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When Learning and Performance are at Odds: Confronting the Tension

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Abstract

This chapter explores complexities of the relationship between learning and performance. We start with the general proposition that learning promotes performance, and then describe several challenges for researchers and managers who wish to study or promote learning in support of performance improvement. We also review psychological and interpersonal risks of learning behavior, suggest conditions under which exploratory learning and experimentation is most critical, and describe conditions and leader behaviors conducive to supporting this kind of learning in organizations. We illustrate our ideas with examples from field studies across numerous industry contexts, and conclude with a discussion of implications of this complex relationship for performance management.

When Learning and Performance are at Odds: Confronting the Tension

By suggesting that those who develop and exercise a greater capacity to learn are likely to outperform those less engaged in learning, we expect few readers to disagree. Indeed, we might make the same unsurprising prediction about individuals, teams, or organizations. The positive relationship between learning and performance is both intuitive and relatively well documented. Research at individual, group, and organizational levels of analysis has provided both suggestive and reasonably conclusive evidence that learning promotes performance, as described below. Nonetheless, the aim of this chapter is to explore some of the problematic aspects of the relationship between learning and performance, a relationship that we suggest is not as straightforward as it first appears.

Why is this relationship problematic? First, although learning is clearly essential for sustained individual and organizational performance in a changing environment, at times the costs of learning may be more visible in organizations than its performance benefits. Learning can be messy, uncertain, interpersonally risky, and without guaranteed results. Moreover, not all learning leads to improved performance; it will depend on what is being learned and how important it is for particular dimensions of performance. Although some learning is straightforward (the knowledge is codified and readily used by newcomers), other forms of learning in organizations rely on experimentation and exploration for which outcomes are unknown in advance (Tucker, Nembhard, & Edmondson, 2006). Lastly, time delays between learning and performance may obscure or even undermine evidence of a clear causal relationship (Senge, 1990; Sterman, 1989).

In the sections that follow, we start by clarifying terms to build a foundation for our arguments. Next, we examine evidence for a positive relationship between learning and performance in organizations. We then explore challenges managers and scholars can face when seeking to enhance or study this relationship. Finally, we propose conditions under which learning – especially in the form of exploration and experimentation – is most beneficial for organizations, and we describe circumstances conducive to learning behavior.

Learning and Performance in Teams and Organizations

We start with some definitions. *Performance* is conceptualized in this chapter as the achievement of goals. Performance usually includes multiple dimensions, some more important to stakeholders than others. For example, performance in hospitals typically includes achievement of clinical as well as financial goals. In addition, academic medical centers typically seek to achieve research and teaching aims. Group goals are often aligned, such that their mutual achievement is possible. However, some performance goals are not necessarily aligned, such as when an organization seeks to excel in innovation while also achieving superb quality and efficiency in an existing business (March, 1991). Where goals conflict, organizations inevitably need to make tradeoffs among competing objectives. In these situations, one aspect of learning is learning which performance variables to maximize. This requires learning how to manage the tensions that may exist between efficiency and cost versus clinical and customer experience.

Learning, whether for individuals or groups, is an active process of gaining information, understanding, or capabilities (Edmondson, 2002; Garvin, 2000; Senge, 1990). *Collective learning* refers specifically to learning by groups or organizations, in

which people must work together to organize the learning process – including such activities as collecting, sharing, or analyzing information, obtaining and reflecting on feedback from customers or others, and active experimentation. Most work in organizations and teams requires coordinated action among multiple individuals. The knowledge required to conduct work successfully takes many forms and resides in many locations. To be successful, groups must access this knowledge, develop a shared understanding of how best to apply it, and act in a coordinated manner that is reflective of new knowledge and insights. In short, work in groups frequently requires collective learning.

Learning behaviors enable groups to obtain and process data that allow it to adapt and to improve. Individual learning behaviors include asking questions, sharing information, seeking help, experimenting with unproven actions, and seeking feedback. Through these activities, groups can detect changes in the environment, learn about customers' requirements, improve members' collective understanding of a situation, or discover unexpected consequences of their previous actions. Team learning behaviors include collaborating, making changes, expecting to encounter problems that will require changes, and reflection-in-action (Edmondson, 1999). At the same time, these learning behaviors require willingness to take interpersonal risks such as discussing mistakes, which in teams and organizations requires that leaders work to create an environment conducive to learning (Edmondson, 2003b; Edmondson, 1999; Edmondson, Bohmer, & Pisano, 2001).

The ability to learn is increasingly recognized as a necessity of organizations operating in fast-changing environments (Banker, Field, Schroeder, & Sinha, 1996;

Osterman, 1994; Safizadeh, 1991). Learning in teams is also recognized as having the potential to enhance continuous improvement of quality, innovation, customer satisfaction (Boyett & Conn, 1991; Cutcher-Gershenfeld, Nitta, Barrett, Belhedi, & al, 1994; Gupta & D, 1994; Hitchcock, 1993; Katzenbach & Smith, 2005; Tjosvold, 1991), improve employee satisfaction (Cohen & Ledford, 1994; Cordery, Mueller, & Smith, 1991), and reduce operating costs and improve response to technological change (Wellins, Byham, & Wilson, 1991).

Learning Leads to Performance Improvement

We start with the general premise that learning positively promotes performance. Supportive evidence of this relationship derives from various settings. Research has demonstrated performance benefits of individual learning behaviors, including for feedback seeking by individual managers (Ashford & Tsui, 1991), for teams seeking information and feedback from outside the team (Ancona & Caldwell, 1992), for research and development teams that experiment frequently (Henderson & Clark, 1990), and for discussing errors productively (Michael, 1976; Schein, 1993; Sitkin, 1992). These learning behaviors collectively were associated with perceived team performance in a study of 51 work teams in a furniture manufacturing company (Edmondson, 1999). In addition, among senior leaders in selected U.S. hospitals, a systems orientation, focused on improving system performance rather than blaming individuals, was associated with stronger perceived organizational safety culture (Singer & Tucker, 2005).

A study of surgical teams at 16 medical centers found a positive relationship between a team's ability to adapt to new ways of working and success in implementing a new technology, one type of performance (Edmondson, 2003b; Edmondson et al., 2001).

The study demonstrated that effective learning processes can overcome structural barriers to implementation of technologies that disrupt organizational routines, requiring both technical learning and new ways of communication and coordinating. Similar learning behaviors within teams and across teams were associated with team member assessment of team performance in an Australian hospital (Chan, Pearson, & Entrekin, 2003). The positive effect of team learning on team performance has also been reported by a number of prominent researchers (Cavaluzzo, 1996; Flood, MacCurtain, & West, 2001; Katzenbach et al., 2005; Meyer, 1994; Roberts, 1997; Senge, 1992; Wheelan & Burchill, 1999). Team learning behaviors were also significantly related to organizational learning (Chan, Lim, & Keasbury, 2003).

Product design firm IDEO exemplifies a learning organization (Edmondson & Feldman, 2004a). The company's success in routinely coming up with great ideas is due in large part to IDEO's capacity to learn about, empathize with, and design products and services to meet the needs of end-users. Senior management's enabling attitude combined with personalized and flexible workspaces filled with idea-generating materials and technologies prompts highly technically skilled employees to think outside the box. IDEO's inclusive, collaborative culture fosters intensive, hands-on, collaborative work among non-conventional designers. Employees act on their ideas with little concern about what others might say. Company slogans include "Fail often in order to succeed sooner," and "Enlightened trial-and-error succeeds over the planning of the lone genius" (Kelley & Littman, 2001). Significant time is devoted to sharing stories, gadgets, and ideas. Regularly scheduled sessions provided opportunities for cross-fertilization and informal knowledge transfer across disciplines and promoted energy within the studio.

IDEO's product development methodology involves brainstorming at every stage, which encourages new ideas and rapid prototypes. Good humor meets the inevitable failures associated with frequent small experiments. These organizational learning characteristics have enabled IDEO not only to win product design awards repeatedly but also to add new services to its repertoire successfully.

Performance Can Appear to Suffer Following a Collective Learning Initiative

The positive association between learning and performance found in the studies described above does not represent the complete learning-performance story. Here, we focus on a more subtle aspect of this relationship. In some settings, learning activities result in either perceived or actual reductions in performance. That is, performance appears to suffer when collective learning goes up (See Figure 1). At least two mechanisms can cause this phenomenon: the first we call the "visibility problem" and the second is the "worse-before-better problem."

Insert Figure 1 about here.

The Visibility Problem

Making errors visible by reporting and tracking them is common in many settings, particularly in high risk settings where mistakes and exceptions frequently occur. However, humans tend to underreport errors, particularly where tracking them is difficult or labor intensive. For example, one hospital in Salt Lake City increased the number of identified adverse drug events (injuries caused by drug-related medical treatment) forty-fold after instituting an information technology system to predict and track errors (Evans et al., 1992). The magnitude of this increase suggests that relatively few errors made in hospitals are reported.

The visibility problem refers to the phenomenon that occurs when some organizational groups report more errors than others and learn more as collectives, but appear to be performing worse than groups that report fewer errors because performance is assessed in terms of error frequency. That is, the errors are more visible than the benefits of learning from them.

As field research in the hospital setting has noted, documented error rates are a function of at least two influences: actual errors made and group members' willingness to report errors (Edmondson, 1996). Where errors are consequential, willingness to report may be the more important factor. Indeed, a study of hospital nursing units found – to the author's initial surprise – that higher documented error rates were correlated with *higher* perceived unit performance, quality of unit relationships, and nurse manager leadership (Edmondson, 1996). Recognizing that *documented* error rates may not reflect *actual* error rates, the research found the primary influence on detected error rates was unit members' perception of the risk of discussing mistakes openly. Interceptions of errors were also more prevalent in units in which members were less concerned about being caught making a mistake. The paper concluded that leadership behavior influenced the way errors are handled, which in turn led to shared perceptions of how consequential it is to make a mistake. These perceptions influenced willingness to report mistakes and contributed to a climate of fear or of openness that further influenced the ability of nursing units to identify and discuss problems. Thus, detection of error varied such that teams that needed improvement most were least likely to surface errors, and teams that learned most appeared to perform relatively poorly in terms of error rates.

In one survey of personnel from 15 California hospitals, an average of 38% of respondents felt embarrassed by their mistakes, 30% reported that it was not hard for doctors and nurses to hide mistakes; 10% felt that individuals in their department were not willing to report behavior that was unsafe for patient care; and 11% felt that reporting a patient safety problem would result in negative repercussions for the person reporting it (Singer et al., 2003). There was substantial variation among hospitals in answer to these questions. These findings further suggest that an organization members' willingness and ability to catch and report errors may help to explain correlations between documented error rates and other measures of performance.

The Worse-before-better Problem

Learning new things inevitably results in making a few mistakes along the way. To be worth the effort, individuals must believe that the potential for gain is worth the cost. For example, if someone who hunts and pecks with two fingers on a keyboard makes an effort to learn to type, the speed and quality of his output is likely to get worse before it gets better. Nevertheless, in the long run, learning to touch type can improve performance substantially. Similarly, when trying to generate novel solutions to problems and new ideas for products, services, and innovations, groups must experiment to find out what works and what does not, so as to learn how to do things better. Experimentation, by its nature, will inevitably result in failures (Lee, Edmondson, Thomke, & Worline, 2004). According to traditional measures, an increase in these small failures would be interpreted as a decline in performance. Yet, without these failures, learning cannot occur.

Despite the increased rate of failure that accompanies deliberate experimentation, organizations that experiment effectively are likely to be more innovative, productive, and successful than those that do not take such risks (Thomke, 2003). Similarly, research and development teams that experimented frequently performed better than other teams (Maidique & Zirger, 1984). In addition, successful implementation of a new cardiovascular surgery technology required acknowledging the challenge and addressing the worse-before-better problem through preparatory practice sessions and early trials upon which team members shared their reflections and discussed opportunities for improvement (Edmondson et al., 2001).

Small failures arise not only in the course of purposeful experimentation, but also when daily work is complex and interdependent. When problems inevitably arise during the course of business in these situations, workers can either compensate for problems, or they can seek to resolve the underlying cause by notifying those who can help to correct the problem. The former would likely go unnoticed, while the latter would expose poor performance. Nevertheless, compensating for problems can be counterproductive if doing so isolates information about problems such that no learning occurs. For example, in seeking to resolve problems themselves, hospital nurses wasted an average of 8% of their time coping with small process failures at significant financial cost associated with lost nursing time (Tucker & Edmondson, 2003)..

In hazardous situations, small failures not identified as problems worth examination often precede catastrophic failures. Small failures are often the key early warning sign that could provide a wake up call needed to avert disaster down the road.

Yet, in recognizing small failures in order to learn from them, individuals and groups must acknowledge the performance gaps.

Learning from Failure is Difficult

Where catastrophic failure is possible, mistakes are inevitable, or innovation is necessary, learning from failure is highly desirable. Yet such learning is hard to do. Research suggests, for example, that hospitals typically fail to analyze or make changes even when people are well aware of failures (Tucker et al., 2003). Few hospitals dig deeply enough to understand and capture the potential learning from failures.

Psychological and Organizational Barriers

A multitude of barriers can preclude learning in teams and organizations (Cannon & Edmondson, 2005). These include limitations in human skills or cognition that lead people to draw false conclusions, and complex and cross-disciplinary work design that can make failures difficult to identify. Additional barriers include lack of policies and procedures to encourage and fund experimentation or forums for employees to analyze and discuss the results.

Learning about complex, interconnected problems also suffers from ineffective discussion among parties with conflicting perspectives. Status differences, lack of psychological safety, and lack of inquiry into others' information and experiences related to substantive issues can combine to ensure that a group as a whole learns little. Powerful individuals or respected experts can stifle dissent simply by expressing their opinions (Edmondson, 1996). Social pressures for conformity exacerbate the impact of leaders' actions, particularly when large status and power differences exist among leaders and subordinates (Edmondson, 2003c; Janis, 1982; Roberto, 2002). In addition, people in

disagreement rarely ask each other the kind of sincere questions that are necessary for them to learn from each other (Argyris, 1985). People tend to try to force their views on the other party rather than educating the other party by providing the underlying reasoning behind their perspectives.

The human desire to "get it right" rather than to treat success and failure as equivalently useful data greatly impedes learning. This is true in routine work contexts, but it is particularly problematic when facing novel and unknown situations in which no one can know in advance all that is needed to perform well. Individuals prevent learning when they ignore their own mistakes in order to protect themselves from the unpleasantness and loss of self-confidence and self-esteem associated with acknowledging failure (Taylor & Brown, 1988). People may also deny, distort, or cover up their mistakes in order to avoid the public embarrassment or private derision that frequently accompanies such confessions, despite the potential of learning from them (Cannon, 1993). In addition, people derive greater comfort from evidence that enables them to believe what they want to believe, to deny responsibility for failures, to attribute a problem to others or the system, and to move on to something more pleasant. Similarly, groups and organizations have the tendency to suppress awareness of failures (Weick & Sutcliffe, 2001). Finally, organizational incentives typically reward success and frequently punish failure, creating an incentive to avoid and hide mistakes.

Teams and organizations are also predisposed to under-react to the threat of failure when stakes are high, different views and interests are present, and the situation is ambiguous. Such decision-making groups can fail to learn and hence make poor decisions (Edmondson, Roberto, Bohmer, Ferlins, & Feldman, 2004b). Multiple

mechanisms can combine to inhibit responsiveness and preclude learning in these cases. First, people tend to filter out subtle threats (Goleman, 1985), blocking potentially valuable data from careful consideration. They also remain stubbornly attached to initial views and seek information and experts to confirm initial conclusions (Wohlstetter, 1962). Groups silence dissenting views (Janis, 1982), especially when power differences are present (Edmondson, 2002, 2003c). They spend more time confirming shared views than envisioning alternative possibilities (Stasser, 1999). Organizational structures often serve to block new information from reaching the top of the organization (Lee, 1993). Rather, they tend to reinforce existing wisdom (O'Toole, 1995).

Learning from Small and Large Failures

Most organizations' inability to learn from failure stems from a lack of attention to small, everyday problems and mistakes. We hypothesize that organizations that embrace small failures as part of a learning process are more likely to innovate successfully. Likewise, organizations that pay more attention to small problems are more likely to avert big ones, especially where tasks are interconnected.

Collective learning requires valuing failure and being willing to incur small failures in front of colleagues. It requires being willing to enhance rather than reduce variance. Learning groups must proactively identify, discuss, and analyze what may appear to be insignificant mistakes or problems in addition to large failures (Cannon & Edmondson, 2005). When organizations ignore small problems, preventing larger failures becomes more difficult (Tucker et al., 2003). (See Figure 2.)

Insert Figure 2 about here.

The Learning Mindset across Different Levels of Analysis

Given the above challenges, this section describes some of the theoretical alternatives for promoting organizational learning that enhances future performance. We tie together different but related ideas from research on organizational learning at several levels of analysis (See Figure 3). Specifically, advocacy and inquiry describe contrasting communication behaviors that originate in human cognition (Argyris & Schon, 1978), and advocacy and inquiry orientations have been used to describe distinct approaches to group decision making (Garvin & Roberto, 2001). Exploratory and confirmatory responses have recently been used to describe distinct ways that leaders can orient individuals and groups to respond to potential failures or problems (Edmondson et al., 2004b). Similarly, learning and coping have been used to compare the ways in which leaders can orient team members to a new challenge or innovation (Edmondson, 2003d). Like inquiry and advocacy, exploration and exploitation describe distinct behavioral characteristics of firms (March, 1991), and leaders can organize to learn or organize to execute respectively to promote these organizational orientations. We compare each set of terms below.

Insert Figure 3 about here.

Advocacy and Inquiry Orientations

As discussed above, group structures and processes can severely inhibit the ability of a group to incorporate effectively the unique knowledge and concerns of different members. Key features of group process failures include antagonism; a lack of listening, learning and inquiring; and limited psychological safety for challenging authority. These kinds of individual and interpersonal behaviors have been collectively referred to as an *advocacy orientation* (Argyris et al., 1978). For example, simple but genuine inquiry into

the thinking of other team members could have generated critical new insights about the threat posed by the foam strike to the Columbia space shuttle (CAIB, 2003). Instead, NASA managers spent 17 days downplaying the possibility that foam strikes on the shuttle represented a serious problem and so did not view the events as a trigger for conducting detailed analyses of the situation (Edmondson et al., 2004b).

A recent analysis concluded that NASA's response to the foam strike threat was characterized by active discounting of risk, fragmented, discipline-based analyses, and a wait and see orientation to action. When engineers became concerned about the foam strike, the impact of their questions and analyses was dampened by poor team design, coordination and support. In contrast to the flat and flexible organizational structures that enable research and development (Hayes, Wheelwright, & Clark, 1988), NASA exhibited a rigid hierarchy with strict rules and guidelines for behavior, structures conducive to aims of routine production and efficiency (Sitkin, Sutcliffe, & Schroeder, 1994). The cultural reliance on data-driven problem solving and quantitative analysis discouraged novel lines of inquiry based on intuitive judgments and interpretations of incomplete, yet troubling information. In short, the shuttle team faced a significant learning opportunity but was not able to take advantage of it due to counterproductive organizational and group dynamics.

In contrast, effectively conducting an analysis of a failure requires a spirit of inquiry and openness, patience, and a tolerance for ambiguity. Such an *inquiry orientation* is characterized by the perception among group members that multiple alternatives exist, frequent dissent, deepening understanding of issues and development of new possibilities, filling gaps in knowledge through combining information sources,

and awareness of each others' reasoning and its implications (Argyris et al., 1978). Such an orientation can counteract common group process failures. Learning about the perspectives, ideas, experiences, and concerns of others when facing uncertainty and high stakes decisions, is critical to making appropriate choices.

Confirmatory and Exploratory Responses

Leaders play an important role in determining group orientation to an observed or suspected failure. When small problems occur, leaders can respond in one of two basic ways (Edmondson et al., 2004b). A *confirmatory response* by leaders to small problems – appropriate in routine production settings, but harmful in more volatile or uncertain environments – reinforces accepted assumptions, naturally promoting an advocacy orientation on the part of themselves and others. When individuals seek information, they naturally look for data that confirms existing beliefs. Confirmatory leaders act in ways consistent with established frames and beliefs, passive and reactionary rather than active and forward-looking.

In uncertain or risky situations or where innovation is required, an *exploratory response* may be more appropriate than seeking to confirm existing views. An exploratory response involves challenging and testing existing assumptions and experimenting with new behaviors and possibilities, the goal of which is to learn and to learn quickly. By deliberately exaggerating ambiguous threats, actively directing and coordinating team analysis and problem solving, and encouraging an overall orientation toward action, exploratory leaders encourage inquiry and experimentation. Leaders seeking to encourage exploration also actively foster constructive conflict and dissent and generate psychological safety by creating an environment in which people have an

incentive, or at least do not have a disincentive, to identify and reveal failures, questions, and concerns. This form of leader response helps to accelerate learning through deliberate information gathering, creative mental simulations, and simple, rapid experimentation.

Rather than supporting existing assumptions, an exploratory response requires a deliberate shift in the mindset of a leader – and of others – altering the way they interpret, make sense of, and diagnose situations. When leaders follow an exploratory approach, they embrace ambiguity and acknowledge openly gaps in knowledge. They recognize that their current understanding may require revision, and they actively seek evidence in support of alternative hypotheses. Rather than seeking to prove what they already believe, exploratory leaders seek discovery through creative and iterative experimentation (Garvin, 2000).

Several years ago, at Children's Hospital and Clinics in Minnesota, the new chief operating officer, Julie Morath, exhibited an exploratory response that promoted an inquiry orientation among group members (Edmondson, Roberto, & Tucker, 2005). Upon taking up her new position, she first strengthened her personal technical knowledge of how to probe deeply into the causes of failure in hospitals through a variety of educational opportunities and experiences. She learned from prominent experts that rather than being the fault of a single individual, medical errors tend to be embedded in complex interdependent systems and have multiple roots. In addition, she overcame organizational barriers by making structural changes within the organization to create a context in which failure could be identified, analyzed, and learned from. Notably, Morath instituted a "blameless reporting" system to encourage employees to reveal

medical errors right away and to share additional information that could be used in analyzing causes of the error. This was in part an attempt to shift the culture to one that supported learning. More concretely, she created several specific forums for learning from failure, including focused event studies in response to all identified failures, small and large, and a leadership team called the Patient Safety Steering Committee (PSSC). The PSSC proactively sought to identify failures and opportunities for improvement throughout the organization, and ensured that all failures were analyzed for learning. In addition, cross-functional teams, known as safety action teams, spontaneously formed in certain clinical areas to understand better how failures occurred, to improve proactively medical safety. One clinical group developed something they called a "Good Catch Log" to record information that might be useful in better understanding and reducing medical errors. Other teams in the hospital quickly followed their example, finding the idea compelling and practical.

Learning-oriented and Coping-oriented Approaches

When implementing an innovation, such as a new technology or practice, leaders can orient those who will be responsible for implementation by responding in one of two ways. They may view the innovation challenge as something with which they need to cope or as an exciting learning and improvement opportunity (Edmondson, 2003d). A coping approach is characterized by protective or defensive aims and technically oriented leadership. In contrast, learning-oriented leaders share with team members a sense of purpose related to accomplishing compelling goals and view project success as dependent on all team members.

In the study of 16 cardiac surgery departments, mentioned above, implementing a minimally invasive cardiovascular surgery technique, successful surgical team leaders demonstrated a learning-oriented approach rather than a coping approach (Edmondson, 2003d). Learning-oriented leaders explicitly communicated their interdependence with others, emphasizing their own fallibility and need for others' input for the new technology to work. Without conveying any loss of expertise or status, these leaders simply recognized and communicated that in doing the new procedure they were dependent on others. In learning-oriented teams, members felt a profound sense of ownership of the project's goals and processes, and they believed their roles to be crucial. Elsewhere, the surgeon's position as expert precluded others from seeing a way to make genuine contributions beyond enacting their own narrow tasks, and it put them in a position of not seeing themselves as affecting whether the project succeeded or not. Learning-oriented teams had a palpable sense of teamwork and collegiality, aided by early practice sessions.

In addition, team members felt completely comfortable speaking about their observations and concerns in the operating room, and they also were included in meaningful reflection sessions to discuss how the technology implementation was going. In teams that framed the innovation as a learning opportunity, leaders enrolled carefully selected team members, conducted pre-trial team preparation, and multiple iterations of trial and reflection. Dramatic differences in the success of learning-oriented versus coping-oriented leaders suggest that project leaders have substantial power to influence how team members see a project, especially its purpose and their own role in achieving that purpose.

Organizational Exploitation and Exploration

Inquiry and advocacy orientations describe individuals and groups; exploration and exploitation are terms that have been used to describe parallel characteristics of organizations (March, 1991). In mature markets, where solutions for getting a job done exist and are well understood, organizations tend to be designed and oriented toward a focus on execution of tasks and *exploitation* of current products or services. In more uncertain environments, knowledge about how to achieve performance is limited, requiring collective learning – or *exploration* in which open-ended experimentation is an integral part. In sum, exploration in search of new or better processes or products, is conceptually and managerially distinct from execution, which is characterized by planning and structured implementation and amenable to formal tools such as statistical control (Sitkin et al., 1994).

Organizing to Learn and Organizing to Execute

In the same way that leader response drives group member orientation, the mindset of organizational leaders as well as the structures and systems they initiate play a large role in determining firm behavior and capabilities. *Organizing to learn* and *organizing to execute* are two distinct management practices, one suited to exploration and the other to exploitation respectively (Argyris et al., 1978).

Where problems and processes are well understood and where solutions are known, leaders are advised to *organize to execute*. Organizing to execute relies on traditional management tools that motivate people and resources to carry out well-defined tasks. When reflecting on the work, leaders who organize to execute are well advised to ask, "did we do it right?" In general, this approach is systematic, involves first-order

learning in which feedback is used to modify or redirect activities, and eschews diversion from prescribed processes without good cause.

In contrast, facing a situation in which process solutions are not yet well developed, leaders must *organize to learn*: generating variance, learning from failure, sharing results, and experimenting continuously until workable processes are discovered, developed, and refined. Motivating organizational exploration requires a different mindset than motivating accurate and efficient execution. Leaders must ask – not "did we succeed" but rather – "did we learn?" In this way, organizing to learn considers the lessons of failure to be at least as valuable as the lessons of success. Such a managerial approach organizes people and resources for second-order learning that challenges, reframes, and expands possible alternatives (Edmondson, 2003a). Practices involved in organizing to learn include promoting rather than reducing variance, conducting experiments rather than executing prescribed tasks, and rewarding learning rather than accuracy (Edmondson, 2003a; Sitkin et al., 1994).

Creating systems to expose failures can help organizations create and sustain competitive advantage (Cannon & Edmondson, 2005). For example, General Electric, UPS, and Intuit proactively seek data to help them identify failures. GE places an 800 number directly on each of its products (Tax & Brown, 1998). UPS allocates protected time for each of its drivers to express concerns or make suggestions (Sonnenfeld & Lazo, 1992). Intuit staffs its customer service line with technical designers, who directly translate feedback from customers into product improvements (Heskett, Sasser, & Schlesinger, 1993). At IDEO, brainstorming about problems on a particular project often enables engineers to discover ideas that benefit other design initiatives (Hargadon &

Sutton, 1997). At Toyota, the Andon cord, which permits any employee to halt production, enables continuous improvement through frequent investigation of potential concerns (Mishina, 1992; Spear, 1999).

Learning Comes at a Cost to Current Performance

Learning often comes at a cost to current performance. First, learning involves acquiring new skills, behaviors, or routines, that, by definition, one has not yet mastered. Therefore, learning can lead to performance decrements in the short term. Second, learning from small problems or process failures, requires eschewing quick fixes and workarounds, and instead stopping to take the time to analyze and seek to address root causes of the problem. Therefore, resolving problems to prevent recurrence is likely to take longer than working around the problem, harming efficiency in the short-term.

These short-term costs of learning are particularly problematic when workers face fragmented tasks or heavy workloads that preclude the necessary slack for learning. For these reasons, problem solving techniques recommended in the quality literature were used infrequently by front line caregivers in hospitals (Tucker & Edmondson, 2002). In this in-depth observational study, nurses were often overwhelmed by their workloads and primarily concerned about their ability to continue providing patient care, virtually eliminating the possibility of contributing to system improvement. Lack of processes and resources needed to tackle improvement efforts, including time to engage in second order problem solving, effective mechanisms for communicating across boundaries, and access to a support person who could facilitate investigation and implementation of solution efforts, discouraged learning behavior.

Despite short term costs, learning can enhance future performance. Interruptions caused by small problems increased the likelihood of performing a task incorrectly (Leape et al., 1995; Osborne, Blais, & Hayes, 1999; Reason, 1990). Solving recurring problems, prevents their recurrence and saves time in the long run. In contrast, working around problems has no effect on the frequency of future problems because nothing is done to ensure that similar events do not recur.

Leading Organizational Learning

Although group and organizational leaders may agree about the benefits of learning, they face a variety of challenges in their efforts to manage organizations effectively. These include recognizing and responding to the need for learning versus execution, embracing the small failures from which organizations can learn, and maintaining the ability to shift nimbly between learning and execution as needed.

Diagnose the Situation and Respond Accordingly

Rather than vary their style as appropriate for the situation, in practice leaders tend to employ a consistent approach. Frequently they gravitate toward organizing to execute, particularly when associated practices are consistent with the organization's culture. However, being good at organizing to execute can hamper efforts that require learning. When leaders facing a novel challenge organize to execute rather than employing a learning approach, their organizations miss opportunities to innovate successfully.

For example, a major telecommunications firm studied in late 1999 was organized to manage precise execution of established work processes (Frei, Edmondson, & Hajim, 2001). In trying to expand into DSL, the organization was undertaking a technological

challenge that required fast collective learning. Management practices honed for ensuring superb execution were not well suited for the uncertainty and rapid experimentation needed to discover the new routines that would ensure successful delivery of DSL services. In short, the firm's excellence in execution did not translate easily into a successful launch in the new technologically novel service.

In contrast, Julie Morath at Children's Hospital exemplified a mindset of organizing to learn. Emphasizing that she did not have the answers, she invited people throughout the organization to join in a learning journey, aimed at discovering how to ensure 100% patient safety.

Embrace Failure

Organizing a team to experiment and learn about an unknown process requires a management approach that embraces failure rather than seeking perfect execution. Discovery and expeditious trial and error are the keys to successful learning. In the Electric Maze[1], an interactive learning exercise adopted at Harvard Business School, participants recognize how unnatural collective learning is for most managers (Edmondson & Rodriguez-Farrar, 2004c). Teams of students must get each member from one end of the maze to the other without speaking. Individuals step on the maze until a square beeps, at which point the individual must retrace the steps back to the start.

To optimize the learning process, the team should "embrace failure" (symbolized in the Electric Maze® exercise as "beeps going forward") and systematically collect as many "failures" as quickly as possible. More typically, however, the need to learn with and in front of others is hampered by the perceived interpersonal risk of "failing" in front

[1] Electric Maze ® is the registered trademarked name by Interel, a company that produces interactive learning tools and devices.

of colleagues by stepping on a beeping square. In reality, only by stepping on beeping squares can the team learn quickly and discover the true path forward. The exercise offers a palpable experience to show managers that the desire to look as if one never makes mistakes hinders team and organizational learning.

Maintain Flexibility and Shift as Needed

Some business situations require innovation and execution simultaneously, or in rapid sequence. However, shifting from organizing to learn to organizing to execute can be difficult. Participants in the Electric Maze Exercise face and come to appreciate this challenge as well. To find the correct path through the maze requires organizing to learn. Once the path is discovered, teams are required to have participants walk through the path as quickly as possible without minimal error. In practical terms, this means the teams must shift their behavior from learning to execution. Most teams have a difficult time switching from the discovery task to the execution task.

The Maze exercise illustrates that managing a team for superb execution of a known process calls for a different approach than managing a team to experiment and discover a new process. Discovery through expeditious trial and error is the key to the first part of the exercise. In contrast, careful adherence to specification helps teams achieve error free execution in the second part. Discovering the path requires teams to organize to learn. Getting all team members successfully through the path requires teams to organize to execute. Organizational effectiveness is maximized when learning and executing situations are clearly framed as such, yet shifting between organizing to learn and organizing to execute is difficult, as noted earlier. The ability to recognize situations that require learning and the flexibility to shift from execution to learning requires

awareness as well as skillful management, posing significant challenge to many leaders and competitive advantage to leaders with such ability.

Implications for Performance Measurement

Implications of the complex relationship between learning and performance for performance measurement are worth a brief discussion. In execution contexts, performance is easier to measure. In exploratory learning contexts, performance is more difficult to measure in the short term, even if it contributes to clear performance criteria in the long term. Consider the Electric Maze exercise again. In the second phase, excellent performance is error free, rapid completion of the task – every member traversing the discovered path. In the first phase, success requires encountering and learning from failures, but how many is the right number? How fast should experiments be run? As in this example, the success of experimentation is far more difficult to assess than the success of execution.

Clearly, there are situations in which it is appropriate to measure performance against quality and efficiency standards. This is true when tasks are routine. However, employee rewards based primarily on indices measuring routine performance, such as accuracy and speed, can thwart efforts to innovate. Stated goals of increasing innovation are more effective when rewards promote experimentation rather than penalize failure (Lee et al., 2004). At Bank of America, for example, innovation was an espoused value (Thomke & Nimgade, 2002). Leaders targeted a projected failure rate of 30% as suggestive of sufficient experimentation. However, few employees experimented with new ideas until management changed its reward system from traditional performance

measures to those that rewarded innovation. Truly supporting innovation requires recognition that trying out innovative ideas will produce failures on the path to improvement.

Leaders need to align incentives and to offer resources to promote and facilitate effective learning. Supporting improvement requires understanding that mistakes are inevitable in uncertain and risky situations. Organizations must reward improvement rather than success, reward experimentation even when it results in failure, and publicize and reward speaking up about concerns and mistakes, so others can learn.

Policies that reward compliance with specific targets or procedures encourage effort toward those measures but may thwart efforts toward innovation and experimentation. For example in healthcare, pay-for-performance incentives have gained popularity in recent years among policymakers and practitioners (Rosenthal, Fernandopulle, Song, & Landon, 2004). Most performance pay systems reward organizations that meet standards of evidence-based practice (Rosenthal et al., 2004). The potential problem with such schemes is that while incentives to promote evidence-based care are appropriate in areas where evidence is clear, without comparable incentives for experimentation where evidence is more ambiguous, performance pay may unintentionally undermine learning behaviors where they are needed. Given that so much of the health care services delivered today is hazardous and uncertain, powerful pay-for-performance incentives may deter desirable learning.

Given the problematic nature of the relationship between learning and performance, to provide incentives for learning, performance measurement must examine learning, not just performance (Garvin, 1993). Useful tools include surveys,

questionnaires, and interviews to examine attitudes toward and depth of understanding regarding new ideas, knowledge, and ways of thinking. Process measures are also helpful (Garvin, 1993; Lee et al., 2004). Direct observation is useful for assessing behavioral change due to new insights. Finally, performance measurement must consider improvement by measuring results over time. Groups that improve more over a fixed time frame or that take less time to improve must be learning faster than their peers. Short learning cycles will translate into superior future performance.

In contrast, an evaluation of current pay-for-performance arrangements among healthcare organizations found no emphasis on quality improvement relative to baseline measures (Rosenthal et al., 2004). Rather, a majority of programs sought to intensify competitive pressures between organizations, exacerbating incentives for organizations to emphasize exploitation in targeted areas. This trend highlights the need for better understanding of learning requirements in organizations and what it takes to meet them.

Conclusions

In this chapter, we have called attention to some of the challenges and tensions that exist when trying to improve team or organizational performance through proactive learning. We note several ways in which learning and performance in organizations can be at odds. Notably, when organizations engage in a new learning challenge, performance often suffers, or appears to suffer, in the short term. Struggling to acquire new skills or capabilities often takes a real, not just apparent, toll on short-term performance. Moreover, by revealing and analyzing their failures and mistakes – a critical aspect of learning – work groups may appear to be performing less well than they would otherwise. We reviewed work that has elucidated the challenges of learning from

failure in organizations, including the challenges of admitting errors and failures and production pressure that make it difficult to invest time in learning. We argued that these challenges are at least partially addressed by managerial efforts to create a climate of psychological safety and to promote inquiry. Leadership is thus essential to foster the mindset, group behaviors, and organizational investments needed to promote today's learning and invest in tomorrow's performance.

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Figure 1.

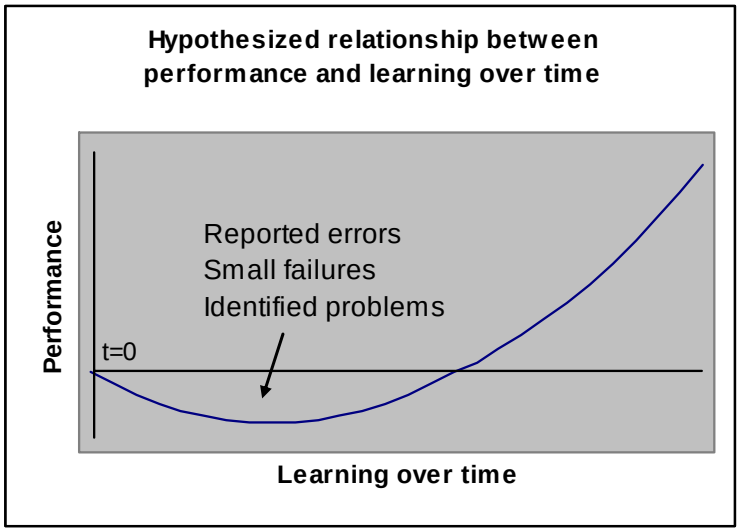
Hypothesized relationship between performance and learning over time
Performance
Reported errors
Small failures
Identified problems
t=0
Learning over time

Figure 2.

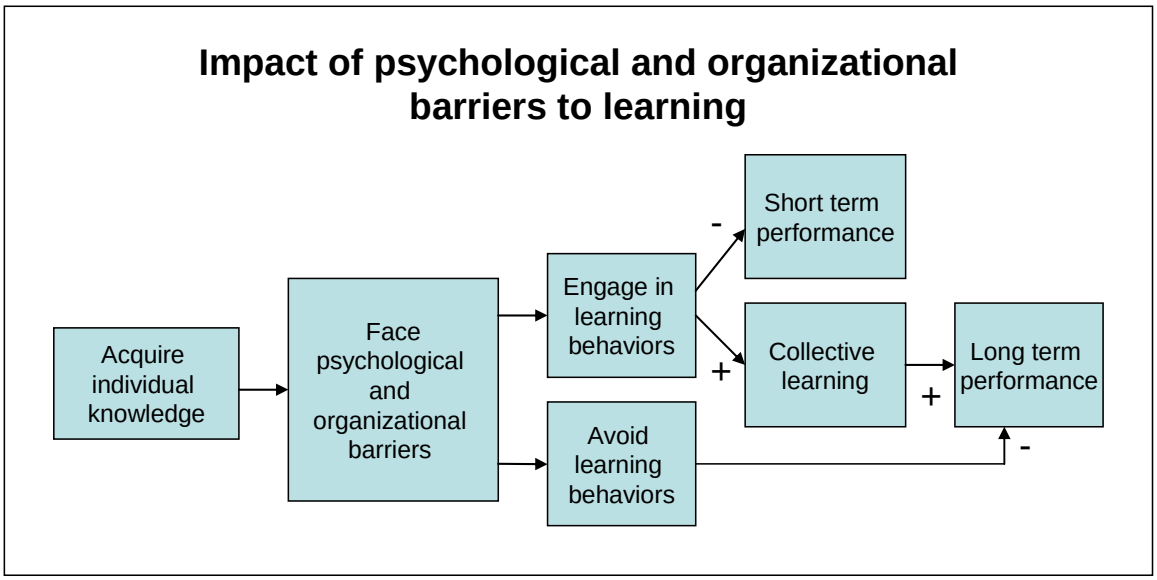
Impact of psychological and organizational barriers to learning
Acquire individual knowledge
Face psychological and organizational barriers
Engage in learning behaviors
Avoid learning behaviors
Short term performance
Collective learning
Long term performance
-
+
+
-

Figure 3.

Learning Mindsets at Multiple Levels of Analysis			
	Dimension	**Performance Orientation**	**Learning and Innovation Orientation**
Individual & group	Behavioral characteristics of individuals and group members	Advocacy orientation - Lack of listening - Reliance of quantitative data	Inquiry orientation - Openness, tolerance for ambiguity - Reliance on intuition and interpretaion
	Leader response to problems	Confirmatory response - Reinforce accepted assumptions	Exploratory response - Experiment to test assumptions
	Leader approach to environment	Coping - View as threat - Technically oriented	Learning - View as exciting opportunity - Team oriented
Organization	Behavioral characteristics of organizations	Exploitation - Appropriate in mature markets - Focus on execution	Exploration - Appropriate in uncertain environments - Focus on learning & experimentation
	Leader mindset and organizational design	Organize to execute - Ask, "Did we do it right?" Promote first order learning	Organize to learn - Ask, "Did we learn?" - Promote second order learning