What is Collaborative Learning?

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Collaboration. Collaborative learning. Community. Communities of learners. Notions of collaboration and community have been informally linked to the learning process for many years, but they have become catch phrases in education in the1980's and the 1990's.Collaborative learning is now finding prominence in college view books, at conferences, and in journals on higher education. Although its various approaches are known by different names, collaborative learning is occurring in every discipline at every level of education. While these strategies are often called "innovative" and "new," they have engaged students and teachers throughout much of this century. We are simply developing new forms and adapting them to new contexts.

Collaborative learning is particularly timely now. In the1980's an avalanche of reports underscored the problems of undergraduate education: the distance between faculty and students, the fragmentation of the curriculum, a prevailing pedagogy of lecture and routinized tests, an educational culture that reinforces student passivity, high rates of student attrition, and a reward system that gives low priority to teaching. In many ways, the academy mirrors larger social trends of fragmentation, lack of civic involvement, and undercurrents of alienation. Collaborative learning, with its emphasis on social and intellectual engagement and mutual responsibility, aims to counteract many of these educational and societal trends.

Collaborative learning holds enormous promise for improving student learning and revitalizing college teaching. It is a flexible and adaptable approach appropriate to any discipline. Nonetheless, teachers who adopt collaborative learning approaches find it challenging. They inevitably face fundamental questions about the purposes of their classes, teacher and student roles and responsibilities, the relationship between educational form and content, and the nature of knowledge itself. Collaborative learning represents a radical departure from contemporary practices in postsecondary education.

In this article, we describe collaborative learning and identify some of its underlying assumptions and goals. We describe some the collaborative learning approaches most widely used in higher education, and we conclude with some observations on the challenges and opportunities that teachers encounter as they work to build collaboration and community into their classrooms.

Characterizing Collaborative Learning

"Collaborative learning" is an umbrella term for a variety of educational approaches involving joint intellectual effort by students, or students and teachers together. In most collaborative learning situations students are working in groups of two or more, mutually searching for understanding, solutions, or meanings, or creating a product. There is wide variability in collaborative learning activities, but most center on the students' exploration or application of the course material, not simply the teacher's presentation or explication of it. Everyone in the class is participating, working as partners or in small groups. Questions, problems, or the challenge to create something drive the group activity. Learning unfolds in the most public of ways.

However practiced, collaborative learning represents a significant shift away from the typical teacher-centered or lecture-centered milieu in college. In collaborative classrooms, the lecturing/listening/note-taking process may not disappear entirely, but it lives alongside other processes that are based in students' discussion and active work with the course material. Teachers who use collaborative learning approaches tend to think of themselves less as expert transmitters of knowledge to students and more as expert designers of intellectual experiences for students--as coaches or mid-wives of a more emergent learning process (Belenky, Clinchy, Goldberger, & Tarule, 1985; Schon,1983, 1987; Whipple, 1987).

Assumptions about Learning

Though collaborative learning takes on a variety of forms and is practiced by teachers of different disciplinary backgrounds and teaching traditions, the field is tied together by a number of important assumptions about learners and the learning process.

Learning is an active, constructive process. To learn new information, ideas, or skills, students have to work actively with them in purposeful ways. They need to attach this new material to, or integrate it with, what they already know--or use it to reorganize what they thought they knew. In collaborative learning situations, students are not simply taking in new information or ideas. They are creating something new with the information and ideas. These acts of intellectual processing—of constructing meaning or creating something new--are crucial to learning.

Learning depends on rich contexts. Recent research suggests that learning is fundamentally influenced by the context and activity in which it is embedded (Brown, Collins, & Duguid, 1989).Collaborative learning activities immerse students in challenging tasks or questions. Rather than beginning with facts and ideas and then moving to an application, collaborative learning activities frequently begin with problems, for which students must marshal pertinent facts and ideas. Instead of being distant observers of questions and answers, or problems and solutions, students become immediate practitioners. Rich contexts challenge students to practice and develop higher order reasoning and problem-solving skills. They invite students to join what Bruffee calls the conversation of the discipline with knowledgeable peers (Bruffee, 1984. See page XXX of this sourcebook).

Learners are diverse. Students bring multiple perspectives to the classroom--diverse backgrounds, learning styles, experiences, and aspirations; teachers can no longer assume a one-size-fits-all approach. When students work together on their learning in class, teachers get a direct and immediate sense of how students are

learning, and what experiences and ideas they bring to their learning. The diverse perspectives that emerge in collaborative activities are clarifying not just for teachers; they are illuminating for students as well.

Learning is inherently social. As Jeff Golub points out, "Collaborative learning has as its main feature a structure that allows for student talk: students are supposed to talk with each other....and it is in this talking that much of the learning occurs." (Golub, 1988).

In collaborative learning, there is the intellectual synergy of many minds coming to bear on a problem, and the social stimulation of mutual engagement in a common endeavor. This mutual exploration, meaning-making, and feedback often leads to better understanding on the part of students, and to the creation of new understandings as well.

Learning has affective and subjective dimensions. Collaborative tasks build connections between learners and ideas and between students and teachers. Listening to and acknowledging diverse perspectives, working in a cooperative spirit, becoming a peer teacher or a peer learner--all these activities are socially involving, as well as emotionally demanding. Such intense social interaction stimulates learners and learning. In collaborative learning situations, students generally experience a shift in their intellectual development as they learn to articulate their own point of view and listen to the views of others. They begin to see themselves not just as recipients of truths from textbooks or faculty members, or procedural knowers (going through the motions called for by the teacher), but as responsible creators of their own knowledge and meanings--a change that is essential to life-long learning and true intellectual development.

Goals for Education

While faculty members use collaborative learning because they believe it helps students learn more effectively, many of them also place a high premium on teaching strategies that go beyond mere mastery of content and ideas; they believe that collaborative learning promotes a larger educational agenda. Still, there isn't just one rationale for collaborative learning, but rather several intertwined rationales.

Involvement. Today's college students are increasingly diverse in terms of background, prior experience, skills, and goals; they are commuter students with busy lives, full of distractions and multiple responsibilities. It should not surprise us that many of these students have little sense of connection to each other or the academic community as a whole. Calls to involve students more actively in their learning are coming from virtually every quarter of higher education (Astin,1985; Bonwell & Eison, 1991; Kuh et al., 1991; Study Group on the Conditions of Excellence in Higher Education, 1984).These exhortations are repeatedly borne out by studies both of students who leave college and those who stay, and by studies on what students find most important and meaningful to their learning(Light, 1990, 1991; Tinto, 1987).Involvement in learning, involvement with other students, and involvement with faculty are factors that make an overwhelming difference in student retention and success in college. By its very nature, collaborative learning is socially and intellectually involving. It invites students to build closer connections to other students, to their faculty, to their courses, and to their learning.

Cooperation and team-work. In collaborative endeavors, students inevitably: encounter difference and must grapple with recognizing and working with it. Building the capacities for tolerating or resolving differences, for building agreement that honors all the voices in a group, for caring how others are doing--these abilities are crucial aspects of living in a community. Too often the development of these values and skills are relegated to what is called the "Student Life" side of the campus. Cultivation of team-

work and leadership skills are legitimate and valuable classroom goals, not just extra-curricular ones.

As Alexander Astin points out in "Competition or Cooperation: Teaching Teamwork as a Basic Skill" (1987), there is both an implicit and an explicit curriculum embedded in the content and pedagogy of any course. Often, the implicit values are unexamined. Many educational reform efforts are unsuccessful because they fail to deal with the implicit values in the educational environment. Astin believes there is an underlying culture of individualism and competition that gets in the way of many current reform efforts. Collaborative learning represents a new and different value system, one that regards teamwork, cooperation, and community as just as important as academic achievement.

Civic responsibility. These collaborative skills and values are essential components in a larger civic landscape. If democracy is to sustain in any meaningful way, our educational system must foster habits of participation and a sense of responsibility to the larger community. Collaborative learning encourages students to acquire an active voice in shaping their ideas and values and a sensitive ear in hearing others. Dialogue, deliberation, and consensus-building out of differences are strong threads in the fabric of collaborative learning, and in civic life as well.

Collaborative Learning Approaches

Collaborative learning covers a broad territory of approaches, and there is wide variability in the amount of in-class or out-of-class time built around group work. Collaborative activities can range from classroom discussions interspersed with short lectures, through entire class periods, to study on research teams that last a whole term or a year. There is also enormous variability in the goals and processes of collaborative activities. Some faculty members design small group work around specific sequential steps, or tightly structured tasks. Others are comfortable with a more spontaneous agenda developing out of student interests or questions. In some collaborative learning

settings, the task for students is to create a clearly delineated product; in others, the task is not to produce a product, but rather to participate in a process, an exercise of responding to each other's work or engaging in analysis and meaning making.

In the next section, we describe a number of widely used collaborative learning approaches. Some of these approaches, such as Guided Design and peer writing, evolved in a particular discipline and then spread to others. Others, such as seminars, peer teaching, and cooperative learning, have been used in many disciplines. Learning communities are a structural approach to curriculum reform that embraces multiple courses or disciplines.

While the approaches we describe are referred to by their distinctive names, there are myriad other small group teaching approaches that also constitute collaborative learning that we will not describe in detail. For example, many faculty punctuate their lectures with questions to student pairs or threesomes. (Johnson, Johnson, & Smith, 1991a).Others create "worksheet workshops" like those Finkel and Monkdescribe in a later article in this sourcebook (pp. XXX).In numerous lab and field courses, student pairs or student teams gather data together and produce reports. In every discipline, teachers are inventing more extended collaborative projects through presentations or debates, dramatizations and research papers. The possibilities are endless.

Cooperative Learning

Cooperative learning represents the most carefully structured end of the collaborative learning continuum. Defined as "the instructional use of small groups so that students work together to maximize their own and each other's learning,"(Johnson, Johnson, & Holubec, 1990) cooperative learning is based on the social interdependence theories of Kurt Lewin and Morton Deutsch (Deutsch, 1949; Lewin,1935).These theories and associated research explore how the structure of social interdependence influences individual interaction within a given situation which, in turn, affects the outcomes of that

interaction (Johnson & Johnson, 1989).Pioneers in cooperative learning, David and Roger Johnson at the University of Minnesota, Robert Slavin at Johns Hopkins University, and Elizabeth Cohen at Stanford University, have devoted years of detailed research and analysis to clarify the conditions under which cooperative, competitive, or individualized goal structures affect or increase student achievement, psychological adjustment, self-esteem, and social skills.

Cooperative learning structures small group learning around precisely defined tasks or problems. Although numbers of cooperative learning strategies are workable in any discipline, there are several essential elements. Positive interdependence of effort is crucial. Cooperative learning activities are designed so that every learner contributes to the collaborative task. There is "promotive interaction"; students work constructively, talking face-to-face, helping each other complete the given task. At the same time, however, careful attention is given to individual accountability and personal responsibility to achieve the group's goals. Within the framework of group work, each student's performance is still individually assessed and each student is held responsible for contributing to the group's success.

In cooperative learning, the development of interpersonal skills is as important as the learning itself. The development of social skills in group work--learning to cooperate--is key to high quality group work, and many cooperative learning tasks are put to students with both academic objectives and social skills objectives. Many of the strategies involve the assigning of roles within each small group (such as recorder, participation encourager, summarizer) to ensure the positive interdependence of the group participants and to enable students to practice different team-work skills. Built into cooperative learning work is regular group processing, a "debriefing" time where students reflect on how they are doing in order to learn how to become more effective in group learning settings (Johnson, Johnson, & Holubec, 1990).

For years, researchers in the cooperative learning field have focused their work on comparing cooperative learning contexts with competitive and individualized ones.

As the Johnsons' summary and analysis of hundreds of studies concludes, cooperative learning situations foster more intrinsic motivation, more continuing interest and commitment to achievement, greater persistence, and the incentive for everyone to succeed together. On the other hand, the motivational environment associated with competitive or individualized learning situations fosters more extrinsic motivation, less continuing interest in achievement, and lower persistence on tasks. Moreover, competition seems to motivate only "winners," students with high ability to achieve in competitive situations (Johnson & Johnson, 1989).Current cooperative learning research is now turning to the internal dynamics of cooperative learning groups, to understand more about the qualities of an effective learning group. Research findings in higher education, though less well explored, appear in more detail in Cooper and Mueck's (pp. XXX) and Slavin's (pp. XXX) articles which follow in this sourcebook.

Under the leadership of the Johnsons at the Cooperative Learning Center at the University of Minnesota, and David DeVries, Keith Edwards, and Robert Slavin at the Study for Social Organization of Schools at Johns Hopkins, cooperative learning has developed in the past 25 years into a forceful movement in K-12 education. Growing numbers of practitioners in higher education are adopting cooperative learning methods. The International Association for the Study of Cooperation in Education (IASCE) publishes the magazine Cooperative Learning and holds triennial conferences. More recently, with support from the Fund for the Improvement of Postsecondary Education, Jim Cooper and his colleagues at California State University Dominguez Hills established a Center for Cooperative Learning in Higher Education which disseminates and researches cooperative learning at the college level and publishes Cooperative Learning in College Teaching.

Problem-Centered Instruction

Problem-centered instruction, widely used in professional education, frequently is built around collaborative learning strategies. Many of these spring from common roots, especially the work of John Dewey in the early part of this century. Dewey endorsed

discussion-based teaching and believed strongly in the importance of giving students direct experiential encounters with real-world problems. Guided Design, cases, and simulations are all forms of problem-centered instruction which immerse students in complex problems' that they must analyze and work through together. These approaches develop problem solving abilities, understanding of complex relationships, and decision-making in the face of uncertainty. While problem-solving has long been a focus of professional education, it is increasingly regarded as an important aspect of the liberal arts as well. Our focus here is on problem-centered instruction that involves collaborative learning.

Guided Design. Guided Design is the most carefully structured approach to problem-centered instruction. The approach asks students working in small groups to practice decision making in sequenced tasks, with detailed feedback at every step. Developed in the late 1960's in the engineering program at West Virginia University, the Guided Design approach has since been adopted in many disciplines and professional programs, most notably in engineering, nursing, and pharmacy, but in many liberal arts and sciences courses as well (Borchardt,1984; Day, Macy, & Jackson, 1984;deTornyay & Thompson, 1987;Miller, 1981; Roemer, 1981; Vogt, Cameron, & Dolan, in press).Each Guided Design activity presents a large and open-ended problem to students, but the problem is broken down into the following steps: (1) situation or problem definition, (2)statement of the goal, (3) generation of possible solutions, (4)evaluation of solutions, and (5) development of a plan of action. Each of these steps themselves involve open-ended questions. To answer them, students must marshal both information and the thinking skills of analysis, synthesis, and evaluation.

They also must build their social skills to work in a team, reconcile differences, and reach a common decision. After developing their response to each step of the "design," each student team receives written feedback from the faculty member, the "professional," about the strengths, weaknesses and implications of their decision. At each step of the process, there is an interplay between novice problem-solver and

expert problem-solver. (Wales, Nardi, & Stager, 1987)Some designs take about a week to complete, while others run over several weeks of a course.

Careful guidance underpins this approach; it develops from the sequenced steps, from related homework assignments, from the thinking of other students, and from detailed feedback from the faculty member at each step in the process (Wales et al., 1978).Charles Wales at West Virginia University, Director of the Center for Guided Design, and Robert Stager at the University of Windsor co-developed this approach. Guided Design practitioners share their work under the auspices of the International Society for Exploring Teaching Alternatives (ISETA), an organization that promotes a variety of alternative teaching approaches.

Cases. Case studies have long been a staple for teaching and learning in the professions, particularly in the fields of business, law, and education, and they are now being used in many other disciplines as well. A case is a story or a narrative of areal life situation that sets up a problem or unresolved tension which the students analyze and resolve. The use of cases does not necessarily imply collaborative learning or small seminar discussion. However, case method teaching frequently asks small groups of students to tackle cases in class or in study group sessions.

Harvard University's Business School pioneered the development of the case method in the early part of this century. The dean of Harvard's first business program saw the case method as especially 'appropriate to educating managers and decision-makers. As one of Harvard's early professors put it, "[Businesspeople must be able] to meet in action the problems arising out of new situations of an ever-changing environment. Education, accordingly, would consist of acquiring facility to at in the presence of new experience. It asks not how a man may be trained to know, but how a man be trained to act" (Dewing, 1931, 23).

More recently, in The Reflective Practitioner: How Professionals Think in Action, Donald Schon examines how professionals solve, problems and how they develop a

highly valuable type of knowledge through reflection-in-action. He believes that education must be designed to promote this reflective practice, by immersing students in the "complexity, uncertainty, instability, uniqueness, and value conflicts which are increasingly perceived as central to the world of professional practice" (Schon, 1983, 14).Cases provide a kind of classroom apprenticeship for professional decision-making.

Cases can describe an actual event or composites of several events. They can be developed from almost any materials- -letters, business reports, legal documents, or descriptions of actual historical events. Effective cases are complex and realistic, with a strong sense of plot and character. Case narratives compress time and space but otherwise mirror real life in all its provocative complexity and ambiguity. Cases can be very brief, as short as several paragraphs, or quite lengthy. As Boehrer and Linsky point out, the definition of a case is quite elastic and the form of cases is changing: "today, video and computer technology come into increasing use, separately and together, both to present cases and to engage students in working through them" (Boehrer & Linsky, 1990, 56).

Harvard's professional schools have spent many years refining the case method and developing new ways of supporting it in the classroom through the development of new cases and faculty training seminars. Harvard remains the richest source of published cases on a wide variety of subjects in business, law, education, and public policy (Christensen & Hansen, 1987; McNair& Hersum, 1954).There is now a new renaissance of interest in teaching with cases, especially in schools of education and many professional graduate schools.

Problem- centered instruction in medical education. Problem-centered instruction has also emerged in recent decades in the field of medical education. This work began in England, then spread to Canada and ultimately to the United States. M.L.J. Abercrombie's research in England in the 1950's had a profound impact on collaborative learning in medical education both in England and North America (Abercrombie, 1970, 1961).She made a compelling case for discussion methods of

teaching, contending that when people work in teams, they make more valid judgements than when working alone. McMaster University in Canada was one of the early pioneers in problem-centered medical education(Barrows & Tamblyn, 1980), followed by Western Reserve University, the University of New Mexico, and others.

In 1985, the Harvard Medical School adopted a problem-based curriculum entitled "New Pathways" that has garnered national attention. It was so successful in its pilot years that the program was quickly extended to all students. While several medical schools have ambitiously mounted whole curricula and extensive teaching support around problem-based instruction, many other campuses have embarked on more modest efforts, building individual courses around these approaches.

Simulations. Simulations are complex, structured role-playing situations that simulate real experiences. These complex scenarios provide one of the most open-ended forms of collaborative learning and often the most exciting way to get students involved. Most simulations ask students, working individually or in teams, to play the roles of opposing stakeholders in a problematic situation or an unfolding drama. Taking on the values and acting the part of a stakeholder usually gets students emotionally invested in the situation. The key aspect of simulations, though, is that of perspective-taking, both during the simulation exercise, and afterward. Following the simulation, there is usually a lengthy debriefing process, a discussion period where students reflect on the simulation and explore their own actions and those of others. This is where important concepts and lessons emerge.

When used in a carefully planned syllabus with a clear purpose, simulations enrich the learning process and provide a tangible underpinning to more theoretical material. A colleague of ours in a social science class asked students to read Machiavelli's The Prince, and write an essay about their ideal society. Then, the class session played Starpower, a trading game about the distribution of power and authority in society. After a debriefing of the simulation, the students tackled a second writing

assignment in which they were asked to juxtapose Machiavelli's analysis of power against their personal vision and their experience in the simulation.

There are now a large number of simulations or educational games, as they are sometimes called, relating to many disciplinary areas (Abt, 1987; Bratley, 1987). Some are quite extensive, taking from four hours to an entire quarter to complete. And a number of simulations utilize computers.
Simulations can also be easily developed from everyday events, and many teachers find it useful to have groups of students develop their own simulations (Glazier, 1969).Some widely used commercially designed simulations are CLUG: the Community Land Use Game (Feldt, 1978); games designed to model prejudice and inter-group cultural communication and relationships such as Bafa and Barnga: A Simulation on Cultural Clashes (Intercultural Press, 1989); and simulations designed to study power and societal relationships such as Starpower, SimSoc:Simulated Society, and What's News? A Game Simulation of TV News. (Gamson,1978, 1984).And for some time business schools have used a variety of simulation games called "operational games."

Writing Groups

Both in theory and practice, the most concentrated effort in undergraduate collaborative learning has focused on the teaching of writing. The writing group approach (known variously as peer response groups, class criticism, or helping circles) has transformed thousands of college writing classes. Through the spread of writing across the curriculum initiatives, writing groups increasingly are appearing in other courses as well. While many proponents of peer writing think of this approach as innovative, writing groups are actually as old as the nation. Anne Ruggles Gere's (1987) fascinating book on the subject describes how writing groups enjoy an extensive history in this country, both within and beyond the academy. Literary societies and writing clubs, developing in early American universities in the late 18th and early 19th centuries, met regularly to debate ideas, and to hear and respond to members' work. Benjamin Franklin and countless aspiring and established writers have met to share and

critique their work. By the early part of this century, many educators were leading writing groups in high school and college classrooms and were convinced that these processes improved critical thinking as well as writing skills(Gere, 1987).

Using writing groups as a vehicle for reforming the teaching of college English visibly surfaced in the late 1960's, when American writing teachers learned about writing group approaches in Great Britain. Indeed, three seminal books advocating writing as a social process' appeared in 1968 (Macrorie, 1968; Moffett,1968; Murray, 1968).In the decades since, a large body of literature about theory and practice has helped writing teachers move to more active, student-centered, sharing classrooms.

Writing teachers at both the secondary and undergraduate level have embraced peer writing because it helps students see writing as an emergent and social process. As Peter Elbow puts it, "Meaning is not what you start out with but what you end up with. Control, coherence, and knowing your mind are not what you start out with but what you end up with. Think of writing then not as a way to transmit a message but as a way to grow and cook a message" (Elbow, 1973,14-15).

Peer writing involves students working in small groups at every stage of the writing process. Many writing groups begin as composing groups: they formulate ideas, clarify their positions, test an argument or focus a thesis statement before committing it to paper. This shared composing challenges students to think through their ideas out loud, to hear what they "sound like," so they will know "what to say" in writing.

Writing groups also serve as peer response groups. Students exchange their written drafts of papers and get feedback on them either orally or in writing. This is a challenging process, one that requires students to read and listen to fellow students' writing with insight, and to make useful suggestions for improvement. Word processors have helped peer writing enormously: In many writing labs, students share their drafts and revise them right on the screens.

Getting and giving feedback helps students understand that writing is a social process, not a solo performance. The mutual support of peer writing groups attempts to make the processes of composing and drafting less lonely and alienating (Spear, 1988).Sharing their writing with peers not only gives student writers an audience, it helps them understand the idea of audience(Maimon, 1979).John Bean puts it this way: "Good writing grows out of good talking. "And, "Good talking means focused dialectical conversation where students can practice creating and testing their own arguments on an audience of peers" (Bean, 1991,1990).

Peer writing also makes better writers. A major research study from the University of Chicago compared results of all the major approaches in teaching composition. It concluded that "having students work independently in small groups on purposefully designed and sequenced tasks produces significantly better results, as measured by the quality of thinking revealed in the writing, than does the lecture method, whole class discussion methods, or open-ended group work" (Hillocks, 1984, as summarized in Bean, 1991, 90).

Peer Teaching

With its roots in our one-room schoolhouse tradition, the process of students teaching their fellow students is probably the oldest form of collaborative learning in American education. In recent decades, however, peer teaching approaches have proliferated in higher education, under many names and structures. Many of these approaches have drawn on the peer teaching methods and studies developed by the Goldschmids at McGill University. Student pairs, called "learning cells, "practice structured approaches for completing out-of-class assignments, as well as for teaching and quizzing each other on new material. In studies comparing the learning cells approach to seminars, discussion and independent study, the learning cell students at McGill not only outperformed others, but they preferred learning cells to the other approaches (Goldschmid & Goldschmid, 1976).

In his recent book surveying the literature on peer teaching, Neal Whitman offers a helpful typology of peer teaching approaches (Whitman, 1988)."Near-peers" are peer teachers who are slightly more advanced than the learners. They may be undergraduate teaching assistants who successfully complete a class and then return to assist the instructor in teaching it by leading discussion groups or help sessions. Another "near-peer" might be a tutor, also a previously successful student who works in one-to-one situations with fellow students in need of help in a specific course. Counselors is Whitman's term for near-peers who also work one-on-one with fellow students, but instead of being attached to a specific course, they offer broad help, perhaps on writing, study skills, or academic advising. A second type of peer tutor is the "co-peer," a student at the same level who helps another. Students may work in two-person partnerships or in larger work groups that share a common task.

Peer teaching designs and programs are prolific and naturally quite variable. The following examples represent three of the most successful and widely adapted peer teaching models.

Supplemental instruction. The supplemental instruction approach is an undergraduate teaching assistant model developed by Deanna Martin at the University of Missouri-Kansas City. It has been adopted at hundreds of colleges in the United States and abroad. This urban campus recognized the need to offer tutoring help to students, but budgetary constraints made one-to-one tutoring too expensive. Their search for an alternative approach led to "Supplemental Instruction." This approach focused not on at risk students," but rather on "at-risk classes," entry level in health sciences, and later in general arts and sciences classes where more than 30% of the students were either withdrawing or failing. The university invited advanced undergraduates who had done well in those classes to become "SI leaders." These students are paid to attend the class and to convene Supplemental Instruction sessions at least three times a week at hours convenient to students in the class. All the students in the class are welcome to attend the SI sessions.

The course instructor works closely with the SI student leader to assess what students need to master the content of the class and to help the SI leader develop sessions to facilitate learning. Still, the SI leader is presented as a "student of the subject," not an expert of the subject--an approach meant to close the perceived gaps between teacher and student and student and subject matter. Evaluations of Supplemental Instruction at the University of Missouri-Kansas City and elsewhere have shown that if students attend the SI sessions consistently, their grades and their persistence in college are significantly higher, regardless of whether they are strong or weak academically(Blanc, DeBuhr, & Martin, 1983; "Supplemental Instruction,"1991).

Writing fellows. The writing fellows approach, pioneered by Tori Haring-Smith at Brown University, is a peer teaching approach somewhat parallel to supplemental instruction. The writing fellows are upper division students who are strong writers. After extensive training, these students are each deployed to an undergraduate class (generally in the discipline of their major) where they read and respond to the papers of all the students. Haring-Smith calls this a "bottom-up approach" to sustaining writing across the curriculum initiatives, particularly in large classes where many faculty flag at assigning writing because there simply are too many papers to which they must respond. Over 50 colleges and universities have created writing fellows programs.

Mathematics workshops. A third peer teaching approach that spread rapidly in the late 1980's is the intensive mathematics workshops program developed by Uri Treisman while he was at the University of California at Berkeley. Treisman wanted to address the drawbacks of traditional tutoring models--particularly those geared to minority students in academic difficulty. Finding that study groups made a difference in student success, he created a co-peer teaching approach called the Professional Development Program. The program assumes the culture of an honors program rather than a remedial program. Graduate instructors (usually doctoral candidates) lead math workshops built around small group problem-solving with an explicit emphasis on peer teaching. These workshops supplement the regular lecture and discussion sections of mathematics courses. This intensive small group workshop approach, which

emphasizes developing strength rather than remediating weakness, and peer collaboration rather than solo competition, completely reversed the prevailing patterns of failure in calculus classes by Hispanic and African American students at Berkeley (Treisman, 1985).This intensive math workshop approach has since spread widely in the mathematics community in high schools, and in both two- and four-year colleges.

These peer teaching approaches and many others like them depart from many tutoring models that focus on the remediation or rescue of the drowning. Many of these newer models require all students to participate as teachers and learners in turn, or they invite all students to participate voluntarily. The tutors are available to all, and the learning context is one of collaboration and success. These programs lead to better learning and higher motivation both for the tutors and the learners. Also, peer teaching introduces countless undergraduates to the stimulation, challenge, and satisfaction of teaching--an important investment in developing the future professorate.

Discussion Groups and Seminars

The terms discussion group and seminar refer to a broad array of teaching approaches. In college settings we usually think of discussions as processes, both formal and informal, that encourage student dialogue with teachers and with each other. These are spaces within classes, where "instructors and groups of students consider a topic, issue, or problem and exchange information, experiences, ideas, opinions, reactions, and conclusions with one another" (Ewens, 1989).Seminar has several connotations; historically the seminar has been thought of as a course where advanced students take turns presenting research for discussion and critical feedback from student peers as well as the teacher. Seminar also refers to an extended discussion in which students and teacher examine a specific text or common experience.

While the terms group discussion and seminar are often used interchangeably, it is interesting to note that discussion derives from the Latin words meaning breaking apart, while the word seminar comes from words having to do with nurseries and seed

plots. As the etymologies suggest, both these settings involve the interplay between the dissection of ideas and the cultivation of new ones, analysis and synthesis, the acknowledgment of diverse perspectives, and the creation of community. These are powerful arenas for collaborative learning, spaces in the curriculum where the conversation turns to mutual search for understanding.

All the approaches we have described above involve discussion. However most have distinct protocols, goals, or structures framing the activity. What we are describing here- -more open-ended discussion or seminars--puts the onus on the teacher or the students to pose questions and build a conversation in the context of the topic at hand. There is enormous variability, then, in terms of who sets the agenda, who organizes and monitors the discussion, and who evaluates what. Some discussions or seminars may be heavily teacher-directed, others much more student-centered. There are a myriad possibilities for discussions, and many good resources on strategies (Christensen, Garvin, & Sweet, 1991; Eble, 1976;McKeachie, 1986; Neff & Weimer, 1989).

Learning Communities

Collaborative learning practitioners would say that all collaborative learning is about the building of learning communities. However, we are using the term learning community here in a broader and more specific sense, in terms of an intentional reconfiguration of the curriculum. In the past 15years, a number of colleges have recognized that deep-seated structural factors weaken the quality of undergraduate learning and inhibit the development of community. These schools have attacked this problem directly by developing learning communities, a "purposeful restructuring of the curriculum to link together courses so that students find greater coherence in what they are learning and increased interaction with faculty and fellow students"(Gabelnick, MacGregor, Matthews, & Smith,1990).As such, learning communities are a delivery system and a facilitating structure for the practice of collaborative learning.

Learning community curriculum structures vary from campus to campus, and can serve many different purposes, but they have two common intentions. They attempt to provide intellectual coherence for students by linking classes together and building relationships between subject matter, or by teaching a skill (e.g., writing or speaking) in the context of a discipline. Second, they aim to build both academic and social community for students by enrolling them together in a large block of coursework. While the learning community approach goes back 60 years or more (Meiklejohn, 1932), we have seen a recent proliferation of learning community approaches on all sizes and types of campuses. Learning communities directly confront multiple problems plaguing undergraduate education: the fragmentation of general education classes, the isolation of students (especially on large campuses or commuter schools), the lack of meaningful connection-building between classes, the need for greater intellectual interaction between students and faculty, and the lack of sustained opportunities for faculty development.

Some learning community models are quite modest. In the Freshman Interest Group (FIG) model used at several large universities, cohorts of 25-30 freshman students enroll in three classes that are an appropriate introduction and platform for a major. In addition, the FIG group meets in a discussion group once a week with a peer advisor. The faculty of the three classes teach them in the usual way, but they rapidly discover that the FIG students become the most active students in their class.

Other learning community models are more complex in terms of both pedagogy and curriculum redesign. In many linked classes, or three-course clusters, the faculty members co-plan their syllabi to address common themes or develop common assignments. Still other learning community models are completely team taught and involve a more ambitious reconfiguring of coursework around broad interdisciplinary themes. Not only are these closely integrated models exciting for students, they are revitalizing for faculty. Team teaching creates a unique opportunity for learning from each other's disciplinary perspectives and for creating and sharing teaching approaches.

By altering the curricular structure to provide larger units of student learning communities frequently provide more time and space for collaborative learning and other more complicated educational approaches. Small group workshops and book seminars are staples of most learning communities. Peer writing groups and team projects associated with labs and field work are also fairly common. Study groups emerge in learning communities, both intentionally and spontaneously. These programs provide a unique social and intellectual glue for students that result in high rates of student retention, increased student achievement, and more complex intellectual development (MacGregor, 1991).

Collaborative Learning: Challenges and Opportunities

In the past decade, collaborative learning approaches quietly have begun to proliferate. Specific strategies are spreading across campuses and through disciplinary and professional networks. And as more faculty members use collaborative learning, the design and analysis of these approaches are becoming more diverse and more sophisticated. Research and evaluation on collaborative learning strategies are sharpening our definitions of student outcomes and giving us a clearer understanding of when collaborative activities do and do not work.

Creating a collaborative classroom is full of challenges and dilemmas. Few of us experienced collaborative work in our own undergraduate settings, and much of our graduate school training reinforced the teacher-centered, lecture-driven model of college teaching. For the individual teacher, stepping "out of the center" and engaging students in group activity is hard work, especially at first. For students and teachers alike, every collaborative activity is new and unpredictable in the way it unfolds. Everyone involved must take some risks.

And designing collaborative learning situations requires a demanding yet important rethinking of one's syllabus, in terms of course content and time allocation. If

some (or a great deal) of the classroom time is considered an important social space for developing understandings about course material, or if some of the out-of-class time is devoted to study groups or group projects, how then should the rest of the class time (lectures, assignments, examinations) be designed? How does the teacher ensure that students are learning and mastering key skills and ideas in the course, while at the same time addressing all the material of the course? Teaching in collaborative settings puts the tension between the process of student learning and content coverage front and center.

As teachers become more involved in using collaborative learning, they discover what radical questions it raises. Collaborative learning goes to the roots of long-held assumptions about teaching and learning. Classroom roles change: Both teachers and students take on more complex roles and responsibilities. (Finkel & Monk, 1983, available in this sourcebook pp. XXX; MacGregor, 1990).The classroom is no longer solo teacher and independent students--it becomes more an interdependent community. This degree of involvement often questions and reshapes assumed power relationships between teachers and students, a process that at first can be confusing and disorienting (Romer & Whipple, 1990).Not only is course content reshaped, so are definitions of student competence. The public nature of group work makes the demonstration of student learning continuous. Thus, for teachers and students, collaborative learning both complicates and enriches the evaluation process.

Challenges to collaborative learning at the classroom level are compounded by the traditional structures and culture of the academy, which continue to perpetuate the teacher-centered, transmission-of-information model of teaching and learning. The political economy of the academy is set up to front load the curriculum with large lower division classes in rooms immutably arranged for lectures, usually in classes limited to fifty-minute "hours." Student-student interaction; extended, careful examination of ideas; the hearing-out of multiple perspectives; the development of an intellectual community--all these are hard to accomplish under these physical and time constraints.

The lecture-centered model is reinforced (both subtly and blatantly) by institutional reward systems that favor limited engagement in teaching and give greater recognition to research. Achievement for teachers and students alike is assumed to be a scarce honor, which one works for alone, in competition with peers. This assumption of scarcity is the platform for norm-referenced grading, or "grading on the curve, "a procedure that enforces distance between students and corrodes the trust on which collaborative learning is built. Moreover, our definitions of ourselves as teachers, as keepers and dispensers of disciplinary expertise, are still very much bound up in the lecture podium. As a young colleague of ours just beginning to use collaborative learning in her class acidly observed, "I know this works, but my colleagues don't respect it as real teaching. They associate group work with lazy, unprepared faculty members."

And there are compelling reasons to believe our colleagues. Lectures, the prevailing mode of classroom teaching in college, have only limited efficacy (Blackburn, Pellino, Boberg, &O'Connell, 1980; Costin, 1972, 1980; McKeachie, 1986; Penner,1984; Thielens, 1987; Verner & Dickinson, 1967).The myths about interpersonal competition--that it is motivating, enjoyable, character-building, and necessary for success in a competitive workplace and world--have been debunked increasingly in the past twenty years, both in theoretical terms (Astin, 1987; Bricker,1989; Nichols, 1989; Palmer, 1983) and through extensive research(Johnson & Johnson, 1989a; Kohn, 1986).Most troubling of all, more than 50% of the students who begin college leave, often never to return. Much of this student leaving has to do with feelings of isolation and a lack of involvement with the college environment (Tinto, 1987).Whether we measure these losses in wasted resources, in thwarted aspirations, or in workplace unpreparedness, the costs of this kind of attrition are too high.

While these reasons may motivate some teachers, what really propels teachers into collaborative classrooms is the desire to motivate students by getting them more actively engaged. Nonetheless, wanting to be a facilitator of collaborative learning and being good at it are very different things. As with all kinds of teaching, designing and

guiding group work takes time to learn and practice. Most teachers start with modest, efforts while others may work with colleagues, designing, trying, and observing each other's approaches.

Several years ago, two colleagues of ours embarked on collaborative learning because they were dissatisfied with their introductory biology course. Because it seemed students were having difficulty grasping the concepts in the textbook, these teachers found themselves devoting too much class time to re-explaining the text material. At the same time, they noticed how engaged students were with their occasional problem-solving exercises and small group seminars on journal articles.

Over a period of a year, these two biologists began to shift their lectured-centered course to one involving small group problem-solving workshops. They developed these workshops as applications and extensions of the textbook reading and required students to complete reading assignments in order to participate in class workshops. At the same time, these faculty members built support for their new approach with their biology department colleagues by asking for their help in defining the knowledge and understandings essential to completion of Introductory Biology. The rewards were immediate: The completion rate of the course soared, student achievement rose significantly, and the course became much more exciting to teach. These teachers have continued their collaboration, refining the workshops in the course and developing new ones.

The story of our biology colleagues is not anomalous. Faculty collaboration seems to be an important ingredient in the design of and experimentation with collaborative learning approaches. Learning new moves in the classroom need not be a lonely enterprise. Faculty development initiatives at the departmental or college-wide level need to acknowledge this as they work to create a supportive climate for dissemination of approaches as well as a forum for work on questions that arise. At several universities, collaborative and cooperative learning "users groups" have sprung up and become valuable structures for sharing approaches and problems. The team-

teaching that is embedded in many learning community programs is a powerful strategy for enabling faculty to build their repertoires and confidence. Research and evaluation, from modest faculty-designed "classroom research" (Cross & Angelo, 1985) to more formal studies, can also help develop approaches and clarify their results. Sourcebooks like this one and growing networks, such as AAHE's Action Community on Collaborative Learning, will also continue to share resources and build momentum.

There is no getting around the challenging nature of collaborative learning. But when collaborative work becomes a regular feature of their class, faculty members usually find it enormously energizing and liberating. The specter of teaching becoming repetitive or routinized simply isn't an issue for these teachers. Every course and every class presents an intriguing opportunity. Teachers relish the intellectual challenges of creating (and re-creating) activities or problems that really engage students. They enjoy those moments when the class becomes a community. And they often speak of the new lens they gain on their students, which comes from watching them struggle with ideas and build meaningful connections to previous learning or personal experiences. They also remark on the fresh perspectives they gain on their subject matter, as it is enriched and challenged by continuous and diverse student examination and re-shaping of it.

Ideally, collaborative learning leads students to become much more directly immersed in the ideas of the class. They will develop confidence and skills at entertaining ideas on their own while learning to raise questions, to listen carefully, and to respond to others' questions. They will develop the ability to stay focused, sustain an idea, build rapport with fellow students and learn the art of disagreeing with others with respect and courtesy. They may learn to recognize and acknowledge the limitations of their own points of view. These intellectual and interpersonal skills don't come easily to college students, not to mention college graduates! Their development requires extended and focused practice. As Finkel and Monk point out in one of the following articles, students' awkwardness and tentativeness can often discourage teachers, and drive them back into the comparative ease of lecturing (Finkel & Monk, 1983).Developing successful collaborative learning activities challenges teachers to

become coaches and facilitators of complex social processes, but these are deeply important ones for true learning.

Ultimately, collaborative classrooms stimulate both students and teachers. In the most authentic of ways, the collaborative learning process models what it means to question, learn and understand in concert with others. Learning collaboratively demands responsibility, persistence, and sensitivity, but the result can be a community of learners in which everyone is welcome to join, participate, and grow.

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Ed.'s note: In a very thoughtful, reasoned way Bruffee makes the case for collaborative learning. He traces its history in terms of our current interests in it, defines it, and through that definition justifies it as an instructional method of merit. Although the paper was originally written for an English faculty member audience, the rationale it establishes for collaborative learning crosses disciplinary boundaries and is relevant in most fields. To emphasize that interdisciplinary relevance (and to make the paper a more manageable reading length), we have deleted some of the passages where the further and more specific application to English is made.

This version is true to the author's intent: "This essay is frankly an attempt to encourage other teachers to try collaborative learning and to help them use collaborative learning appropriately and effectively. But it offers no recipes. It is written instead on the assumption that understanding both the history and the complex ideas that underlie collaborative learning can improve its practice and demonstrate its educational value."

Please visit http://files.eric.ed.gov/fulltext/ED357705.pdf for the original publication and references.