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Developing and using small-group approaches takes time and practice. In this chapter, our faculty informants answer some of the most frequently asked questions about implementing these strategies and overcoming challenges.

Implementing Small-Group Instruction: Insights from Successful Practitioners

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As we talked with faculty members around the country who are enlivening their classes with small-group work, they described their approaches with enthusiasm and confidence. Yet faculty members who are skeptical about these approaches, and even those tentatively interested in trying them, still raise important concerns about both the philosophy and the actual strategies of undertaking group work. "It really can't be that easy, can it?" they ask, quite rightfully.

A frequent concern that surfaces in many discussions about small-group learning has to do with the assumption that if you are in favor of it, you are de facto opposed to the lecture in any form. This presumption of the new truth is hardly the attitude that will bring about the kind of institutional change that we are hoping for in the coming years. All the teachers we interviewed believe deeply in small-group learning but also spend a significant amount of time lecturing, leading whole-class discussions, and engaging in other kinds of teaching approaches. This is our practice as well. Lecture and small-group work must be framed as both/and endeavors, not either/or ones; yet somehow the message is too often sent that to be in favor of small-group learning is to be completely anti-lecture.

In this chapter we will address a number of concerns about using small-group work that have emerged in the professional literature and that we have encountered as we discussed this approach with colleagues. We will address these concerns based in part on our reading of the literature, but

more particularly on the experiences of the practitioners whose approaches are featured in this volume.

Reduced Content Coverage

Aren't you sacrificing content coverage? Class time spent doing group work is certainly time taken from lecturing.

This question comes up most often in discussions about the value of the time spent in groups in class. It speaks to a central issue that has served as a flash point in higher-education circles as articulated by Barr and Tagg in their influential article in *Change* magazine (1995), which called for moving from a teaching to a learning paradigm. We agree with Barr and Tagg that it is more productive to think about the teaching/learning process from the perspective of the gains learners make over the duration of a class rather than from the perspective of what we teachers cover. If cognitive and affective student gains are the measures of success for teachers, then both anecdotal and research evidence appear to lean strongly to using significant amounts of group work, rather than lecturing alone, as we have outlined in Chapter One and will further detail in Chapter Six.

The faculty members we interviewed expressed consistent satisfaction that students in their classes are demonstrating one or more of these indicators of increased learning: much greater conceptual understanding, more complex critical-thinking skills, better class attendance, more independence in lab settings, and greater confidence.

About two-thirds of the faculty members we interviewed said that they covered fewer topics in class when they used group work, but that students learned and retained more of the "big ideas" that they chose to address relative to using lecture formats. Deborah Allen (biology, University of Delaware) said that she suffered from "coveritis" anxiety when she first moved from a lecture format to a group-work approach. "It forced me to take a hard look at the course content, and make good decisions about what the students really needed, versus what I liked to talk about" (Deborah Allen, personal interview with the authors, Feb. 1999). In speaking of reformatting her biology classes from the lecture to small-group work, Patricia Hauslein (biology, St. Cloud University) noted that "if we give them tiny bits of everything, all they will have is rubble. We want to give them the framework, and then they can fill in the floor plan" (Patricia Hauslein, personal interview with the authors, Sept. 1998).

A few years ago Jim Cooper was giving a workshop on small-group work. One faculty member was clearly unhappy with the half-day presentation on various cooperative-learning techniques. Finally, the exasperated participant said, "I teach Biology 101. If I don't cover the content of all seventeen chapters of the textbook, students won't be prepared for Biology

102." When Cooper asked how happy the Biology 102 teachers were with the current graduates of Biology 101, the participant said, "They say that the 102 students don't know anything." This is an extreme example, but we believe that if faculty members will use student performance as the primary criterion of success, adding active and small-group learning to the classroom will follow.

One faculty team, colleagues of Jean MacGregor, addressed this issue head-on when they moved to adopt small-group approaches in their Biology 101 class. They invited the rest of their small biology department out to breakfast and explained their new approach. Then they told their colleagues that the new method would indeed sacrifice some lecture coverage, and they asked them what biological concepts were the most essential, nonnegotiable ones for the students to understand well before they entered advanced biology classes. The list of essential understandings, generated on a paper napkin, not only became the driver for the Bio 101 course design but involved everyone in the department in an important beginning discussion about learning outcomes. Even more significantly, it began a process of trust-building with the course reformers.

Reduced Amount of Learning

Do students learn as much using small-group approaches? Is there evidence of this?

We noted in Chapter One the evidence of the power of small-group learning. Work by Ebert-May, Brewer, and Allred (1997), Heller, Keith, and Anderson (1992), Wright (1996), O'Donnell and Dansereau (1992), Mazur (1997), Springer, Stanne, and Donovan (1999), Johnson and Johnson (1989), and others represent formal evidence of the power of small-group work as reported in the college teaching and learning literature. These studies build on hundreds of precollegiate studies demonstrating the power of small-group learning on a host of student outcomes.

Our informants repeatedly told us that their students were performing as well as or better than students in previous teaching settings when small-group activities were not used. All expressed satisfaction that their students are generally demonstrating stronger conceptual understanding, critical thinking skills, and attendance; more independence in a lab setting; and a greater sense of confidence. Diane Ebert-May (botany and plant pathology, Michigan State University) believes that faculty members nationwide must take much more seriously the systematic investigation of whether and what students are actually learning. As she puts it, "The biggest frustration for me is that most faculty members are not using the same empirical approach in their teaching that they are employing in their research" (Ebert-May, personal interview with the authors, July 1998).

Need for Prerequisite Learning

Don't you have to teach students certain information before they work in groups?

About half of those we interviewed agreed that lecturing, reading of material, or other preparatory work should precede group work. Cathy Bristow (entomology, Michigan State University) said, "I agree with this. Students can brainstorm problems, but if they don't have any of the necessary foundation information, just talking about it rapidly loses any utility" (Cathy Bristow, personal interview with the authors, Jan. 1999). Bristow called for a balance between lecturing on foundational concepts and small-group work to apply the concepts. Jim Cooper lectures during the first sixty to ninety minutes of his three-hour classes in graduate educational research methods, then students solve problems (closely linked to the lectures) from a workbook he wrote with Pamela Robinson. He feels that providing a lecture prior to group problem solving ensures that all members of the groups have at least some common experience, which helps them work constructively in teams. Farah Fisher (computer-based education, California State University, Dominguez Hills) has students take a five- or ten-minute quiz at the start of every weekly class to help ensure that they have read the homework assignment prior to doing any group work.

In contrast, approximately half of the faculty members that we talked with felt that this was a ridiculous question. However, many of these teachers use small-group activities to launch students into new material: they present an interesting question or puzzling problem as a strategy to stimulate the students' curiosity and elicit their current conceptual understanding of a topic—essentially, they are laying a foundation for the reading or lecture material to build on. These teachers felt that students could construct their own meaning from relatively new material. Diane Ebert-May said, "That question is loaded with assumptions. It assumes that if you are telling students something, they understand it. This just isn't confirmed by theory. A learner gets to content through creating the mental frameworks for placing the content. It's up to us [teachers] to enable the student to create the frameworks" (Diane Ebert-May, personal interview with the authors, July 1998).

Importance of Solitary Learning

Learning is a solo activity. I had to learn it by myself; therefore students have to learn it by themselves.

Many of those we interviewed disagreed vehemently with this notion. Ray Lischner (computer science, Oregon State University) indicated that professors, who have doctorates and a lifelong commitment to their disciplines, commit an unpardonable sin of teaching when they assume that the students are just like themselves. He says, "Someone with that attitude

should be kept as far from the students as possible" (Ray Lischner, personal interview with the authors, Oct. 1998). Diana Archibald (English, University of Massachusetts-Lowell) suspects that professors with that attitude are inclined to underrate students' abilities. "I think you get what you expect from them. If you expect students not to know too much, well, they pick up on this, and they don't become actively engaged" (Diana Archibald, personal interview with the authors, Jan. 1999). Patricia Hauslein cites Parker Palmer's notion that truth is arrived at by collaborative conversations. She says, "I talk about the fact that truth is not owned individually; the truth is agreed upon by communities of people. And I remind students that biology has a strong history of research teams" (Patricia Hauslein, personal interview with the authors, Sept. 1998).

As noted earlier, many of those we interviewed suggested a balance between group and individual work. John Wright (chemistry, University of Wisconsin-Madison) said, "Both extremes are wrong. . . . Cooperative learning is effective but solo activities are also necessary" (John Wright, personal interview with the authors, Oct. 1998). Kay Hudspeth (Maximizing Engineering Potential Program, California State Polytechnic University, Pomona) indicated that some individual learning is appropriate but that students need to "check out what they know with their peers" (Kay Hudspeth, personal interview with the authors, Oct. 1998).

Jean MacGregor, Karl Smith, Jim Cooper, and Pamela Robinson do both individual and group activities. For example, in Cooper's research methods class, students in teams critique a journal article in class before they critique articles individually as homework. He also has students read and critique former students' qualitative research proposals in teams before writing their own proposals. We often find that having teams work on problems and other assignments in class before having students complete individual assignments is a kind of helpful scaffolding technique. The complexity of tasks is reduced before individual assessments of competence are required.

Colleagues' Concerns

What challenges or points of concern have you gotten from colleagues?

Many of the faculty members we interviewed described some degree of skepticism (or even hostility) from colleagues, especially at first. Diane Ebert-May noted that some colleagues have felt her approaches are too "touchy-feely," even though her small-group activities involve high degrees of accountability and occupy only a small fraction of the time spent in her classes. This lack of understanding was also reflected when a dean came to observe a young colleague of Jean MacGregor. This biologist was doing fine work in building small-group learning into his introductory biology class. His dean showed up to conduct a formal classroom observation of him at a moment when the entire class was in groups of three talking animatedly

through a set of worksheet problems. Glancing quickly at the scene, the dean said to the teacher, "Oh, I see you are doing group work. I will come back another day when you are teaching." One of the saddest examples of a faculty member misunderstanding small-group approaches occurred when Jim Cooper shared with a colleague that he felt underprepared for that night's class. "Just put them in groups," replied his colleague (quite seriously). Fortunately, these tend to be isolated experiences particularly in recent years, as momentum for small-group approaches has grown. Still, we all should recognize that too many of our colleagues regard small-group approaches as frivolous and a waste of time.

A number of faculty members we interviewed indicated that they perceived only minor resistance from colleagues when it came to the use of small-group work. This may reflect a sampling bias on our part because many of those we interviewed have national reputations for being effective teachers, particularly in large classes. These individuals may enjoy such strong reputations that they are less inclined to encounter active resistance from colleagues. More likely, their approaches to teaching (based on our conversations with them) are so coherent and reasoned that resistance is unlikely to emerge among colleagues. In speaking with these informants, we were impressed with their knowledge of teaching and learning. They spoke of how important it is to have clear ideas about what they want their students to learn, thoughtfully structured assignments and teaching strategies to ensure that these goals are achieved, and meaningful assessment strategies to assess the effectiveness of their teaching.

Student Resistance

What problems or points of resistance have you gotten from students?

According to our informants, student resistance to small-group instruction is generally not due to dislike of small-group work as much as dislike for how these strategies are implemented. The faculty members we interviewed indicated that initial resistance among students generally focused on prior bad experiences with poorly planned and executed group work in high school and college. Features of small-group work perceived as contributing to these negative perceptions included lack of clarity in small-group assignments; unclear or unfair grading of small-group work, often associated with excessive group grading without individual accountability for each team member's contributions; inequitable commitments to teams by individual members; poor planning and organization of the group activities; and inadequate introduction or rationale for group work. As noted in Chapter Two, there is a period of adjustment for students (and for faculty members) that should be expected when educators implement many small-group procedures, according to our informants.

Dan Udovic (biology, University of Oregon) stressed the importance of the clarity of assignments and making these assignments at the correct level

of difficulty—neither too challenging nor too trivial. He also pointed to the importance of structuring the tasks so that students do not get bogged down in figuring out how to attack the task, thus wasting time for both students and teachers. Udovic said, "The real challenge here is to create a meaningful problem of suitable complexity and to provide enough time for students to work through it" (Dan Udovic, personal interview with the authors, Nov. 1998). Readers interested in constructing problems and other group assignments may want to consult the workbooks and Web sites identified in Chapter Six to find materials that have been field-tested with students.

When it comes to student resistance, we do not think we can underestimate the shifted expectations students have to experience as they begin to understand, see the value in, and invest energy in small-group learning. Students do not arrive at the door with these understandings. If the other classes they attend carry no expectation of group work, it is as though the ground has shifted under them when they arrive at these kinds of interactive classes. We need to make clear to students that a different set of expectations is at work. We are asking students to make several moves (MacGregor, 1990, pp. 25–26):

- From listener, observer, and note taker to active problem solver, contributor, and discussant
- From low to moderate expectations of their preparedness for class to high ones
- From a private presence in the classroom with few risks to a public one with many risks
- From attendance dictated by personal choice to attendance dictated by community expectation
- From competition with peers to cooperative work with them
- From responsibilities and self-definition associated with learning independently to responsibilities and self-definition associated with learning interdependently
- From the notion that teachers and texts are the sole sources of authority and knowledge to the notion that peers, oneself, and the thinking of one's community are additional and important sources of knowledge

Logistics

How do you handle the logistics of using groups in large classes?

Some colleagues wonder about classroom control issues, fearing that once students move from lecture to small-group work it will be difficult to get them back to attending to the lecture. Most of those we interviewed did not find this to be a problem. Many have a signal to return from group work to the lecture, such as raising a hand or simply asking students to stop talking (because several use microphones, their voices can be heard over the students). We have found that if teachers or TAs circulate among the groups,

they can easily determine when the groups have completed their discussions and are ready to return to teacher-centered instruction. This monitoring of groups by walking around is also an effective way of ensuring (by the teacher's or TA's presence) that students are on-task.

Most of those we interviewed were not concerned that students will be off-task during group work. They stressed that the tasks have to be well-structured and challenging and that the time allowed should be limited and clearly defined. Diana Archibald noted that "you have to give students clear tasks and make sure they are held accountable. Students need structure. And they need the challenge of producing a product at the end of the group work" (Diana Archibald, personal interview with the authors, Jan. 1999). John Wright indicates that the tasks he gives groups are "concrete, and students know I am calling on people after the group work. . . . I am not going to let them off the hook so they really stay on-task" (John Wright, personal interview with the authors, Oct. 1998).

Helen Place noted, "Occasionally I have a hard time with a class getting them quiet again: the chatter syndrome. Several groups were chatterers and just wouldn't stay on-task, and other students started to complain. I tell students they have a perfect right to ask other students to shut up so they can hear. One time a woman student stood up in the middle of my lecture and shouted at a group behind her to 'be quiet!' The whole class (of four hundred) broke into applause. Normally, I have the mike and simply ask for their attention. That usually quiets them down, because the answer is about to appear, or I start on a new problem. Mostly they are well-behaved" (Helen Place, personal interview with the authors, Sept. 1998).

Our informants did acknowledge, however, that it is not unusual to have a few groups in each class with some communication difficulties and to encounter occasional groups that are outright dysfunctional. Teachers resolve these problems in a variety of ways. Many spoke of setting appropriate guidelines for effective communication and teamwork at the beginning of the course. Others put the responsibility of group functioning on the groups themselves, preferring not to intervene. Some allow groups to "fire" a member who is dysfunctional (usually after repeated offenses of clearly stated guidelines).

We wondered if there were problems in using small groups with specific student populations, including shy students, ESL students, and students of color. We did not find significant numbers of interviewees who felt that these groups experienced particular problems. In fact, several said that small groups were beneficial to those who might be less inclined to contribute in large-class settings. A significant amount of precollegiate research indicates that small-group work may be particularly effective for minority students and women (Johnson and Johnson, 1989). Less work has been done at the collegiate level, but this work tends to support the efficacy of small-group work for minority students and women (Treisman, 1986; Light, 1992; Gilligan, 1982).

Craig Nelson (biology, Indiana University) told us, "It has been a decade since I had a student who was really unable to participate extensively in structured small-group learning (and have only had about three since I began using these techniques thirty years ago). I attribute this to two factors, mainly. First, I make preparation for group work count heavily on the grades and I assess it regularly. Second, I make each group responsible for eliciting reasonable involvement from each student. For example, all group members lose points unless they ask each member what they have written out in the preparation on each key point—the group's first task is to find out where each person starts. I find that these two principles in combination foster extensive involvement of shy students, ESL students, and members of historically underpowered groups: rural whites, students of color, and so on" (Craig Nelson, personal interview with the authors, July 1999).

Diane Ebert-May reports, "When I taught introductory biology to classes of about 350 at Northern Arizona University, Native American students thrived most noticeably in their cooperative groups. Navajo and Hopi students tended to exhibit quiet behavior and traditionally do not make eye contact with adults with whom they are conversing. Knowing this cultural phenomenon, I tried to form cooperative groups in ways that would benefit more reserved students, especially Native Americans. To accomplish this early in the course, I personally invited in a low-key, inconspicuous way, Native American students who sat off by themselves when they entered the classroom to join a group of three that was forming. I encouraged these students of color to join cooperative groups who sat near the front of the classroom, attended class regularly, and appeared to be open and engaged in their roles as students. Often I facilitated the formation of a group that included one adult learner (over twenty-five years old), a Native American student, and two traditional Caucasian students. Student accomplishments in these specially formed cooperative groups suggested that their diversity served as one of their strengths (that is, the value of diversity, both cultural and biological, is one thread of my course). The Native American students completed the course successfully and often earned points well above the class mean, and were the top students in their groups" (Diane Ebert-May, personal interview with the authors, July 1998).

A Hewlett Foundation–funded project under way at the University of Texas-Austin may provide useful data in the coming years because it is looking at the impact of small-group work in very large classes as a strategy for building tolerance and understanding between different groups early in students' college years. The rationale for this project is that students' first-year experiences on the campus are crucial to connecting them to campus life and enabling them to meet and know other students of different backgrounds. And most students' beginning experiences in large universities are in very large-class settings. So UT-Austin is researching what the impact would be if at least some of those large classes emphasized small-group learning. The Hewlett grant, administered by the Office of Graduate Studies and

the Center for Teaching Effectiveness, is providing grants to faculty members teaching classes of one hundred students or more to work with their teaching assistants to incorporate small-group activities or redesign their current strategies substantially. The project also includes a data collection component, which will examine students' sense of connectedness to the campus, their learning preferences, and their responses to small-group learning.

Evaluation

Does using small-group instruction change the ways you evaluate students?

All the faculty members we interviewed indicated that when they moved from primary reliance on the lecture to significant amounts of small-group learning their student-assessment techniques also changed dramatically. They spoke of putting more emphasis on *student skills* and *outcomes* and less on content recall assessed through multiple-choice exams.

In revamping his course in biology for nonscience majors, Dan Udovic (personal interview with the authors, Nov. 1998) spoke of moving from a "tell them and test them" mentality to one requiring more writing, more research projects, and more assessment using rubrics for grading projects and position papers. John Wright indicated that his move to small-group work entailed assessments not based on grading on the curve but on a mastery-learning approach, including provisions to redo work based on teacher feedback. He spoke of moving beyond simply solving chemistry problems to having students *explain* their strategies for solving problems.

A number of informants stressed the importance of using a criterion-referenced grading procedure based on actual performance of individual mastery of course content and understanding. Traditional norm-referenced grading (that is, grading on the curve), they noted, defeats the purpose of cooperative strategies and focuses on having students compete against one another for scarce commodities (As and Bs).

In responding to how his assessment strategies have been effected by switching to small-group work, John Wright said (personal interview with the authors, Oct. 1998), "*Lots* of changes! Evaluation is one of the big frontiers in all of this. You are changing a lot more dimensions of the learning process. . . . When you are changing these things, the assessment needs to reflect those changes. Our students are engaged in mastery learning so they can get nearly perfect scores. All their independent work and small-group work is graded. A lot of these assignments are done with mastery learning so if students get it wrong, they can do it again and get points back. So students have more chances to do better, and given the opportunity, they do. I have students do that kind of mastery learning and then have the exams based on their describing the logic in problems they have already worked. I ask, 'What is the science that underlies the strategy that you used in solving that particular problem?' So there is a real incentive to get the problems

correct. They are responsible not just for solving the problem but for explaining their strategy for solving it."

Another assessment issue raised by our informants addressed group versus individual course grades. Although students in the small-group procedures described in this volume are encouraged to help one another (a technique called *positive interdependence* in the cooperative-learning literature), most of the course grading is based on individually completed tests and other assignments. Thus, a relatively small percentage of course grading (perhaps 5 to 15 percent) is based on undifferentiated group grades in which all members of a team receive the same grade, regardless of their relative contributions to the team effort. Some of the group work, especially in the informal strategies outlined in Chapter Two, includes no formal grading of any sort. We find that many small-group strategies are perceived by students as so valuable that no grade is required to motivate them.

Many faculty members spoke of informal classroom assessments as vital to the success of small-group work. Diana Archibald spoke of "ink-shedding," a type of minute paper in which students are asked to write (shed ink) on an issue being examined in the course or on the overall teaching methods used in the course. For example, when her class had gone flat in the middle of one semester, she asked students to ink-shed. She found that many of them were sick and facing exams in other classes—information that most instructors would not have gotten with traditional end-of-semester course evaluations.

John Wright spoke of a board of directors composed of six to fifteen students who meet briefly with him on a weekly basis. He finds the feedback from this group invaluable (although as Tom Angelo notes, do not ask for this type of feedback if you cannot deal with the information you may get).

One of the most powerful elements of small-group instruction is its capacity to provide continuous two-way communication between teachers and students. Faculty members are able to receive information from students while there is time to modify instruction and course content as a result of that feedback. Students are able to modify their approaches to course content at earlier stages of the term as a result of the feedback they receive from other students and their teachers. Compare this with a lecture course that has a midterm and a final, where feedback is often given well after it is too late for either teachers or students to address problems.

Use of Teaching Assistants

How are your TAs involved in the kinds of approaches you are using?

Many faculty members we interviewed indicated that supportive TAs were utterly essential to the success of their approaches. They also stated that they were investing significant time in teaching and coaching their TAs to participate fully in coaching and leading small-group activities.

Predictably, they reported that some TAs were very enthusiastic about these approaches; others, less so. Some universities are moving to restructure courses from three lectures–one discussion section each week to two lectures–two discussion sections, or are reconfiguring labs specifically to increase small-group learning time. A few campuses, such as the University of Delaware and the University of Texas-El Paso, are investing in student peer facilitators to work in large classes as coaches-facilitators of small groups. All these efforts require significant commitments of resources.

The importance of appropriate training for TAs was highlighted by Diane Ebert-May: "Cooperative learning needs to be modeled by all participants in a course, especially faculty members and teaching assistants. Therefore, actively involving TAs in all decisions about reforming a course is critical. We structured the professional development program for the teaching assistants to include practice of effective pedagogy (for example, cooperative learning), introduction to the literature about teaching and learning, and development of the laboratories. We met several days before the beginning of each semester and weekly thereafter. The weekly TA meetings modeled cooperative learning, that is each person had a role in the meeting, such as COW (commander of the week—as named by the TAs) and timekeeper. The COW rotated each week with the associated responsibilities of providing an overview of the forthcoming lab, recommending teaching strategies, and approximating a time line for each lab. All of the TAs reflected on their students' learning from the previous week, talked about what worked and what did not work, and made suggestions for changes. I served as the faculty resource person; the TAs were the decision makers within the context of the reformed course. The most striking observation I made each semester was how the TAs grew from dependence on me to interdependence with each other, how they began to see themselves as reflective teachers, and how they began to focus on students as learners. The majority of TAs indicated that because of their involvement in inquiry-based labs, they themselves became better scientists." (Diane Ebert-May, personal interview with the authors, July 1998).

Helen Place noted, "I encourage all of my TAs, both graduate and undergraduate, to come to lecture and help me during the small-group learning. It is important for the TAs to hear my version of the activity and the level of discussion so they can emulate my approach during tutorials. Also, the TAs learn that teaching can be interactive, even in big classes. It is important to me that more students, during the lectures, can ask questions if there are more 'experts' to ask. I've found that more TAs monitoring groups of students, even those hiding in the back row, tend to keep more students on-task. Often students are more willing to ask TAs rather than let me think they are *dumb*. The challenge is that some TAs lead the students astray. They either don't know the answers or they regurgitate something they just learned in a graduate class. I often have the answers to group problems written out before class and provide them to the TAs. When I don't

have answers prepared, I encourage the TAs to work as a group and do the problems before they head out to help the students. I find that undergraduate TAs who took their beginning chem classes from me make better helpers than the new graduate students. I also find that these same undergraduate TAs are more likely to run interactive tutorials" (Helen Place, personal interview with the authors, Sept. 1998).

The Question of Time

Doesn't small-group work take more time? Is it worth the time it takes?

Our faculty informants had a wide range of responses to part one of this concern. Some felt that it did not take more preparation time, particularly if more informal procedures such as think-pair-share or ConcepTests were used. Others noted that their time commitments lessened as they gained experience in using groups. Virtually all faculty members said that the benefits were worth the additional time commitments. Tom Lord (biology, Indiana University-Pennsylvania) said, "Isn't that what professors buy into when they signed their contracts . . . providing the best learning experience possible for the students?" (Tom Lord, personal interview with the authors, Jan. 1999). Helen Place (personal interview with the authors, Sept. 1998) commented, "If we can find a better way to do something, isn't that the way to do it?"

Our informants were mostly in agreement that engaging students in group work in class is not something they have all figured out. Developing good tasks, problems, or questions is an ongoing challenge; so is finding the right balance in classes between group discussion and lecture/presentation. This kind of teaching is a continuing learning experience, which presents new issues and challenges constantly. What our faculty informants value most as they work on these issues is colleagues to turn to for support and for ideas, both about approaches and about dealing with problems. They often mentioned how much they valued the support of their TA team, individuals they knew at other campuses, and less frequently, colleagues in their own department or across campus. Those teachers in national networks (most frequently in science, engineering, and mathematics) seem to have benefitted most from sharing ideas with colleagues.

In the next and final chapter we speculate on whether and how the use of small-group learning will become more widespread in college classrooms. We also offer there a list of resources to assist and support those interested in participating in this movement.

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