ENVIRONMENTAL INHIBITORS TO INFORMAL LEARNING IN THE WORKPLACE: A CASE STUDY OF PUBLIC SCHOOL TEACHERS

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The purpose of this study was to examine environmental inhibitors to informal learning in the workplace. Twenty-two experienced teachers were interviewed and numerous site visits were made to each school where these teachers worked to develop a greater understanding of the ways in which aspects of their work environment inhibited them from engaging in informal learning. Four environmental inhibitors emerged from an analysis of the data: lack of time for learning, lack of proximity to learning resources, lack of meaningful rewards for learning, and limited decision-making power in school management. Implications of these findings for theory, research, and the facilitation of informal learning in the workplace are discussed.

The nature of professional work has changed dramatically in recent years. It involves far greater pressures, more complex and ill-structured problems, and greater uncertainty than ever before (McLagan, 1999). A group of professionals for whom these defining aspects of work especially apply are public school teachers.

During the past 20 years in America, the scope and intensity of teachers' jobs have rapidly increased (Hargreaves, 1992). Presently, teachers are required to teach more content and subjects to classes containing greater numbers of students with emotional, social, and learning problems than in the past. Many of these problems are far more serious in nature than ever before. In addition to teaching responsibilities, the decentralization of decision making in school districts calls for teachers to play an increasingly active role in the management and operation of schools. These changing role expectations have resulted in many new learning needs for teachers.

In large part, school districts in the United States rely on formal training and development activities to promote teacher expertise. Districts provide a variety of opportunities for teacher training and development, ranging from district-sponsored

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in-service activities to financial support for professional conferences. The intent of such activities is to help teachers develop improved job knowledge and teaching skills, greater understandings of school functions and responsibilities, and greater confidence in their roles as educators.

However, recent studies have shown that professionals learn a great deal through informal learning in the workplace (Cseh, Watkins, & Marsick, 1999). Informal learning refers to activities initiated by people in work settings that result in the development of their professional knowledge and skills (Lohman & Woolf, 1998; Watkins & Marsick, 1992). Unlike formal learning, informal learning can be either planned or unplanned and structured or unstructured. In the context of teaching, examples of such activities include talking and sharing materials with other teachers, searching the Internet for instructional content, and experimenting with new instructional strategies. Recent reports have indicated that as much as 90% of new learning is acquired through informal learning activities in the workplace, rather than organizationally planned or sponsored activities away from the workplace (Brinkerhoff & Gill, 1994; Lovin, 1992).

The importance of informal learning in professional development has focused greater attention on the interplay between informal learning and the organizational environment where this learning occurs. However, previous studies of this topic have focused predominantly on the identification of knowledge and skills that individuals need to successfully adapt to changing work environments (Daley, 1997; Kozlowski, 1995). A relatively unexamined area of investigation concerns the ways in which organizational environments influence the desire or ability of individuals to engage in informal learning. This is a particularly important area of investigation for teachers because the nature of schools and teachers' jobs have changed so dramatically in recent years.

Facilitating Informal Learning in the Workplace

Informal learning is an important way that individuals construct meaning from their experiences (Daley, 1997; Lovin, 1992; Watkins & Marsick, 1992). This type of learning typically is triggered by a discrepancy between a person's entire history of experiences and a new experience that cannot be handled automatically (Jarvis, 1987a, 1987b). The inability to cope with the situation unthinkingly or in a routine way gives rise to a potential learning experience.

Individuals respond to potential learning experiences by engaging in a series of steps that closely resemble the steps of the problem-solving process (Cseh et al., 1999). In a reconceptualized model of informal learning, Watkins and Marsick (1992) describe these steps as (a) framing the context, (b) responding to triggers to a potential learning experience, (c) interpreting the experience, (d) examining altern-

ative solutions, (e) choosing learning strategies, (f) producing alternative solutions, (g) assessing intended and unintended consequences, and (h) evaluating lessons learned. As individuals successfully navigate through these problem-solving steps, reflective learning occurs (Cseh et al., 1999; Jarvis, 1987a, 1987b).

Opportunities for reflective learning abound in today's workplace (Schön, 1987). Professionals must deal with the "low-lying swamp of messy problems and persistent dilemmas of practice" (Sykes, 1996, p. 466). Such problems and dilemmas promote critical reflection, experimentation, and thereby learning (Smylie, 1995). In a recent study of informal learning among public school teachers, Lohman and Woolf (1998) found that teachers associated three main types of informal learning activities with reflective learning outcomes: knowledge exchanging (sharing and reflecting on others' practice and experiences), experimenting (actively trying out new ideas and techniques), and environmental scanning (independently scanning and gathering information from sources outside the school).

Historically, organizations have used one of two approaches to facilitate these types of informal learning activities (Brown & Duguid, 1991). The most common approach has been to formalize the activities, that is, to officially sanction and structure them. A second, less common approach has been to restructure the organizational environment so that it is more conducive to self-initiated engagement in these types of learning activities.

Based on the study of canonical and noncanonical practices in organizations, Brown and Duguid (1991) assert that distinctly different outcomes will result from these two approaches. Canonical practices represent espoused and sanctioned practices of organizations, whereas noncanonical practices represent naturally occurring practices of emergent or existing communities of practice in organizations; these communities seldom are recognized by the organization. It is through noncanonical practices that "learners can in one way or another be seen to construct their understanding out of a wide range of materials that include ambient social and physical circumstances and the histories and social relations of the people involved" (Brown & Duguid, 1991, p. 47). Attempts to reorganize the workplace into canonical groups can actually disrupt highly functioning noncanonical communities and thereby decrease individual and group learning. As such, a more productive approach to foster informal learning is to create organizational environments that do not inhibit individuals and groups of individuals from learning on their own.

Therefore, if teachers rely on informal learning activities for their professional development, and if the nature of the organizational environment influences their participation in these types of activities, then more must be known about the environmental influences that inhibit teachers from participating in informal learning. This information could be used to reconsider conventional approaches for facilitating informal learning in the workplace.

METHODOLOGY

The purpose of this qualitative study was to develop a deeper understanding of the types of environmental influences that inhibit public school teachers from engaging in informal learning. The participants, data collection, and analysis procedures for this study are described in this section.

Research participants. Experienced teachers were selected as the focus of this study. Because the tenure system in American public schools is based on 3 years of teaching experience, experienced teachers in this study were considered to be those with more than 3 years of teaching experience.

Twenty-two experienced teachers from three schools (one elementary, one junior high, and one senior high school) in a southeastern Iowa school district participated in this study. This school district consisted of 16 elementary schools, 2 junior high schools, and 2 senior high schools. At the time of the study, the school district enrolled 9,947 students and employed 730 teachers.

Of the 22 teachers, 6 taught at the elementary school. These teachers had an average of 10.5 years of teaching experience ($SD = 4.3$). All 6 teachers were female and collectively represented all the elementary grade levels. Eleven of the 22 teachers taught at the junior high school. These 11 teachers had an average of 11.7 years of teaching experience ($SD = 4.0$). Three of these 11 teachers were male. Academic subjects taught by these 11 teachers included health education, language arts, math, physical education, science, and special education. The remaining 5 teachers taught at the senior high school. They had an average of 9.6 years of teaching experience ($SD = 4.3$). Three of the 5 teachers were female. Academic subjects taught by these 5 teachers included language arts, math, and social studies.

Data collection and analysis procedures. The teachers were recruited by invitation from the principal of each school to participate in this study. Each of the 22 teachers accepting the invitation participated in a semistructured, in-depth interview of 1 to 1½ hours conducted by one of two researchers over a 6-month period. In addition to the interviews, numerous visits were made to each school to gain a greater understanding of the school setting where the teachers worked.

Data analysis was composed of three broad phases within a constant comparative framework (Miles & Huberman, 1994). The first phase consisted of building a set of categories that represented the learning experiences of the teachers. The researchers' conceptual framework of teacher learning was used to construct 70 codes within six independent dimensions: learning methods, learning sources, environmental characteristics influencing learning, personal characteristics influencing learning, learning potency (enhancer, inhibitor, or catalyst to learning), and teacher responsibilities. After the conceptual framework was constructed, both

researchers independently coded an interview transcript. The researchers then reviewed each other's application of codes to segments of text in the transcript. When consensus was reached on the interpretation of codes to text segments for the first transcript, the researchers independently coded a second transcript and repeated the interrater analysis process. By the fifth transcript, a high degree of consistency between the researchers had been established when applying codes to segments of text. As a result of this interrater analysis, eight additional codes were created to form a categorizing framework consisting of 78 codes within six dimensions (see Table 1). At this point, two teachers reviewed the coding of their respective interview transcripts. Both reported that the codings accurately described the learning activities that they had discussed in their interviews.

The second phase of data analysis involved an iterative coding process through which the remaining transcripts, field notes, and memos were coded. In this process, the principal investigator coded the data, the research assistant reviewed the codings and proposed changes and/or additions to the assigned codes, and the principal investigator reviewed and, when deemed appropriate, integrated the research assistant's proposed changes into the data. This process yielded a total of 1,502 coded segments of text.

The third phase of data analysis consisted of inducing themes relevant to the research question from the coded data. The data that were coded as inhibitors to learning were analyzed in this study. A matrix of the 10 learning methods and 10 learning sources was constructed for each school. These matrices were used to accumulate coded segments of text from the transcripts, field notes, and memos. An entry was made in a master spreadsheet data file for each cell in each matrix. Each entry contained the school where the teachers taught, the cell reference number, a one- or two-sentence description of the pattern of meaning that was shared by coded segments of text in the cell, and a notation indicating whether the description was broadly agreed upon as indicated by 75% or more of the quotations in the cell, somewhat agreed upon as represented by approximately half of the quotations in the cell, or a minority view represented by only a small percentage of the quotations in the cell. After all the cells for one learning method had been analyzed, themes were induced to capture relationships among those descriptors coded as broadly agreed upon. After the induction of themes from descriptors was completed for one learning method, the same process was used to analyze the coded segments of text for the next learning method in the matrix. This process continued until all the learning methods in each of the three matrices had been analyzed. Throughout this analysis process, both researchers constantly reviewed and comparatively analyzed each other's emerging descriptors and themes.

Four major themes emerged from the analysis of the data. These themes represented critical aspects of the school environment that inhibited teachers from engaging in informal learning experiences.

TABLE 1

Categorizing Framework for Analyzing Environmental Inhibitors to Informal Learning

Dimension	*Code*	*Dimension*	*Code*
Learning method	Collaboration Formal training Independent research Individual experimentation Mentoring Observing Reflecting on past experiences Role playing Sharing resources Talking	Learning source	Administrators Existing information resources Other staff People outside school Professional development activites outside school district Professional development activities within school district Students Tacit Teachers Work group membership
Environmental influences	Administrator's behaviors Availability of time Community perception of teachers Competing goals Cultural norms Departmental offices Financial resources Impact of technology Incentives and rewards Instructional assignments Meetings Physical aspects of building Policies and procedures School schedule Size of student enrollment Student attributes Teacher participation in decision making—high Teacher participation in decision making—low Teacher evaluation The changing world Grade level/elementary Grade level/junior high Grade level/senior high	Personal influences	Age Applied focus Autonomy Commitment Educational background Educational philosophy Expertise Flexibility Gender Initiative Interpersonal skills Love of reading Openness to change Organizational skills Patience Procrastination Readiness to learn Self-concept Supervisory skills Teaching experience
Teaching responsibilities	Instructional content Instructional materials and resources Instructional strategies Extra- and cocurricular activities School duties School/district management Parent involvement Delivering lessons Evaluating learning Managing classroom Mentoring and developing teachers Motivating students	Learning potency	Enhancer to learning Inhibitor to learning Catalyst of learning

RESULTS

Four environmental inhibitors to informal learning emerged from an analysis of the data: lack of time for learning, lack of proximity to learning resources, lack of meaningful rewards for learning, and limited decision-making power in school management.

Lack of time for learning. Lack of time for learning was the most common inhibitor to informal learning. Teachers reported that they require greater amounts of time for their own development because the demands of their jobs had intensified in three dramatic ways.

First, teachers reported that they were responsible for teaching more students than ever before. Increasing numbers of students had placed corresponding demands on teachers' time. As a junior high math teacher reported,

> I've got about 170 students in my classroom. I don't get to see each one of them as much as I should be. I lose a fair number of my prep periods during the week bringing kids in for extra help. Kids come in before school, come in after school, things like that, and I'm still not seeing all the kids I need to see. When I'm using time to improve my class, be it new technology that I want to bring in, or a new unit that I want to extend on, and I have to do that all myself, that takes up time. So, therefore, sad but true, learning from my colleagues or helping my colleagues sometimes has to go by the wayside because we do not have the time to do it.

For the study participants, more students directly translated into less time for their own professional development.

Second, teachers indicated that greater numbers of students with special needs were being integrated into their classrooms. To effectively deal with the challenges that integration presents, teachers indicated that they must spend a great deal of time learning about the different types of special needs, instructional strategies for teaching special needs students, and organizational strategies for handling the inclusion of special needs students in their classrooms.

A third way in which teachers' jobs had intensified concerns nonteaching responsibilities. The school district in which these teachers worked had shifted from centralized school district management to site-based management. This change resulted in greater demands on teachers to participate in school management and operations committees. Such involvement has necessitated that teachers be away from their classrooms more frequently than in the past. The majority of the participants reported that such responsibilities have resulted in additional work for them, because substitute lesson plans had to be prepared and classroom work followed up on upon their return, and, as a consequence, have interfered with their performance of essential teaching tasks. A junior high teacher articulated the conflict between nonteaching and teaching demands in this way:

> I think I probably need more time, less district demands, just to let me take care of the business I need to do for the kids, the kids I need to attend to, because I have to get so fragmented in serving them; this committee, going to this committee, and going to that committee, and going to this district workshop, when I really just need time to develop what I need to do for kids here.

An issue compounding the learning challenges presented by job intensification was that teachers' time was almost completely committed. The amount of nonteaching time per day that each teacher had varied depending on the school. Senior high teachers had two 50-minute nonteaching periods, junior high teachers had two 45-minute periods, and elementary teachers had two 25-minute periods. Teachers reported that these blocks of time were too short to accomplish any substantive work. As a senior high teacher noted,

> even with two prep periods it's not enough. I think the contact time and the number of kids come first. And when you deal with 150 kids during the day it's very hard to work on a curriculum project in the midst of that, it's really hard.

Lack of nonteaching time was a particularly acute problem for elementary teachers, who indicated that 25-minute blocks of nonteaching time were consumed "by the time you walk your children to this other class, come back, pick up your mail . . . make phone calls, do e-mail, and do paperwork. . . ." As a consequence, elementary teachers were left with too little time during the school day for planning and developing lessons.

To keep up with essential teaching tasks, the majority of participants reported that they worked many more hours than were required by the school district. An elementary teacher stated,

> I usually try to get here between 7:00 a.m. and 7:15 a.m., and I won't leave before 5:00 p.m. or 5:30 p.m. most days. [I] come in on the weekends, three or four hours at least on Sunday. And, I am not the only one who does that. I see everyone around me doing that.

With the intensification of teachers' jobs and a lack of nonteaching time, teaching schedules were found to play an important role in a teacher's ability to engage in informal learning. Schedules in which teachers shared nonteaching periods enabled teachers to ask questions, collaborate on projects, and share instructional resources with colleagues. However, teachers reported that the need for shared nonteaching time was seldom considered when teaching schedules were developed.

Lack of proximity to learning resources. A lack of time inhibited engagement in informal learning to an even greater extent when teachers lacked proximity to certain resources. Proximity to four learning resources was reported as being most

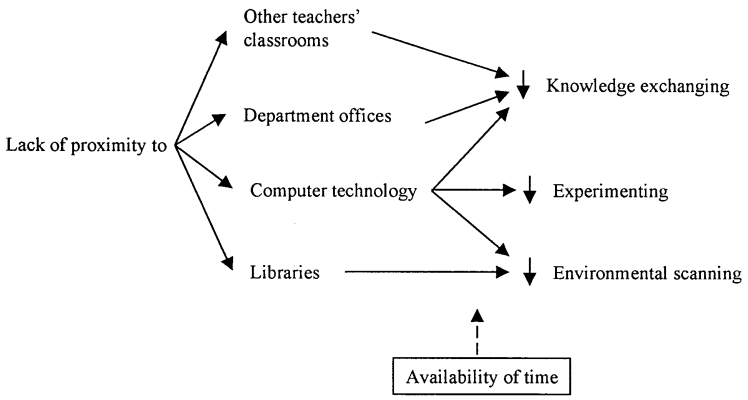

Figure 1. Influence of the Lack of Proximity to Learning Resources on Informal Learning Activities

crucial: other teachers' classrooms, department offices, computer technology, and libraries. As shown in Figure 1, the lack of proximity to these four resources inhibited teachers from engaging in knowledge exchanging (sharing and reflecting on others' practices and experiences), experimenting (actively trying out new ideas and techniques), and environmental scanning (independently scanning and gathering information from sources outside the school).

First, a lack of proximity among teachers' classrooms diminished a teacher's ability to exchange knowledge with colleagues, particularly those in the same grades or subject areas. Consequently, teachers were less likely to informally talk and share resources with those whose classrooms were not near theirs. A kindergarten teacher noted that there is

> . . . a kindergarten teacher right across the hall and many times during the day I'll go in there and I'll ask a question. . . . And she's always in here just to ask questions about things. [The third kindergarten teacher is] way down the hall. And often we'll do the same thing and she has no clue because we've just kind of discussed it right before the kids get in from recess.

A senior high teacher described the challenge presented by a lack of proximity to other teachers' classrooms: "It just seems like we're so spread out. The people are easy to talk to if you can find them. It's finding them that is the tricky part." Many teachers knew where their colleagues were located but did not have access to them. In the words of a senior high teacher whose classroom was removed from her peers, "I never see them. I see them at lunch and I see them again at 3:45 p.m., whereas everyone also sees each other between every single hour because they're standing in the hall talking."

Second, a lack of proximity to department offices inhibited teacher interaction and resource sharing. Department offices provided a place for teachers to informally talk with, ask questions of, and share instructional materials with their colleagues. Teachers whose classrooms were not in close proximity to department offices voiced their dismay at not being able to capitalize on these types of informal learning activities. For example, a senior high teacher reported that her department office

> . . . is down that main hallway, and all the math rooms are right there, except for this one. The other teachers are in and out [of the office constantly]. I don't have that choice. If I forget something down in the office, I have to send a student to go get it, because I can't be out of this hallway. I have to be in the hallway or I have to be in this room. And, I don't have time to get down there and back.

This inhibitor was reported only by secondary teachers, as no department offices were present in the elementary school. The absence of department offices in the elementary school appeared to heighten elementary teachers' use of their own classrooms for interacting and resource sharing with colleagues.

A third resource that teachers lacked proximity to was computer technology. All teachers in the participating school district had computers in their classrooms. These computers were networked throughout the district and connected to the Internet. However, other classes were frequently scheduled in teachers' classrooms during their nonteaching periods. As a result, they had to vacate the classrooms and lost access to their computers during these times. Computers were available for teachers in some department offices, and teachers competed with each other for them during their nonteaching periods. In general, teachers reported that a lack of access to computers inhibited their ability to communicate with others via electronic mail, develop their technology skills, and conduct research on the Internet.

A lack of proximity to libraries was the fourth inhibitor to informal learning. Teachers reported that they frequently wanted to access information in libraries to further develop their content knowledge as well as their knowledge of learning and instruction; however, the ability to do so was dependent on a teacher's proximity to school and community libraries. As a junior high teacher gleefully reported, "I'm lucky I'm near the library. I'm always running to the library for something." The majority of the participants indicated that they were not as fortunate.

Lack of meaningful rewards for learning. A lack of meaningful rewards also inhibited teachers from engaging in informal learning. Experienced teachers were frequently asked to participate in nonteaching school activities such as sponsoring student clubs, reviewing curriculum, mentoring teachers, leading teams and departments, and supervising student teachers. Participating teachers indicated that these types of nonteaching activities provided rich opportunities for gathering new ideas about teaching and learning, reflecting on their practice, and sharing their expertise

with others. However, these teachers also reported that they received few, if any, extrinsic rewards for participating in these activities.

Specifically, teachers reported that they received few monetary rewards for participating in nonteaching activities. For example, a senior high teacher reported that she had served as the chair of her department for 10 years and had never received any compensation for that service. In some cases, monetary rewards for nonteaching activities were so minimal that they insulted teachers. An example was the $70 stipend that the school district paid to a teacher for leading a team of teachers for an entire school year. An elementary teacher reported that the paperwork she had to complete to receive this stipend was so burdensome that it was not worth the bother.

In addition to a lack of monetary rewards, teachers seldom received recognition for their participation in nonteaching activities. A perception shared by teacher-participants was that administration rarely acknowledged the time and effort that teachers spent on nonteaching activities, as well as the value of those activities to their schools and community. Disappointed with the lack of recognition from administration, the majority of the teachers reported that they predominantly relied on each other for informal words of encouragement and praise.

Unfortunately, with the intensification of their jobs and the resulting demands on their time, along with a lack of meaningful extrinsic rewards for nonteaching activities, experienced teachers reported that they were discontinuing their involvement in those activities that they considered to be ancillary to their main teaching responsibilities. As an elementary teacher reported, teachers

> . . . are beginning to sort of say, "Wait a minute. You're taking me out of my classroom. You're not doing very much to reimburse me. I'm having to sit down and write sub plans. I'm not working with my kids. It's not worth the trade off."

Limited decision-making power in school management. In contrast to time, proximity, and rewards, limited decision-making power in school management was a more subtle inhibitor to informal learning. The decision-making power of teachers in the school varied depending on the nature of the decisions being made. Teachers had extremely high levels of autonomy over what occurred in their classrooms, as evidenced by a secondary teacher's account that "administrators don't dare tell [her] how to run her classroom." In contrast, teachers were found to have very little input in decisions concerning the management of their schools. These decisions were made by administrators with little involvement of teachers.

Three examples of such situations were the junior high teacher study groups, the school district's classroom observation policy, and the school district's early release policy. Yearlong teacher study groups in the junior high school were formed the year this study was conducted. Each study group was assigned a topic, with some focusing on teaching and learning and others on school management and operations. All participants in the school management and operations groups

reported that administration had rejected their groups' interim findings and ideas and told them that "you can only make suggestions that an individual teacher could do within her classroom." These teachers felt disillusioned, unappreciated, and stripped of power. As a consequence, they did not pursue any other meaningful work in their groups for the remainder of the year. In fact, the junior high teachers reported that in the following year, all study groups would probably focus on teaching or learning, because those were the areas where they were more likely to effect change.

A second example involved the school district's classroom observation policy. Teachers reported that they often wanted to informally cover each other's classes so that they or their colleagues could observe the classroom techniques of fellow teachers. However, to observe colleagues' classrooms, teachers were required to request substitute teachers to oversee their classes. Not only did this policy inhibit teachers from conducting professional development observations, it also placed an unnecessary financial burden on the school district. According to the majority of participants, the net effect of this policy was that "we have a gold mine in the next room that we're not taking advantage of." Several teachers reported that teachers had repeatedly tried, without success, to change this policy.

Third, teachers lacked input when deciding how to make use of early release time. In the year before this study was conducted, the school district had received approval from the community to release school 1½ hours early on Thursdays. The intent of early release was to provide teachers with additional nonteaching time for professional development and school management tasks. Teachers reported that the district required teachers to attend mandatory district-sponsored training programs on these Thursday afternoons. The majority of the participants did not believe that these programs addressed their learning needs. What they did believe was that mandatory attendance at the programs was a way of legitimizing early release time to the community. This lack of control over how to spend nonteaching time was strongly resented by participants.

These three examples illustrate that teachers' influence was limited to the classroom. Because of this limitation, teachers indicated that they were inclined to focus future learning experiences on topics related to classroom learning and instruction. This connection between limited decision-making power and the narrowing of one's focus in learning is a crucial, but subtle, way of inhibiting informal learning.

DISCUSSION

This study had two limitations. First, the primary method of data collection was self-report. To minimize the potential biases that might result from self-reports, the findings were based on major themes represented by the majority of the participating teachers. Second, the teachers in this study were voluntary participants. As a consequence, it is possible that they had a greater commitment to professional development than the general teacher population. Despite these limitations, the

findings of this study have important implications for theory, practice, and research in informal learning.

Theoretical perspectives on promoting informal learning. The Power-Load-Margin model of McClusky (1984) provides a useful lens through which to consider the struggles that teachers in the current study faced in their attempts to engage in informal learning. In this model, margin in life is represented by the ratio of a person's load (the demands made on an individual by self or society) to power (the resources that a person can command in coping with his or her load). The power that people have available over and beyond what is required to handle their load represents their margin in life. The concept of margin is significant to informal learning in that people require ample margins to engage in growth-enhancing learning experiences (Main, 1979). In the present study, teachers' loads were increasing. They were responsible for teaching more students, accommodating greater numbers of students with special needs, and participating in more school management activities than ever before. Yet, the power that teachers had for coping with their loads was decreasing. For example, teachers indicated that more and more of their planning time was being consumed with student help sessions and school management responsibilities. Thus, teachers' loads were increasing whereas their power was doing just the opposite, the net result of which was a decrease in their margin in life. This model vividly demonstrates the ways in which environmental inhibitors can impede informal learning.

Further insight regarding the nature of the inhibitors to informal learning that were found in this study can be gained by examining them in relation to Cross's (1981) conceptualization of barriers to participation in adult learning experiences. Cross classifies barriers to participation as dispositional, situational, and/or institutional. Dispositional barriers represent personal attitudes and beliefs about learning and education that inhibit participation in learning experiences, whereas situational barriers represent external influences beyond a person's control that inhibit participation. In contrast, institutional barriers represent those practices and procedures that inhibit working adults from participating in educational activities. It is compelling to note that the four inhibitors found in the current study (lack of time, proximity to learning resources, meaningful rewards, and decision-making power) are classified as either situational or institutional, but by no means are dispositional. These teachers perceived that the major forces inhibiting them from informal learning resided in the environment, not within themselves.

This perception is consistent with the work of renowned performance analysis theorist, Thomas Gilbert. Gilbert (1996) developed a behavioral engineering model (BEM) to facilitate the diagnosis and resolution of human performance problems in organizational settings. According to the BEM, the three most critical causes of performance problems in rank order are a lack of information, a lack of resources, and a lack of motivation. These three types of performance problems can reside in either the work environment or the individual. In the work environment,

performance problems occur when workers lack knowledge of performance expectations and the adequacy of their performance (information), the tools and materials needed to perform job tasks (resources), and incentives and rewards that are contingent upon performance (motivation). In regard to individuals, performance problems occur when workers lack the technical knowledge and skills required to perform job tasks (information), the physical and mental capabilities required for performance (resources), and the disposition to work (motivation). Gilbert's work has shown that at least 80% of all performance problems are caused by deficits in the work environment. Thus, improved job performance is most likely when environmental causes of poor performance are addressed according to their rank order.

The BEM was created for analyzing and improving work performance. However, it also appears to be highly related to the findings of this study. Of the four environmental inhibitors found in this study, two (lack of time for learning and lack of proximity to learning resources) would be classified in the BEM as resource deficits, and two (lack of rewards for learning and limited decision-making power) would be classified as motivation deficits. According to the BEM, increased engagement in informal learning can be realized by first remedying resource deficits and then remedying motivation deficits. The application of the BEM to the findings of this study results in the development of a plan for reducing environmental constraints to, and thereby promoting the development of, informal learning in the workplace.

Facilitating informal learning. As shown in Figure 2, a force-field analysis diagram has been constructed to depict the relationship between the environmental inhibitors that were found in this study and the activities (knowledge exchanging, experimenting, and environmental scanning) that teachers typically use to learn informally (Lohman & Woolf, 1998).

A principle of force-field analysis is that improvement can be most readily achieved by decreasing the strength of resisting forces (Pfeiffer, 1991). To facilitate informal learning, therefore, the following five recommendations address strategies for decreasing the strength of the inhibitors to informal learning that were found in this study.

First, classrooms need to be strategically assigned so that teachers, especially those in their early stages of development, are located near peers in the same subject area or grade level. The findings of the current study confirm past research (e.g., Zahorik, 1987) regarding the importance of interactions among teachers in the same grade levels or subject areas in relation to professional growth and development. Although school systems in other industrialized countries strategically place novice teachers next to more experienced teachers in the same grade levels or subject areas to maximize teacher interaction and sharing, classroom assignments in the vast majority of U.S. schools are based on seniority (U.S. Department of Education, 1997). As a consequence, novice teachers are frequently assigned to those classrooms that are furthest from their colleagues. American school systems need

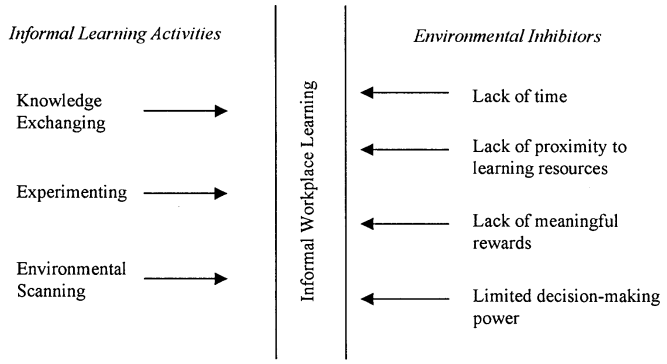

Figure 2. Environmental Inhibitors to Informal Learning in the Workplace

to reassess the value of conventional practice that bases classroom assignments on factors such as seniority; instead, classrooms should be strategically assigned, regardless of seniority, so that teachers in the same subject areas or grade levels are located near each other.

Second, a greater amount of unencumbered time must be built into a teacher's workday. Teachers in the current study reported that a lack of uncommitted time limited their participation in informal learning activities. This finding has been corroborated in previous studies. For example, a survey conducted by the National Education Association (1987) found that secondary teachers in the United States have only 13 minutes of preparation time for each hour of instructional time. Elementary teachers have even less nonteaching time than secondary teachers. This is not the case in other countries, however. Darling-Hammond (1996) reports that European and Asian teachers have much more nonteaching time for learning-related activities than do American teachers. In China, for instance, beginning teachers have reduced teaching loads, which provides them time to observe others' classrooms and develop lessons.

However, simply increasing nonteaching time may not be sufficient to foster informal learning among teachers. Control over free time is also a critical element in informal learning. Administratively mandated use of nonteaching time for observation, mentoring, or other collegial activities may be a Faustian bargain in which "for the worldly riches of 'extra time' . . . [teachers] trade something of their professional souls—control and discretion over how such time is to be organized and used" (Hargreaves, 1992, p. 103). As a result, increased amounts of unencumbered

time, with discretion over how that time is used, would provide teachers with greater opportunities for informal learning.

Therefore, a related recommendation is to schedule common student-free times for teachers in the same grade levels or subject areas. Traditionally, the need for shared planning time has not been taken into account when developing school and teacher schedules (Little, 1990). In a few notable instances, schedules in the participating schools had been designed so that certain teachers shared common planning periods. Teachers reported that such schedules increased the frequency and quality of their interactions and collaborations with colleagues. This finding is consistent with what Hargreaves (1991) refers to as "collaborative collegiality." This form of collegiality evolves spontaneously, unpredictably, and on a voluntary basis and is oriented to developmental purposes that teachers are themselves committed to. It is in contrast to the more common form of collegiality that Hargreaves calls "contrived collegiality," in which fixed times and places for collegial interaction are mandated by administrators, and for purposes that teachers may or may not be committed to. Hargreaves notes that it is only the collaborative form of collegiality that leads to desired outcomes like teacher empowerment, critical reflection, and commitment to continuous improvement.

A fourth recommendation for facilitating informal learning is to increase teachers' access to communication technology. In the current study, teachers reported that their lack of access to computer technology and telephones inhibited them from gathering information in a timely manner. Additional computers in teacher work areas to provide teachers with access to electronic mail and the Internet, along with the creation of listserves for teachers of different subjects and grade levels, would help teachers communicate with others and gather information when the need to do so arises (Tobin, 1998). Furthermore, readily accessible and available telephones would help teachers communicate with individuals outside the school building, such as parents and educational specialists, in an efficient and timely manner.

A last recommendation for facilitating informal learning concerns the rethinking of reward and performance-evaluation systems. As more and more schools transition to site-based management, their operations become increasingly dependent on teacher involvement in nonteaching school activities. Even though many of these activities broaden teachers' professional expertise in areas such as supervision and leadership and provide opportunities for teachers to informally share professional experiences and knowledge with colleagues, teachers feel that the additional responsibilities are deleterious to their classroom teaching effectiveness. In the current study, experienced teachers reported that with the intensification of their jobs, the increasing demands being placed on their time, and the lack of meaningful rewards, they were discontinuing their involvement in activities that they considered ancillary to their main teaching duties. For these reasons, reward systems must be revised so that meaningful consequences are associated with participation in nonteaching activities. Examples of possible rewards include reasonable

stipends and recognition awards for school and district service. In addition, a component of teachers' formal performance evaluation should address participation in nonteaching activities. Such changes in the reward and evaluation systems would provide teachers with additional incentives to engage in a broader range of school activities.

Future research of informal learning. The degree to which the findings of this study apply to other professions and organizational contexts needs to be examined. Therefore, an appropriate next step would be to replicate this study with other professionals who are also experiencing escalating levels of job intensification. Furthermore, future research should explore the efficacy of performance analysis theories to explain and predict an individual's ability and desire to initiate, persist, and complete informal learning activities.

In summary, to promote informal learning, adult educators must be cognizant of the types of informal learning activities in which people engage as well as the ways in which workplaces influence participation in these activities. In the present study, four environmental inhibitors to informal learning were discovered. These inhibitors were a lack of time for learning, a lack of proximity to learning resources, a lack of rewards for learning, and limited decision-making power.

To minimize the influence of these inhibitors, the following four strategies are proposed. First, increase the unencumbered time of learners to provide greater freedom to participate in informal learning activities. Second, reduce the physical distance between learning resources and learners to increase the frequency and efficiency with which resources are accessed. A third, related strategy is to expand access to communication technology as a means of improving the efficiency of information-gathering activities, especially when close physical proximity to resources is not feasible. And fourth, revise reward and performance evaluation systems to provide meaningful incentives for engaging in informal learning and professional growth-enhancing activities.

Planned efforts such as these would help create organizational environments that foster informal learning. A comment that has been attributed to Benjamin Disraeli, a 19th-century prime minister of England, is that man is not the creature of circumstances. Circumstances are the creatures of men. Organizational environments, like circumstances, are created by people and, as such, can be redesigned to minimize if not eliminate inhibitors to informal learning.

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