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Project-based Learning: Building Communities of Reflective Practitioners

Abstract In this article we delve into the potential learning capacity inherent in project-based organizations derived from conclusions drawn from action research as well as extensive field experience. We propose project-based learning as a means to deal with the challenge of sustainable growth of learning capacity, i.e. developing learning capabilities that enable reasoning beyond the short term; knowledge creation and sharing beyond the individual or team. Based on stories from the field, we explore the distinguishing features of project-based learning and ways in which project-based learning can be instrumental in building communities of reflective practitioners. Key Words: communities of practice; leadership; organizational learning; psychological safety; reflective practice

Is there a path to sustainable growth of learning capabilities within an organization? Can we meet the challenge of thinking, reasoning, and acting beyond the short term? Can projects enable or facilitate the creation and diffusion of knowledge and innovative practices beyond individuals, specific teams or projects?

These are the questions we set out to explore based on two complementary perspectives: stories from the field by Nick Zeniuk (a former project manager in Ford Motor Company) and findings from action research conducted by Karen Ayas in Fokker Aircraft. Drawing from research findings and practice, we hope to bring in the voice of a practitioner/consultant and a researcher in addressing these questions.

Whether we look into literature or listen to the stories of executives and project leaders engaged in change initiatives in the various SoL (Society for Organizational Learning) member companies, there is an abundance of success stories (e.g. O’Reilly, 1995). Our concern is that the majority of these success stories are associated with a single project or a pilot group in a large organization. To date, there are very few examples of enduring engagement in learning and profound large-scale transformation; not many succeed in diffusing the organizational learning methods and tools throughout the organization (Senge et al., 1999). These dynamics apply to the diffusion of any innovative practice, not just

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organizational learning, and they have prevailed through the industrial age (Kleiner, 1996). There are numerous examples of ‘skunk works’ in organizations where project teams produce genuine breakthroughs in product development or process design that do not spread to other parts of the organization.

Senge et al. (1999: 321) explain:

In many ways, zeal and isolation are the most insidious unintended consequences of profound change initiatives. The deeper and more effective the changes that occur in a pilot group, the more easily they can come into conflict with the larger organization. The more people do change, the more different they become, in their thinking and acting, from the mainstream culture. The more they do succeed in producing significant advances in practical results, the more potentially threatening they become to others competing with them for management attention and reward.

Building communities of reflective practitioners may be a way to meet the challenge of diffusion of learning, and projects may serve as practice fields for developing learning capabilities and cultivating effective habits of reflective practice that cross the boundaries of the specific project or project team.

**Tolerance for Reflective Practices**

Organizational culture entails the shared beliefs, values and norms in the organizational context. Culture may determine individual behavior, but it is also concurrently constituted through human behavior (Swierenga and Wierdsma, 1992). Culture awareness increases the likelihood of learning becoming a natural process in the organization. This requires surfacing the hidden, basic assumptions and beliefs embedded in the organization (Schein, 1997) and developing the capability to engage in ‘double-loop learning’, using the inquiry processes Argyris and Schön (1978) suggest. A project design effective for learning necessitates a context where project members can question institutional norms. A culture based on commitment to truth and inquiry starts at the individual level as individuals reflect on their personal visions, question their own assumptions, understand what dictates their actions and how they contribute to their problems (rather than outside forces), feel the necessity to change and see their own part in the change process (Senge, 1991).

As Schein (1997) has pointed out and demonstrated with numerous studies, you cannot actually ‘create’ or ‘change’ a culture. At best, you can set the stage for the culture to evolve. Over time, through new ways of doing things, an organization may embody a different set of assumptions and ways of looking at things. This in turn requires developing cultural flexibility and tolerance for these new ways of doing, articulating and acting upon new ideas. It calls for allowing the different parts of the organization to operate by different norms than the ‘mainstream’ culture (de Geus, 1997). Tolerating the use of reflective practices in project work may be a first step in setting the stage for the evolution of a culture that is conducive to learning.
Raelin (see ‘Public Reflection as the Basis of Learning’, this issue) argues that reflection is fundamental to learning and that it provides a basis for future action. We cannot learn from our actions unless we are aware of the consequences of our behavior. There is a gap between what we think we do—‘espoused theory’—and what our behavior shows—‘theory-in-use’ (Argyris and Schön, 1978). Senge (personal conversation, 1999) states that ‘our core challenge is to become more reflective on the reasoning that guides our actions and gradually improve our theories-in-use’.

Projects may serve as the ideal setting for developing inquiry skills that enable us to better understand our assumptions and the consequences of our actions. For our purposes, project-based learning is about using projects as vehicles for creating such a context: setting the stage for reflective practices and inquiry at all levels within the organization, to reveal deeper aspiration and construct shared understanding. It is about acquiring habits of reflective practice in the project environment to benefit the individual, the organization and society. The essence, therefore, is the context that projects may or may not provide for double-loop learning and building communities of reflective practitioners. Exploring how to make learning in projects more meaningful, relevant and enduring, our focus here is on reflective practices that increase the ‘quality of learning’ in projects (Ayas, 1997) and enhance learning capabilities of individuals throughout the organization.

Senge et al. (1999: 45) define ‘learning capabilities’ as skills and proficiencies that ‘enable people to consistently enhance their capacity to produce results that are truly important to them’. The capability to reflect in action (Schön, 1983) or on action (see Raelin, this issue), to question old beliefs and assumptions, to have open and candid conversation, to develop awareness of how our own actions create the systemic structures which produce our problems, to unlearn old ways of doing things and to let go of old habits are all examples of learning capabilities. As Senge et al. (1999) explain, these cannot be ‘forced, rushed or imposed on others’.

Developing learning capabilities takes time and practice. They may require us to break from our old habits and acquire new ones. Covey defines habits as ‘the intersection of knowledge, skill and desire’ (1989: 47) and argues that creating a habit requires work in all three dimensions. ‘By working on knowledge, skill, and desire, we can break through to new levels of personal and interpersonal effectiveness as we break old paradigms’ (Covey, 1989: 47). Some habits are the result of life-long conditioning. They are deeply embedded and extremely difficult to reverse. It is, therefore, an enormous challenge to change the way we think and the way we act. Acquiring habits of reflective practice in projects and organizations is extremely challenging.

Reflective practices that help develop learning capabilities in projects include the use of various organizational learning tools (e.g. the ladder of inference, left-hand column, system archetypes), dialogue, story-telling, and individual or group exercises for team building, team learning and leadership development. These are all practices that empower project members to reflect on task and team related aspects of project work and help them understand how their own behavior impacts on others. The aim with such practices is to improve project performance and refine learning capabilities of individuals.
Distinguishing Features of Project-based Learning

Project-based learning lays the foundation for communities of reflective practitioners (Schön, 1983; Raelin, this issue). It aims to contribute to the evolution of a culture where project members engage in understanding the underlying system dynamics and unintended consequences of fire fighting that project work may require. As Dewey (1933) notes, reflective practitioners are open-minded and willing to accept responsibility for their decisions and actions. They have enhanced learning capabilities; they can accommodate multiple perspectives and cope with complexity. They have deeper understanding of the underlying causes of action, and they can discern the discrepancies between theory-in-use and espoused theory (Argyris and Schön, 1978).

We distinguish project-based learning from learning in project-based organizations. Learning is not a natural outcome of projects and a project-based organization is not necessarily conducive to learning. Organizations seek to have flexibility and adapt to the demanding environment through projects. Although an increasing number of organizations manage by projects and through project teams, the vast majority of organizations still underperform (Hastings, 1993). Adoption of project-based management may indeed offer benefits in the long term (Turner et al., 1996; Lundin and Midler, 1998). It is mostly through projects that knowledge is generated in organizations (e.g. Nonaka and Takeuchi, 1995; Leonard-Barton, 1995). Yet, knowledge created within a project is not always diffused, and lessons learned may not be shared across projects. In their analysis of 19 project-based organizations, Keegan and Turner (see ‘Quantity versus Quality in Project-based Learning Practices’, in this issue) conclude that learning continues to evade and that the overwhelming trend is constant deferral of learning to future points in time due to short-term pressures. This trend is especially alarming when projects are increasingly used for organizational change and project teams serve as pilot groups.

Traditional project management is the process of planning, organizing, directing and controlling company resources for a short-term objective or to achieve specific goals. As projects face higher degrees of technical complexity and interdependency across functional boundaries, even the success of a single project becomes increasingly dependent on the organizational capability to generate and share knowledge. The challenge with project-based learning is developing the capability of continually enhancing the collective capacity to reflect, to (un)learn and to ‘learn to learn’ over time. Developing and cultivating such reflective practices in the project environment and embedding learning into project work on a continual basis requires a fundamental shift from the traditional practice of project management.

We identify the following distinguishing features of project-based learning (see Figure 1):

- there is a sense of purpose and clarity of both long- and short-term objectives;
- the project environment offers psychological safety and there is a commitment to telling the truth;
- there exists a learning infrastructure and there is a balance between emerging and formal structures;
Figure 1  Project-based learning

- there are communities of practice that cross project boundaries;
- leaders set the tone for learning and model the reflective behavior;
- there is systemic and collective reflection: problems and mistakes are opportunities for learning.

As will be illustrated in the two cases that follow, project-based learning as discussed here applies to large and complex projects where hundreds of people may be involved in a project, and projects may include a large number of teams or groups that need to work together (e.g. new product development projects in the car or aircraft industry). In such large and complex projects learning does not happen naturally, it is a complex process that needs to be initiated and sustained. To be effective and sustainable in the long run, the learning process needs to deliberately cross the boundaries of individual teams or groups that belong to a project.

In each of the cases presented briefly below, the project environment has been conducive to the development of learning capabilities and has nurtured reflective practices. In both cases, each one of the features outlined above has been essential in providing a fertile ground for project-based learning (PBL) and setting the stage for a culture of reflective practices to evolve over time. These cases are intended for providing an account of the practice of PBL in two different contexts.

The Ford Story\textsuperscript{2}

The Ford Lincoln Continental project team set company records in multiple measures of cost, quality and timing. The program met all product and business objectives and achieved extraordinary results: it saved US$60 million in launch rework costs (two-thirds of budget); it recovered from starting four months late; and it achieved the most trouble-free production launch in history. This success
story has been covered in numerous publications (e.g. O’Reilly, 1995; Roth and Kleiner, 2000) but the focus here is on the transformation that was triggered by project-based learning capturing the reflections of a former project manager. Can we attribute these extraordinary results to the practice of the organizational learning tools that help build learning capabilities, and engaging the project team in reflective practices over the course of four years?

In 1992, the formal structure in product development at Ford was a project-based organization. All new vehicle programs had dedicated project teams with a program manager. The Lincoln Continental program consisted of a cross-functional team of about one thousand members including engineers, planners, manufacturing and finance people. At the beginning of the project, the team’s behavior was typical of other Ford teams, with a tendency to advocate and defend individual and functional positions, and to demonstrate little genuine inquiry or communication skill. In addition, team members were trapped by their own assumptions of their job description (an engineer, a controller etc.) and therefore understood the product development process from their own limited perspective. The increasing competitive pressure from Japan was forcing the company to become more productive. Declining budgets, reduced resources, and demand for higher quality were putting a serious strain on team performance.

In 1992, with the program four months behind schedule, a small leadership group at Ford (including Fred Simon, the program manager) decided to collaborate with MIT researchers at the Center for Organizational Learning (now SoL). The Lincoln team was one of the first project teams to practice organizational learning tools. The leadership group encouraged project members to practice and develop learning capabilities of reflective conversation, inquiry skills, dealing with complexity and understanding interdependence. Tools like the ‘left-hand column’ and ‘ladder of inference’ (Argyris, 1993) provided the team with the means for inquiry into their assumptions and helped them to understand how they drew their conclusions. Yet, due to time pressures of the project, the use of these innovative practices and other very effective tools like the system archetypes (e.g. ‘Fixes that Fail’; ‘Shifting the Burden’, Kim, 1994) were not so readily tolerated.

The leadership team required seven to eight months of working together to cultivate their reflective practices before they became a cohesive group. Once they realized how their mental models and ‘job descriptions’ contributed to conflicting problem definitions and solutions, they began to think collectively and differently. They also realized that they were responsible for their own learning and the application of the learning tools to real business issues. MIT researchers assisted the leadership team, providing the knowledge and tools, but the leaders assumed the responsibility for engaging the other team members in the theory and practice of organizational learning.

The leadership team and Daniel Kim from MIT designed a two-day ‘learning lab’ for introducing the ‘five disciplines’ of the learning organization (Senge, 1990a) to project members. The reflective learning tools were applied to specific engineering and business issues—the learning lab was designed to integrate the ‘on-line’ with the ‘off-line’ work practices. Through a management ‘flight simulator’, project members discovered the dynamics underlying the product development process and understood how small changes at the beginning of the process
could dramatically affect the final outcome. To facilitate reflection, all learning lab participants kept journals.

The Lincoln team did not have the time or the resources to engage every single project member in the learning labs. Although only approximately 150 members (20 percent of the team) participated in ‘formal’ learning (learning labs), the diffusion of reflective practices was much broader. There was a visible and significant shift in the way project members communicated and related to each other. They were able to conduct reflective conversation without fear and to operate at a level of trust rarely experienced in the organization.

This was most probably attributable to the active involvement of key line managers (including the program manager himself) in the transformation. As the leaders’ reflective practices improved and they became ‘true believers’ (Senge et al., 1999), they were able to successfully engage the team. Their enthusiasm for using these tools and methods grew. Results were immanent. Conversations and relationships improved, meetings became shorter and scarcer, objectives were clarified, innovative processes were developed and new knowledge was created. As a novel learning structure emerged, communities of practice evolved to anchor these creative processes. The project met or exceeded all of its objectives (the first in many years!), yet when asked at the end of the project ‘What were you most proud of?’, the majority of project members responded: ‘the experience’—the experience of working and creating together in an inspiring project environment free from intimidation and mistrust.

In reflecting on this story (Roth and Kleiner, 2000), Kanter concludes that there is no case for organizational learning because it was in fact the ‘immune system’ of the larger company that won the war; that the learning did not go beyond the team which was disbanded once the project was over. The Lincoln project team did not set out to change the culture, all the learning efforts were focused on the project. Yet, some reflective behavior and innovative processes were diffused beyond the specific project. Project leaders encouraged metaphors that aligned the team as they collectively developed a vision for the launch of the car, contributing to the diffusion of knowledge through ‘socialization’ (Nonaka and Takeuchi, 1995). This set the stage for use of evocative metaphors that inspired commitment, alignment and passion throughout the supply chain.

The challenge was to improve the collective capacity to collaborate and create new processes for improving product development and facilitate an error-free, on-time launch of the product. As a result, there were seventeen process innovations (e.g. on-line bill of material, interior harmony buck, interposed prove-out program, etc.) which were institutionalized and implemented in all project teams.

In the few years after the successful launch of Lincoln Continental, Ford launched a variety of new products, including two at the same plant. They continued to experience development and assembly launch problems, although there was an improvement relative to prior years. In this period, approximately 20–30 percent of the original Lincoln team members were part of the 1998 Lincoln Continental which was launched successfully—meeting or exceeding all its objectives, similar to the original Lincoln. Another major project, the Lincoln LS, introduced learning initiatives shortly after the Lincoln Continental but with less fanfare and attention. It was successfully launched recently and named ‘The luxury car of the year’.

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In fact, over the years as team members were reassigned to other projects, their reflective practices did continue to develop. Many were assigned to leadership roles in other project teams and helped their team members engage in reflective practices. ‘After initial skepticism, learning initiatives were introduced throughout product development in selected manufacturing facilities and they were no longer perceived as threatening’, states Margie Hagene, an internal consultant in product development who continues to work with senior leaders at Ford.

The Fokker Case

The Jetline Avionics project team outperformed all the new product development (NPD) teams at Fokker Aircraft not only in terms of performance indicators such as time, cost and quality but also in ‘project maturity assessment’ (Ayas, 1997) that included dimensions such as teambuilding, leadership and learning. Comparing project performance before and after the implementation of ‘project design for learning’ and the practice of project-based learning over a period of two years, the average budget overrun in NPD projects decreased from 17 percent to 6 percent and the time overrun decreased from 11 percent to 7 percent. Additional investment in reflective practices with the pilot project team, Jetline Avionics, made this project achieve what previously was perceived as impossible in the organization.

Project design for learning is an infrastructure conducive to learning that benefits from an alternative way of organizing project teams, the project network structure (PNS). PNS is an organic structure based on the evolution of project work content over the course of the project life cycle. Developed through action research (Ayas, 1997), the project network structure is a modification of the autonomous project team structure designed to compensate for its weaknesses and to deal with the challenge of integrating a large number of people (as in the case of large and complex product development projects). Often, especially with projects of long duration, members of an autonomous project team find it difficult to go back to the organization and tend to leave when the project is complete (Wheelwright and Clark, 1992). The design of PNS, an organic network of self-managing teams, is a dynamic approach to design derived from principles of organizational learning. PNS is constituted by teams within teams, thus enabling teams to stay at their most effective size (Katzenbach and Smith, 1993).

The practice of project-based learning in product development began with the implementation of the new structural arrangement for projects. All ongoing development projects were shifted to project network structures, creating the new product development sector. Setting the stage for the desired cultural evolution required interventions for team building as well as an appropriate leadership model. At the outset, as within any organization, the cultural problems and functional resistance created a major barrier to the desired transformation. It was common that the specialists who were involved in product development projects found working in a team an unnatural and uncomfortable experience. Soon, after shifting the structure, it became evident that it was essential to create the intellectual awareness of the value of project-based learning. Time had to be
invested in developing committed, cohesive project teams and cultivating habits of reflective practices.

To cultivate reflective practices, 'team learning' sessions were conducted in the Jetline Avionics project. The content of the sessions evolved as a result of the dynamic interaction with project members, adapting it to the specific project needs and requirements. These sessions provided the means for learning to become an integral part of project work. They were highly interactive and included short lectures, group and individual exercises, brainstorming and dialogue techniques, and simulation games, as well as questionnaires for feedback and assessment. Some of the aspects covered by these sessions were:

- shared vision over project and team objectives
- creative communication for cross-fertilization of individual competencies
- leadership for learning
- assessment for learning (i.e. feedback for continuous improvement).

This pilot study demonstrated that project-based learning might lead to superior performance. A review questionnaire was used to assess present and desired performance (as perceived by project members) after a six-month interval. The initial review indicated an average of 60 percent for the present performance and 75 percent for the desired performance. Six months later the review results were 75 percent for the present performance and 92 percent for the desired performance. These results indicated that while project members had reached their initial desired performance rate of 75 percent, they no longer found this a desirable level of performance: their aspirations now were much higher. This showed the potential for considerable scope of performance improvement and the benefits of investment in project-based learning.

The Jetline Avionics team served the purpose of a demonstration project for other product development projects. It triggered important changes in human resource policies leading to further learning opportunities in projects in the product development sector. It contributed to creating a project environment conducive to building communities of reflective practitioners.

For instance, initially it was not clear to organizational members that project-based learning could be beneficial for long-term career development. Formerly, the career management policies encouraged individuals to set their career goals to excel only within a given functional specialty, rather than to develop the required competencies to become successful project leaders or reflective practitioners. With project-based learning, mobility between functional and project organizations became a prerequisite in order to climb the professional ladder.

Changes in the reward systems also supported project-based learning. At the outset, the existing reward systems acted as barriers: meeting specific short-term goals, rather than the long-term investment in project-based learning, was recognized and rewarded. Project leaders were rewarded for the project's success rather than their contribution to the learning and development of team members. Rewards were based on individual performance. As a consequence of changes that were triggered by PBL, leaders' evaluations were no longer solely based on the contribution to the specific project but also on the contribution to developing team members' learning capabilities. Furthermore, use of self and peer review,
rather than solely subordinate review, allowed individuals’ contributions in reaching both project and team related goals to be recognized and evaluated.

At Fokker Aircraft, increased emphasis on project-based learning and reflective practices did not remain restricted to the product development sector. Although PBL was intended and proposed for product development, the underlying principles were adopted for different purposes in other parts of the organization, such as the large-scale change program consisting of over 40 different company-wide process improvement projects.

Implications for Theory and Practice

Drawing further examples from these cases and literature we look into the distinguishing features of PBL and identify implications for theory and practice.

Sense of Purpose

Projects such as new product development (NPD) projects offer a clear sense of purpose and urgency. This was the case at both Ford and Fokker. When project members work to create something new, the task at hand is clear, and there is pride and passion around what they create. This may be stronger in NPD projects but may be applicable to many other types of projects.

The paradox of project-based learning is that while individual projects with shared vision and passion may offer an environment conducive to learning, they might also create strong barriers to the continuity of learning beyond the project boundaries. Project-based learning relates to both short- and long-term corporate goals. Unless there is an explicit sense of purpose for the long run, project-based learning cannot be sustained.

In the context of project-based learning, the explicit emphasis is not only on the specific task at hand but also on long-term investment in people. For continuous improvement in project performance and building communities of reflective practitioners, the delicate balance between task and people needs to be maintained. Most project leaders are naturally focused on the short-term results and the task at hand. As the Fokker case illustrated, if they are solely evaluated on their short-term performance, i.e. performing within time and budget constraints, this naturally makes the investment required for learning and reflection a very low priority for them in the first place.

Learning Infrastructure

Senge et al. (1999: 425) define learning infrastructures as ‘ways of organizing resources and opportunities to promote regular reflection and sharing’. Leonard-Barton (1995) mentions the ‘fractal’ of human behavior that gives the organization its character and permeates its daily activities. The behavior of individuals and small groups reflects the attitudes toward knowledge creation and sharing in the organizations. Although individuals are responsible for the behavior patterns in the organizations, the nature of knowledge creating activities—the atmosphere of functional or dysfunctional attitudes—is dependent on the particular setting. At
the individual level, the immediate surrounding (whether it is a department, a task group, or a team) affects learning. At the group level, the larger setting within which the groups function influences learning.

The organizational design influences the inter-group relations or to what extent informal networks grow. Galbraith (1994) argues that although informal networks within organizations occur naturally and randomly, organizations can be designed in a way that eliminates the randomness in their creation. As illustrated by the Fokker case, paying deliberate attention to the design of large and complex projects can play a significant role in accomplishing this task (Ayas, 1997). The tendency in the majority of the organizations is to assign projects to the existing structures and thus create formal, rigid structures for large and complex projects. Yet, along the course of a project the needs and requirements may change and the project may benefit from different emerging structures.

We posit that the challenge of the formal system is to allow the informal structures that facilitate project work to evolve and provide the learning infrastructure. As Senge et al. (1999) explain, there needs to be an understanding of the need for formal design (the intentional architecture, strategy and structure) and emergent design (the ways that people naturally redesign the organization as they live in it).

**Communities of Practice**

To carry on their project work effectively, project members need to develop the capability of managing across boundaries, using the existing governance structures. Project managers have to expand their sphere of influence and build credibility beyond the project. If we assume that learning is social, learning is engagement in practice and dealing with boundaries (Wenger, 1998). Project-based organizations offer an excellent opportunity to engage in learning and to acquire reflective habits that transcend the boundaries of projects. It is not only the nature of single projects that supports learning but also the web of relationships that are created in organizations that manage by projects.

Membership in projects is temporary and thus offers individuals the opportunity to belong to multiple communities. In project-based organizations there are a large number of weak ties that help diffuse knowledge and practices (Granovetter, 1973). In the majority of organizations, project members maintain their links with their functional departments (where they will return upon the completion of the project if they are fully assigned to it). Membership in multiple existing communities contributes to creating informal webs of people who act as knowledge brokers (Wenger, 1998). Project-based organizations thus enable continuous building and cultivation of relationships, nurturing the development of ‘communities of practice’ (Brown and Duguid, 1999).

Communities of practice are natural internal mechanisms where ideas and practices spread in work settings, although they tend to exist outside the boundaries of the formal hierarchy. Project-based organizations may grow into constellations of interrelated communities of practice, offering a web of mutual support for cultivating reflective practices. When projects share members, they are bound together and become embedded in the same social network (Granovetter, 1973). The recursive interaction among projects creates social networks of mutual
assistance. Project-based learning looks to augment the natural workings of such social networks and communities of practice that already exist.

*Psychological Safety*

With project-based learning the intent is to create a practice field, to provide the playing room—a space where people feel comfortable practicing learning without the fear of failure, a space where they can raise difficult issues; a place where they do not resort to defensive behavior. Creating ‘psychological safety’ (Schein, 1999) is a considerable challenge. It is not just a matter of intent; it requires very skillful behavior that is developed over time as people learn to trust one another.

The Ford case illustrates this very clearly. As William Isaacs, one of the lead researchers from MIT involved in the Lincoln project explains:

> Many factors contributed to these successes. But a central one that Fred and many others often commented on was the freedom of communication and the capacity to reflect directly on previously undiscussable issues. For perhaps the first time, managers were prepared to listen to engineers in a way that led engineers to feel safe to raise problems early. (Isaacs, 1999: 353)

As Fred Simon, former Ford Lincoln Continental program manager puts it:

> you cannot create trust directly. You can only create conditions conducive to trusting. (Senge et al., 1999: 248)

Isaacs further explains:

> Simon gave his team leaders tools and an atmosphere in which it was possible to share meaning—to reflect on what was working and not working—without being punished . . . People learned. And they found a way to detect and reduce errors much more quickly than before. (Isaacs, 1999: 213)

Project members learned a set of basic tools and skills for conversation, and through a climate of psychological safety they began to talk openly about difficult issues and the problems they were facing.

> Fred and his team developed a method and infrastructure for listening—in particular, for the kind of interpersonal learning that could enable people to conduct difficult conversations more effectively, remaining open to the possibility that they could accommodate and learn from their differences. (Isaacs, 1999: 349)

*Leadership for Learning*

It is commonly agreed that leaders have great influence on the performance of their team. Senge (1990b) argues that leaders must be capable of building shared vision, inspiring commitment, translating emerging ideas into workable goals, and empowering people. This requires leaders who have the ability to reflect on their view, expose their reasoning and encourage others to be inquisitive.

The leadership model in project-based learning is therefore very different from the management model. It reflects the emergent structure and the evolving culture. Leaders may evolve where and when necessary. Leadership is not equated with position in the project hierarchy.
The safety net that was created in the Ford case was continually reinforced by the project and team leadership. Says Zeniuk: ‘Fred Simon, the program manager, … became very active in the team transformation. Fred’s involvement was necessary to legitimize the process and provide leadership support’ (O’Reilly, 1995: 11).

The leader as a reflective practitioner sets the tone for learning. Leaders should ideally also take a significant role in the change process by engaging in personal transformation, and become coaches and facilitators serving others. Sustainability and continuity of learning initiatives seem to be much more prevalent in organizations where leaders ‘lead by learning’ and are fully engaged in the process, assuming a leadership role in the transformation.

Leaders may be unaware that their behavior is inconsistent with what they espouse. They cannot see themselves and they need others to help them to do this. As the late Dr Deming put it for the Lincoln team, ‘The eye cannot see itself’. Drawing from his own experience, Zeniuk states:

If you are in a senior leadership position, you are alone and you will be the last one to know what really is going on. My greatest challenge was to have people around me who could tell the truth and consequently see myself. But it takes a great deal of trust before someone can really tell the truth. It can only start by the leaders’ commitment to truth.

Shell Oil CEO Phil Carroll puts it even more firmly: ‘if you don’t have a fundamental commitment to the truth and telling the truth, you can’t lead. And telling the truth is so much more difficult than just “not lying” ’ (Senge et al., 1999: 248).

Systemic, Collective Reflection

Reflective practices and continuous engagement in learning require the use of reflective learning tools. A learning tool is an artefact that will lead to new ways of thinking through its use (Senge et al., 1994). It may be perceived as a supportive mechanism, necessary and useful for developing skills and capabilities to confront new and different issues in future projects. After action reviews, project and team audits, and lessons learned databases are some examples of such supportive tools for project-based learning.

For example, the US Army has institutionalized collective reflection through ‘After Action Reviews’ (AAR). The AARs help to discover what happened, why it happened, and how it might take place differently next time. As Roth recounts (Senge et al., 1999), the AAR is not a sufficient learning tool by itself, but it is part of an integrated self-reinforcing system established to develop the learning capabilities of organizational members. The Shell group also uses the AAR process for systemic reflection and has a technology infrastructure to enable people to reflect together across projects (Isaacs, 1999).

Project audit is a procedure that can be used for systematically developing data on the project’s characteristics and performance, and conducting an analysis of the underlying sources of the performance one observes (Wheelwright and Clark, 1992). The project audit can provide the guidelines for areas of attention, and can focus on specific questions to be addressed at both the team and project levels.
In the case of Fokker, since phasing was used for complex development projects, the project audits were coupled with project reviews that took place at the completion of each phase, i.e. at fixed milestones during the projects. Due to the size and complexity of the majority of product development projects, project audits were performed within every team that constituted the project network, not just at project level or core team. The systematic use of project audits ensured that crucial information was not lost. Causes of failure and underlying sources were identified at the level of teams and ‘lessons learned’ were accurately recorded. These entailed a set of recommendations to safeguard that the same mistakes were not repeated in future projects and by other teams. Some of the ‘lessons learned’ were also shared verbally across projects through initiatives of the project or team leaders. In addition, a project history library was set up with all the documents containing concluding reports and lessons learned.

**Concluding Remarks: Balancing Action and Reflection**

In the typical, task-centered project where short-term pressures prevail, it is not an easy task to shift the focus from action to reflection. Cultivating habits of reflective practice in the fast-paced project environment requires deliberate attention to learning and seeing beyond the task at hand. We posit that this may be facilitated or accelerated through insider/outsider collaboration.

The insider/outsider collaboration creates new ways for people to reflect on what is happening. The outsider brings a broader perspective and thus may help the practitioner see the systemic aspects of the problem, shifting the attention away from blaming and individual preferences.

In many of the current projects ongoing within the SoL companies, it is the collaboration between researchers and practicing managers that leads to theory relevant to practice and to action that stems from reflective practices rather than defensive reasoning. In the case of Fokker, the insider/outsider collaboration provided an environment that fostered reflective practices. At Ford, the partnership between MIT researchers and project leaders enabled the development of learning capabilities. Fred Simon, looking back on his experience with MIT, admits that he had been very much a skeptic about ‘having a bunch of academics come in and mess around with his business’. Yet, he soon realized the significance of changing the way people behaved (Isaacs, 1999).

Effective collaboration between academics and managers benefits both practice and theory, enhancing the significance and relevance of research, informing both practitioners’ and academics’ views and actions. Bartunek and Louis (1996) explain that ‘true’ insider/outsider research typically includes both taking appropriate action and making a scholarly contribution. It is also not unusual that action research be chosen as the methodology. Action research provides a link between scientific understanding and social action. It helps practitioners articulate their tacit theories and thus incorporates local knowledge.

In the Fokker case, action research played a significant role in building an infrastructure which could support and sustain reflective practices. The inquiry into processes, which the practitioners knew at action level but had not actually thought about conceptually or reflected upon, contributed to the externalization
of tacit knowledge. Similarly on the Lincoln Continental team, the new knowledge for developing the innovative product development processes and designs was constituted in action, in the 'doing'—enabled by enhanced reflective practices and 'evocative' leadership style.

In both Ford and Fokker a genuine partnership existed between academics and project and team leaders. There was a commitment among the researchers to contribute to practice by developing effective tools and methods, and the practitioners were willing to invest time and energy in reflection and learning to reach a better understanding in light of new conceptual models and better theories and tools. They worked together to build a community of reflective practitioners who were capable of using the learning tools and helped the organizational members to develop learning capabilities that transcended the boundaries of specific projects.

Notes

1. SoL, formerly the Organizational Learning Center at MIT, is a global learning community dedicated to building knowledge for fundamental institutional change. SoL has corporate, consultant and research members. Both authors of this article are affiliated with the Society for Organizational Learning.
2. This is the Ford story as told by Nick Zeniuk, a project manager at the time, based on his personal experience and observations.
3. This case is based on action research conducted by Karen Ayas at Fokker Aircraft over the course of three years. See Ayas (1997) for a discussion of the methodology and the framework 'Project Design for Learning' which was developed and implemented in the new product development sector.

References


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