

Group Process Research *Implications for Using Learning Groups*

Carolyn Birmingham and Mary McCord

If we want to transform newly formed groups into high-performance learning teams, what do we need to do? This chapter summarizes some of the key findings from the research literature on group dynamics that indicate what groups need to become high-performance teams.

The primary objective of this chapter is to review the extant empirical literature that focuses on the development of high-performance teams. The focus of the review is identifying prescriptions for creating and managing high-performance teams, that is, teams whose primary function is to enhance members' educational development. The review is organized around the key findings that emerged from an extensive study of intact work groups (from a wide variety of work settings) that was conducted by Hackman (1990). Based on his research, no group can become a high-performance team unless its members: (1) bring adequate knowledge and skill to bear on the task, (2) employ task performance strategies that are appropriate to the work and to the setting in which the work is being done, and (3) are motivated to exert sufficient effort to accomplish the task at an acceptable level of performance.

The following paragraphs address each of these key factors. The first section examines the literature that deals with bringing adequate knowledge and skill to the work of the group, and addresses questions regarding group composition and formation in relation to the complexity of the tasks to be performed. The next section discusses conditions that affect the development of group processes that encourage active member participation. This discussion focuses on research related to the impact of the group or team maturation process and the nature of the tasks that groups are expected to perform. The final section examines the research related to the characteristics of performance and reward and feedback systems that are effective in promoting active member participation and team development.

ENSURING ADEQUATE MEMBER KNOWLEDGE AND SKILLS

In business settings, success in dealing with complex problems is primarily measured by the “products” created by employee groups. Therefore, organizations strive to recruit team members who already have needed skills, either by assembling teams from existing employees or by hiring new ones. Educational settings, however, differ from the typical workplace in the formation of groups in two important ways. One is that the most important measure of success is what group members learn, not what they produce. In fact, learning is typically enhanced by assignments that require students to struggle with challenging intellectual tasks. The other difference is that in learning groups, the primary purpose of group interaction is increasing members’ skills. As a result, members seldom start out with the skills they need to accomplish their assigned tasks. Thus, in educational settings, the primary focus of the group formation process is creating groups whose members are, in combination, capable of acquiring the information and skills needed to complete the tasks through which the learning occurs.

In both workplace and classroom settings, giving groups complex intellectual tasks can be a two-edged sword. On one hand, solving complex problems requires broad-based member input and open give-and-take discussion. Thus, complex problems provide the opportunity for group members both to contribute to the success of their group and to learn from each other as a natural part of doing their work. On the other hand, to have the resources necessary for solving complex problems, groups must contain members who either have or are capable of acquiring a wide range of intellectual, process-management, and interpersonal skills. As a result, one key to using groups effectively, either for solving complex problems or for creating a rich learning environment, is forming the groups so that members either have or are capable of acquiring the resources required for their assigned work.

In general, the actual group formation process, in either business or educational settings, typically involves assessing the capabilities of a limited pool of potential members and distributing them among the number of groups that are to be formed. Thus, the process of forming groups requires varying the group size and the diversity of group members to match task requirement needs (Gersick, 1988; Gersick & Hackman, 1990; Hackman, 1990). Also included in this equation are the processes by which groups are formed and the length of time groups should remain together.

Group Size

Extant literature reporting on the optimal size for teams identifies two factors that have a significant impact on decisions about the ideal size of a group or team. One is that the lower limit for the ideal group size is determined by the difficulty of the tasks to be performed (Hackman, 1990). With simple tasks, a team would not be needed at all. However, the more complex the task, the larger the ideal size group. However, the other factor is that the relatively short duration of academic terms tends to set an upper boundary to the ideal size group. This is because the larger the group, the greater

the time and effort required to develop a level of group cohesiveness required for effective group work.

To no surprise, studies which date back to the 1950s, on the appropriate size of problem-solving groups (Bales, 1950), generally involve making a judgment about a trade-off between resources and member involvement (Kowitz & Knutson, 1980; Scheidel & Crowell, 1979). On one hand, larger groups generally have more resources and, as a result, are capable of dealing with more complex problems. On the other hand, as groups become larger, fewer members actually participate in group discussions (Bales, 1950). As a result, members of larger groups tend to be less satisfied with, and less committed to, the success of their groups.

In terms of actual numbers, most researchers have concluded that for significant intellectual work, the minimum size for an effective group is five members. At the other end of the spectrum regarding size, most studies have concluded that groups larger than seven members tend to encounter significant problems with group processes (Kowitz & Knutson, 1980; Scheidel & Crowell, 1979). Given the importance of having groups or teams work on complex tasks, this research suggests that groups of five to seven would appear to be optimal.

Group Diversity

Although the ideal diversity of the team is also a function of the tasks to be performed (Hackman, 1990), empirical research on team effectiveness clearly poses a dilemma for people forming groups. On one hand, diversity typically enhances a group's information gathering and processing capacity by increasing the likelihood of having a broader set of member viewpoints. As a result, few would argue against the potential value of forming problem-solving groups so that members are likely to have a diversity of opinions (Watson, Kumar, & Michaelsen, 1993).

One must also be alerted, however, to the potential for negative impact when group members are diverse. In fact, a great deal of research tends to highlight at least the initial negative impact of member diversity (e.g., Chatman & Flynn, 2001; Watson et al., 1993; Williams & O'Reilly, 1998). In part, the initial negative impact of member diversity results from a combination of two factors. One is that diverse groups are less likely to be cohesive than homogeneous groups (Shaw, 1981). The other is that group cohesiveness generally enhances group effectiveness (Evans & Dion, 1991; Gruenfeld & Hollingshead, 1993; McGrath, 1984; Shaw, 1981). In part, the initial negative impact of having highly diverse groups is that they take longer to develop to the point where they can use member resources effectively (Watson et al., 1993). However, although diverse groups typically have more initial difficulties, after forty hours of working together they are typically more effective than homogeneous groups (Watson et al., 1993). Thus, given the importance of using assignments and tasks based on difficult problems, the empirical research on group effectiveness clearly supports using heterogeneous learning groups, assuming that the groups work together long enough to become cohesive.

Forming Groups

Regardless of the setting, anyone faced with managing multiple teams has a limited set of potential team members. Therefore, he or she has to employ some mechanism to assign individuals to groups so that two important things can occur. One is ensuring that each of the groups has members with the necessary skills and abilities to complete their assigned tasks. The other is ensuring that the process used to assign individuals to groups is perceived by the students as a process that is fair. If students are comfortable with the process, they are much more likely to be motivated to succeed to “prove” their worth. On the other hand, if the group assignment procedures are perceived as being biased in some significant way, members are likely to feel that the unfair selection process offers a ready-made excuse for failure.

Alternative Strategies

The three group-formation methods discussed in the literature are self-selection, random assignment (Griffin, 1985), and assignment by individual student ability (Evans, 1988). In general, self-selection tends to be the most problematic group-formation strategy. For instance, the data show that self-selected groups are generally homogeneous (Bies & Shapiro, 1988) and, as a result, have less potential for solving complex problems. That is, using student-formed groups creates the potential for groups with uneven and/or inadequate resources. Surprisingly, students often perceive that self-selection gives some groups an unfair advantage (Bies & Shapiro, 1988).

Forming groups by random assignment is a somewhat better method. And it has the advantage of being perceived as fair by the students (Griffin, 1985). On the other hand, with random assignment there is a risk that, as in self-selected groups, some of the groups may end up with inadequate resources (Evans, 1988).

Taken together, the empirical literature supports two practices for forming groups. One is that the teacher should form the groups. The other is that he or she should use a group-formation process through which the available resources (and liabilities) are evenly distributed among the groups so that they are generally at the same ability level. If learning groups are generally equal in ability, the instructor can use a common set of assignments without having to worry that some assignments are too difficult for some groups but too easy for others. The prescription for forming groups is that the instructor should stratify the selection pool so that assets and liabilities will be evenly spread across groups, and use some form of a random assignment procedure in actually assigning members to groups to ensure that the process is perceived as being fair.

Next Steps

Although correctly forming groups is likely to increase the extent to which members have (or are likely to be able to acquire) needed skills, getting the groups formed is only the first step in creating high-performance teams. Newly formed groups, for a va-

riety of reasons, are simply not able to work together effectively. Thus, once the groups are formed, the next problem is to create conditions that are likely to stimulate the active give-and-take discussion that is required to complete tasks that are complex enough to provide opportunities for significant learning.

DEVELOPING PROCESSES THAT PROMOTE ACTIVE MEMBER PARTICIPATION

Helping groups become effective involves a number of important ingredients. Two of the most important steps are ensuring that members meet together over time to enable them to mature as a group, and members are required to complete tasks that are complex enough to provide opportunities for significant interaction and learning. This section discusses each of these critical steps.

The Impact of Group Maturity on Group Member Participation

The literature on small-group effectiveness identifies a number of group interaction characteristics (see Table 4.1) that are clearly different in newly formed as compared to longer-term groups. These characteristics undoubtedly have implications for the kind of give-and-take discussion that is essential to group and team effectiveness, regardless of the setting. They include individual members'

1. level of trust in, and attraction to, their group;
2. motivation to achieve group goals;
3. willingness to help each other;
4. awareness of each other's skills and abilities;
5. ability to share information effectively;
6. willingness to disagree;
7. preferred method for resolving conflict;
8. overall ability to complete difficult intellectual tasks.

Group Trust and Attraction

In part, attraction to a group depends on the level of trust that members have in each other. Further, since one of the most important conditions for developing trust is seeing other team members reliably complete tasks over time (Gulati, 1995; McAllister, 1995; Ross & LaCroix, 1996), members of newly formed groups are unlikely either to trust each other or to be highly attracted to their group (Hambrick, Davison, Snell, & Snow, 1998). Over time, however, as members have the opportunity to demonstrate that they will reliably contribute time and effort to ensure that the group task is completed, sociability, attraction, and cohesiveness all increase (Jarvenpaa, Knoll, & Leidner, 1998; Johnson, Johnson, & Scott, 1978; Knoll & Jarvenpaa, 1995).

TABLE 4.1

Summary of Empirical Research Interaction Characteristics of New versus Mature Groups

Interaction Characteristics	Group Maturity		Conclusions Based on Research by:
	New Groups*	Long-Term Groups	
• Trust in & Attraction to Group	Low to Moderate	Potentially High	McAllister (1995); Johnson, Johnson, & Scott (1978); Ross & LaCroix (1996); Hambrick, Davison, Snell, & Snow (1998); Gulati (1995); Jarvenpaa, Knoll & Leidner (1998)
• Motivation to Achieve Group Goals	Little identification with group or goals	High identification with group and goals	Brandon & Pratt (1999); Saunders (2000); Jarvenpaa, Knoll & Leidner (1998); Evans & Dion (1991); McGrath (1984); Langfred (1998)
• Willingness to Help Other Members	Self-interest paramount	Members support and help each other	Johnson, Johnson, Johnson, & Anderson (1976); Lazarowitz, Sjaram & Steinberg (1980)
• Awareness of Members' Skills and Abilities	LOW–Based on stereotypes of members' <u>personal</u> attributes	HIGH–Based on observations of members' behavior	Harrison, Price, & Bell (1998); Zalkind and Costello (1962)
• Effective Sharing of Task-Related Information	Focus on social; high dependence on group's best member	Focus on task; all members' input available to & used by group	Gersick (1988); Johnson, Johnson, Johnson, & Anderson (1976); Johnson, Johnson, & Scott (1978); Watson, Michaelsen, & Sharp (1991)
• Willingness to Disagree (potential for open give-and-take discussion)	LOW–Most discussion focuses on areas of agreement	HIGH–Members willing to voice and attempt to resolve differences	Ellis & Fisher (1975); Arrow & McGrath (1993); Moreland & Levine (1988); McGrath & Gruenfeld (1993); O'Connor, Gruenfeld, & McGrath (1993); Leana (1985); McGrath, Arrow, Gruenfeld, Hollingshead, & O'Connor (1993); Simmons & Peterson (2000)
• Method of Resolving Conflict	Mostly use face-saving strategies (e.g., voting, compromise)	Open discussion aimed at reaching group consensus	Gruenfeld, Mannix, Williams, & Neale (1996); Birmingham & Michaelsen (1999)
• Ability to Complete Difficult Intellectual Tasks	Inherently low due to low member commitment and avoidance of open discussion	Potentially high due to increased member commitment and more open discussion	Hackman (1990); Arrow & McGrath (1993); Jehn & Mannix (2001); Watson, Michaelsen, & Sharp (1991); Gruenfeld & Hollingshead (1993); Watson, Kumar, & Michaelsen (1993)

* Includes existing groups with new member(s) added

Motivation to Achieve Group Goals

Group goals are a key element of the development of member trust and group cohesiveness in several different ways. In particular, groups with high levels of diversity need common goals to establish a basis for thinking of themselves as a team (Brandon & Pratt, 1999; Saunders, 2000). Working cooperatively to accomplish team tasks and goals provides members with the opportunity for ongoing interpersonal and informational exchanges between group members (Jarvenpaa et al., 1998). Further, over time, goals even provide a basis for team interaction. For example, groups with high levels of trust discuss group goals more than do groups with low levels of trust (Jarvenpaa et al., 1998).

Given the centrality of group goals in the group development process, it is not surprising that highly cohesive groups are generally more effective in achieving group goals than less cohesive groups (Evans & Dion, 1991). The ability of highly cohesive groups to achieve their goals is, however, a potential cause for caution. Generally, cohesion influences a group in the same direction as the existing group norms (McGrath, 1984). If a group is highly cohesive and has norms that are task-performance oriented, then members are motivated to outperform other groups (Langfred, 1998). If not, however, group norms often focus on unintended or undesired goals (e.g., protecting members from unreasonable demands from managers or teachers) and can motivate members to restrict their productivity (e.g., Seashore, 1954; McGrath, 1984).

Willingness to Help Each Other

Another positive aspect of increased group cohesiveness is that members of cohesive groups tend to feel a higher degree of responsibility for each others' well-being. As a result, they are more likely to provide interpersonal support (Likert, 1961) and help each other (Lazarowitz et al., 1980).

Awareness of Each Other's Skills and Abilities

In most instances, members of new groups know very little about each others' skills and abilities. In fact, members' initial perceptions of each others' skills and abilities are likely to be based on the stereotypes of what Harrison et al. (1998) called personal diversity, that is, observable physical characteristics such as race, gender, and so on (see also Zalkind & Costello, 1962). As a result, groups will be largely unable to utilize members' knowledge and skills very effectively until they have enough contact to be able to learn about each other as individuals. Over time, watching other team members at work allows members to assess each other's skills and abilities more accurately (Harrison et al., 1998).

Effective Sharing of Task-Related Information

A number of studies have found that information sharing in newly formed groups is not likely to support high task performance on intellectual tasks (see Table 4.1). For example, Gersick (1988) found that most new-group interaction fo-

cuses on social issues such as members getting to know each other. Consequently, the exchange of task-related information is likely to be both low in quantity and mostly focused on the facts and ideas that members already have in common (Johnson et al., 1976; Johnson et al., 1978). Given this limited ability to share task-related information, it is not surprising that the effectiveness of newly formed groups in dealing with intellectual tasks seldom exceeds the ability of their best individual member (Watson et al., 1991).

Over time, however, group members grow more comfortable working with each other, and group interaction shifts from interpersonal to task issues (Gersick, 1988). A number of studies have also shown that cohesive teams exhibit a higher rate of information exchange and develop expertise in eliciting and using information that, in the beginning, was known to only a single group member (Johnson et al., 1976, 1978). Similarly, Watson, et al. (1991) found that groups that had worked together for over twenty-five to thirty hours were both more effective than, and less dependent on, their best member. They reasoned that the most logical explanation for their findings was that working together had increased the quieter members' willingness to speak up and enabled the more assertive members to learn the importance of listening to what others had to say before reaching a group decision.

Willingness to Disagree

The effective performance of nonroutine tasks requires constructive conflict (task or functional conflict; see Amason, 1996; Amason & Schweiger, 1994; Jehn, 1994, 1995, 1997, 2000; Jehn, Chadwick, & Thatcher, 1997; Jehn & Mannix, 2001; Priem & Price, 1991). However, a number of studies have found that members of newly formed groups are likely to withhold the information that would make constructive conflict possible. For example, several empirical studies (see Table 4.1) found that members both of new groups (Ellis & Fisher, 1975; McGrath, Arrow, Gruenfeld, Hollingshead, & O'Connor, 1993) and of established groups that have added members (Arrow & McGrath, 1993; Moreland & Levine, 1988) intentionally suppress information that members believe may produce conflict. In addition, members of new groups respond differently from members of longer-term groups when they do become aware of differences of opinion. For example, unless group members trust each other (which is unlikely in newly formed groups), any conflict is likely to be seen as a personal attack, that is, a relationship conflict (Simmons & Peterson, 2000). On the other hand, Leana (1985) found that established groups were much more likely to challenge each other's ideas, even if the challenger held a minority opinion.

Methods of Resolving Conflict

In addition to the fact that conflicts are less likely to arise in newly formed groups (for the reasons already outlined), the methods used to resolve the conflict that does occur are very different in new groups, as compared to mature or cohesive groups. For example, even though voting is less effective than discussion as a means of handling disagreements in decision-making groups (Innami, 1994); Gruenfeld, Mannix,

Williams, and Neale (1996) found that newly formed groups were likely to use voting as a means of resolving conflict. Similarly, Birmingham and Michaelsen (1999) documented that new groups generally resolved conflicts by adopting a solution that was clearly a compromise, but later on as they became more cohesive, these same groups nearly always engaged in give-and-take discussion until they were able to reach a group consensus.

Overall Ability to Complete Difficult Intellectual Tasks

Many of the dysfunctional processes that are characteristic of newly formed groups result from the fact that they are faced with the dilemma of having to complete a task at the same time they are learning to work with each other (e.g., Argote & McGrath, 1993; Gruenfeld & Hollingshead, 1993; Levine & Moreland, 1990; McGrath, 1991). Ironically, the same dysfunctional processes may actually be helpful in the long run. For example, although clearly suboptimal from the standpoint of either task effectiveness or learning, behaviors such as searching for areas of agreement, withholding information that might create conflict, and voting or compromising to minimize discussion when conflicts arise, all tend to reduce members' uneasiness about working with each other. The key is that they are all practical ways of building a level of trust that is likely to enable effective group problem solving later on.

Developing newly formed groups to the point that give-and-take discussion (the kind that promotes learning) occurs on a regular basis, is much more of a process than an event and guides much of managerial practice in nonclassroom settings. For example, even though sports teams are made up of highly skilled athletes, the standard practice of professional sports coaches is to prepare for the games that "count" by holding a training camp and playing a series of preseason games. These training camps and preseason games provide the building blocks for future productivity by enabling team members to interact enough to have the opportunity to learn from and about each other. Taken together, the evidence from both management practice and the studies cited in Table 4.1 suggests two essential conditions for the development of high-performance teams in any setting (including higher education). One is maintaining a membership that is stable long enough for members to have the opportunity to learn to work together. The other is that the groups must engage in activities that require members to interact with one another.

Tasks that Promote Ongoing Interaction Among Group Members

Overall, the literature on small-group effectiveness suggests that ideal intellectual tasks for groups have three characteristics. One characteristic is related to the manner in which member input is combined. Another has to do with the difficulty of the tasks to be performed. The final characteristic relates to whether or not the significance of the task is likely to motivate individual members to prepare for and participate in group or team discussions.

Task Requirements for Combining Members' Inputs

Shaw (1981) identifies two different types of group tasks with respect to their requirements for combining members' input. One type, which we refer to as *joint* tasks (see "disjunctive tasks" in Shaw, 1981:174–176), requires members to jointly create a product (e.g., frame a house). The other task type, which we refer to as *independent* tasks (see "conjunctive tasks" in Shaw, 1981: 174–176), involves members independently contributing components to an overall product (e.g., a group of Boy Scouts completing a five-mile hike in the shortest possible time).

With joint tasks, group performance effectiveness is a function of the combined input and competence of group members. As a result, performance on joint tasks (e.g., a group discussion that leads to the creation of images or ideas, Frank & Anderson, 1971) is typically better in larger or more diverse groups (Bray, Kerr, & Atkin, 1978; Ziller, 1957). With independent tasks, however, a group's performance is largely determined by its least competent member. For example, although peer pressure may motivate the slowest scout to go faster than he would go on his own, he will inevitably increase the time required for the entire group to reach their destination. Thus, with independent tasks, a larger or more diverse group will likely lower the expected group performance (Frank & Anderson, 1971).

The differences between joint and independent groups appear to be particularly important when the work is intellectual in nature. Joint intellectual tasks, for instance making a complex decision, are likely to generate high levels of give-and-take discussion (and produce significant learning) because members intuitively realize that their performance is likely to be enhanced by a greater volume or diversity of member input. For example, Michaelsen, Watson and Black (1989) compared individual and group test scores and found that over 98 percent of the groups scored higher than their own highest scoring member. By contrast, independent intellectual tasks (e.g., members each creating their assigned segment of a group term paper) seldom produce any significant amount of substantive discussion because much of their time and effort is spent on members individually working on only their own component of the overall group task. Further, the larger the group, the greater the risk that a member will detract from the overall group performance by either doing poor quality work or failing to complete his or her part on time (Davis, Kerr, Atkin, Holt, & Meek, 1975).

Making a group decision is clearly a joint task (Shaw, 1981). As a result, basing grades on decision-based assignments motivates students to engage in give-and-take discussion because they realize that group or team performance is likely to be higher with greater member input. Further, the resulting give-and-take discussion both increases learning and promotes team development.

By contrast, the dynamics created by group term papers and presentations are likely to inhibit a high level of give-and-take discussion. In part, this is due to the fact that the only aspect of completing a group paper or presentation that is clearly a joint task occurs when the group is in the process of deciding which students should be responsible for the pieces of the overall product. The remaining aspects of the work (i.e., doing research on various elements of the project as well as preparing sections of a group paper or individual parts of a presentation) are, by their very nature, independent tasks (Shaw, 1981).

Further, the greater the emphasis on the form of the paper or presentation (greater length, specific evaluation criteria, etc.), the more students will tend to treat the assignment as an independent task by minimizing their discussion on substantive issues for two reasons. First, groups feel pressure to work on the part of the assignment that they think will really “count” (the actual paper and/or presentation). Second, and because emphasizing the form of the presentation tends to pressure students into dividing up the work before their groups have developed to the point that members are willing to openly disagree (e.g., Arrow & McGrath, 1993; Ellis & Fisher, 1975; McGrath & Gruenfeld, 1993; Moreland & Levine, 1988; O’Connor et al. 1993). As a result, the task allocation decisions are typically made by one or two dominant individuals who end up being resented by quieter members who do not like their part of the assignment but were unwilling to risk being seen as being either selfish (if they wanted to do more) or lazy (if they felt as if they were given more than their fair share of the work).

Level of Task Difficulty

Even joint intellectual tasks must be at an appropriate level of difficulty. If tasks are too simple, there is no need for group interaction (thus no opportunity for learning [Bray et al., 1978]), because one competent member acting on his or her own can (and likely will) complete the task on behalf of the group. On the other hand, tasks that are too difficult are just as likely to be counterproductive. Extremely difficult intellectual tasks elicit some initial discussion, but, especially in new groups, produce so much tension and interpersonal conflict that they disrupt the group development process (e.g., Eisenstat & Cohen, 1990). By contrast, using appropriately difficult tasks is one of the most effective methods for generating broad-based member participation (Harkins & Petty, 1982).

Task Significance

The other characteristic of effective group tasks, supported by empirical research on small-group effectiveness, is related to the observation that tasks that are significant (i.e., have the potential of measurably affecting people’s lives) are, in and of themselves, highly motivating (Hackman & Oldham, 1976, 1980). For example, a number of management scholars (e.g., Greenburg & Baron, 2000; Lawler, 1988) point to the motivational advantages of organizing work for teams around serving a specific group of customers or producing “whole” products to make the work itself more interesting. In addition, studies have shown that intrinsically interesting tasks (Harkins & Petty, 1982) and personally relevant tasks (Brickner, Harkins, & Ostrom, 1986) are likely to elicit high levels of member interest and commitment.

While appropriate tasks and assignments are critical to the development of high-performance teams, equally important are the methods used to evaluate the performance of the teams. Therefore, the third section of this chapter is devoted to a discussion of methods for evaluating and rewarding both individual and team performance. The discussion addresses the last of the three hurdles Hackman (1990) reported that any

TABLE 4.2
Summary of Empirical Research on the Impact of Performance Measurement and Reward Systems

Measurement/Reward System Characteristics	Impact on Team Members' Behavior	Conclusions Based on Research by:
• Members' Individual Contributions are Measured	Increased individual effort	Kerr & Bruun (1981); Williams, Harkin, & Latane (1981)
• Members' Individual Contributions are Rewarded	More and better quality member contributions	Schnake (1991)
• Collaborative Behavior is Measured and Rewarded	More cooperation and higher team performance	Hackman (1990)
• Members Anticipate External Evaluation of Group Performance	More and better quality member contributions	Harkins & Jackson (1985)
• Reward System Promotes Shared Fates and Goals	Increased member commitment to team	Brandon & Pratt (1999)
• Rewards Based on Group Performance	Increased effectiveness of team member interaction	Ancona & Caldwell (1992)
• Team Members Held Accountable for Actions	More careful analysis in discussing alternatives	Tetlock (1985, 1992)

formance to encourage group functioning (Ancona & Caldwell, 1992). Another study (Brandon & Pratt, 1999) found that shared fates and goals are critical for developing group identity. Finally, Tetlock conducted two studies (1985, 1992) in which he found that, when decision-making groups are held accountable for their actions, they consider relevant information and decision alternatives more carefully.

Creating Conditions that Foster Group Self-Management

Two other studies have also identified conditions that are related to members' motivation to spend time and effort to ensure that their team is successful. One is whether or not members anticipate that their team's performance will be evaluated by someone external to the team (Harkins & Jackson, 1985). The other is whether or not members view themselves as being in a competitive situation. That is, will their performance be evaluated in relation to other comparable teams (Kravitz & Waller, 1980)?

Thus, even when tasks are clearly appropriate for learning groups, they are likely to fail unless the assessment–reward (grading) system encourages collaborative task behavior (Hackman, 1990). Overall, these empirical studies suggest four practices that are likely to encourage responsible member behavior. Two are related to what is being measured. The other two are related to what “counts” (what is rewarded—or not rewarded). Specifically, members are more likely to be motivated to ensure that their team is successful when: (1) individual contributions are measured, (2) individual contributions count, (3) team performance is measured (especially in relation to other teams), and (4) team performance counts.

Taken together, these studies suggest that an effective grading and performance evaluation system should include mechanisms for measuring and rewarding both individual preparation for team work and for assessing and rewarding team performance.

Without this kind of accountability, one of two problems will almost certainly occur in learning groups. First, when individuals are not prepared to contribute to their group's task, other students are forced to carry their load. And second, when only one or two members prepare for group work, most group discussions degenerate into social events (Michaelsen & McCord, 2000).

The Importance of Timely Feedback

Feedback is essential to learning of any kind. Thus, creating an assessment–evaluation system that includes mechanisms for measuring and rewarding both individual members' contributions to their team and team performance is only the first step toward creating conditions that promote responsible member behavior and learning. In one sense, the performance-and-reward system is the theory, but performance feedback is the practice. Thus, the next step in promoting team development and responsible member behavior is ensuring that members receive performance feedback so that they can learn by experiencing the consequences of their choices.

A number of empirical studies have documented the importance of performance feedback for promoting high levels of member motivation (see Table 4.3). For example, probably the most widely accepted models for assessing a job's motivational potential is whether or not the person performing the job will have access to timely feedback on how well he or she is doing (Hackman & Oldham, 1976, 1980). In addition, a number of studies on goal setting have found that timely performance feedback powerfully affects member motivation by influencing their choice of future personal goals (Locke, Shaw, Saar, & Latham, 1981).

Performance feedback is also important to the development of the group. For example, Zander (1971) reviewed a number of studies on goal setting and found that timely performance feedback powerfully affects member motivation by influencing their choice of future group goals. Performance feedback also helps members develop a clear understanding of how both their individual efforts and the way in which members work together affect their group's effectiveness (e.g., Gersick, 1988, 1989; Hackman, 1990; McGrath, 1984, 1991; McGrath & Gruenfeld, 1993). Similarly, performance feedback in the form of group rewards promotes effective group functioning (Ancona & Caldwell, 1992).

Taken together, these studies suggest that timely performance feedback does much more than aid learning. It is particularly important in a learning-group setting because it has a powerful impact on team development in two different ways. First, timely performance feedback increases individual members' motivation to invest time and effort on behalf of their group or team. Second, timely performance feedback provides members with data that enables them to learn to work together more effectively.

SUMMARY AND CONCLUSIONS

At the beginning of this chapter we identified three hurdles that groups must overcome in order to develop into high performance teams: (1) bringing adequate knowl-

TABLE 4.3
Summary of Empirical Research on the Impact of Performance Feedback

Performance Feedback System Characteristics	Impact on Team Members' Behavior	Conclusions Based on Research by:
• The work itself enables members to track their own performance	Higher member motivation, effort, and contribution	Hackman & Oldham (1976)
• Members are aware how well they are performing	Members will select difficult but achievable <i>personal</i> performance goals	Locke, Shaw, Saar, & Latham (1981)
• Members are aware how well their group/team is performing	Members will select difficult but achievable <i>team</i> performance goals	Zander (1971)
• Members have ongoing access to performance feedback	Increased understanding of how to contribute individually and how to work effectively as a group/team	McGrath (1984, 1991) McGrath & Gruenfeld (1993), Gersick (1989, 1988), Hackman (1990)
• Members receive performance feedback by being rewarded	Increased effectiveness of team member interaction	Ancona & Caldwell (1992)

edge and skill to bear on the task, (2) employing task performance strategies that are appropriate to the work and to the setting in which it is being performed, and (3) motivating members to exert sufficient effort to accomplish the task at an acceptable level of performance (Hackman, 1990). In reviewing empirical literature related to these hurdles, we have discussed several key issues that instructors must address as they contemplate using learning groups in their classes (see Table 4.4).

The first of the issues identified in the literature focuses on the composition of the groups and falls in the category of the first of the hurdles outlined above. Of greatest significance in this area are data concerning the optimal size and diversity for individual groups as well as the methods used for forming groups. Empirical research reported herein suggests that groups should have at least five and preferably six or seven members and should be as diverse as the class membership will allow (see Table 4.4). The goal is to have groups large and diverse enough to contain members with the knowledge and skill to successfully complete the group assignments, but small enough to develop into a cohesive working unit.

With respect to the issue regarding the formation of groups, the data show that the instructor, not the students, should take responsibility for forming groups. When the instructor is the one making the decisions, there is greater likelihood that student assets and liabilities will be more evenly dispersed among the groups. Also, if the instructor makes group assignments based on known criteria, and especially if the process takes place in a "public" setting, students are less likely to be concerned about one or more groups having an unfair advantage.

The issues discussed earlier in of this review are those related to the second of the three hurdles set forth by Hackman (1990), that is, developing processes that promote active member participation. The emphasis here is an examination of factors that encourage members to contribute actively to the work of the group. Our survey of the literature reveals two important practices that encourage active member participation. One is maintaining a stable membership in the groups or teams. The other is using tasks that require member interaction. Research shows that multiple benefits result from members engaging in open give-and-take discussion as they work together to

TABLE 4.4
Research-Supported Prescriptions for Developing Highly Effective Learning Groups

How large and how diverse should the groups be?

- At least 5; preferably 6 or 7 members
- As diverse as the class membership will allow

How should the groups be formed?

- By the instructor and in a manner that assures:
 - ◆ Equal diversity and skills across groups
 - ◆ Perceived fairness of the member allocation process

How long should group membership remain stable?

- Permanently (within the limits of normal school terms)

What kinds of group tasks/assignments are most effective?

- Assignments based on Joint (not Independent) tasks to:
 - ◆ Ensure content-related give-and-take discussions
 - ◆ Provide a basis for peer teaching/learning
 - ◆ Promote group development
- Too difficult for individuals, but challenging for groups
- Based on issues of inherent interest to students

What kind of performance/reward systems should be used?

- Must include measures of and rewards for:
 - ◆ Individual member contributions to their group
 - ◆ Group performance (especially vs. other groups)

How important is timely performance feedback?

- Essential for the development of:
 - ◆ High member motivation
 - ◆ Effective group functioning

complete group assignments. For example, as group members become better acquainted, they become more aware of each other's assets and liabilities and more aware of how to use those to the best advantage. They also learn to trust one another more, which results in a greater willingness to share salient information. The combination of these behaviors results in a heightened desire (by members) to achieve group goals. The data also show that because these processes occur over time as the group matures, they have a powerful positive impact on the development of cohesiveness among group members.

When we look back at the previous section, which examines the last of Hackman's (1990) hurdles, that is, motivating members to exert sufficient effort to accomplish the task at an acceptable level of performance, we find the research to be quite straightforward. In regard to the characteristics of effective reward and performance feedback systems, the empirically based small-groups literature strongly supports two key practices. First, instructors should use a grading system that includes *measure-*

ment and rewards for both individual members' contributions to their group and for the performance of the group as a whole—especially in relation to comparable groups. Second, instructors should create conditions in which students have as much immediate feedback as possible on both individual members' contributions to their group and on group performance.

While the data do not reveal a specific recipe for guaranteed success with groups, the findings presented here provide a great deal of guidance for developing and using learning teams effectively. The research on developing high-performance teams highlights a number of specific practices that, if applied individually, are likely to provide incremental improvements in learning-group effectiveness. Further, these same practices, if followed in combination, will greatly increase the probability of developing truly high-performance learning teams.

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TEAM-BASED LEARNING

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Edited by

LARRY K. MICHAELSEN,
ARLETTA BAUMAN KNIGHT
AND L. DEE FINK