate Feedback

For teams to perform effectively and to develop as a team, they must have regular and timely feedback on group performance. This happens in two important ways in team learning.

Timely feedback from the Readiness Assessment Tests. The Readiness Assessment Tests (RATs) are an important source of feedback that supports both learning and team development.

They support learning by informing individual students and the groups as to how effective their current learning procedures are. High scores mean they are doing what they need to be doing to learn, and vice versa for low scores.

Feedback from the RATs also facilitates the team development process in important ways. Because the group scores are made public, group members are highly motivated to pull together to protect their public image. Also, because the feedback is immediate, students are both aware of situations when the group failed to capitalize on the knowledge of one or more of their members and are highly motivated to do something about it (Watson, Michaelsen & Sharp, 1991). As a result, they very quickly learn the importance of including everyone in the decision making process.

Timely feedback on application-focused team assignments. Providing immediate feedback on application-focused team assignments is also important for both learning and team development. But it typically also presents a much greater challenge than providing immediate feedback on the RATs.

Whereas RATs are designed to ensure that students understand basic concepts, most application-focused team assignments are aimed at developing students’ higher-level learning skills and, as a result, can be much more difficult to evaluate. One key to providing immediate feedback on application-focused team assignments is requiring the right kind of “output” from the teams (i.e. assignments that require students to make complex decision, but represent their work in a simple form—see below). The other is using procedures that enable teams to assess and provide feedback on each others’ work.

Concluding Comment on Part I. Although learning groups have positive effects on students' engagement and learning in most courses, their educational value is dependent on two conditions. One is the extent to which students are motivated to prepare for group work. The other is the extent to which students are willing to engage in give-and-take discussions (i.e., students' individual knowledge is of no value unless they are willing to voice what they know). Although constructive disagreement within a group is essential to significant learning, the level of trust required for members to be willing to challenge each others' views requires a level of cohesiveness that only develops through a series of positive group interactions.

By adhering to the "Four Essential Principles of Team Learning", teachers ensure that the vast majority of groups will develop a level of cohesiveness and trust required to transform groups into effective learning teams.

Part II - Implementing Team Learning

One of the greatest benefits of team learning is that teachers are forever freed from the burden of being the one primarily responsible for "covering" all of the course content; instead, it is the students who do this work. Team learning uses a sequence of events prompts students to engage in their initial exposure to the content before class, and then spend the majority of class time working on assignments in which they learn how to apply the knowledge. As a result, effectively using team learning typically requires redesigning a course from beginning to end and the redesign process should begin well before the start of the school term.

The redesign process involves making decisions about and/or designing activities at four different points in time. These are: 1) before class begins, 2) the first day of class, 3) each major unit of instruction and, 4) near the end of the course.

Before Class Begins

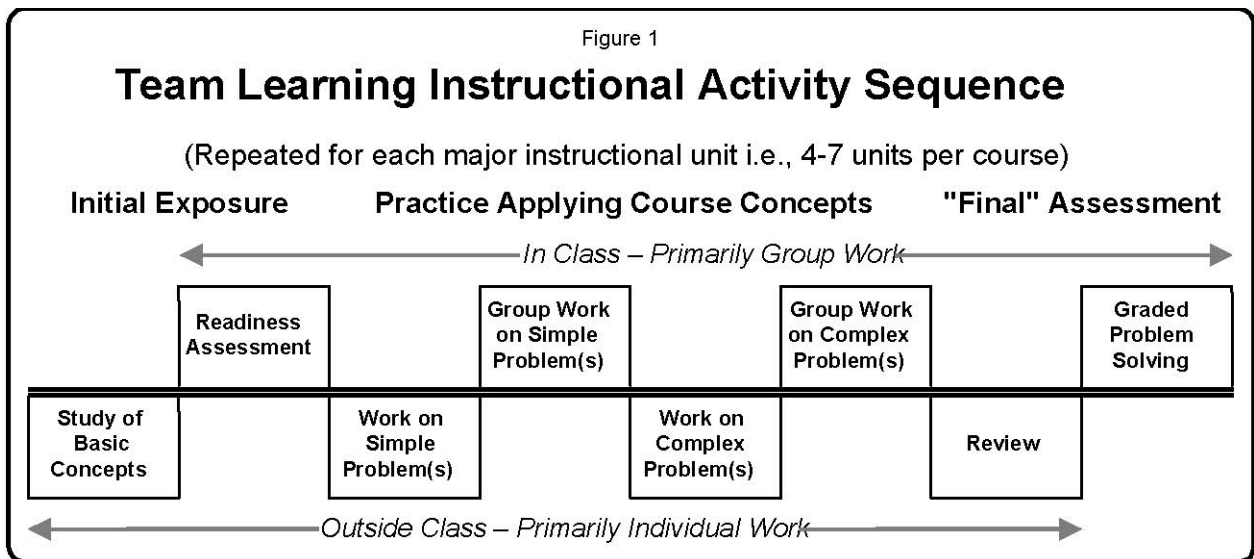
The pre-class work involves three key tasks: 1) partitioning the course content into macro-units, 2) identifying the instructional goals and objectives, and 3) designing a grading system.

Partitioning the course content. The first step is to partition the course content into 4-7 macro-units based on the major topics of the course. These major units of instruction form the basis for defining objectives and for designing both the Readiness Assessment Tests and the application-focused assignments. Typically, these units consist of 2-4 chapters from the course text and/or a number of outside readings that can be tied together with an overall conceptual theme

To identify these macro-units, the teacher should ask him/herself: What are the 4-7 major topics that students need to learn about in this course? The next question is how much time (i.e., how many weeks of class time) does the teacher want to devote to each topic. Do the topics all require about the same amount of time, or do some require more than others?

Then, within each macro-unit of instruction, the class will typically follow

the sequence of in-class and out-of-class activities shown in Figure 1. In the first phase of this sequence, students acquire their initial exposure to the content. Then they practice learning how to apply the content to a series of questions or problems. Finally, after they have practiced several times, the teacher in essence says: "You have done it several times. Do it one more time so I can grade it, and we will then move on to learning about the next major topic in the course.



Identifying the instructional goals and objectives. With team learning, it is important to identify two different types of learning objectives. The first type of instructional objective, and, by far the most important, involves identifying what students will do with their newly acquired knowledge. The second type of instructional objective focuses on identifying the course concepts and terminology that students must know in order to achieve the doing objectives.

The doing objectives are important for a variety of reasons. But key amongst these is the impact on student motivation. Although most students are willing to put in the effort needed to understand basic concepts, they are likely to rebel at the expectation that they should be primarily responsible for their initial exposure to course content unless they know why the concepts are important. If the only pay-off from the students' pre-class study/reading is covering more meaningless minutia (at least in their minds), they are likely to complain about "having to pay tuition to be in a class where the teacher doesn't teach." On the other hand, if working on their own enables them to work on challenging and relevant application-focused assignments, most students both appreciate and support what the teacher is trying to do. As a result, the instructor must have a clear answer to the question, "What do I want students to be able to do when they have finished the course

Designing a grading system. The third early step in re-designing the course is to ensure that the grading system is designed to reward the right

things. An effective grading system for team learning must address the concerns of both students and the instructor. For both, the primary concern is previous experience with small groups where too many groups had "free riders". Students worry that they will be forced to carry their less able or less motivated peers. Instructors worry that they will have to choose between grading rigorously and grading fairly.

Fortunately, both sets of concerns tend to be alleviated by a grading system in which a significant proportion of the grade is based on: 1) individual performance, 2) team performance, and 3) each members' contributions to the success of their teams. Having a significant part of the grade based on each of the first two components is key to ensuring that students will be rewarded for their individual effort and that teams will have the resources they need to complete team assignments. Students must first perceive that each of the factors (i.e., individual performance, team performance, and members' contributions to the success of their teams) is important to their course grade. After that, the only concern left is that the relative weight of the factors is acceptable to both the instructor and the students. (A procedure for determining the relative weight of the grade components is addressed in the next section.)

The First Hours of Class: Getting Started on the Right Foot

Activities that occur during the first few hours of class are critical to the success of team learning. During that time, the teacher must see that four objectives are accomplished. First, the teacher must ensure that students understand why the teacher is using team learning and how the class will be conducted. Second, the task of actually forming the groups must be completed. Third, the students' concerns about the grading system must be alleviated, and fourth, some mechanism must be set up to encourage the development of positive group norms.

Laying the groundwork for team learning. Because team learning is so fundamentally different from traditional courses, it is important that students understand both how the class will be conducted and the rationale for this approach to learning.

In order to foster students' understanding of team learning, I typically use two activities that work quite well. The first involves a presentation comparing this course with a traditional course. This comparison looks at the relative importance of different learning objectives and how these objectives are accomplished. The second activity involves the class in a demonstration of how the Readiness Assessment Test works, using the course syllabus as "content" material to be covered. Right after the groups have been formed, the students are given time to read through the course syllabus, take an individual test on it, followed by a group test on the same questions. By the end of this walk-through, they understand what they need to do to get ready for the first "real" RAT that will count as part of the course graded.

Forming the groups. As discussed above, the group formation process needs to distribute assets and liabilities and avoid the emergence of sub-

groups. As a result, the starting point in the group formation process is to gather information about the specific student assets and student liabilities that could potentially impact student performance in this class. Assets and liabilities for a particular course might include such things as work experience, previous relevant course work, access to perspectives from other cultures, etc.

After student characteristics have been identified, actually assigning students to groups, can be done in a variety of ways. This requires that the teacher know how large he/she wants the groups to be and then, based on this and the size of the whole class, how many groups are needed.

In general, the ideal group size for the development of teams is five to seven members. Once group size is determined, one can begin the process of distributing individual member characteristics across the groups.

I recommend actually forming the groups in class in the presence of the students. This procedure virtually eliminates student concerns about any ulterior motives the instructor may have in forming the groups.

To form groups in class, the teacher begins by simply asking questions about the factors that are important to group success. For a class in management, typical questions could include, "How many of you have four or more years of full-time work experience?", "How many have access to a laptop computer you can bring to class?", "In which country did you attend high school?, etc. Students respond to each of the questions either orally or with a show of hands. Then, students possessing a series of specific assets are asked to form a single line around the perimeter of the classroom with the rarest and/or most important category at the front of the line. After students are lined up, they simple count-off down the line by the total number of groups in the class. All "ones" become Group 1, all "twos" become Group 2, etc. With this simple method, individual student characteristics can be easily distributed across the teams.

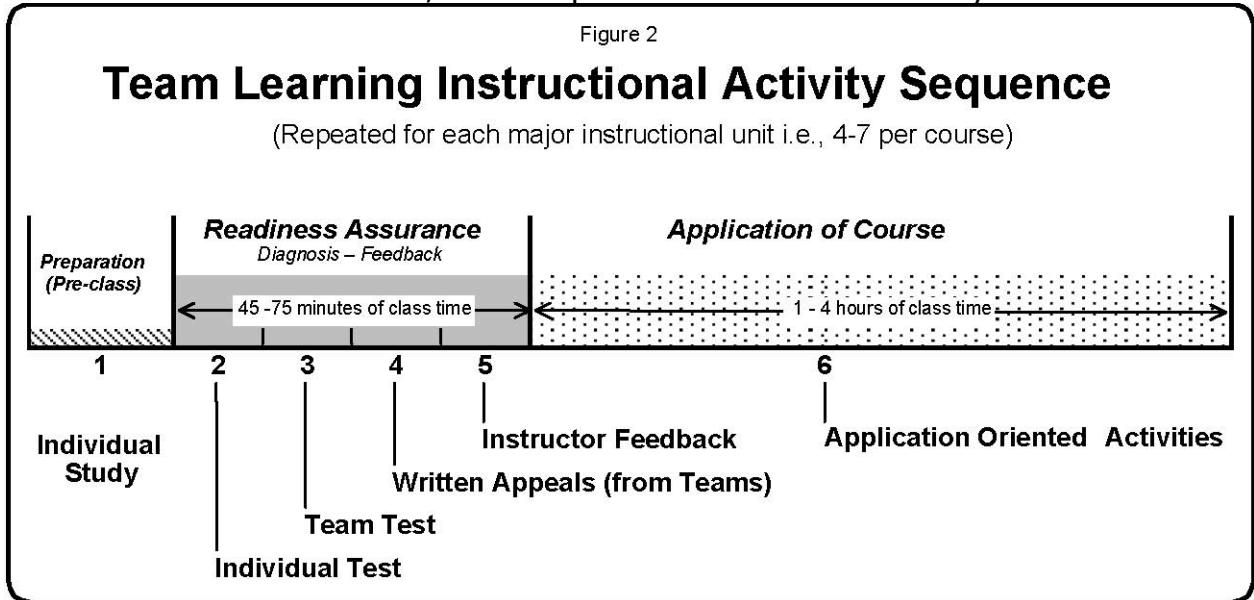
Alleviating student concerns about grades. The next step in getting started on the "right foot" with team learning is to address student concerns about the grading system. For the most part, students' uneasiness about grades in a group-oriented course are based on past experience in which they have been forced to choose between carrying the group or getting a bad grade. Fortunately, their anxiety largely goes away when they understand two of the essential features of team learning. One is that two elements of the grading system, "counting" individual scores on the Readiness Assessment Tests and basing part of the grade on a peer evaluation, create a high level of individual accountability for pre-class preparation and class attendance. The other is that there is little danger that one or two less-motivated members can put the group at risk because the team assignments will be done in class and will require thinking, discussing, and deciding.

An effective way to alleviate student concerns about grades is to directly involve them in the development of the grading system. Students become involved by participating in an exercise called "Setting Grade Weights." Within limits set by the instructor, representatives of the newly-formed teams negotiate with one another to reach a mutually acceptable set of weights for

each of the grade components: individual performance, team performance, and member's contributions to the success of their teams. After an agreement has been reached regarding the grade weight for each component, the standard applies for all groups for the remainder of the semester.

Each Major Unit of Instruction

For each of the 4-7 major topics in the course, team learning sets up a sequence of learning activities, as shown in Figure 2. These instructional units extend over 6-10 class hours, which equates to 2-4 weeks in many courses.



Each of the in-class activities should be contribute to two major educational goals. One is to build students' understanding of course content. The other is to increase group cohesiveness to the point that the majority of the groups successfully develop into self-managed learning teams.

Ensuring content coverage. In team learning, the basic mechanism to ensure that students are exposed to course content is the Readiness Assurance Process. This process occurs 5-7 times per course and constitutes the first set of in-class activities of each major instructional unit. It also provides the foundation for individual and team accountability as one of the building blocks of team learning (see above). The Readiness Assurance Process has five major components, as shown in Table 1.

Table 2.1

Readiness Assurance Process

- 1) **Assigned Readings** . In most instances, the students are initially exposed to concepts through assigned readings.
- 2) **Individual Test** . Additional exposure during the individual test helps reinforce students' memory of what they learned during their individual study.
- 3) **Team Test** . During team tests, students orally elaborate the reasons for their answer choices. As a result, they are exposed to peer input that aids in strengthening and/or modifying their schemata related to key course concepts. In addition, they gain from acting in a teaching role.
- 4) **Appeals** . During this step students are given the opportunity to restore credit for questions missed on the team test by making a successful written appeal. Because students have the opportunity to increase their score, they are highly motivated to engage in a focused re-study of troublesome concepts.
- 5) **Oral Instructor Feedback** . Steps 1-4 ensure that the instructor is aware of students' level of concept understanding. In step 5, the instructor provides feedback/corrective instruction that is specifically aimed at resolving any misunderstandings that remain after students have done the focused review in preparing the appeals.

Assigned readings. Prior to the beginning of each major instructional unit, students are given a reading assignment that is to be completed outside of class. The readings should contain information on the concepts and ideas that students should understand by the conclusion of the instructional unit and constitutes the first component of the Readiness Assurance Process. Students are to complete the readings and come to the next class period prepared to take a test over the material they have just read.

Individual test . The first in-class activity in each instructional unit is the Readiness Assessment Test (RAT) over the set of assigned readings. The RATs typically consist of short multiple-choice questions on the key concepts from the readings. As a result, the RAT questions should focus on foundational concepts (and avoid picky details) but be difficult enough to create discussion, once the teams take the test.

Team Test. When students have finished the individual RAT, they turn in their answers and immediately proceed to re-take the same test, but this time as a group. And, in order to complete the group test, members must reach agreement on each test question. As an integral part of the Readiness Assurance Process, the discussion required to choose a group answer both

serves as an excellent review of the readings and allows students to learn from each other.

As soon as groups complete the test, they turn in their answers for immediate scoring. Both sets of answer sheets (individual and group) are then handed back so that students have feedback on both individual and group performance. This allows them to have concrete and immediate feedback on how effective they have been in using the intellectual resources of group members. Individual scores remain anonymous, but the group scores are posted on the blackboard so the groups can monitor their performance by comparing their scores with those of the other groups.

Appeals. At the end of the testing sequence, students are allowed and encouraged to appeal any questions that were missed by the group on the group test. This is an open-book process in which students can submit any reason they have for arguing that their answer should be considered "correct" rather than wrong. This exercise provides yet another review of the readings.

Instructor Feedback. After the students can submitted their appeals, the teacher can comment, in the form of a mini-lecture or short discussion, on any topics or questions that the groups seemed to still be unclear about.

The Readiness Assurance Process in Summary. One of the very attractive features of the Readiness Assurance Process is that it allows instructors to virtually eliminate class time that is often wasted in covering material that students can learn on their own.

It is also important to emphasize the significance of the Readiness Assurance Process because of its effect on team development. The RATs are the single most powerful team development tool I have ever seen because they promote team development in four specific areas. First, starting early in the course (usually the first few class hours) the students are exposed to immediate and unambiguous feedback on both individual and team performance. As a result, each member is explicitly accountable for his or her pre-class preparation. Second, because team members work face-to-face, the impact of the interaction is immediate and personal. Third, students have a strong vested interest in the outcome of the group and are motivated to engage in a high level of interaction. The strong interest results from the fact that the students receive both intrinsic and extrinsic rewards for successful team performance. Finally, cohesiveness continues to build during the final stage of the process, i.e., when the instructor is presenting information. Groups become more cohesive because the groups know they are getting information that they will need in the next phase of the sequence, the application problems.

Team Folders and the development of positive team norms.

Learning teams will only be successful to the extent that individual members adopt the two critical group norms: pre-class preparation and class attendance. Fortunately, if students have ongoing feedback emphasizing the fact that pre-class preparation and class attendance are critical to their team's success, these norms will pretty much develop on their own. One very

simple, yet effective, way to provide such feedback to the students is through the use of team folders. The folders should contain an ongoing record of each member's attendance, along with the individual and team scores on the RATs and other assignments. The act of recording the RAT scores and attendance data in the team folders is particularly helpful because it ensures that every team member knows how every other team member is doing.

Near the End of the Term

Near the end of the term, teachers need to remind students of what they have learned about: 1) course concepts, 2) concept applications, 3) the value of teams in tackling intellectual challenges, 4) the kinds of interaction that promotes effective team work and, 5) themselves.

Brief review of course content. One of the greatest benefits of using team learning is also a potential danger. Since so little class time is aimed at providing students with their initial exposure to course concepts, many tend to forget how much they have learned and, based on the reduced volume of lecture notes alone, some may actually feel that they have been cheated. An effective way to prevent this potential problem is devoting a class period to a concept review. In its simplest form this involves: 1) giving students an extensive list of course concepts (usually on a single sheet), 2) asking them to individually identify any concepts that they don't recognize, 3) compare their conclusions in the teams, and 4) review any concepts that teams identify as needing additional attention.

Understanding content applications. By the end of most course, instructors may need to help students review and integrate what they have learned about applying the content. One way of doing this is by assigning teams to solve problems that are unstructured and require using concepts from multiple content areas. For example, during the semester, a teacher of statistics might have students decide whether or not some treatment had produced a significant result in a given situation. Later, the instructor might use a case in which different groups were using statistics to argue for different policies and asking them to decide which group had the soundest argument for their position. In my own courses, I often use novels and full-length feature films to provide a complex setting in which students can practice integrating a wide range of management and organizational behavior concepts.

Learning about the value of teams. One of the major learning goals in team learning is for students to understand and appreciate the significance of team work in solving challenging problems—in any sphere of life. Usually, by mid-term, students are quite aware that their teams are outperforming their own best member, but they are seldom aware of either the magnitude or the pervasiveness of the effect. Therefore, near the end of each term, I create a transparency that shows 5 cumulative scores from the RATs for each team—the low, average and high member score, the team score and the difference between the highest member score and the team score. Most students are

literally stunned when they see the pattern of scores for the entire class. In the past 14 years, over 99% of the teams have outperformed their own best member by an average of nearly 11%. In fact, in the majority of classes, the lowest team score in the class is higher than the best individual score in the entire class (e.g., see Michaelsen, Watson & Black, 1989).

Recognizing effective team interaction. One other observation is that, although the teams become effective at solving complex problems, students generally fail to recognize the changes in members' behavior that have made the improvements possible.

To increase their awareness of the reasons for changes in individual behavior, I have used two different approaches that focus on the relationship between group processes and group effectiveness. One approach is an individual assignment that requires students to: 1) review their previous observations about the group, 2) formulate a list of "changes or events that made a difference," 3) share their lists with team members, and 4) create a written analysis that addresses barriers to team effectiveness and keys to overcoming them. The other, and more effective approach, involves the same assignment but, having students prepare along the way by keeping an ongoing "log" of observations about how their team has functioned.

Learning about themselves. One of the most important contributions of team learning is that it creates conditions that can enable students to learn a great deal about the way they interact with others. In large measure, this occurs because of the extensive and intensive interaction within the teams. Over time, two important things happen. One is that members really get to know each others' strengths and weaknesses and, as a result, have clear insights as to what kind of feedback is needed. The other is that, in the vast majority of teams, members develop such strong interpersonal relationships that they feel morally obligated to provide honest feedback to each other.

This is one of the functions of a well-designed peer evaluation process. In its simplest form, this involves formally collecting data from team members on how much and in what way they have contributed to each others' learning and making the information (but not who provided it) available to individual students.

Part III - Benefits of Team Learning

Using groups, even in a casual way, produces benefits that cannot be achieved with students in a passive role. While even the casual use of teams is beneficial, it must be stressed that team learning allows the achievement of important outcomes that simply cannot be obtained with temporary groups or occasional group activities. Some of these benefits include: 1) developing students' higher level cognitive skills in large classes, 2) providing social support for "at-risk" students, 3) promoting the development of interpersonal and team skills, and 4) building and maintaining faculty members' enthusiasm for their teaching role.

Using Learning Teams in Large Classes.

Team learning is one of the few ways, maybe the only way, to achieve higher-level cognitive skills in large classes. Team learning is also effective in motivating attendance, handling discipline problems, and engaging members who would benefit from group work but, given the opportunity, would prefer to work alone. While temporary groups can provide a valuable aid in small classes where the instructor's physical presence is sufficient to ensure that no one "escapes" (either physically or mentally) and that students are actually working on assigned tasks, temporary groups simply cannot exert enough influence on their peers to motivate attendance, handle discipline problems, engage members, etc., especially in large classes.

Increased Social Support for Various Types of At-Risk" Students

Students in team learning classes have a social support base that is beneficial in multiple ways, unlike temporary groups whose social support typically ends when the class period is over. For example, group-based instructional approaches have been shown to reduce stereotypes of racial and ethnic minorities and physically handicapped students (Johnson, Johnson & Maruyama, 1983) and increase self-esteem (Johnson & Johnson, 1983). In most classes, the social interaction, which is a natural part of team learning, provides benefits to students who often do not feel at ease in a traditional classroom. For example, international students often find lasting friendships and grow in their understanding of a new culture; older students discover that their accumulated life awareness is an appreciated and valuable asset; students who are at risk of dropping out form working relationships that assure them of help in future assignments and other classes; and students who are having difficulty maneuvering their way through the campus bureaucracy have a ready source for answers to their questions and concerns.

Development of Interpersonal Skills

Unlike temporary groups, where tough interpersonal issues can be avoided simply by waiting until the groups are re-formed, students in team learning classes cannot easily escape the problems they encounter in their groups. As a result, many learn lessons about themselves that allow them to be more effective and productive when they finish school and enter the work force. In addition, because students have to learn to work together, they develop the understanding and skills they need to work productively as task group members. Finally, part of effective group work is believing that the benefits of working in groups outweighs the costs. Unlike groups used in a supplementary way, the vast majority of team learning groups provide solid evidence of the terrific potential of effective learning teams for accomplishing difficult intellectual tasks.

Building and Maintaining an Enthusiasm for Teaching

Probably the greatest benefit of team learning is that it has a tremendous positive impact on the instructor. Being responsible for creating enthusiasm and excitement about the course content is a burden that few are able to carry for long without burning out. As a result, even the most

dedicated and talented instructors are likely to try to find ways of reducing their teaching load. With team learning, however, the groups handle most of the aspects of teaching that, for most, are simply drudgery. For example, the instructor almost never has to go over basic concepts or answer simple questions. The RATs handle that task with ease and most of the remaining questions, even in basic courses, are challenging enough to be interesting. In addition, instructors rarely have to worry about attendance problems. Students come to class because they want to.

Team learning also produces instructor enthusiasm because it taps into the energy that is released as the student groups develop into learning teams. Although there are typically some initial struggles, most groups' capabilities steadily improve to the point where students behave more like colleagues than "empty vessels." This is the natural outcome of empowering groups by structuring them so that they have needed resources, are exposed to appropriate performance evaluation systems, and have the opportunity to engage in meaningful and challenging assignments. As a result, the vast majority of students willingly share responsibility to ensure that learning occurs. When this happens, teaching with team learning is simply more fun.

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