The Organizational Context of Teaching and Learning

Changing Theoretical Perspectives

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Sociologists have a predilection for the collective. We are centrally concerned with social facts, characteristics of collectivities that give shape and motivation to individual action. Sociological research on schooling shares this interest in the collective. School resources, composition, climate, leadership, and governance, all collective attributes of schools, are often looked to as sources of influence on the outcomes of schooling for individual students.

Yet the study of school organization is marked more by failure than by success. It is especially significant that the most important contribution by sociologists to research on schooling—the famous Coleman Report of 1966—is also the most spectacular failure to connect the collective with the individual in an educational setting. Variation in school conditions was largely unrelated to differences in student outcomes, as school-level effects were dwarfed by the powerful influence of the home environment for student learning. Though policymakers drew implications from the positive impact on learning of the proportion of White students in a school, the effect of racial composition was small compared to the great importance of individual family background factors. This pattern of results, emphasizing the individual over

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the collective despite the sociologist's predilection for the opposite, was only to be expected given that over 80% of the variation in student learning occurs within schools, not between schools. If most of the variation in learning is internal to schools, then schoolwide characteristics cannot explain a large proportion of the variation in learning.

Despite these limitations, efforts to study school organization and student learning persist. School climate is a popular term for the normative environment of schools, and hundreds of studies have tried to document an association between climate and student learning (Anderson, 1982). Yet findings for school climate research have been weak and inconsistent, and recent authors, pointing to substantial variation within schools in perceived climate, have questioned whether the concept is meaningful (Pallas, 1988). Studies in the effective schools tradition also emphasized collective properties of schools, such as goals, leadership, and disciplinary environment (e.g., Edmonds, 1979). Although researchers have consistently reported associations between these conditions and students' achievement, this research tradition has been challenged for a lack of rigor and systematic focus in its investigations and a lack of attention to possible mechanisms through which school characteristics are supposed to influence student learning (Barr & Dreeben, 1983; Purkey & Smith, 1983).

More recent and empirically promising studies of schools and student learning also neglect important linkages. Research that documents the achievement advantages of Catholic schools has identified students' academic course taking as a key mechanism, but it is not clear whether this mechanism operates primarily at the individual or the collective level (Bryk, Lee, & Holland, 1993; Coleman & Hoffer, 1987). A study of city high schools reported higher achievement in magnet schools than in comprehensive schools, but could not say what it was about magnet schools that led to higher achievement (Gamoran, 1996c). Research on restructured schools indicated that schoolwide restructuring may aid achievement, but many questions remain concerning what, exactly, is effective about restructuring and how school structure is linked with student learning (Lee & Smith, 1995, 1996, 1997; Newmann & Associates, 1996).

In this chapter, we respond to current limitations in the study of school organization and student learning. First, we take stock of research on school organization in greater detail. Second, we propose a new way of looking at the relation between the school's organizational context on the one hand, and the activities of teaching and learning on the other. Third, we present some different scenarios for teaching and learning activities and show how the organizational context of the school may play a different role in each case. Finally, we discuss the challenges of empirically verifying this new model of the organizational context of teaching and learning.

SCHOOL EFFECTS: FROM THE BLACK BOX TO NESTED LAYERS

Early studies of the impact of schools on student learning were exemplified by Coleman and colleagues' (1966) landmark research on equality of educational opportunity. Coleman and his colleagues estimated an economic production function in which student learning is an output that responds to various economic inputs such as expenditures, facilities, equipment, and background characteristics of teachers. In this model, the school is an unopened black box. What goes on inside the school—the production process itself—is not observed. If the production process were straightforward and predictable, the input–output production function would be a sensible way to study the impact of school resources. Yet the process of teaching and learning is complex and not fully routinized. Input–output studies do not reveal
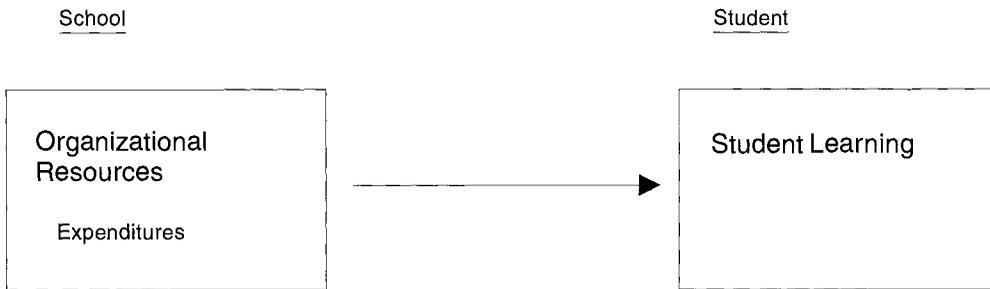
School   Student

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┌─────────────────────────┐                        ┌─────────────────────────┐
│                         │                        │                         │
│  Organizational         │                        │  Student Learning       │
│  Resources              │  ──────────────────▶   │                         │
│                         │                        │                         │
│  Expenditures           │                        │                         │
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FIGURE 2.1. The input–output model of school organization and school learning.

much about the effects of schools because so much depends on how the resources are used, and the use of resources is not included in the usual production function. Figure 2.1 provides a schematic display of the input–output model.

Scholars, educators, and politicians alike were surprised to discover that for the most part, variation in school resources bore little direct relation to variation in students' achievement, once background differences among students were taken into account (Coleman et al., 1966; Hodgson, 1975). This finding was reconfirmed in extensive reanalyses (Hanushek, 1994; Jencks et al., 1972; Mosteller & Moynihan, 1972). Most recently, a meta-analysis suggested that average resources do matter for student learning (Greenwald, Hedges, & Laine, 1996; see Hanushek, 1997, for a critique). Moreover in developing countries, where levels of resources such as trained teachers, textbooks, and facilities vary widely, the link between such resources and students' achievement tends to be stronger than it is in the United States and in other developed countries (Fuller, 1987; Fuller & Clarke, 1994; Heyneman & Loxley, 1983). In any case, it is clear that the relation between resources and outcomes is inconsistent—sometimes positive, sometimes negative, and sometimes absent—and the question of how to use resources effectively is much more important than whether average resources matter for average outcomes.

Opening the Black Box: The Nested Layers Approach

During the 1980s, sociologists of education began to open the black box of schools by studying the processes through which learning occurs. Bidwell and Kasarda (1980) distinguished between the effects of schools, the organizational context for teaching and learning, and schooling—the experiences students have in school that actually produce learning. According to this view, schools set the conditions for schooling, so that the influence of schools as organizations is always mediated by their impact on the schooling process. In this formulation, one understands the effects of schools by tracing the impact of school conditions on schooling activities and then by examining the connection between schooling activities and student learning.

Barr and Dreeben (1983) elaborated on this approach by exploring the organizational linkages among the different structural levels of school systems. In their view, outputs at one level of the organizational hierarchy (e.g., the school) become the inputs at the next level (e.g., the classroom). For example, school administrators allocate time to classroom teachers, make decisions within classrooms about how to use time, and instructional time allows teachers to cover the curriculum, which promotes student learning (Gamoran & Dreeben, 1986). This nested layers approach opened up the black box of schooling and focused attention on the

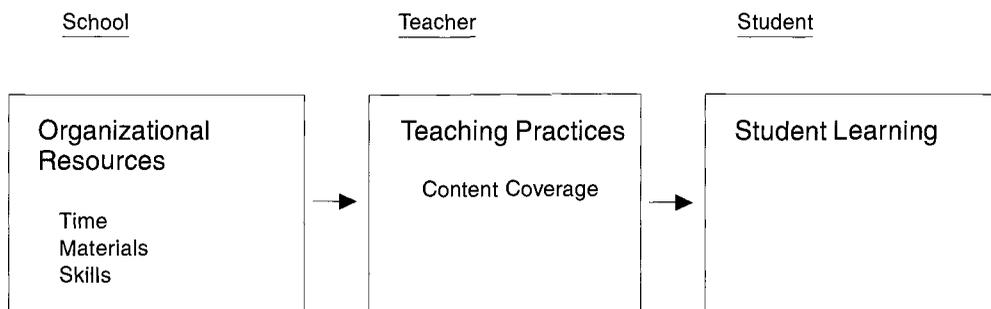School   Teacher   Student

FIGURE 2.2. The nested layers model of school organization and student learning.

technology of schooling, that is, the processes of teaching and learning within classrooms. Figure 2.2 displays the nested layers model.

The theoretical foundation for the nested layers model was laid by Parsons (1963), who distinguished between the technical, managerial, and institutional levels of organization, and argued that influences tend to flow across adjacent levels. In Parsons' scheme, resource allocation was a managerial activity, and the outputs of this activity affected processes at the technical level, which in schools consists of teaching and learning. Barr and Dreeben (1983) provided concrete specification of resources allocated at the managerial level (time and materials) and activities occurring in the technical level (coverage of curricular content).

The notion of nested layers offered a valuable conceptual advance over previous work, and it has achieved some empirical success as well. Studies of the flow of resources, most notably time for instruction, show that allocations from the district and school to the classroom set constraints on teaching, which in turn influences student learning (Gamoran & Dreeben, 1986; Monk, 1992). In their analysis, Barr and Dreeben (1983) took advantage of the statistical technique of path analysis, widely known to sociologists since Blau and Duncan's (1967) seminal work on social stratification, but not previously used to examine the inner workings of school systems. Using a path model, Barr and Dreeben provided empirical documentation of the flow of resources and activities from school to classroom, from classroom to instructional group, and from group to individual student. The logic of path analysis is also evident in nested layers analyses by Alexander and Cook (1982), Rowan and Miracle (1983), Gamoran and Dreeben (1986), and others.

The nested layers model appears to have correctly identified the connections between resource allocation and the technology of teaching. However, efforts to examine a wider spectrum of school conditions have yielded inconsistent results for the nested layers model. For example, not all subjects and grade levels indicate that curricular allocations exert strong influences on student learning. Doyle (1992), summarizing the literature on the impact of curriculum on pedagogy, concluded that "curriculum is a weak force for regulating teaching" (p. 488). Although teachers tend to cover the topics reflected in the formal curriculum, they use their own discretion and may vary widely in teaching methods, in time devoted to various topics, in modes of assessment, and so on (Barr & Sadow, 1989; Freeman & Porter, 1989; Stodolsky, 1988). These findings derive from the United States, but in other countries where high-stakes tests are more closely linked to prescribed curricula, the effects of curricular allocations on teaching practices may be stronger (Stevenson & Baker, 1991; Gamoran, 1996a).

Moreover, researchers have had difficulty showing that features of schools other than resources allocated for instruction have any bearing on student learning. For example, Gamoran

(1987) examined a range of high school characteristics in an attempt to identify organizational conditions that influence learning by setting the conditions for students' instructional experiences. Although Gamoran observed strong relations between instructional experiences (e.g., coursetaking) and achievement, these associations were largely unrelated to school characteristics (e.g., student body composition, availability of academic programs). Other studies of school effects have been similarly unsuccessful in tracing the influence of organizational conditions through instructional experiences to student learning (e.g., Gahng, 1993; Gamoran, Porter, & Gahng, 1995). Researchers have uncovered important effects of different types of schools, such as Catholic schools (Bryk et al., 1993; Coleman & Hoffer, 1987) and magnet schools (Gamoran, 1996c), but the organizational conditions that mattered tended to be aggregate indicators of students' instructional experiences, such as extensive academic coursetaking and orderly classrooms. Research on school types thus supports the conclusion that instructional conditions affect student learning but offers less evidence about organizational influences on instructional conditions.

Recent studies of schools and student learning have focused less on the organizational constraints of material resources and shifted the emphasis toward organizational structures and processes such as leadership, collaboration, and efficacy among educators in a school. This literature builds on the effective schools tradition (e.g., Edmonds, 1979; Purkey & Smith, 1983) that emphasized key conditions at the school level including goal consensus, high expectations for student learning, principal leadership, emphasis on basic skills, and monitoring of students' progress. Like the effective schools tradition, several recent studies show consistent associations between organizational conditions and student learning. For example, Bryk and Driscoll (1988) observed a strong positive association between students' achievement in mathematics and an index of school community—whether teachers worked together, whether the principal supported the teachers' work, and so on. Similarly, Lee and Smith (1995, 1996) showed that students' achievement is higher in high schools in which teachers perceive a greater sense of efficacy and responsibility for student learning and in schools where educators have engaged in restructuring activities, such as team teaching, changing the grouping structure, flexible scheduling, and so on.

This body of work, from research on effective schools to studies of restructuring, is limited by ambiguity in causal mechanisms and even in causal direction. If high expectations are associated with high achievement, for example, which causes which? Research on effective schools gave little attention to the actual mechanisms through which school conditions are translated into achievement. How were expectations elevated, goal consensus achieved, and so on, and how were these conditions linked to student learning? These questions were not addressed.

Current work has implicitly adopted the nested layers view as a conceptual framework. That is, the organizational context is assumed to influence student learning by constraining conditions for classroom instruction. In this framework, social conditions such as a strong sense of community promote adherence to an academic mission among teachers, which leads to enhanced teaching and greater learning. Despite the clearer conception of mechanisms, causal ambiguity remains problematic. For example, Lee and Smith (1996) argued that students achieve more when their teachers accept collective responsibility for students' learning. Lee and Smith supported their claim by showing an association between teachers' sense of responsibility and student learning. In fact, however, the causal process could run in the opposite direction: Teachers may be more apt to accept responsibility in schools where levels of learning are high.

In a study of mathematics reform, Adajian (1995) showed that teachers who participated

in schoolwide professional communities engaged in more innovative mathematics teaching, including an emphasis on problem solving and on hands-on applications. This finding is consistent with the notion that a community of teachers encourages instructional innovation, which promotes greater learning. However, it is not clear from Adajian's cross-sectional data whether the professional community led to innovative teaching, or vice versa. Similarly, Lee and Smith (1997) interpreted their analysis of national data to indicate that high levels of academic coursetaking and instructional emphases on problem solving and on inquiry accounted for the benefits of restructured schools over traditionally structured schools. Yet an alternative hypothesis—that innovative instruction may lead to both school restructuring and better learning—cannot be dismissed.

Just as Barr and Dreeben (1983) took advantage of statistical advances in path analysis, current work on the relation between school conditions and student learning has also benefited from new statistical techniques, particularly multilevel modeling (or hierarchical linear modeling). The multilevel approach distinguishes group-level and individual-level effects more accurately than earlier regression methods (Bryk & Raudenbush, 1992; Goldstein, 1995). Multilevel modeling is a particularly elegant method for examining differences between groups in individual-level effects; for example, multilevel methods provide the best evidence that the effect of socioeconomic status on student learning is weaker in Catholic schools than in public schools (Bryk et al., 1993). This finding indicates that achievement is more equitably distributed in Catholic schools. However, the multilevel approach does not address the causal ambiguities of the nested layers model, nor does it offer any special benefits in the quest to identify the mechanisms through which school conditions influence student learning. On the contrary, multilevel analysts often specify individual or classroom conditions such as coursetaking and instruction as aggregate school conditions, missing the opportunity to link school conditions to student learning through the mechanism of individual or classroom-based academic experiences (Bryk et al., 1993: Lee & Smith, 1997).

The nested layers model operates well for instructionally specific resources such as time and materials and for clearly defined teaching activities such as content coverage. It seems particularly appropriate when there are clear norms about the salience of curricular topics, such as early reading instruction. It is not clear that the perspective can be applied to a broader range of school and/or classroom conditions.

The Loose-Coupling Alternative

Whereas Bidwell and Kasarda (1980) and Barr and Dreeben (1983) responded to the failure of the input–output model by specifying more carefully the technical connections between organizational resources, teaching practices, and student learning, other writers emphasized the general absence of tight connections within the school system organization. Earlier, Bidwell (1965) had recognized the structural looseness of schools, and writers such as Weick (1976) and Meyer and Rowan (1977, 1978) expanded this notion to suggest that the structural isolation of classrooms, the autonomy of teachers, and the relative absence of formal authority means that schools are loosely coupled organizations. In a loosely coupled system, decisions occurring in one segment of the organization do not reverberate in clearly patterned ways elsewhere. Thus, what occurs in one classroom may have little impact on another, and decisions made by the principal have only modest effects on what students actually experience (Weick, 1976). According to this view, schools are tightly coupled around symbolic designations such as who gets taught by whom but are loosely coupled on matters of core technology

such as what gets taught in the classroom (Meyer & Rowan, 1978). Teaching practices are a result of teacher training and on-the-job socialization and are not affected much by schoolwide conditions such as resources, plans, or administrative decisions (Weick, 1982). Student learning is primarily a response to societal expectations rather than to particular school conditions or to classroom instruction (Meyer, 1977).

The reason schools are loosely coupled, according to this perspective, is that it is difficult to judge their effectiveness using a bureaucratic model of costs and outputs (Meyer & Rowan, 1977, 1978; Weick, 1976). Teaching is an uncertain technology: cause–effect relations are not well understood, and there is no consensus on the best teaching methods. Moreover, the goals of schooling are ambiguous and often conflicting, so it is hard to determine what standards to use for judging schools. Finally, the participants in schools change over time, adding further uncertainty to the complexities of teaching and the ambiguities of goals. Consequently, schools turn away from their technical cores (teaching and learning) and emphasize their symbolic attributes such as categories and certification. In schools, structures are detached from activities, and activities are disconnected from outcomes (Meyer & Rowan, 1978). A logic of confidence allows schools to appear to work when the symbolic trappings of grade-level structures, certified teachers, students progressing from grade to grade, and so on, are present (Meyer & Rowan, 1978). In this way schools avoid inspection of their technical cores and focus on legitimation in the wider society.

Metz (1989) and Hemmings and Metz (1991) provided evidence from a study of eight high schools that is strikingly consistent with the loose-coupling perspective. Despite substantial differences among the eight schools in the characteristics of their communities, all adopted the same set of structures and routines, from the arrangement of classrooms, to the organization of the curriculum, to the allocation of time. These outward attributes articulated each school's legitimacy as a "real school." Despite the similarities, students' experiences could differ dramatically from one school to the next, because students' schooling experiences bore little relation to the symbolic structural features of their schools. Moreover, the acceptance of a real school as an organizational framework limited consideration of alternate arrangements, even when the standard structures and processes were unsuccessful in promoting pupils' progress. According to Metz (1989),

> If one looks at students' learning simply as a technical system, it is quite remarkable to see situations where a technical process (or the social structure which frames it) is clearly not effective on a massive scale, but no one in the organization calls for developing alternative technical or structural approaches. (p. 79)

On the contrary, educators in schools with the least successful students were often the most insistent that their schools reflected the societal consensus on what high schools should look like.

If schools are loosely coupled, what keeps them coupled at all? How is work coordinated in a loosely coupled organization? First, as noted previously, some aspects of schools are tightly coupled: categories such as grade levels and teacher are closely monitored and used to arrange persons and positions (though not activities). Second, according to Weick (1982), teachers' common professional socialization helps coordinate work in schools. Weick argued that "even though (educators) don't communicate much with each other, they can still coordinate their actions because each person can anticipate accurately what the other person is thinking and doing" (1982, p. 675). In fact, common socialization may be the basis for the logic of confidence, that is, unexamined assumptions about who is doing what in their classrooms. For example, fourth-grade teachers may assume that third-grade teachers are introducing concepts on which they will build when they teach the same students in the following year. Similarly,

teachers teaching the same subject area in different grades share a common disciplinary socialization that yields a coherent approach to teaching despite the absence of formal mechanisms of coordination (Rowan & Miskel, 1999; Stodolsky & Grossman, 1995). Shared views of subject matter probably reflect both socialization in teacher training programs and broader social definitions of subject-matter characteristics. Several writers have noted that teachers of mathematics and of foreign languages tend to see their subjects as sequentially organized in clear hierarchies, whereas language arts and social studies teachers have more flexible views of their subject matters (Gamoran & Weinstein, 1998; Loveless, 1994; Rowan, Raudenbush, & Cheong, 1993; Stodolsky & Grossman, 1995;).

Meyer and Rowan (1978) acknowledged that loose coupling is probably more important in the United States than in many other countries because of the strong American tradition of decentralization and local control over education. Other countries typically have more centralized control over the curriculum, regulated through national testing, which results in tighter alignment between formal goals and outcomes than in the United States (Bishop, 1998). Formal inspections from central authorities, which rarely occur in the United States, may also serve to regulate the practice of teaching (Wilson, 1996). Thus, loose coupling as an explanatory framework may be more successful for the American case than elsewhere. Still, uncertainties that are inherent in teaching raise questions about the tightness of coupling even in more centralized educational systems than that of the United States (Benavot & Resh, 1998).

The loose-coupling model, displayed in Figure 2.3, offers a strong challenge to the nested layers approach. Where nested layers is correct for the narrow conditions of resources and content coverage, could loose coupling prevail for other conditions of schooling, such as leadership, relations among teachers and between teachers and students, and so on? Loose coupling would account for the weak and inconsistent impact of school climate on teaching and on learning (Anderson, 1982). It would also explain why policy interventions often fail to reach the classroom, particularly in the United States (e.g., Pressman & Wildavsky, 1979). Further, as Meyer (1977) has argued, loose coupling is consistent with the finding of little
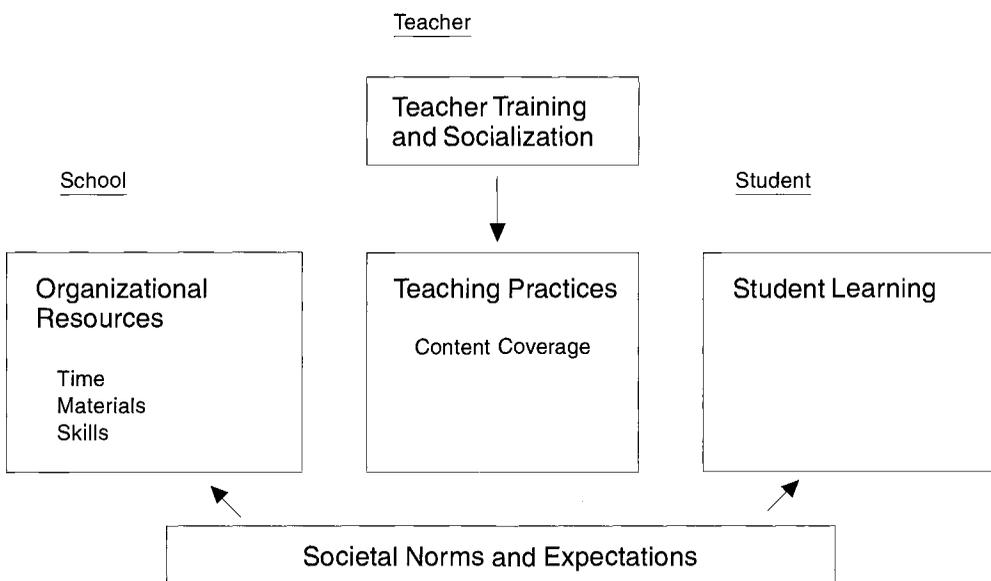
FIGURE 2.3. The loose coupling model of school organization and student learning.

variability between schools in student learning alongside substantial variability within schools. By and large, according to this view, schools operate similarly because they are focused on conformity to a common set of societal norms.

Moving beyond the nested layers model to confront the challenge of loose coupling requires a more nuanced analysis of the linkages between school conditions, teaching practices, and student learning. As a starting point, it is essential to rethink common assumptions about causal direction and change and to probe more deeply for the mechanisms that may connect the different elements of school organization.

Beyond Nested Layers

Building on the insights of Rowan (1990) and Newmann and Associates (1996), we suggest that the nested layers approach is limited by its assumption of a one-way relationship between organizational conditions and instructional practices. Rowan argued that when teaching is understood to be a complex, nonroutine activity, organizational support for innovation and success requires an organic relation between teaching practices and school organization, a connection that involves feedback and growth in both directions. The greater the recognition of the uncertainty and complexity of teaching, the more likely organic structures are to emerge. For example, teachers who recognize the complexities of teaching are more prone to form collegial networks for sharing information and mutual support. Rowan buttressed these claims with an insightful review of studies that indicated weak effects of collaboration and collegiality on teaching practices. Instead, organizational structures sometimes grew out of the demands of teaching. For example, Cohen, Deal, Meyer, & Scott (1979) observed that complex instructional tasks contributed to increased communication and teaming among teachers, but team teaching did not bring about complex instruction. Still, Rowan concluded that when collegial relations are intensive and embedded in a culture that emphasizes continuous improvement, the strength and quality of social relations among teachers may influence teaching practices. Although provocative, this conclusion was based on few cases, and Rowan found it difficult to provide evidence that relations among teachers substantially affect how they carry out their work in classrooms. In a subsequent empirical study, Rowan and his colleagues (1993) reported that the more teaching was viewed as a nonroutine activity, the greater the prevalence of organic management in the school. However, organic management did not result in greater amounts of ongoing learning among teachers.

Further support for the notion that organizational support for effective teaching may emerge from teachers' commitment to innovative instructional practices comes from Newmann and Associates' (1996) study of 24 highly restructured schools. This research began with the idea that there are levers at the school site that, when pressed, lead to better teaching and to more learning. What the investigators found, however, was more complex than a simple nested layers story. All 24 schools had innovative structural features, but few exhibited consistent evidence of exceptionally high-quality teaching and learning. The most successful schools were those in which educators were committed to intellectual quality in students' academic experiences and in which this commitment was the driving force behind organizational reforms. For example, teachers at Cibola High School were committed to disciplined inquiry and students' construction of knowledge. They used detracked classes to engage students in project work that resulted in high-quality instruction and high levels of learning. By contrast, teachers at Wallingford High School, who were also committed to detracking, had little notion of how their teaching might change in a detracked context. At Wallingford, researchers ob-

served low-quality teaching and learning, mainly reflected in lectures and in a watered-down curriculum. Thus, detracking as a school organizational characteristic grew out of and supported a particular pedagogy in Cibola, whereas it was unrelated to instruction at Wallingford.

Similar conclusions emerged recently from another major study of school restructuring. Peterson, McCarthey, and Elmore (1996) reported that school structure had little consistent impact on teaching practices. Instead, teaching practices changed in response to teachers' learning, particularly when learning occurred in a community of educators. Teaching practices contributed to school conditions as much as the reverse. The authors concluded the following:

> Changing practice is primarily a problem of [teacher] learning, not a problem of organization. . . . School structures can provide opportunities for the learning of new teaching practices and new strategies for student learning, but structures, by themselves, do not cause learning to occur. . . . School structure follows from good practice not vice versa. (p. 149)

Our view of the organizational context of teaching and learning, displayed in Figure 2.4, is more closely related to the nested layers model than to loose coupling. As in the nested layers view, and in contrast to loose coupling, we argue that student learning responds to instruction. This notion derives from research that documents the impact of variation in teaching on student learning, ranging from coursetaking effects (Gamoran, 1987), to content coverage (Barr & Dreeben, 1983; Gamoran, Porter, Smithson, & White, 1997; Rowman & Miracle, 1983) to instructional coherence and teacher–student interaction (Gamoran, Nystrand, Berends, & LePore, 1995). Also consistent with the nested layers view, we expect that organizational resources affect student learning, but only as they are applied by teachers in classrooms. This aspect of our model has its foundation in research by Barr and Dreeben (1983; see also Gamoran & Dreeben, 1986). These studies showed that resources matter for learning when teachers apply resources in their classroom teaching. However, our model moves beyond the nested layers view in that we recognize that the relation between school conditions and classroom teaching may work in both directions and may shift over time. School conditions may respond to teaching practices, and teaching practices may be constrained or encouraged by their organizational context, as causal effects flow in both directions.
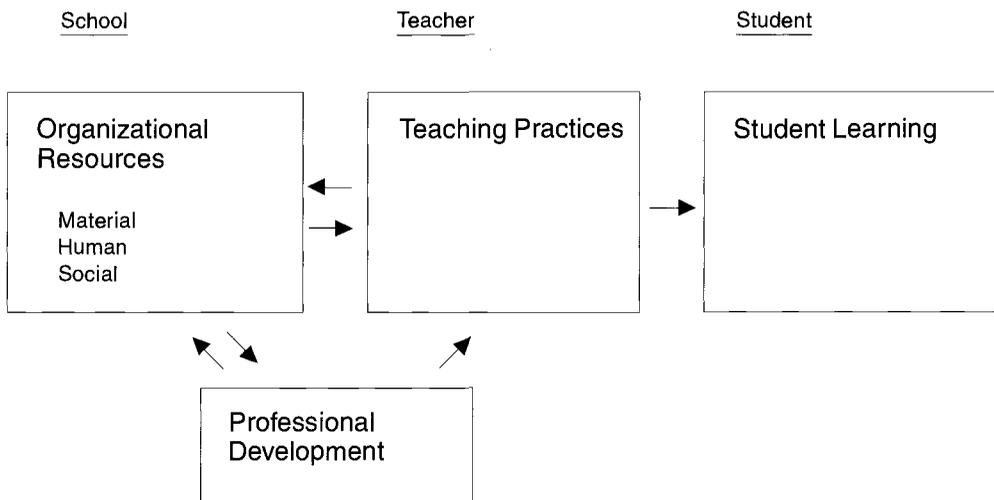

FIGURE 2.4. A dynamic, multidirectional model of school organization and student learning.

At the same time, our model draws from loose coupling the notion that teaching practices are influenced by professional socialization and training. As Peterson, McCarthey, and Elmore (1996) noted, teachers can learn to change their practice. This conclusion suggests that teachers not only respond to preservice training, as discussed by Weick (1982), but also to professional development that occurs on the job and that is a requirement for maintaining teaching certification in most states. In some cases professional development may be the sort of ritual activity that Meyer and Rowan (1978) recognized as important for legitimation but having little real significance for practice. In other cases, however, Peterson, Elmore, and McCarthey's findings suggest that professional development may result in meaningful change for teachers who participate.

ORGANIZATIONAL RESOURCES AS THE CONTEXT FOR TEACHING AND FOR LEARNING

Before elaborating on the role of professional development, we need to consider what aspects of school organization constitute salient contextual conditions for activities and outcomes. Prior research indicates that organizational resources constitute the most essential elements of the school's organizational context for teaching and for learning (Gamoran & Dreeben, 1986; Kilgore & Pendelton, 1993). We offer a broader conception of organizational resources than is found in most previous studies, as indicated in Figure 2.4 and as elaborated in the following sections. Resources emphasized by the input–output and the nested layers models are subsumed in our approach, and we also incorporate aspects of the school climate and school effectiveness traditions. Leadership, collaboration, and administrative support, as well as knowledge and skills, are all seen as types of resources that educators can draw on to improve their teaching. Hence, much of the past research on school effects is incorporated into our framework. However, our model does not include all aspects of school context. We focus on three categories of essential resources: material, human, and social. Other recent writers also point to the special salience of these conditions (Anderson, 1996; Newmann, 1998; Spillane & Thompson, 1997).

Material Resources

Despite inconsistent empirical support for the impact of expenditures on students' achievement, material resources constitute an important condition in the organizational context of teaching. Such resources include curriculum materials, equipment, and supplies; time available for teaching, planning and preparation; expenditures for personnel, particularly instructional staff; and the authority to expend funds for other purposes related to teaching and to learning. Material resources have no direct connection to learning because their impact depends on how they are used. Typically, educators at the school level have little discretion over the allocation of funds. According to the study of restructured schools, even when funding decisions are made at the school level, resources may not be used in ways that improve teaching (Newmann & Associates, 1996). However, some schools used resources in ways that improved instruction by allocating extra time for collaboration among teachers, by supporting professional development, and by providing tutoring sessions for students who needed extra help.

A variety of literatures support the conclusion that the effects of material resources are

contingent on use. Resources devoted to instruction, not surprisingly, are more likely to pay off for student learning than resources directed in other ways (Newmann & Associates, 1996). Even when resources are allocated toward instructional needs, however, their benefits depend on how they are applied. Reducing class size, for example, may be the most common application of additional resources, yet a research literature consisting of hundreds of studies has yielded widely varying results. As Slavin (1989, 1990) has argued, reducing the number of students in a class is unlikely to yield any differences in student learning unless teachers are engaged in practices that are enhanced by working with fewer students at a time. When teachers carry out standard routines of lecture and recitation, it matters little whether there are 15, 20, or even 30 students in the class. Class size is likely to affect learning when instruction emphasizes more interactive involvement such as project work, extensive writing, and discussion, which may foster more intensive participation and feedback when there are fewer students at hand.

A similar argument can be made about time for instruction, another application of material resources. Generally, the research indicates that more time for teaching results in more learning for students (e.g., Brophy & Good, 1986). The implicit mechanism underlying the findings, as Barr and Dreeben (1983) explained, is a nested layers model: when teachers have more time available, they use it to cover the curriculum more extensively or in greater depth, and this yields enhanced learning for students. However, the pattern is not invariant. For example, when more time is allocated to first-grade teachers, they use it to advance their highest priority, the reading curriculum (Gamoran & Dreeben, 1986). They do not use additional time for other subjects, such as mathematics, science, or social studies (Gamoran, 1988). Thus time, a resource allocated by administrators to teachers, is an essential element in the context of first-grade reading instruction, but it has limited implications for first-grade teaching in other subjects. More generally, the impact of time as an organizational resource clearly depends on how that time is allocated by teachers within classrooms.

Because the impact of resources depends on how the resources are used, control over material resources is also an important consideration. According to one view, because teachers have the closest contact with students, they know best what resources are needed to meet students' needs. This perspective sees teachers as knowledgeable professionals and suggests that the greater teachers' control over the allocation of resources, the more effectively the resources will be used (Gamoran, Porter, & Gahng, 1995). However, research to date has found little evidence for effects of teacher control over resources on teaching or learning (Park, 1998).

Human Resources

Some perspectives on schooling assume that differences among teachers in how they have been trained or in what they know have little to do with the effects of instruction on learning. Older notions of teacher-proof curricula (see Brophy & Good, 1986) have counterparts in the most extreme view of standards-based reform, which emphasizes standardized curricula as the key to successful teaching and student testing as the means of ensuring that the curriculum is taught (see Borman, Cookson, Sadovnik, & Spade, 1996). The input–output model of schooling similarly ignores the teaching process in considering the production of learning (see Figure 2.1). These views are consistent with a highly bureaucratized model of schooling in which teachers adhere to standard procedures to maximize efficiency (e.g., Callahan, 1962).

Research evidence depicts teaching as an activity that, in some cases, is highly routinized. Jackson (1968) observed that teaching tends to be preactive, or scripted in advance, rather than reactive, or responsive to students. Many writers have documented the extent to which classroom life is dominated by teachers (e.g., Gamoran et al., 1995; Goodlad, 1984; McNeil, 1986). As loose-coupling theorists have shown, this attempted routinization has gaps—points at which teaching may or may not coincide with what students need for learning. Nonetheless, a logic of confidence allows teachers to proceed without being troubled by a mismatch between script and students (Hemmings & Metz, 1991; Meyer & Rowan, 1978).

Recent research on teaching, however, indicates that the logic of confidence does not always prevail and that teachers' knowledge makes a difference in the quality of instruction and, in particular, teachers' abilities to respond to students (Cohen, 1990). Drawing on findings from cognitive science, education researchers posit three types of knowledge that are essential for teaching: pedagogical knowledge, in which teachers know general strategies of teaching; content knowledge, what teachers know about their subject matters; and pedagogical content knowledge, the knowledge of how to teach a particular subject matter in a way that fosters students' understanding (Shulman, 1987). Following this argument, then, we propose that teachers' human resources—their knowledge, skills, and dispositions—constitute an important resource that may shape the quality of their teaching and their students' learning. Studies of teacher knowledge in specific areas of pedagogic content indicate that the implementation of a new instructional approach improves as teachers come to understand it more deeply (Tharp & Gallimore, 1988).

The emphasis on human resources implies a different model of change than that favored by a model focused on material resources. If human resources are important, then teacher development may be a central element of reform activities (Tharp & Gallimore, 1988). Given the high degree of teacher autonomy in the classroom, a perspective that emphasizes teachers' learning over material resources seems especially promising.

Principal leadership is another type of human resource found in schools. Research in the effective schools tradition emphasized leadership, but empirical corroboration for the salience of principal leadership for student learning is weak (Good & Brophy, 1986). A key limitation of this work is its failure to specify the mechanisms by which leadership may stimulate better learning. Current research on leadership emphasizes of the principal's role in creating a community with a common purpose (Newmann & Associates, 1996). Successful principals provide a vision that sets forth a particular mission for the school and galvanizes commitment from teachers and from students. At the same time, the principal may be able to select staff members who accept the school's mission. In this way, a principal's leadership may result in a schoolwide instructional emphasis on common goals.

Interestingly, this view of leadership is more compatible with the loose-coupling model than with nested layers. Rather than viewing the allocation of resources as the key mechanism for the impact of leadership, as implied by the nested layers view, this perspective on leadership emphasizes its symbolic attributes, which are central to loose-coupling theory (Meyer & Rowan, 1978). Even though selecting staff is a technical activity, it has symbolic implications when acceptance of a common vision is a chief criterion for selection. According to loose coupling, structure and technical work are weakly connected, but rituals and symbols, including those that define the school's mission in the wider society, play an important role in pulling together and legitimizing the school in its social context. Following this view, principal leadership may affect the work of teachers by shaping a purpose for the school through selection of staff and articulation of a guiding vision.

Social Resources

Our argument about social resources comes neither from loose coupling nor from the nested layers model. Both views stress the isolation and autonomy of teachers within their classrooms, differing in that nested layers studies have shown that material resources allocated to classrooms and used by teachers can affect student learning (e.g., Gamoran & Dreeben, 1986). According to these perspectives there is little to be gained from collegiality among the faculty of a school, except perhaps the pleasures of a friendlier workplace. Similarly, these widely followed theories would lead one to expect few benefits of teacher participation in collective decisions about school policies. According to loose coupling, school policies simply have little relevance for what goes on in classrooms. According to the nested layers view, policy decisions are managerial activities whose impact occurs through the allocation of resources, regardless of how allocative decisions are made. For different reasons, neither perspective supposes that relations among teachers matter for instructional practices.

In contrast, an emerging literature about the social organization of schools suggests that under certain conditions, social relations among educators may profoundly influence teachers' classroom work and thereby affect student learning. As Rowan (1990) explained, when teaching is viewed as complex and interactive, dynamic and changing as opposed to routine, an organic system of management that relies on developing commitment rather than imposing controls may lead to more successful teaching and learning. Organic management means encouraging social relationships of trust, shared responsibility, collective decision making, and common values as mechanisms for bringing about change. When these activities are focused on student learning, they may indeed matter for instruction and for achievement (Newmann & Associates, 1996). Thus, aspects of the social environment of the school, including shared values, collaboration, and collective decision making, constitute social resources on which educators may draw to bolster their teaching.

At the same time, social resources may also emerge from experiences in the practice of teaching. Teachers who refrain from regarding instruction as a standardized, routine activity are faced with the uncertainties of finding successful ways of meeting students' needs. This uncertainty is always present in teaching, but typically it is obscured by the logic of confidence that promotes following prescribed routines that avoid being deflected by students' responses. Recognition of uncertainty may lead teachers to talk with one another—breaking down the usual isolation of teaching—as they search for better solutions to the problems of teaching and learning that appear in their classrooms. These discussions about instruction may strengthen the collective ties among teachers and teachers and in turn may help address their concerns about teaching.

Although Newmann and Associates' (1996) findings are consistent with the view that social resources matter for teaching, an alternate interpretation of the evidence cannot be rejected. Even when social relations among teachers emerge out of practical experience, these social relations may have little bearing on instruction because teachers are autonomous in their classrooms. Under this scenario, social relations would be a correlate of successful teaching but not a causal factor. Research to date cannot adjudicate among the alternative interpretations.

PROFESSIONAL COMMUNITY. One way of characterizing social resources in a school is as a professional community of educators. Several recent writers claim that a strong professional community provides the capacity for improving instruction and ultimately for enhancing student learning. Talbert and McLaughlin (1994) distinguished between professionalism and

community: professionalism includes technical knowledge, an ethic of service, and commitment to the profession, and community refers to collaboration and continuous learning among teachers. Their view of professionalism is akin to our notion of human resources, except that they examine the collective, shared presence of technical knowledge, finding that teacher collaboration and learning promote a technical culture in the school. Newmann and Associates (1996) explored the contribution of professional community to authentic pedagogy, an instructional focus on disciplinary content, students' construction of knowledge, and relevance. Professional community, in their view, consists of shared purpose, a collective focus on student learning, collaboration, reflective conversations about teaching, and deprivatized practice (i.e., breaking the usual isolation of teaching by observing one another's teaching). They found more authentic pedagogy in schools with stronger professional communities. Secada and Adajian (1997), using a similar view of professional community but adding collective control over key decisions to the concept, provided a case study of an elementary school that illustrates how one schoolwide professional community helped teachers improve their teaching of mathematics.

Findings from studies of professional community are provocative, but several caveats are in order. First, the studies are based on small samples of schools. Second, particularly in the case of Newmann and Associates (1996), generalization from the evidence is difficult because the schools were selected especially for their unique features. Third, most studies of professional community have implicitly adopted the nested layers view that professional community enhances teaching and thereby improves learning; yet it is also possible that professional community is a by-product of enhanced teaching, rather than a stimulus. Secada and Adajian (1997) suggested that teachers' professional community and instructional practice may affect one another, but their empirical analysis was limited to one causal direction: the influence of professional community an instruction. Similarly, Louis, Kruse, and Marks (1996) acknowledged that the connections between social relations among teachers and classroom instruction are complex:

> [Our analysis] cannot prove that professional community causes teachers to engage in more authentic classroom practice. A skeptic could plausibly argue that teachers who are making efforts to increase authentic pedagogy are more likely to seek support for this difficult task from colleagues, thus creating professional community. (p. 184)

SOCIAL CAPITAL. We may also think of social resources in a school as a form of social capital. Social capital in a school refers to trust, expectations, shared understandings, and a sense of obligations that may characterize networks of relationships among educators (see Coleman, 1988 for a more general definition). In contrast to schools in which teachers work in isolation, teachers in some schools form relationships with one another around academic concerns of teaching and learning. These social networks constitute resources on which teachers can draw in their efforts to improve teaching (Kilgore & Pendelton, 1993). Collaboration, collegial relations, and opportunities for reflective discussion about teaching help build social capital. In such schools, teachers are likely to work together, even in the classroom; in this way, teaching becomes deprivatized and the typical isolation of teaching is overcome. Administrative support, such as advice and consultation about teaching and school policies, also builds social resources on which teachers can draw. Coleman (1988) explained that social capital can facilitate the development of human capital. In the case of schools, social capital among teachers helps them improve their knowledge and skills (i.e., their human capital) by providing a normative environment that encourages experimentation, offers a place to discuss uncertainties, and rewards improvement. This portrait differs substantially from the standard picture of

schools in which teachers' activities are largely unseen by other adults and their unique contri-
butions are unrecognized and unacknowledged.

More broadly, it is important to recognize the potential interplay between material, hu-
man, and social resources (which may also be termed economic, human, and social capital;
see Spillane & Thompson, 1997). Just as social capital may promote human capital, teachers
with particular knowledge and dispositions may be more likely to forge relations of social
capital in the first place. Moreover, economic capital may be essential for developing both
human and social capital, as teachers' learning and collaboration require infusions of time,
materials, and expertise from outside the standard worklife of a school and its staff. Perhaps
most important, economic resources devoted to teachers' professional development may stimu-
late both human and social capital as well as their interplay. This possibility is reflected in the
arrows in Figure 2.4, which run in both directions between organizational resources and pro-
fessional development.

PROFESSIONAL DEVELOPMENT AS THE ENGINE OF CHANGE

What is the basis for suggesting that professional development is a key mechanism for im-
proving teaching? Surely many teachers would react to this claim with skepticism, as profes-
sional development is often regarded as a necessary job requirement without much connection
to the actual work of teaching (Sparks & Loucks-Horsley, 1989). Much professional develop-
ment, it seems, fails to influence practice. Workshops are typically isolated events, often unre-
lated to teachers' ongoing concerns. At best, a workshop is seen as useful if it provides a new
tool for a teacher's toolkit—something that can be applied in an immediate and direct way
(Fullan, 1991). This type of professional development does not result in meaningful change
(Goldenberg & Gallimore, 1991), nor, we suspect, does it contribute to significant variation in
teaching practices among teachers.

However, current research on teaching suggests an alternate possibility. Professional de-
velopment that is sustained, coherent, collaborative, and reflective may lead to real changes in
practice (Darling-Hammond & McLaughlin, 1996). Lieberman (1996) proposed an expanded
view of professional development including direct learning through courses, through work-
shops, and through other avenues, informal learning in school through peer coaching, through
sharing experiences, through conducting case studies, and the like, and informal learning out-
side of school through opportunities such as networks, partnerships, and collaboratives. Ac-
cording to Lieberman, "Teachers who engage in these new professional opportunities often
find themselves in an exciting and powerful cycle: The more they learn, the more they open up
to new possibilities and the more they seek to learn more" (p. 189–190). Not all teachers
follow this path, but those who do are profoundly influenced in their practice.

Professional development may influence organizational resources in two ways. First, it
may contribute to teachers' knowledge, skills, and dispositions, that is, the human resources
of a school. This is a common view of the benefits of professional development (e.g., Sparks
& Loucks-Horsley, 1989), and it stands behind the regulations of many states that require
teachers to participate in professional development in order to maintain their teaching licenses.
Second, professional development may contribute to the social resources of a school, particu-
larly if it is collaborative and reflective. When serious professional development is based in a
school, it may help establish many of the features of a professional community, including
collaboration, shared values, deprivatized practice, and reflective discussions about student
learning. Thus, professional development has potential for building a school's capacity to

create change in teaching and in learning (Darling-Hammond & McLaughlin, 1996; Little, 1986; Newmann & Associates, 1996; Tharp & Gallimore, 1988).

At the same time, organizational resources may affect the provision and nature of professional development. Professional development requires substantial funds, particularly if it is sustained over time and involves collaboration among teachers. Little (1986, 1990) showed that conditions for effective professional development are difficult to maintain, requiring time, leadership, and energy. Thus, the relation between organizational resources and professional development is dynamic, sometimes building momentum as noted by Lieberman (1996), but at other times faltering due to lack of resources (Little, 1990).

Not only do resources and professional development affect one another, but the impact of professional development on teaching probably depends in part on the level of resources available for implementation and for diffusion of new ideas and practices. Lotan, Cohen, and Morphew (1997) reported that teachers were more likely to engage in nonroutine behavior— a key outcome of their complex instruction professional development program—in schools where principals were more knowledgeable and supportive and where teachers obtained assistance in acquiring materials and supplies. Examining the persistence of a similar reform, Dahl (1997) found that new practices were more likely to be sustained over time when principals helped coordinate both material resources (supplies, equipment, and space) and social resources (teachers' opportunities to work together).

A key question for our formulation concerns the salience of the school's boundaries for changes in teaching and in learning. Our model assumes that resources that reach the school are of primary importance (see Figure 2.4). This assumption is clearly appropriate for material and human resources because resources applied in the classroom are filtered through the school and through teachers. It is less clear whether the school is an especially important locus of social resources. If teachers find professional communities in other types of organizations or collaboratives, how much does the school really matter for their development as successful teachers? Although much of the research literature focuses on schoolwide professional communities (e.g., Newmann & Associates, 1996), it is clear from research on high schools that departments are the key organizational units (Little, 1990; Talbert, 1995). Consequently, it may be that departments rather than whole schools should be the focus of research on professional community. Middle and elementary schools, though not typically divided into departments, may have other types of subgroups in which professional communities are embedded. In addition, teacher networks that draw participants from many different schools may serve as important professional communities for some teachers (Newmann & Associates, 1996). Hence, there is no guarantee at any level that the boundaries of the professional community are the boundaries of the school.

Professional Development and Schoolwide Transformation

In some cases, professional development serves as a stimulus to change throughout a school. Humbolt Elementary School, one of the schools included in Newmann and Associates' (1996) study, joined a national organization for school reform after a few teachers became interested in its instructional approach. In-service participation by these teachers ultimately led to the adoption of a new approach by the entire school staff. In most cases, however, the schools that exhibited exceptionally high-quality teaching and learning were not so much transformed as established as new schools from the beginning. Change, moreover, was not seen as something that took place once but was regarded as a process of continuous improvement. At Career

Academy, an elementary school, key innovations included portfolio assessments, narrative reports on students' progress, and remaining with the same teacher for more than one year. Researchers concluded that "all three practices are works in progress, however, and teachers work continually to define and enrich them" (Newmann & Associates, 1996, p. 84). Similarly at Cibola High School, a teacher explained that ". . . every year we should get better. What we accepted as a minimum one year should be unsatisfactory the next year. It has to be that way. We have to ask for more every year. That's an ongoing thing, we'll never stop struggling over that" (Newmann & Associates, 1996, p. 131). In successful restructured schools, innovations were dynamic and adaptive, not static.

Professional development often played a key role in stimulating, supporting, and enhancing these changes. Careen Academy provides persuasive evidence of the power of professional development (Newmann & Associates, 1996). Careen teachers participate in a summer institute lasting 1 to 3 weeks every year. They also attend four Saturday workshops, as well as a variety of activities outside the school district. Newmann and Associates (1996) also discovered that teachers were participating in three voluntary study groups on an ongoing basis. These activities contributed substantially to teachers' efforts in the classroom.

Despite these cases of wholescale development and change, other evidence indicates that most often, change efforts fall short of schoolwide transformation. Drawing on recent research, we have identified three other outcomes that commonly occur, even in the face of sustained, reflective professional development involving a number of teachers in a school: Teachers who favor change may find themselves in constant conflict with other actors in the school, due to others' resistance to change; they may compromise their ideals and moderate their teaching initiatives to avoid conflict (or adapt their technological efforts to accommodate existing circumstances); or they may create alternative structures within schools in which the new teaching practices may flourish, but not expand beyond the boundary of the alternate structure (e.g., a school-within-a-school). The outcome that finally emerges depends in part on the dynamic interplay between organizational resources and teaching practices. Research on school restructuring provides illustrations for these claims and draws attention to possible mechanisms through which the various outcomes may occur.

CONSTANT CONFLICT.   In some cases, change efforts result in continual conflict within schools. Mechanisms that produce this conflict are varied. In Fremont High School, one of the highly restructured schools examined by Newmann and Associates (1996), a group of teachers attempted to eliminate low-level math classes and teach all students in mixed-ability classes within a subset of the school. These changes resulted in tension within the school, with teachers outside the group complaining that too much time was spent addressing affective needs and not enough was spent on academic concerns and arguing that students were not being prepared for upper division math courses. The same study found another example of constant conflict at Selway Middle School, a charter school led by a group of four teachers committed to authentic instruction. Although other teachers shared the ideal of authenticity, they resented the oligarchic control exercised by the four leading teachers and believed they had no voice in the policies and direction of the school.

In the first case, conflict occurred between two groups of teachers with competing ideas about the essential goals of math instruction and with differing views of the varied capabilities of students. In the second case, the conflict was also between groups of teachers, but it centered on control and governance issues rather than on a philosophy of teaching. In still other instances, conflict occurs between administrators and teachers or between teachers and parents. More generally, constant conflict seems to emerge under any one of three circumstances:

when there are philosophical differences about what constitutes real teaching and learning; when there are competing preferences for the allocation of limited resources; or when teachers resist additional work necessary for teaching reforms. Actions that foment conflict include administrators' active opposition to change, restriction of resources to leaders of change processes, sabotage by antireform forces, and educators lining up external forces to oppose the sought-after changes.

COMPROMISE AND ADAPTATION.   Efforts to avoid internal conflict may lead to a second type of outcome, in which would-be reformers moderate their innovations as an adaptation to existing conditions. In some cases this means taking on the language of change without carrying out the activities of change. Researchers observed this situation in restructured schools where teachers "talked the talk" but did not "walk the walk"—that is, teachers spoke the rhetoric of reform but did not engage in innovative instructional practices (Gamoran, 1996b; Newmann & Associates, 1996). This outcome may result from a lack of training among teachers, from an assumption that desired changes cannot succeed, or as a consequence of pressure from other sources, such as district pressure to raise standardized test scores.

One may find that the adaptation response is an incremental step on the way toward long-term change. More commonly, however, our experience suggests that limited changes do not continue incrementally over the long term. Instead, once the boundaries of change are defined, further reforms in the same area of work do not occur.

ALTERNATE STRUCTURES.   Sometimes teachers seeking change manage to avoid compromising their innovative approach to teaching and learning but are unable to diffuse their initiative to the entire school staff. In this circumstance the initiative often emerges as an alternate structure within a traditionally structured organization. An extreme example of this outcome was Island High School, in which every new idea seemingly resulted in a new structure. There were special programs for at-risk youth, for pregnant girls, for bilingual students, for low-achieving students, for technology-oriented students, and so on (Newmann & Associates, 1996). More commonly, a new initiative may result in a school-within-a-school that exists alongside and often in competition with the regular structure.

Why do innovative practices emerge through alternate structures instead of as transformations of existing institutions? Lack of organizational resources, particularly limited material and social resources, is the most likely reason. First, whereas special resources may be available for modest reforms, the new resources may be insufficient to encourage a more complete transformation. Second, teachers within schools are typically isolated from one another, separated by the boundaries of their classroom walls. They may lack opportunities to learn from one another and to teach one another. Communication among teachers around substantive issues is typically limited. Third, and probably most important, there is a strong norm of autonomy within schools, and it is considered inappropriate to criticize other teachers. Teachers are reluctant to question others' professional judgment, preferring to let others proceed as they have been and limiting the innovative practices to those who come to it on their own.

When outsiders see that reforms have been limited to alternate structures, they may take this result as a sign of the reform's failure. This perception may further inhibit growth or may lead to the reform's decline. Limitations on growth may also lead to a "circle the wagons" mentality among the leaders of change, a strong defense of a limited territory to keep the reform alive. These processes may tend to solidify the segmented character of school reforms, as Newmann and Associates (1996) observed at Island High School.

EXAMPLES OF TEACHING AND LEARNING: APPLYING THE MODELS

Thus far we have alluded to different views of teaching, but we have not provided many details. We noted, for example, that the uncertainties of teaching are often ignored in favor of standard routines, but sometimes uncertainties are recognized by teachers who may respond by attempting to increase their own knowledge. This example suggests that differences in conceptions of teaching may have consequences for the organizational context of teaching. That is, the aspect of the organizational context that is most salient may depend on one's conception of teaching. To explore this issue more fully, we describe three different approaches to teaching that we term teaching for understanding, conventional teaching, and core knowledge teaching. Each of these approaches calls into prominence different aspects of our dynamic model of the organizational context of teaching and learning.

Teaching for Understanding

According to Carpenter and Lehrer (1999), student understanding involves five interrelated forms of mental activity: constructing relationships, extending and applying knowledge, reflecting about experiences, articulating what one knows, and making knowledge one's own. By teaching for understanding, we mean instruction designed to stimulate these mental activities. A variety of writers have described such teaching as emphasizing students' construction of meaning and discovery of knowledge through active learning (e.g., Cohen, McLaughlin, & Talbert, 1993). Newmann and Associates (1996) had a similar concept in mind when they examined authentic pedagogy, which involves disciplined inquiry, student construction of knowledge, and relevance to students' lives beyond the school.

Teaching for understanding requires teachers to confront the uncertainties of teaching. As emphasized in loose-coupling theory, teaching is an ambiguous technology. Typically, this uncertainty is managed by focusing attention on the symbolic and ritual aspects of schooling and by avoiding inspection of the technical core. In teaching for understanding, however, the logic of confidence is not sufficient for managing uncertainty. These teachers are forced to go beyond scripted routines because they are faced with pressing questions about what students do or do not understand and what activities may improve understanding for particular students at a particular point in time. Teaching for understanding requires a means of managing uncertainty that recognizes and responds to questions rather than avoiding them. In response, teachers are likely to reach out to other teachers involved in similar efforts. Colleagues may provide moral support as well as practical suggestions. They may talk with one another, plan together, visit one another's classrooms, and so on—in short, they may begin to construct a professional community. Thus, a supportive social environment may emerge from efforts to teach for understanding. To flourish, however, this environment requires material resources, particularly time for collaboration, and human resources, some level of knowledge about fostering students' understanding, which may come from professional development. We propose that the relation between teaching for understanding and social resources in a school is dynamic, as the uncertainties of instruction, once recognized, provide the content of social relationships among educators, and these relationships in turn contribute to enhanced teaching for understanding. This conception is consistent with Bidwell, Frank, and Quiroz's (1997) finding that progressivist views of teaching are more prevalent in schools in which working conditions are more collegial.

Teaching for understanding may also call for another connection not previously recognized in Figure 2.4; feedback from student learning to teaching practices. Teachers who are focusing on students' understanding must adjust their activities in response to students' progress in learning. Thus, teaching for understanding forms a nexus between two dual processes: on the one side, the dynamic relation between teaching for understanding and social relations in the school, and on the other, a feedback loop between teaching and learning.

Conventional Teaching

By conventional teaching we mean teaching organized through a set pattern of lecture, recitation, and seatwork. This is not an abstracted ideal type; rather it accurately characterizes much of the teaching in American schools, particularly after the primary grades. A variety of studies have depicted this emotionally flat, teacher-dominated process (e.g., Goodlad, 1984). Nystrand (1997) described it as "monologic instruction," meaning that classroom life is essentially a monologue—even when students recite, they are following a script that has been laid down by the teacher. The flow of questions and answers follows a well-known pattern of initiation (teacher question), response by a student, and teacher's evaluation of the student's response (Mehan, 1979). In this type of instruction, even small-group work is prescripted by teachers (Nystrand, Gamoran, & Heck, 1993).

What are the key organizational contexts for conventional teaching? Here the flow tends to be one way, not dynamic. Consistent with the nested layers model, allocations of time and curricular materials are expected to influence teachers' coverage of curricular content. In contrast to teaching for understanding, social resources would have little impact on teachers' instructional practices. In conventional teaching, teachers work in isolation from one another, and issues of potential uncertainty are submerged beneath instructional routines. Consequently, there is little impetus for reflection about the substantive problems of teaching. Of course, teachers talk every day with their colleagues about the troubles of the job. These conversations, however, typically focus on administrative issues or on problems of specific students, rather than on new instructional approaches, on content questions, or on the intellectual quality of students' work (Newmann & Associates, 1996). We propose that the predominance of conventional teaching coupled with the marginal relevance of social resources for conventional teaching accounts for the inconsistent and generally weak effects of school-level social indicators such as collegiality and collaboration. Teachers' expectations and efficacy are exceptions to the pattern of weak school effects, but these apparent effects are better explained as responses to students' success rather than as determinants. For conventional teaching and social resources, loose coupling prevails.

Core Knowledge Teaching

Core knowledge teaching refers to teachers who emphasize the transmission of subject-matter knowledge from established authoritative sources to students. According to Hirsch (1993, 1996), this transmission of knowledge is the essential function of schooling. In contrast to teaching for understanding, where students construct meaning for themselves, core knowledge views meaning as residing outside students, within the subject matter itself. Core knowledge teaching also contrasts with conventional teaching in two important ways. First, core knowledge has explicit standards for what constitutes important knowledge (Hirsch, 1996).

Second, core knowledge teaching emphasizes depth of knowledge to a much greater degree than in conventional teaching, which often introduces fragmented bits of information and ignores controversy and underlying linkages among issues (McNeil, 1986).

For core knowledge teachers, the key organizational resources are curricular materials and their own knowledge of the subject matter. Thus, material and human resources are more salient than social resources. One could imagine that core knowledge faculty might engage in substantive discussions of curricular content, and from these discussions might emerge a professional community of teachers, as in teaching for understanding. However, because the core knowledge curriculum is largely given, whereas students' understanding is highly uncertain, one would expect social relations among teachers to play a less prominent role in responding to and shaping instructional practices of core knowledge teaching as compared with teaching for understanding. Consistent with this view, Bidwell, Frank, and Quiroz (1997) reported no significant associations between the character of teachers' working relationships and their reported emphases on instructional rigor.

As in conventional teaching, we expect that student learning occurs in response to core knowledge teaching, without a meaningful feedback loop. Thus, teaching for understanding is the only case of those we have considered in which instruction responds significantly to student learning.

CONCLUSIONS: TOWARD A RESEARCH AGENDA

In this chapter, we have both simplified and added complexity to conceptions of how the school as an organization provides a context for teaching and for learning. We simplified them by arguing that organizational resources are the most essential aspects of the organizational context. We subsume most of the conditions examined in previous research under our concept of resources, including such widely diverse conditions as time, materials, class size, knowledge, leadership, and collaboration. The focus on resources allowed us to trace the development of theoretical conceptions of school organization, from input–output notions, to nested layers, to our own model. In each of these perspectives, resources are the most salient features of the context of teaching and learning.

In simplifying it, we have left out some aspects of school organization. In particular, aspects of structure that are not merely a matter of resources are not found in our model. For example, structural differentiation into tracks and ability groups is usually not a matter of economic resources, yet it figures prominently as a context for teaching (Oakes, Gamoran, & Page, 1992). Interestingly, changes in differentiation policies often fail to bring about instructional improvements (Gamoran & Weinstein, 1998). Research in this area shows that structural differentiation is not an easy policy lever because of resistance to change and insufficient knowledge about teaching under new structural conditions (Wells & Serna, 1996). Indeed, research findings about structural differentiation are consistent with the general conclusions of Peterson and associates (1996), that structural conditions may facilitate teaching improvements but they are not the primary causal factors. Further research may help to specify more fully the importance of structure as a complement to resources (Newmann, 1998).

Composition of the student body is another organizational feature that does not figure prominently in our analysis. Composition, like structure, may be associated with differences in teaching and in learning but does not appear to be a driving force (Gamoran, 1992). An important question about composition is whether it operates as a contingency for organizational resources; that is, whether different types and levels of resources are needed to bring

about similar changes in schools that differ in their student bodies. For example, is professional development of a certain type or quality necessary to improve teaching when the students are especially disadvantaged? This complication may also be addressed in future research.

Although we simplified it by leaving out some aspects of organization, in other ways our model is more complex than previous visions of schools and schooling because it recognizes the possibility of dynamic, multidirectional associations between organizational resources, teaching, and learning. Such complexity may not prevail in all cases, but it likely occurs in many of the reform efforts currently underway, which focus on teaching for understanding (Cohen et al., 1993), authentic pedagogy (Newmann & Associates, 1996), and dialogic instruction (Nystrand, 1997). Research on how these dynamic associations emerge is essential for learning how to provide a supportive context for new instructional approaches. Some combination of survey and qualitative research that monitors schools and districts over time is needed to trace the connections among resources, teaching, and learning.

The relation between teaching and its organizational context depends in part on what conception of teaching prevails. The importance of particular resources may also vary among and within educational systems in response to different or to changing conceptions of governance and accountability. For example, whereas loose coupling has been especially apparent in the United States until now, new accountability standards for what teachers teach and for what students learn may change the connections between allocations and outcomes. A question for future research is whether reform that emphasize new standards will be accompanied by tighter linkages between curricular allocation and students' performance, as envisioned in the nested layers view, or whether increases in professional development for teachers, rather than the pressures of curriculum and testing, may lead to changes in teaching. Yet another alternative is that longstanding norms in American education will be maintained, and educators will successfully resist pressures for greater accountability in the context of a persistently loosely coupled system. Cross-national research, as well as research that monitors trends within education systems over time, would shed light on these issues.

Research on the allocation and impact of resources has yielded clearer conclusions for some resources than for others. For some narrowly specified aspects of time, curriculum coverage, and student learning, the nested layers view has been sustained. Human resources such as teachers' knowledge also seem closely linked to teaching when teaching practices are carefully specified. Existing research offers less confidence about the impact of other human resources, such as leadership, or about social resources, particularly the relationships among educators. Research on these conditions is inconclusive, and we have argued that a more nuanced analysis of resource flows is necessary to identify their multidirectional effects.

An organization is a system of linked relationships, not simply a collection of individuals or of isolated categories. An organizational role, such as teacher, has meaning only when thought of in connection with some other role, such as student, principal, or parent. For this reason a sociological study of an organization calls for a study of relationships, centering on how relationships become ordered, how they change, and how they influence outcomes. What may prove intriguing across organizations are differences in the character of the linkages that prevail. A focus on relationships offers greater possibilities for understanding the context of teaching and learning, and thus for supporting the reform of teaching, than does a focus on the traits of organizational participants.

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