

*was the best motivator of good writing that I observed in 40 years of teaching!*

## ***Chapter 8***

# ***Cooperative Learning***

Cooperative learning is a new idea to professors who think of higher education as lectures, laboratories, term papers and competitive exams. Evaluating the roles of individual, competitive and cooperative learning in the classroom, Johnson and Johnson (1994) state “*Cooperation is the most powerful of the three ways to structure learning situations.*” While college students often meet in discussion groups and work together in pairs in laboratories, formal cooperative learning is more than just having students work together. Cooperative learning focuses on group work where professors are guides more often than lecturers. Our approach to cooperative learning prior to my retirement from Cornell in 1998 are in Boomer and Moen (1996), Fazzari and Moen (1996), Moen and Decker (1996), Runge and Moen (1996), Moen et al. (1996), Moen et al. (1998), and Moen et al. (2000); some of the details are summarized in this chapter.

The concept of cooperative learning has been discussed for many years (Slavin 1983) and was active in public education during the late 1800’s (Johnson et al. 1984). Because students teach themselves and their peers they retain information more effectively than when they learn passively by themselves (Davis 1993, Ventimiglia 1995). By working with their peers rather than competing against them, students learn to communicate, compromise, and produce as a team.

The room in which cooperative learning takes place may not look much different from other college classrooms or laboratories; it is how learning takes place that is different.

### ***A COOPERATIVE LEARNING ENVIRONMENT***

Lecturing is so traditional in college that many professors may find it difficult to move toward a cooperative learning environment. College students may have a hard time adjusting too because they expect to go to lectures, take notes, read text and reserve reading assignments, write term papers, and take tests. Both professors and students may resist a cooperative learning approach just because it is different.

Giving lectures may seem to be more efficient than implementing interactions among students during lecture periods, and it is if delivering information is the goal. While it is not my intent to minimize the value of a stimulating lecture, our goal as educators should be to maximize learning. College classrooms, however, are often designed for high faculty:student ratios that maximize information delivery. *If maximizing learning is the goal, then professors should try to develop the most effective learning environment possible.*

#### ***Physical Design***

A well-designed cooperative learning classroom promotes communication and cooperation among students so learning occurs naturally. The arrangement of the room should encourage discussion, and information resources and research equipment should be readily available so students can work together efficiently. As Johnson et al. (1984) point out, the physical arrangement of a room or rooms is an

important determinant of how, and how much, students learn.

***Furniture.*** Students should be able to work in small groups at small tables, and meet as a larger group at larger tables. Chairs should be placed around the tables with no “head” chair for the professor because students work with, rather than just listen to, the professor. Computers should be an integral part of the room; they should never be in a separate “computer room” because they are used so often throughout the learning process. TV/VCR units should be available for individuals and small groups to view course-related videos. The traditional blackboard should also be available for students to use when sharing and discussing ideas. Ideally, a cooperative learning environment should include a room or group of adjacent rooms where a variety of activities—formal and informal, small group and large group—can take place.

***Research equipment.*** College courses usually include some kind of independent library, laboratory, or field research. Laboratory and field research involves special equipment that should not only be readily available to the students, but instructions for its use should be published electronically on the local area network. Manufacturer instructions can be supplemented by material written by students who have used the equipment, helping students learn to use the equipment more quickly. Keep in mind that students in a cooperative learning environment design their own experiments rather than all doing the same one at the same time.

***References.*** References needed to prepare background information and document current work by students should be readily available either physically or electronically from the cooperative learning area. A collection of particularly

important reference books should be available in a library corner and the in-room computers make it possible for students to access library resources. If a work group needs to go the library to access references, a cooperative learning environment provides that flexibility.

All of these ideas, and many more not mentioned, will likely not be possible to include or implement immediately when moving to cooperative learning in college courses. Suggestions for making the transition are in Chapter 11, and as cooperative learning becomes more important in college courses, rooms will, hopefully, be designed to accommodate this dynamic approach better.

### ***Group Design***

Cooperative learning focuses on learning groups that vary in size from two to the whole class. A small working group of 3-5 students is one of the more common group sizes. Each individual in the group is responsible for part of the group work, and the group is responsible to the whole class.

***Small working groups.*** A small group of 3-5 students can work on a specific concept, experiment, publication or presentation and share their results with the class. Such a group should have a leader, and students should take turns being the leader if they work together for a longer period of time. Working groups should change periodically, and the individuals should be identified objectively rather than by students choosing their own partners. Each learning group is to be responsible for some identifiable learning experience, and each individual in the group is responsible for contributing to the group.

***Individual responsibilities.*** Individual students are responsible for their own reading, writing, and contributing to the groups ideas. Individuals take turns being leaders. Sometimes they may be given specific roles, such as chairperson, recorder, and even “encourager.” The chairperson leads the group, the recorder takes notes on work being done, and an encourager commends the others for their contributions. *The role of an encourager can be very effective because students want to do better when others recognize their work and commend them for it.*

***The class as a whole.*** All of the students learn from each other in a cooperative learning environment. The publications of individuals and small groups should provide substantial information to the entire class. Large group discussions and class conferences provide opportunities for students to share formally what they have learned with the whole class.

### ***The role of an Oral Communication System***

Students should be encouraged to make professional-quality oral presentations in a cooperative learning environment. It cannot be assumed that students know how to do that...instructions for a variety of oral presentations were part of the ***Oral and Written Communication System*** in our Cooperative Learning Center, accessed through the menu below.

- ❑ Oral Communication Guidelines
  - ❑ Introducing Ourselves and Others
  - ❑ Interview Guidelines
    - ❑ Job Interviews
    - ❑ Information Interviews
  - ❑ Performance Reviews
  - ❑ Speech-making Guidelines

### *A Course Continuum*

- ☐ Presenting Scientific Papers
- ☐ Meeting Preparation Guidelines
  - ☐ Preparing Meeting Agendas
  - ☐ Chairing a Meeting
  - ☐ The Business Lunch
  - ☐ Telephone Conference Calls
  - ☐ Radio Presentations
  - ☐ Video and TV Productions

Students in the management class (see the course list on page 97) participated in almost all of the above oral activities. They conducted information interviews with other professors, sometimes while having a business lunch, prepared agendas and chaired meetings, introduced speakers, arranged for telephone conference calls, and more. All of these activities were real; they were not practice sessions where another student pretended to be a special speaker...students introduced real guest speakers for the class.

### ***The Roles of the Professor***

College professors are not likely to be able to make sudden and wholesale shifts from traditional to cooperative learning. Many elements of cooperative learning can be incorporated in the more traditional classroom and course structure, however. Some ideas are shared below.

***The lecture period.*** A subtle shift in emphasis can be made by thinking of the lecture period as a time when a variety of learning activities, including one or more short lectures, replace the traditional 50-minute lecture. Delivering large amounts of information by lecture is no longer necessary because information can be made readily available electronically. Short lectures of 10-15 minutes duration can be interspersed with temporary discussion groups of a few minutes duration. They can be set up in almost any

classroom for discussion of an idea, concept, or question presented by the professor. Group size is determined in part by the arrangement of seating, but three students in a group is a good size.

***The professor as guide.*** The professor is much more of a guide who works with the students than the one who is the source of knowledge for the students. Rather than being the authority who is responsible for what the students learn, the professor becomes a facilitator who helps students identify what they should learn and helps the students become responsible for their own learning.

***Authentic assessments.*** Professors traditionally write and administer examinations periodically throughout a semester. This tends to make the professor-student relationship an antagonistic one because the students are assigned grades relative to their performance on the professor-mandated test. Authentic assessments can replace the more arbitrary tests in a cooperative learning environment as students are evaluated on the basis of their participation, productivity, and publications. Such evaluations are similar to on-the-job assessments that look at the overall performance of a person rather than their responses to specific questions.

### ***The Roles of Students***

Students actively participate in their own learning in a cooperative learning environment. While they work with other students much of the time, they must complete their own individual learning activities as well.

***Individual learning activities.*** In the traditional college course, individuals are usually expected to do their own work and write their own papers; they are not encouraged to

work together. In a cooperative learning environment, individuals are expected not only to learn on their own but also to share what they learn with other students. Specific learning requirements are divided up among the students rather than imposed on all of the students at one time. Students then use what they learn to be each other's teachers.

***Cooperative learning activities.*** College students are often expected to do research projects, often alone. Having two or three students work together on original research increases the number of ideas, provides practice in group planning, and may increase the scope of a project and the amount of data that can be collected. Promoting discussions in the planning, data collection, interpretation, and reporting phases of research provides meaningful practice for professional work. Discouraging cooperative research denies students opportunities to work in the way career professionals usually do...*cooperatively with other professionals.*

***Competitive learning activities.*** Competitive learning has a place in cooperative learning environments because every student should be held accountable for the quality of their work. The competitive component may not have to be imposed by professors, however, because peer pressure is a powerful motivator. When students know other students will use their work, competitive motivation happens naturally. *A cooperative learning environment should have an appropriate balance between individual, cooperative, and competitive learning activities.*

***Mentoring.*** It is customary to have laboratory assistants who are responsible for "running the labs" and helping the students with their assignments. Undergraduate students who work ahead of the rest of the other students can be mentors, helping others students acquire the knowledge and skills needed. Students often enjoy learning from a peer more than



from an authority figure, and *a mentoring environment reduces dependence on a laboratory assistant or professor.*

### ***The Roles of Undergraduate Teaching Assistants***

Undergraduate student teaching assistants are a valuable and potentially large human resource in a cooperative learning environment (Moen et al. 2000). Professors can identify a group of excellent undergraduate assistants by recognizing the good work their students do, showing respect for their abilities by providing them with meaningful responsibilities, valuing their opinions and perspectives, and by using their academic contributions in meaningful ways with other students. Students look forward to being teaching assistants when meaningful opportunities are provided.

Undergraduate teaching assistants in the Cooperative Learning Center were models for the other students to follow. They had been selected because of their interest and commitment to the cooperative learning environment. They guided learning groups as they prepared plans, helped students design their field research and analyze their data, helped student project leaders prepare for meetings of the learning groups, wrote computer programs, and much more.

The undergraduate teaching assistants met weekly to discuss issues related to the learning environment, to discuss how particular problems might be handled, and to prepare for future activities in the Learning Center. The teaching assistants felt they were an integral part of the learning environment because their ideas and evaluations of the learning environment were respected and implemented.

### *A Course Continuum*

Some particularly important activities and responsibilities of the group of undergraduate teaching assistants in the Cooperative Learning Center are described briefly on the next page.

- *A wilderness canoe trip to Algonquin Park during the fall break provided an opportunity for the students to enjoy time together and “bond” as a group.*
- *The weekly meetings provided me with an opportunity to share the cooperative learning philosophy and implement specific ideas that strengthened that philosophy.*
- *The students chose different responsibilities in the Learning Center, such as computer operation, library organization, maintain the reprint collection, etc.*
- *Two students signed up for one or two afternoons each week as the TA in charge of the Learning Center, although any TA could assist any time they were able to.*
- *Some of the student teaching assistants were able to help students write computer models, and assisted them with formatting, programming logic, etc.*
- *All of the teaching assistants learned how to edit text files with the student authors before the file was submitted to the “editor-in-chief,” that is to me, the professor!*

Many more activities and responsibilities could be added to the above. The best way to summarize the roles of undergraduate teaching assistants is by describing them as professional support staff with responsibilities similar to those of the professor and graduate teaching assistants. At Cornell, the undergraduate teaching assistants enrolled for credit rather than being paid in dollars.

One of the most striking outcomes of this unusual reliance on undergraduate teaching assistants was the high respect the students showed for the undergraduate teaching assistants. I observed senior students enrolled in a course working with a junior teaching assistant as if the TA was a professor!

It must be emphasized that the group of undergraduate teaching assistants learned how to be helpful teaching assistants just as students must learn how to cooperate in a cooperative learning environment. They learned how to gain the respect of the students. When they had questions about how to handle particular situations or students, I would discuss them privately or with the whole group at our next weekly meeting. *Being an effective undergraduate teaching assistant involved a lot of learned behavior.*

### ***BENEFITS OF COOPERATIVE LEARNING***

Many students do better when governing their own learning in a cooperative learning environment than when being told what to do. Improvements are not automatic just by turning responsibility over to them, however. Master teachers who motivate students to want to learn and help them learn how to learn very likely have a well-designed framework behind the learning environment that is invisible to the students.

We all need skills to be successful learners, and after over 40 years as an educator I was still learning new learning skills. Information access and problem-solving power have never been greater than they are now because of the personal computer. Learning opportunities never before dreamed of are now available, and it is vital that professors take a long hard look at how they can be used creatively in the classroom. *Avoid doing the same things quicker and slicker*

*on a computer; make the learning environment more creative and learning more meaningful instead.*

A cooperative learning center provides opportunities to blend a number of different activities together, not only within a course but also between courses. An important concept in cooperative learning, especially with the course continuum discussed in Chapter 9, is that students from several courses work together in a cooperative learning environment at the same time.

Since cooperative learning involves planning by students, they gain practice in time management. By sharing what they learn, they participate in lateral information transfer. These two attributes of cooperative learning are discussed next.

### ***Time Management***

Time is a precious and limited resource. When a professor tells the students what to do and when to do it, the professor has assumed responsibility for time management. This is an expeditious way to run a course, but courses should be designed to enhance learning rather than efficiency in teaching. Helping students learn how to manage time by giving them more responsibility for decisions about their progress and productivity during a semester is an important part of the learning experience. Knowing how to manage time effectively contributes to success in both personal and professional life, and professors should give their students opportunities for time management whenever possible. Some considerations when helping students learn to manage their own time follow.

***Avoiding over-commitment.*** One of the ways professors can help their students learn good time management is by avoiding over-commitment. Teachers need not “cover the

material” just to get through it, and they need not burden students with assignments in order to prove it's a “tough course.” It is better to think of quality time with students who learn their lessons well because they want to than to over-commit them. *Being a good time management model helps students learn to manage their own time better.*

***Setting due dates.*** It is customary for teachers to set due dates for assignments. Setting one date for all students is an easy way to keep the course calendar simple, but having all the students turn in their assignments at one time creates a workload that often results in long delays in returning their work. Having students set the due dates for their work, within a reasonable time frame of course, puts the responsibility for time management on the student. Further, it spreads the dates out, giving teachers and assistants more time to go over the work with each student and to return it to them sooner. This should result in higher quality work that is worth sharing with other students. *The long-term benefits of closer attention to quality student work are real.*

### ***Lateral Information Transfer***

Another benefit from cooperative learning is that lateral transfer of information is maximized. In other words, students in a cooperative learning environment learn from each other rather than waiting to learn from the teacher. A cooperative learning environment is like a one-room school where learning takes place across several grades.

***Cooperative work on assignments.*** It is traditional to have students do their own work, yet it can be very valuable for them to work together on assignments. The “do your own work” tradition is perpetuated in part because teachers feel they must evaluate students individually. While grades are assigned to individuals, the work of individual students

in a cooperative setting can still be evaluated. In fact, individual evaluation is often easier in a cooperative setting because those who work well with others are easily recognized. *It is a more authentic real-life assessment because working together is expected in our society.*

**Seamless courses.** Having students from several courses working together in a cooperative learning environment promotes the concept of “seamless” courses. Students learn from each other just by working together, whatever course they are enrolled in. Meaningful connections between course contents are made spontaneously in a seamless course environment, which is better than trying to force interdisciplinary coursework. Watching first-year students work alongside Ph.D. candidates in a seamless course environment was rewarding for me when I observed less experienced undergraduates benefit from the help they receive from my more experienced graduate students.

### ***COMPETITION AND CONFLICT***

Making a limited number of “A” grades available in traditional college courses guarantees competition. How is the number of “A” grades determined? Usually by decision of the professor. If a course is meant to be tough fewer A’s are given. If a professor wants to make a course easier, more are given. However the number is determined, professors can establish arbitrary quantities of student grades.

One of the characteristics of professional work is that workers need to cooperate with each other. They ought to share appropriately, encourage when necessary, and contribute jointly to the success of work groups. Students should be introduced to this need for cooperation when they are preparing for their careers. Cooperation is not automatic in college classrooms when students begin working together

on projects designed to emulate professional work, however, and conflicts arise often. Some experiences with conflict resolution are described next.

### ***Competition may be Good or Bad***

In a cooperative learning environment, competition can be good or bad, depending on the context. If there is too much competition in a cooperative learning environment, the benefits of effective cooperation may be set aside as students are reluctant to help the competition, *i.e.* each other. If there is too little competition, students may not be motivated to learn as much. An appropriate amount of competition helps motivate students, and the best form of competition in a cooperative learning environment is peer pressure. Students should want to do well so they do not let their peers down. They may try to outdo each other, even though the ultimate goal is group productivity. Conflicts are sure to arise when groups of students work together, especially when the cooperative approach is new and they have not yet benefited from the effects of cooperative learning.

### ***Resolving Personality Conflicts***

Two students told me, independently, that they could not get along with the other. Since I did not expect either of them to tell each other that they had talked with me about their problem, I asked each of them to concentrate on being more courteous, polite, and complimentary to the other. Then I arranged for them to work together on a project. I did not observe open conflict between them as they worked, but neither did I pry into their feelings to see if my suggestions and arrangement worked. I was willing to accept the fact that the benefits of my experiment might not be realized by

either or both of them for some time. Asking them to evaluate the arrangement too soon may have led them to conclude it was a failure. I waited to see if it worked, and in a meeting of seniors discussing their experiences in the Cooperative Learning Center, one of the two commented on the valuable lesson learned when she realized she had a bad attitude toward someone she was working with. The positive approach was more effective than giving each one of them a little talking to about “getting along with others.”

### ***Resolving Professional Conflicts***

Conflicts between professionals occur regularly in the workplace. When students work together in cooperative learning environments, they not only function more as professionals than students do in traditional learning environments, but the potential for professional-type conflicts is also there. *Learning how to deal with professional conflicts is an important part of career preparation.*

***A case of hurt feelings.*** Nine seniors in my management class were working together on a project that required individual contributions, small group contributions, and whole-group discussions. During common time one day, one student was quite critical of another student. A third student came to the defense of the second student. The first student quickly left at the end of the class period, although he and the third student had arranged to have lunch together after class. Several of the students stopped in my office during the day to talk with me about the group dynamics that morning. They saw something unique during that period—open conflict—that they had not seen before in four years as undergraduates. They also knew that such dynamics can



easily happen in the workplace, and they told me they learned a lot that day. What did I learn?

***What professors learn from student conflicts.*** It was interesting to watch group dynamics when conflicts develop, and there is a delicate point where intervention is needed. It is generally better to let students work differences out on their own, but mediation may be needed. I learned, from the experience described above, how much students appreciated seeing the conflict, although they did not like the conflict itself. Even those who were part of it appreciated it afterwards because they knew it was a learning experience for all rather than a career-threatening professional mistake by each of them. Opportunities like this do not come up in traditional lecture settings where one-way information delivery is the primary form of communication. *“Better to learn from it now than to learn it the hard way when on the job,”* one of them said.

***Skill-building by design.*** I learned from the experiences described above that college students need to learn, with deliberate planning on my part, how to interact with each other when there is criticism of a coworker in a cooperative learning environment. As we reflected on the experiences in that course, we agreed at the end of the semester that we all learned some powerful life-long lessons. We learned that interactions among the students could become more important than subject matter! Conflicts can overshadow the reason for taking a course, or the professional work that needs to be done. *One of the most important points to remember is that proper responses to criticism and problem solving are learned behaviors.*

***The professor has the ultimate responsibility.*** Ideally, students will work out their differences among themselves. Further, it is idealistic to think that every student will react positively and responsibly to all aspects of a cooperative

learning environment. That will not be case. For example, a graduate teaching assistant had to assert his authority over a student who insisted on wearing his cap when making a presentation to the class. Since we expect professional appearance and manners, the student was asked politely to remove his cap and refused. In another case, I had to assert my authority over a student who insisted on the right to sit on laboratory tables during class. Since the student did not respect my request to refrain from that behavior (which had been called to my attention by several other students), I made it clear that even though we work together in the Cooperative Learning Center, I was ultimately responsible.

### ***CONCLUDING REMARKS***

The examples given in this chapter are based on my experiences with students in a cooperative learning environment that developed over a 10-year period in the 1990s. My overall feeling from my experiences the last several years of my career is that focusing on interactions among students in a subject-area setting was a two-way street. Students learned a lot about getting along with each other and about the subject matter. The traditional setting is a one-way street. Students may learn a lot about a subject in lecture courses, but little about getting along with others. This would not be a problem if people do not need to work effectively with others. *Getting along with others is learned behavior, however, and the need to get along with others cannot be escaped in today's society.*