1. Learning to Work in Schools

There is growing consensus that American education needs fundamental reform. The widespread dissatisfaction with secondary education, in particular, is partly based on two concerns about skill demand in the workplace. One is that America is losing its competitive edge over other nations that educate and train a higher-skill workforce (Commission on the Skills of the American Workforce (CSAW), 1990). The second is that changes in the workplace will continue to demand highly skilled and more flexible workers (Bailey, 1991). These concerns have spawned dozens of new proposals for restructuring secondary education to improve the connection between school and employment and ensure student readiness for high-skill employment opportunities and lifelong learning (e.g., Council of Chief State School Officers (CCSSO), 1991; U.S. Department of Labor, Secretary’s Commission on Achieving Necessary Skills (SCANS), 1991).

Two questions hold center stage for school reformers:

• What kinds of skills should be taught and learned?
• How should schooling be organized to teach these skills?

The answers to these questions are the topic of much debate among educators, policymakers, researchers, the business community, and the general public. Recently, the question of which skills should be taught was the focus of a widely cited commission report sponsored by the Secretary of Labor (SCANS, 1991). That report recommends that students be taught generic skills—problem solving, communication, teamwork, higher-order thinking—in addition to subject-matter or domain knowledge. It also notes that students’ attitudes toward work need improvement.

The “how” question is being addressed at two levels. At the program level, one sees the development of many models to improve the “school to work” transition (cf. Stern, 1990; Bodilly et al., 1993). These models often require changes in curriculum, pedagogy, and organizational structure in addition to new relationships between secondary schools and institutions that provide postsecondary education and training. Program level changes often entail changes in the classroom as well. Policymakers and researchers have paid considerably less attention to the classroom level—in particular, to the identification of teaching practices and policies that will support learning new
kinds of skills. This lack of attention has occurred despite new theories of student learning that call for changes in teaching practices to support learning these skills (Raizen, 1989; Collins, Brown, and Newman, 1989).

**Research Objectives and Approach**

We have conducted two studies that focus on the teaching and learning of generic skills at the classroom level. The main goal of these studies is to inform the design and development of courses that aim to improve the connection between school and employment by teaching generic skills and attitudes in addition to domain-specific skills. We focus on the classroom level of program implementation in the belief that the design of classroom activities and selection of pedagogical practices are essential to improved instruction and learning.

The first study, whose results were published earlier, developed an approach for studying instruction in generic skills and attitudes and applied it in several vocational classrooms (Stasz et al., 1990). We made a number of findings regarding how generic skills and work-related attitudes are imparted in vocational education settings and how these settings differ from academic ones. These findings implied that lessons learned about teaching generic skills and attitudes in vocational settings may not transfer easily into academic classrooms or programs that integrate vocational and academic education.

The present study directly addresses potential differences between academic and vocational classrooms in the teaching and learning of generic skills and attitudes. Our sample of case study sites includes both academic and vocational classrooms. This extension permits us to address several relevant issues, including whether generic skills are taught in academic domains and how teacher training and work experience influence the teaching of such skills.

As in the previous study, we use ethnographic field methods to observe, record, and analyze the classroom activities directed toward the teaching and learning of generic skills and attitudes. We also developed a framework for thinking about how to enhance attitudes toward work through the design of the learning environment. That framework purposely blurs the distinction between school and work to consider what studies of traditional apprenticeship (cf. Lave, 1977) and work design (cf. Hackman and Oldham, 1980) imply for classroom instruction.¹

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¹As part of the present study, we also surveyed students to measure relevant individual characteristics (background and self-efficacy for learning) and related these to learning outcomes.
When comparing all the classrooms, we found strong similarities among those that appear, on the indices developed, to succeed in conveying generic skills and attitudes. There are also strong differences between these classrooms and those that fail to do so. Through these comparisons, we are able to identify a large set of common practices associated with the teaching of generic skills and to organize them into an instructional model that can help guide the design and development of courses that aim to provide improved instruction in generic skills and attitudes. We describe in detail three well-designed vocational and academic classrooms where teachers successfully impart generic skills and work-related attitudes.

Since the questions above—regarding what generic skills are and how to teach them—motivate our research, we explain them more fully before proceeding.

**What Skills and Attitudes Should Be Taught?**

Spurred by observed changes in the workplace and employers’ dissatisfaction regarding the skills of high school graduates, researchers have developed new conceptualizations of skills that attempt to separate different types of skills into discrete categories. The first cut separates domain-specific or occupationally specific skills from “generic” skills. For the most part, this distinction is not controversial. A second cut separates “basic” and “higher-order” skills. This distinction is debated in the education and research communities, and current work challenges the assumption that skills underlying complex performance can be sequenced from basic or low level to complex or high level (see Stasz et al., 1990 for further discussion). For the purposes of our research, we define two broad categories of generic skills:

- **Basic or enabling skills** include such abilities as reading, doing simple mathematics and such “life skills” as reading a schedule or filling out an application. Rudimentary prosocial behaviors can also be considered basic skills. Basic skills are often used in the service of more complex tasks requiring higher-skill levels.²

- **Complex reasoning skills** comprise the second category of generic skills. Some tasks require formal reasoning: the problem to be solved specifies all premises or given information in advance. Other tasks require informal or

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²It is widely recognized that, from a cognitive perspective, skills such as reading are themselves complex; it is from the perspective of their role in work that they are considered “basic” and “enabling.”
everyday reasoning: Premises are not completely supplied for the problem, and everyday thinking activities must be invoked (e.g., planning, making commitments, evaluating arguments, choosing options; see Galotti [1989] for a detailed discussion). Complex reasoning skills are the types of skills needed in “flexible” work arrangements (U.S. Congress Office of Technology Assessment [OTA], 1990; SCANS, 1991; CSAW, 1990).

These generic skills can be applied in a variety of domains or vocations and in combination with domain-specific knowledge and skills that define competence in a particular area.

A third component of our conceptualization identifies work-related skills and attitudes that individuals bring to a task. These can influence how any skills are acquired and learned.

- **Work-related skills and attitudes** include cooperative skills; personal qualities such as individual responsibility, self-esteem, self-management, and sociability (cf. SCANS, 1991); “habits of thought” that can lead individuals to engage in higher-order thinking (cf. Resnick, 1987a); and psychological factors that influence a person’s motivation to respond to a task in either adaptive or maladaptive ways (cf. Dweck and Leggett, 1988).

These three categories of generic skills and attitudes often overlap and it is difficult to determine exactly what proportion of different skills or attitudes contribute to skilled performance. We do know, however, that individuals faced with school-related, work-related, or everyday life tasks bring a constellation of knowledge, skills, and attitudes to bear in accomplishing them.³ Knowledge, skills, and attitudes interact with each other and with the task in complex ways to produce degrees of success or failure. While skills define a person’s competence or ability to do a task, attitudes influence willingness and the effort expended to perform a task (Stasz et al., 1990).⁴

While this conceptualization does not sort out distinctions between “levels” of skills or the precise relationship between skills and attitudes, it provides a useful

³Our definition of generic skills is similar to the three-part foundation skills identified by SCANS (1991). Our conceptualization places a stronger emphasis on work-related attitudes and focuses more on the interplay between skills and attitudes. The SCANS (1991) formulation also includes five “competencies” that effective workers can productively use (resources, interpersonal skills, information, systems, technology).

⁴Several psychological models distinguish motivation and skill or ability as separate, but interacting antecedents of cognitive performance, e.g., Beach and Mitchell’s (1978) contingency model; Chaiken and Stangor’s (1987) systematic processing model; Petty and Cacioppo’s (1984; 1986) elaboration likelihood model. While it is beyond the scope of the present study to examine these with respect to generic skills, we accept their basic premise.
starting place for thinking about generic skills, their relative importance, and their teachability. It seems clear that individuals may not be able to bring their basic and complex skills to bear on a task effectively if they lack attitudes conducive to work. Conversely, a person who is unskilled but bubbling over with positive work attitudes may be a good candidate for education or skill training. However, we argue that those with only basic skills and prosocial attitudes, although perhaps readily trainable, will have limited roles in the workplace and limited ability to adapt to workplace change. Complex reasoning skills and work-related attitudes, in particular, appear to be key attributes for adapting to changes in the workplace. These are the attributes that employers value and school reformers hope to impart.5

To guide our observation and analysis of the teaching and learning of generic skills and work-related attitudes, we developed a conceptual approach that posits how the learning environment can affect (a) the individual’s attitudes toward engaging in the task and (b) the teacher’s ability to cultivate attitudes that enhance task performance. This conceptualization draws on research findings from two domains, cognitive science and organizational behavior.

Cognitive science research emphasizes the benefits both to learning and motivation of teaching theories and facts in the context of “real-life” problems and activities that can include group work and hands-on use of relevant tools (cf. Resnick, 1987b). This research on “cognitive apprenticeship” suggests that the instructional environment should support a culture of “authentic practice” where students and teachers can actively communicate and engage in the skills involved in expertise, including solving problems and carrying out tasks in a domain (Collins, Brown, and Newman, 1989).

Research in organizational behavior provides insights into how task design and other aspects of the working environment can enhance worker motivation and performance (Hackman and Oldham, 1980; Bailey, 1991). A “socio-technical systems” approach focuses attention on the design of work itself: for example, defining “flexible” work designs to replace more traditional ones as a means to achieve the “high-performance” workplace (CSAW, 1990; SCANS, 1991).

5See Stasz et al., 1990 for a review of the literature on changes in the nature and structure of work that underlie the demand for generic skills and on school reformers’ rationale for teaching them. See also Resnick, 1987b; Berryman, 1991; Raizen, 1989; Capelli, 1992.
How Should Generic Skills and Attitudes Be Taught?

Broad descriptions of needed workplace skills and attitudes are a necessary, but not sufficient, step in changing education to improve the connection between school and postsecondary education or employment. Educators will need to design new programs that prepare students for careers that may very often not fit the old categories of managerial or entry-level work (Capelli, 1990; OTA, 1990). Teachers—who have the ultimate responsibility for carrying out any curricular reform—must design activities and use teaching practices that impart generic skills and attitudes.

At the program level, educators facing the challenge of how to prepare students for the new workplace can build on a solid base of existing programs in vocational-technical education. In “cooperative education,” for example, schools and businesses work together to promote learning that extends what is taught in the classroom by providing students’ experience in paid jobs. This method gives students direct practice in learning at the workplace. Vocational programs also offer important learning opportunities through operation of school-based enterprises. Significant new approaches include career “academies” and the “tech-prep” movement that offer high school students rigorous courses of study focused on specific occupational areas while giving more students the option to go to college (Stern, 1990). Such programs represent a departure both from traditional academic programs, which are faulted for being too “decontextualized,” and traditional vocational education, which keeps work and school too separate.

Practices that place students in college-bound, vocational, and general tracks may not provide comparable opportunities for learning generic skills. Programs that combine school and work can challenge existing education practices that separate academic and vocational curriculum, teachers, and students. Academic and vocational teachers may need to collaborate to develop new curricula (cf. Grubb et al., 1991; Bodilly et al., 1993). For these reasons, it is important to examine school- and district-level policies and practices of the sorts that have been shown to affect the teaching context and are amenable to policy interpretation: (1) teaching conditions, (2) press for achievement, and (3) access to knowledge (Oakes, 1989).

Less is known about specific classroom level practices that support learning in school-to-work programs or individual courses that aim to teach generic skills.

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6For a review see Stern, 1990.
Many practitioners and researchers agree that learning through the work process itself is an effective method for acquiring work-related knowledge (Resnick, 1987a, 1987b; Collins et al., 1989; Brown et al., 1989; Raizen, 1989). In the absence of direct experience, the same research supports “situating” learning in the context of real-life problems suggested by the culture of authentic practice (as discussed above). This requires that teachers revise their role as lecturers and become the students’ guide, model, or coach in the learning process. It also requires students to take a more active role in learning—to learn how to apply abstract concepts, work in teams, use tools effectively, and communicate their knowledge to others. Because situated learning, informed by the culture of practice in a profession or trade, aims both to improve learning and engage students, it provides a powerful model for designing programs and classroom activities that can enhance generic skills and dispositions. In short, students learn to work in classrooms where skills and attitudes are taught in the context of complex, realistic tasks.

Research Scope

By focusing our analysis at the classroom level, we necessarily limited the number of cases we could study. On the one hand, the small sample size reduces the generalizability of our findings. On the other hand, our case study approach provides rich information on teaching practices and student behavior and perceptions that practitioners sorely need.

In reporting this research, we pay particular attention to “classrooms that work”—i.e., that appear to be successful in imparting generic skills and attitudes, based both on observations of the instructional process and student perceptions of learning—while using classrooms that achieved less success as sources of illuminating counter-examples.

Although our work is addressed primarily to teachers and administrators who wish to improve the teaching of generic skills and attitudes, it will also be of interest to policymakers. In addition to classroom practice, we also examine the policy contexts for classrooms in order to gain insight into what kinds of policies can facilitate—or hinder—instruction in generic skills and attitudes.

Organization of the Report

Six sections follow this Introduction. Section 2, which presents our research methods, will primarily interest researchers. Section 3 is of more general interest: It compares the classrooms we studied across a comprehensive set of domains.
and suggests an instructional model for generic skills and attitudes. Sections 4, 5, and 6, which provide detailed descriptions of three classrooms that work, will be of particular interest to practitioners. Conclusions and implications are presented in Section 7.