Learning With Peers:

From Small Group Cooperation to Collaborative Communities

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Peer learning has been suggested by many as an educational innovation that can transform students' learning experiences. Policymakers and researchers see small group work as a way to improve attitudes toward school, foster achievement, develop thinking skills, and promote interpersonal and intergroup relations. Yet, like most other simple suggestions such as lengthening the school year or assigning more homework, learning from peers in cooperative or collaborative groups is complex and difficult to achieve. When practiced in an uninformed manner, it can stigmatize low achievers, exacerbate status differences, and create dysfunctional interactions among students. There are ways to overcome these problems, but none assure unqualified success and none can be applied as a recipe. Rather, the ways to overcome these problems must be adapted to the unique circumstances of students, curriculum, and context. Creating successful group work is not simply a matter of putting students together. Students do not automatically become more involved, thoughtful, tolerant, or responsible when working with others.

The effects of group work depend on how the group is organized, what the tasks are, who participates, and how the group is held accountable. Teachers must consider the purposes in designing group work and address potential problems of process if group work is to be successful. In this article, we illustrate variations in purposes and types of group work and then detail factors that influence the process. Finally, we describe new developments in peer learning, collaborative communities, highlighting potential contributions of technology.

Forms of Group Work

Teachers are often advised through policy statements that they should have their students work in small groups. The reasoning behind this advice can come from disparate sources. One major source comes from recent successes in American business that are often claimed to be the result, in part, of changes in the way workers and management interact. Small-group problem-solving has replaced top-down, rigid management. To some, it follows that if small groups are going to be the problem-solving units in businesses, schools should have the same arrangement so that students can learn early in their lives how to work in small groups. Regardless of the validity or wisdom of this advice, it is not so easy to transform the culture of schools to incorporate extensive use of small-group learning. One

major reason is that there is an enormous variety in the ways in which small groups can be organized. Teachers have to be selective in their choices depending on their goals, the work that is to be accomplished in the group, and how performance will be evaluated.

Several widely used types of research-based group work are available to teachers. All conceive of this approach as part of a larger set of instructional methods, not as a panacea to change classroom teaching and learning completely. These approaches differ; there is no one way to do group work. Although developers have comprehensive goals, they tend to emphasize academics (e.g., Johnson & Johnson, 1986; Sharan, 1980; Slavin, 1990) or improved group relations (Aronson, Blaney, Stephan, Sikes, & Snapp, 1978; Cohen, 1986). The tasks vary from highly structured worksheets where students practice skills or learn definitions to more open-ended activities where students identify and solve problems. Cooperation is established in some by prescribing student roles. In Aronson's "jigsaw," the learning material is divided into small portions, and each group member works with members of other groups to study and become expert in one segment of the material. These "experts" return to their original groups to explain their portion. The group is held accountable for learning all the material. In other programs, such as Sharan's "group investigation," ways to ensure cooperation are not prescribed. Products can be created by individuals or devel-

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oped by the whole group. Students may be rewarded for their own work, or rewards may be interdependent and determined by group performance. Some programs do not specify how to determine rewards. Slavin's programs combine individual accountability and group interdependence through quizzes and by basing team rewards on aggregate individual performance. In some, competition among groups is included; in others, rewards are not conditional on how other groups performed.

Obviously, adding small-group work to classroom instruction is not simple. Teachers need to have clear purposes when using group work, and they need to be aware of some of the many limitations and considerations to successful use. It is to these that we now turn.

How Groups Work

Even if teachers decide that they want to use small-group learning, what problems might they confront? Will students actually learn more information and learn to think more deeply if they work in groups? Will they cooperate with each other, sharing in the labor and contributing to the thinking? Will they help each other and seek guidance from peers when they need it? Will they be happy with lowered grades if one of the group members does not understand a concept? Will they be willing to work with students who look different from themselves, speak English with a different accent, or have different attitudes about the world? These are very real questions for which teachers need to have answers if they are going to change.

Research has shown that successful groups promote (a) student exchanges that enhance reasoning and higher-order thinking; (b) cognitive processing such as rehearsing, organizing, and integrating information; (c) perspective-taking and accommodation to others' ideas; and (d) acceptance and encouragement among those involved with work (Bossert, 1988–1989). Recent reviews note that research focused on outcomes reports different findings than research focused on processes. The latter report potentially serious problems and factors that influence their occurrence (Good, Mulryan, and McCaslin, 1992; Webb & Palincsar, 1996) . For group work to succeed, educators must consider norms, tasks, help giving and seeking, and group composition.

Group Norms

Effective group work requires students to share ideas, take risks, disagree with and listen to others, and generate and reconcile points of view. These norms do not necessarily pervade classrooms. Students are used to working individually, being rewarded for right answers, and competing with each other for grades. Placing students in groups does not mean they will actually cooperate. There is considerable and disturbing evidence that students often do not behave prosocially. One problem is failure to contribute. When groups create a single product and receive one grade, students sometimes do not do their fair share. They try to get a free ride or engage in social loafing. Moreover, students who do most of the work feel exploited and reduce their efforts or work on their own. Forceful students may also dominate discussions, pressure others to accept their perspective, or force conclusions on the group. Others may ridicule and exclude group members or discount their

contributions. Rejected members are likely to be humiliated and withdraw. Managing interpersonal relations often detracts from learning content, as well. Attempts to promote positive norms include pretraining for cooperation, including listening and resolving conflicts, teaching students to appreciate the skills and abilities of others, and using rewards that promote interdependency.

Tasks

Tasks influence student interchanges and the opportunities for learning that result. Students can benefit when they share ideas, accommodate others' perspectives, and give and receive help. This is likely to occur when tasks entail problem-solving and involve more than one right answer, not when students complete worksheets aimed at improving low-level skills or recall. When students connect their ideas and explain them to others or when students generate problem solutions based on information they have gathered, more discussion and elaborated responses will be needed to help peers understand their perspective. Such desirable interchanges are uncommon. Palinscar, Anderson, and David (1993) have shown that students need considerable assistance in the process of argumentation and have developed a program to help students systematically consider alternative explanations for phenomena and offer justifications for their reasoning. Moreover, negotiating such complex tasks requires considerable skill to plan, monitor, and evaluate progress.

Giving and Seeking Help

Giving and seeking help are central to learning in groups. Help-giving can benefit even high achievers, but only when they give elaborated explanations that require clarified and organized thinking. Help-seekers do not always benefit from the help they get. The help must be timely, elaborated, comprehensible, cogent, and must be correct to avoid reinforcing misconceptions. Effective help is automatic. Students may not know how to help effectively and may require special training to learn how to elaborate their thinking. Suggestions for helping students craft good explanations include giving examples, creating analogies, and using multiple representations. Moreover, students may not be aware that they need help nor seek it when needed. They may not know how to ask questions that identify their problem, or they may be unable to make use of help they receive. More troubling though are students who remain silent or withdraw because they believe that needing help indicates incompetence (Nelson-LeGall, 1985).

Accountability

Rewards influence group interactions and whether students are willing to give help. Evaluation can be based on individual performance regardless of how the group does. Alternatively, groups can be assessed on a single product with all students earning the same grade. Some argue that interpersonal relations suffer when there is a single group grade; failing groups have lower self perceptions, less satisfaction, and blame low achievers for the group's performance (Ames, 1981). Slavin (1990) asserts that individual accountability and group rewards are essential to ensure cooperation. Individual accountability ensures that one student does not do the group's work. Unless group re-

wards are interdependent, students view interaction as wasteful. Slavin's programs also stress intergroup competition and prizes. However, critics claim that such rewards are actually detrimental because they focus students on grades more than learning. When rewards are based on competition between groups, the results can be detrimental for relations with other classmates.

Group Composition

The mix of achievement levels, race and ethnicity, and gender influences how students interact, who benefits, and whether students actually engage in serious thought. Low achievers and special education students are sometimes stigmatized in heterogeneous groups. High-ability students may dominate group discussion; low-ability students may lack necessary skills and misinterpret tasks. When speed is important, more able students may take over if they resent students who slow down work. When group rewards are interdependent, high achievers are more likely to offer help. Generally, groups are more successful when members are drawn from high and middle or middle and low achievement levels or where students are all in the middle. When three levels are included, middle students benefit less because they are less likely to give explanations. The mix of student backgrounds also affects peer acceptance, encouragement, and interaction. Cohen (1986) suggests that status differences become even more salient during group work; minority students generally are presumed by majority students to be less competent and may be rejected or excluded. To address these problems, she has developed approaches to help teachers and majority students view minority students as competent. These include having low-status students teach a task on which they received prior training to high-status students and using tasks that require multiple abilities so all students can contribute.

The factors discussed in this section show that teachers need to make many decisions about how to promote group norms, help students develop skills and habits to learn with peers, design and select tasks and group students in a way that promotes learning, and determine ways to hold students accountable.

Collaboration

Newer models of group work are available to help promote some of the benefits that are presumed to accrue from small-group learning. Recent research portrays collaboration as a key to help students construct knowledge and to introduce them to disciplinary language, values, and ways of knowing. The disciplines represented in school subjects have special vocabularies, bodies of knowledge, and methods for gathering evidence and evaluating findings that novices need to learn. Collaborative learning that engages students in the construction of shared meaning will help advance the learning of disciplinary knowledge and understanding (Brown, 1995).

In Webb and Palincsar's (1996) view, collaboration subsumes cooperation but extends it in several important ways. The aim is to build communal knowledge through conversation. Collaboration can occur within a whole class, among groups in a class, and with people and groups outside the classroom. As students converse, they are exposed to and draw on the expertise of others and learn from them (Bruer, 1995). In collaboration of this sort,

groups are not highly structured nor are specialized roles assigned. Collaborative tasks tend to be open ended and answers are not predetermined. Knowledge generation is emphasized as students pose questions or define problems. They gather information and data, interpret findings, and use evidence to draw conclusions. Individuals, groups, or the whole class may create unique artifacts to represent understanding. Because the aim is to share ideas with the whole class or community, interdependence is highlighted; there is little emphasis on group rewards to ensure cooperation or group competitions to motivate students. These newer approaches to peer learning entail some of the same difficulties described above regarding small-group learning. To address them, emerging computing and communications technologies (e.g., powerful, low-cost computers; the Internet; and the World Wide Web) are being used to support collaboration.

Technological Support for Collaboration

Technologies such as E-mail increase opportunities for conversations by enabling large groups of students to exchange data and share observations in asynchronous conversations (i.e., conversations that do not require all parties to be involved at the same time). Programs also support synchronous conversations in which students converse by typing. Technology also helps support and keep track of dialogue among students and serves as a public archive of conversations. Software (e.g., CSILE, Scardamalia & Bereiter, 1991) specifies and organizes elements of conversations such as generating hypotheses or predictions and commenting on others' work. Unlike E-mail systems then, these collaborative software applications are expressly designed to support the creation of shared understanding. In addition, conversations can be stored, reflected on, and reacted to, creating a common knowledge base that is open to review, comment, and manipulation (i.e., searching conversations by date, subject, or author) by many—not just the conversants. Experience indicates that students who do not typically engage in classroom discussion participate in these computer-based, classroom-wide conversations. The newest generation of collaborative environments supports conversations but goes substantially further by providing a "place" to which students can go. This new generation of environments (such as those under development by Soloway and Krajcik, 1995) provides tools to accumulate and integrate a range of communications functions. Such software will constitute a suite of virtual Internet rooms where students can go to collaborate. Conversations can take place in the context of digital artifacts. Students can view the same drawing, text document, or interactive program in one window as their conversations go on in another window, or students can drop output from their simulation program into a collaborator's visualization program, all the while chatting synchronously.

A number of technological challenges need to be addressed for these new tools to have an impact (e.g., adequate computer availability, easily mastered programs suited to learners' needs). More importantly, effective instructional strategies are needed to help students use such systems productively. While considerable research has examined small-group collaboration, there is no comparable body of experience for the use of technology-supported small groups.

Conclusions

Peer learning can be a powerful tool. However, it is not a guaranteed solution to educational problems. Small-group instruction can be used in appropriate as well as inappropriate ways. Results can be positive when close attention is paid to norms, tasks, the mix of participants and their skills, and methods to ensure accountability.

Note

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Simple Answers: Alternative Teacher Certification

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I f our public schools, particularly our urban schools, are failing to educate America's youth, a seemingly simple solution is to recruit better teachers. There are, the argument goes, a great number of potentially good teachers who did not earn teacher certification as undergraduates, but who now as more mature adults want to teach. Military retirees, second-career seekers, empty nest housewives, downsized professionals, and recent college graduates are viewed as an untapped resource. To attract them to public school teaching, alternatives to undergraduate teacher education programs are needed (Clinton, 1996).

Alternative certification eases entry requirements, minimizes preparation needed prior to paid teaching, and emphasizes on-the-job training. Such policies have created a variety of state, district, and privately run alternative route programs enabling college graduates to teach in public schools without completing a teacher education program.

Implied Problems Addressed by Alternative Certification

Implicit in this argument for alternative certification are three major problems: the quality of people entering teaching, the quality of teacher education programs, and the ability of the present system to supply enough good teachers for urban schools. Alternative certification policies are seen as positively affecting recruitment, preparation, and retention of quality teachers, particularly for harder-to-staff urban schools (Ashton, 1991; Dill, 1996; Feistritzer, 1994; Haberman, 1992; Natriello & Zumwalt, 1993).

Recruitment

Alternative certification is seen as attracting higher-ability, more diverse, experienced people with subject matter majors. Instead of relying on the usual pool of undergraduates

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