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Teams as Learners

A Research-Based Model of Team Learning

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Organizational literature heralds the value of team learning but does not provide a research-based description of it. This article describes a model of team learning that was derived empirically from case studies in two companies, one with a cross section of employees in a petrochemical company and the second in a data-processing unit that had been reorganized into self-managed teams in a manufacturing company. The authors draw conclusions about changes in learning processes, conditions, and perceptions of time and explore research implications regarding human dynamics.

As organizations move away from the steep hierarchies common to the industrial era toward flatter, more integrative networks appropriate for the knowledge era (Savage, 1990), teams are being used to solve highly complex problems (Katzenbach & Smith, 1993). Corporations are searching for ways to enhance the effectiveness of teams. Recently, some theorists have pointed to the potential value of team learning to help organizations achieve breakthrough innovation (Marsick, Dechant, & Kasl, 1993;

The thinking on which this article is based arises from joint writing and joint development of ideas among all three authors over an extensive period of collaboration.

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Savage, 1990; Senge, 1990). Senge, for example, emphasizes that "teams, not individuals, are the fundamental learning unit in modern organizations. This [is] where 'the rubber meets the road'; unless teams can learn, the organization cannot learn" (p. 10).

Although the organizational literature advocates team learning, it offers neither a definition nor a clear description of what it is. This article presents a research-based model of team learning. Our purpose is to describe what we found when we raised the question: What does team learning look like? We begin by describing our research methods, the team learning model, and how team-learning concepts differ from group dynamics. Next, we tell the stories of three teams and use our model to interpret their experience. We conclude with some implications for future research around team learning.

RESEARCH METHODS AND MODEL BUILDING

We began the project with traditional case study research (Yin, 1989) in a petrochemical company that had introduced high-involvement management (Lawler, 1986) to promote autonomy in work teams and decentralization of decision making. We interviewed 28 employees representing a diagonal, cross-functional slice of the organization. Using content analysis and elements of grounded theory (Strauss & Corbin, 1990), we coded transcripts for learning processes and conditions that facilitated or impeded learning in the company teams. At two different stages of our coding process, additional analysts were recruited to code a number of transcripts independently and cross-check our interpretation. We returned to the case study site and presented our tentative findings to a group of our interviewees, as well as to a cross section of managers, all of whom confirmed that our emerging description of team learning was a valid description of their experience. The model for team learning we derived from the petrochemical case study focused on team-learning processes and conditions (Dechant & Marsick, 1991), although we began to speculate, based more on theoretical inference than data, about developmental stages in teams as learning systems (Dechant, Marsick, & Kasl, 1993).

We continued our research with a second case study, this time of a single department within a manufacturing company that we named the Brewster Company. During a five-month period in 1990, we interviewed 23 of 25 members of a data-processing unit who had been reorganized into three self-managed teams. We began our analysis by coding the same transcripts and refreshing our capacity for intercoder agreement on team-learning processes and conditions. We then divided the interviews, recorded in approximately 800 pages of transcripts. Each of us independently coded the interviews

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from a single team and wrote a case analysis of that team's learning. Differences among the three teams were striking. We at first suspected that our inter-coder agreement, in this case disagreement, accounted for differences in the case analyses. A process of cross-checking led us to realize that the differences among teams were real, and that these differences could be characterized by the stages of team learning about which we had been speculating.

Thus the team-learning model was derived partially from the petrochemical data and enhanced by the Brewster data. However, the two cases are not the only source of our interpretation and analysis. Working in a constructivist paradigm, we are aware that as our perspective changes, so does our understanding of team learning. The three of us have worked together on team-learning research for about five years. Our experience helped us to understand the phenomenon we are studying (Kasl, Dechant, & Marsick, 1993), along with insights we have gained as individuals through other research collaborations.

TEAM-LEARNING MODEL

We define team learning as a process through which a group creates knowledge for its members, for itself as a system, and for others. Our model describes team-learning processes, conditions that support learning, and modes of functioning as a learning system.

Team-Learning Processes and Conditions

In an earlier report on our study's findings (Dechant et al., 1993), we portrayed team learning as an interrelated set of processes in which collective thinking and action play a central role.[1] These processes are described in Table 1. Although we differentiate several processes in this thinking-acting interaction, it is important to emphasize that the processes are interdependent, interacting with each other to produce new knowledge. Enabling conditions within the team, which we describe in Table 2,[2] affect its ability to learn.

Modes of Team Learning

Earlier, we posited four evolutionary stages that we believed to be developmental. Our Brewster data demonstrate how teams can and do move back and forth between these stages. Although we still believe that a team's capacity for learning is characterized by a broad developmental arc, we recognize that use of the term *stage* connotes a one-way, stepwise progression that does not capture the complexity of a team's development as a learning system. To suggest nonlinear change, we now choose the term *mode* to refer to the configuration of learning processes and conditions that typify a team's operation as a learning system. We name these modes Fragmented, Pooled, Synergistic, and Continuous.[3]

TABLE 1
Definition of Team-Learning Processes

Learning Process	*Definition*
Framing	Framing is the group's initial perception of an issue, situation, person, or object based on past understanding and present input.
Reframing	Reframing is the process of transforming that perception into a new understanding or frame.
Experimenting	Group action is taken to test hypotheses or moves, or to discover and assess impact.
Crossing boundaries	Individuals seek or give information, views, and ideas through interaction with other individuals or units. Boundaries can be physical, mental, or organizational.
Integrating perspectives	Group members synthesize their divergent views such that apparent conflicts are resolved through dialectical thinking, not compromise or majority rule.

NOTE: All the learning processes are clearly represented in our data and validated through several rounds of asking outsiders to code our transcripts. However, the work of Schön (1983) and Mezirow (1991) strongly influenced our early conceptualization of "framing/reframing" and "experimenting."

TABLE 2
Definition of Team-Learning Conditions

Condition	*Definition*
Appreciation of teamwork	This condition includes the openness of team members to hearing and considering others' ideas. It also reflects the degree to which members value playing a team role and the extent to which they act in ways that help the team build on the synergy of its members.
Individual expression	Reflected in this condition is the extent to which team members have the opportunity to give their input in forming the team's mission and goals, influence the team's operation on an ongoing basis, as well as feel comfortable expressing their objections in team meetings.
Operating principles	This condition reflects the extent to which the team has organized itself for effective and efficient operation; how well the team has established a set of commonly held beliefs, values, purpose, and structure; and how effectively the team has balanced working on tasks with building relationships within the group.

In the Fragmented mode, individuals learn separately, but the group does not learn as a holistic system. Members retain their separate views and are often not committed to working as a group. In the Pooled mode, individuals begin to share information and perspectives in the interest of group efficiency and effectiveness. Sometimes, small clusters of individuals learn together, but the group as an entire unit does not learn; there is not yet an experience of having knowledge that is uniquely the group's own. In the Synergistic mode, members create knowledge mutually. Divergent perspectives are integrated through dialectical processes that create shared meaning schemes.

Simple phrases or metaphors from the team's experience often become code words for more elaborate meanings. Because each individual contributes to the team's knowledge, individuals integrate team knowledge into personal meaning schemes. As a result, knowledge created in a synergistic mode is frequently shared outside the group. Our concept of the Continuous mode describes a team in which synergistic learning becomes habitual. This mode continues to be posited, not data-based, and is not discussed in this article.

We use a metaphor of color to illuminate qualitative differences among the learning modes in how knowledge is used. Imagine a large sheet of paper on which the team's knowledge is painted. In the Fragmented mode, the colors that characterize each individual's knowledge are separate. Bold shapes of red, blue, and yellow are discretely formed and stand out as isolated splotches on the paper. In Pooled learning, the colors are carefully arranged with an eye for pattern and relationships. Perhaps the painting evokes a patchwork quilt or a mosaic. Although individual units of color remain separate and distinct, they are interrelated and complementary. These harmonious patterns contrast with the random splotches of color that represent the Fragmented mode. In Synergistic learning, colors are blended to form completely new ones. Instead of joining individual knowledge and insights into a mosaic of team capacity, individual contributions pour forth to mingle with others, forming new colors that had not been seen before.

Team Learning and Group Dynamics

The literature on group dynamics and team building helps to explain how teams manage tasks and interpersonal relationships (Forsyth, 1990; Otter, 1996; Worchel, Wood, & Simpson, 1992). Capacity for task management is related to the learning condition that we call "operating principles," and interpersonal relationships to the conditions that we call "appreciation of teamwork" and "individual expression." Thus the group dynamics and team-building literature provides a rich description of many conditions that are essential for team learning to occur. Healthy group dynamics is prerequisite for team learning because it provides a fertile ground in which learning can germinate and grow. For example, conflict can occur when team members cross boundaries to gain new perspectives. Before members can learn through the conflict, they need a process for confronting it (operating principles), they need to be open to hearing and considering each other's ideas (appreciation of teamwork), and everyone has to have the opportunity to offer input (individual expression).

However, having healthy group dynamics in place does not guarantee collective learning. More is needed. The team-learning processes that are fostered by supportive conditions include cognitive processes (framing, reframing, integrating perspectives) and two specific, linked behaviors (crossing boundaries, experimenting) that are not fully addressed in the organizational literature. Teams can work their way through the developmental stages of forming, norming, storming, and performing (Tuckman, 1965), yet never challenge dysfunctional assumptions or create new knowledge through strategies such as reframing or perspective integration.

THE BREWSTER COMPANY: AN ILLUSTRATION OF TEAM LEARNING

We now illustrate our team-learning model by telling the stories of three self-managed teams from Brewster Company, the site for our second case study. Pseudonyms are used for both the company and the individuals in these stories.

Brewster Company takes a commodity raw material and converts it into a number of consumer products that are sold in retail markets; it also processes and sells the raw material in several forms to other industries. During the 25 years since its founding, the Brewster Company has grown to encompass nearly 175 plants and offices in North America and Europe with a total of 50,000 employees and annual sales of $6 billion. After years of rapid expansion, growth stalled. The company was faced with rising costs and heated competition. Old ways of working did not seem to work as well anymore.

The story of the data-processing and information systems group that is the focus of this case study begins at the point where the Brewster Company—recognizing its declining profit margins and unrealistic growth expectations—had decided to undergo reforms. Around this time, Norman arrived as a new director of the systems group's parent department, bringing new initiatives that catalyzed discussions between Marie, the systems group manager, and her staff. As a result, Marie suggested that her group split into self-managed teams and turned them loose to organize themselves. This reorganization, which involved matrix management, took three months of extensive discussions. Marie recounted, "It was beginning to be interminable. You can imagine trying to get 25 people to agree on anything."

The Logistics group was the first to declare itself a team. Its members had been working together on the logistics project prior to Marie's tenure as their manager. Ultimately, two additional teams emerged—Production Systems and Distributed Systems. In the next section, we describe important events that characterize each team's development and interpret each team's experience by using the concepts from our team-learning model.

The Production Systems Team Story

Members of the Production Systems team were diverse in technical knowledge and background. Walt, with an operations background, was the most senior in both age and experience. Stephen was an engineer. The remaining members we interviewed—John, Roland, and Nick—were experts in different types of software and hardware. We were unable to interview Lee, the sixth member of the team.

Prior to reorganization, members of this group had been working on a variety of mill-related projects. Following reorganization, they were assembled into a group dedicated to the task of linking process applications in the mills to data processing. At the outset, the team met to organize and establish a mission, holding a series of meetings—daily at first, then biweekly. Members viewed these early sessions as "figuring out what each of us was doing. . . . Everybody brought in their projects, talked about those projects so we understood what was happening and who the customers were."

However, members attained neither a common vision nor a commitment to working collaboratively, a state reflected in members' replies when the interviewer asked, "How does your team work?" For example, Nick answered, "There's a group of us—subgroups if you will—that are working on certain projects, but the team itself is not working on one massive project. . . . I think we're still trying to find a definition of ourselves." John noted, "Everybody was working on their own." The inclination of people to think and act as individuals rather than as members of a team became the bane of the Production Systems team's existence. Here are a few examples of how the team operated on the basis of this mind-set.

My project or yours? The first story is about a disagreement between Lee and Roland. Lee was already working on a project when Marie assigned Roland to work on it also because he had different expertise. It was evident from the start that Lee and Roland saw things differently. Roland's view was that "there was an ownership issue with Lee . . . a perception [that] someone else was taking over her project . . . the two of us being more or less lead analysts." Although we never spoke to Lee, we do know about some of the actions she took to resolve the dispute. She proposed, for example, that scheduling be split up into two areas, one to be managed by her and one to be managed by Roland. The conflict was presented to the Production Systems team for discussion but was not resolved. Shortly thereafter, Roland went out of town, finding upon his return that the team had met and handed over sole ownership for the project to Lee. Roland reported that he preferred to move on to other projects rather than continue the conflict.

The betrayal. The second story is told by John, who was the leader of a project to which Stephen had also been assigned. John felt betrayed when he discovered that Stephen was making individual arrangements to work with clients:

> And a lot of times I would voice everything to Stephen and say, "I had this conversation, this is what's going on." We've had conference calls with Stephen being included, and then after the conference call, a few days later, I find out that Stephen had independent meetings with the vendor over the phone. He's planning trips to go out to their site or planning trips to go to one of our mills. . . . I'm supposedly the leader of the project, and he's handling these things individually without letting me know.

None of my business. The third story illustrates the team's emergent operating norm. The group fell into the habit of meeting only to talk about projects as they arose, prioritizing them according to significance for the business, then assigning them on the basis of members' personal interests. Once this was done, members went off to work as individuals, reporting on progress in subsequent meetings. Roland elaborated, "People felt [at meetings] that if something was being discussed that didn't relate to them directly, they would be better off doing some work than sitting there listening to a status update." Consequently, it was common for members to skip those team

meetings when they had nothing to report, or to get up and leave if they felt what was being reported was not relevant to their immediate work.

Interpretive Discussion: Fragmented Team Learning in Production Systems

The Production Systems group represents the initial or Fragmented mode of team learning. The group as a whole never shared a joint purpose; members seldom worked interactively on projects. They remained individually responsible for project outcomes.

The way this team functioned is typical of systems professionals. Based on expert analysis at the launch of a project, a master plan is created. People are assigned work on the basis of their expertise. By contrast, the Brewster Company's vision for self-managed teams required each individual to take on a wide variety of projects, some of which might fall outside of his or her primary expertise. Tasks were to be rotated and responsibility shared. The Production Systems members never enacted the company's vision for self-managed teams. Walt reported, "Some people are still comfortable with the old mode of 'leave me alone; I don't really need to know what you're doing or to know some of these skills that you have.' "

Team-learning processes, as defined in Table 1, are in their most rudimentary form when teams function in the Fragmented mode. Having failed to reframe their way of thinking about how teams work, members of Production Systems did not cross boundaries or integrate perspectives. The conditions, listed in Table 2, that foster team learning are, for the most part, absent or negative. Because members did not appreciate teamwork, they found themselves without compelling reasons to foster individual expression or to create effective operating principles. Conflict was repressed or suppressed, as illustrated in Roland's reassignment from Lee's project while he was on a field trip. Norms reflected the valuing of the individual over the group, as illustrated in the tacit agreement that it was OK to walk out of a team meeting if a member did not find it relevant to his or her immediate work.

Production Systems never moved beyond the Fragmented mode of team learning. Members learned individually rather than collectively. In contrast, there are a number of incidents from the Distributed Systems team experience that illustrate the Synergistic learning mode. We turn next to this team's story.

The Distributed Systems Team Story

Distributed Systems was the smallest of the three teams. It supported "new related administrative types of projects or systems" in the mills. Its members included software specialists Amy, Peter, and Leroy; hardware specialists Dale and Robert; and John, who moved from Production Systems to Distributed Systems after a departmental reorganization in July 1990. Many on the team attributed its success, in part, to the background of its members. They were young and did not have long histories at Brewster. Three had been there less than a year and no one more than six years. No one had prior managerial experience, although several did talk about prior experiences

in successful teams. Unlike other teams, members were "all working on the san platform, using the same types of systems and the same hardware."

Like Production Systems, when this team began working together, it did not ha a clear idea of a common vision. The group somewhat mechanically followed recon mended steps for getting started, which included regular meetings, specialized trai ing, and shared leadership roles. All team members reported in their interviews that unanticipated crisis in March was the force that helped them coalesce as a real tean

Weathering the crisis. The crisis was a production deadline for a software proje that had been "on the back burner" for about a year and a half. As Leroy, the origin project manager tells it, he was behind schedule, but this only became a problem whe the software, which he demonstrated to the new users in March, had to be up an running by April. When Amy joined Leroy to help prepare the prototype, she realize how much work was needed to meet the April deadline. She called on Peter to hel Hardware specialists Robert and Dale were not as active at this early stage but wer part of team meetings where progress and problems were aired. Everyone "chippe in . . . did what it took." Disagreements were solved reasonably by thinking togethe about different perspectives and options. The team was proud that it was able t complete the project by deadline.

Nonetheless, Amy and Peter found Leroy's behavior erratic during the crisis. H worked creatively but not systematically. Amy observed that he would make "a quic change on just the one piece, and that one piece works, but he never retests" for impa on other parts of the program. To make matters more complicated, Leroy misse deadlines and was tardy or absent from work without adequate notice. Leroy, howeve did not realize others were dissatisfied. For his part, Leroy thought that the organizatio was not sufficiently respectful of family values. The culture of the organizatio demanded that people work late if needed. His wife worked, which left him with "hal an hour or 45 minutes to get home at the end of the day, relieve the babysitter so tha the children weren't left alone."

Giving Leroy feedback. After the crisis, Distributed Systems members heard tha Human Resources (HR) was consulting with Marie about Leroy's performance prob lem. The team had grown close as it worked together to weather the crisis. Pete reported that the team decided to challenge Marie and HR: "I thought if we're reall a team, we should be addressing this issue ourselves. . . . [Marie and HR] were a bi hesitant, but then they said, 'If we're going to do this [self-managed teams], we'r going to have to do it all the way.' "

With help from an HR-sponsored training program that taught team members hov to give each other feedback, the Distributed Systems team focused on Leroy's issue for the better part of a day. Marie, who was present as a silent observer, noted that "the discussed a very delicate performance issue openly, honestly, and it was very obviou that it was hard for them to do, that they were not doing it to pick on this person."

Maturing as a learning team. Distributed Systems thought that the experience o handling these events propelled them to more effective team performance. Rober pointed to another key to the team's successful learning:

> None of us really have [*sic*] a major ego problem about discussing something and either having their [*sic*] mind changed or at least seeing the different opinion and supporting that particular opinion . . . instead of thinking *I* have to do this, it's *we* have to do this. . . . If there's a problem, it's not *you* have to solve it . . . *we have to solve it.* We have to work with other teams as a team. [italics added]

In contrast to the Production Systems team, Distributed Systems valued regular meetings, often daily, for joint planning, problem solving, and for cross-training. Peter comments, "We're trying to get it so that the whole group will be aware of what you're currently doing so that if there would be any need to help out with something that becomes a hot spot, the group" could pitch in. John, who transferred from Production Systems as part of the July reorganization, was not used to working in the open, direct way practiced by his new team. Team members described how they socialized John into being more open and challenging in their team meetings, teasing him when he kept quiet.

Distributed Systems began to flex its team muscles and increasingly challenge others' practices. For example, when Marie requested that all members of the department rate each other so that performance review would be collaborative, members of this team challenged her plan, explaining that they did not know people outside of their team well enough to do the ratings. Marie modified her strategy for performance review. In a second example, in a culture in which the user was considered king, the team began to challenge users' requests if it thought the requested project would not be "value-added."

Interpretive Discussion: Synergistic Team Learning in Distributed Systems

The Distributed Systems group functioned in the Synergistic mode. The team turned crisis into learning—first, by helping Leroy meet his deadline rather than leaving him to sink or swim alone; and then, by giving Leroy difficult feedback even though the immediate crisis had passed. This cycle of action during crisis, followed by reflection during the feedback, enabled the group to reflect together at a deeper level and thus convert short-term solutions into longer term learning about how the team should work together.

This team regularly employed the learning processes outlined in Table 1. Experimentation was frequent and bold, leading to new frames not only for the team but for others. The team challenged taken-for-granted personnel practices in the larger system, as well as the company-wide value that user needs supersede technical judgment. It evolved a norm of active participation that is a hallmark of integrating perspectives in synergistic learning. The team found it easy to cross boundaries by gathering needed information from outside sources as well as from each other. The team also took pride in transporting the team's learning into the larger organization. When others complained that their teams did not function well, Distributed Systems encouraged them to go back to their teams and work things out together, as they in Distributed Systems had learned to do.

The conditions that facilitate team learning, outlined in Table 2, were present and highly favorable in the Distributed Systems group. Norms emphasized the value of teamwork, the importance of each person's participation and opinions. As Amy observed, "Usually, we all listen to each other. I don't think there's a member on the team that we don't hear out, and if we agree, we agree; and if we don't, then we just talk about it."

The Production and Distributed Systems stories illustrate teams that function primarily in a single mode. We now turn to the Logistics team, whose experience illustrates how a team moves back and forth between the modes.

The Logistics Team Story

The Logistics project had a four-year history at the time of the research interviews. Dean, one team member, called the project "a sort of a grand idea" that would have altered fundamentally the working relationships among the mills as well as between the mills and headquarters. Gradually, in response to limits in resources of time and money, the grand idea of the original logistics project vision was scaled back, and the system was reconceptualized from a mainframe to a personal computer (PC).

Not surprisingly, with four years elapsed time and major reconceptualization in the system design, the logistics project experienced significant personnel turnover. When we began our research in June 1990, the Logistics team had eight persons, seven of whom we interviewed. Some had been with the project as long as two years, and the newest member for only a few weeks. The story of the Logistics group is punctuated by four events that provide context for interpreting how the team learned.

Prototype fails. In October 1989, several logistics programmers demonstrated a prototype to representatives from the user community who were pleased with what they saw. As the team later discovered, the demonstration was problematic because it did not include connections to the rest of the system, nor did it include real data. When the logistics team started trying to make those real-world connections, it ran into trouble.

War Room games. After a few months, Marie asked two persons who were not on the team to take a look at the prototype and figure out why it was performing poorly. Stephen, a technical specialist, and Barbara, a trusted assistant, set up "a war room." Barbara explains, "We took a conference room for two weeks and set up the PCs and brought in the software and then brought in two of the people that had worked specifically on this piece." After systematically "trying everything," Stephen and Barbara reported to Marie that the software in the prototype "was totally inappropriate. Just bag it!"

In his interview, Rodney reported that he had tried, shortly after his arrival at Brewster, to tell the team exactly what Stephen and Barbara would discover a full year later—that the software was inadequate for the intended task. Rodney remembers telling the team, " 'That software's not going to work. . . . What you're designing on paper is fine, how it looks on paper is great. When you get to actually programming that software, it ain't going to work.' . . . That's exactly what happened." The team

disregarded his warning. Rodney observed that the person who had selected the software interpreted his assessment as a criticism of her personally rather than of the software.

Black Wednesday. Shortly after the War Room revelation, Marie arranged an all-day meeting with the Logistics team and its users—a meeting that came to be called Black Wednesday. Dean explained, "Basically, we got yelled at by Marie and the users about how frustrated they were, . . . that if we all knuckled down harder and applied ourselves even more, that we could do this." Wynona described it as a critical turning point. "Marie blamed everybody. . . . It was just like a big ranting session. Shot morale right below the floor."

At issue was a series of missed deadlines and the users' increasing frustration. Although Marie believed that the team wasn't working hard enough, the team saw it differently. Kay observed that management, under pressure from users, set deadlines without regard for team members' technical expertise. Dean agreed:

> If we say something was going to take a year and a half, our best estimate, . . . there were several times when the user community and Marie . . . [would] say, "That's unacceptable. So we'll make it shorter." . . . The question I asked at a couple of meetings was, "Just by saying that it's going to take a year now, instead of a year and a half, will that make it actually happen faster?" . . . But I was kind of chastised [by Marie and Barbara] for being antiteam.

After Black Wednesday, some members left the company; others worked on disheartened. Wynona explained, "The focus after that really was more like 'Just do your work.' . . . We just stopped having our weekly meetings with the little team and sharing stuff and trying to move forward." Dean reported that the team

> became the laughingstock of the whole company and the people who weren't involved in it at all, the people who worked on a different floor would walk right in and say, "How's logistics, ha ha ha?" They heard about it, it was like this big disaster.

The world brightens. After Black Wednesday and at Marie's directive, the Logistics team met daily with the users to keep them updated on progress. About the beginning of June, another event catalyzed a brighter view for the team. Rodney explained that he "was getting aggravated" and approached a fellow worker to suggest that the Logistics team "should get together as a team without managers and decide what our problem is and then present it to them as a unified team, because whenever we did it one at a time, it didn't seem to get the message across." A few minutes before a scheduled team meeting, Rodney was talking to Barbara about his idea and "everybody started walking into the room and she started writing it down on a flip chart, . . . just different things that I was naming at random, and the more I brought it out, it got the others . . . to open up." The result was a list of about 25 difficulties with work on the Logistics team.

As they gazed at the list, group members saw that the users had played a major role in the difficulties. Users' lack of clarity and their continuing requests for changes, combined with the team's pattern of accommodating those requests, had stymied the project. The group then created a plan for fixing these problems. When the team reported its analysis to Marie, she backed it up and suggested a meeting with the users.

Kay reported, "This is really the first time that we've challenged the users and said that we need to do this analysis, and we need to take the time to do it right." The result, Kay believed, was an important change for the Logistics team:

> This group is pretty stable and I would say that out of all the groups within the [department], we are the most cohesive at this point. . . . The personality problems have been ironed out and people have gotten either used to each other or learned how to deal with one another.

Kay observed that in the past, when people had problems, they would "just sit there and try to do it by themselves. . . . And now . . . it's much more of a group effort. . . . So usually, the problem gets solved faster, even though there's not any more knowledge."

Interpretive Discussion: Team Learning in Logistics

In telling their stories, Logistics team members reported on experiences that the team had over the last 18 months. During this time, the team seems to have moved from Pooled to Fragmented and Synergistic modes. The team's movement among learning modes facilitates comparison of learning processes and conditions.

The Pooled learning mode. Prior to Black Wednesday, when the Logistics team was functioning in a Pooled learning mode, our data suggest that the reframing process was qualitatively different from the reframing that happened subsequently during synergy. New frames in the Pooled mode were imposed on the team by outside forces. The first example, scaling back the project scope, took place because of budget and resource considerations. The second example is Marie's intervention. When Marie brought in Stephen and Barbara to troubleshoot, she substituted a new problem frame by asking them to find out, "Why doesn't the prototype work?" Marie moved the Logistics team out of the frame in which members had been stuck, "How can we make the prototype software perform more efficiently?"

The Logistics data also help us see that there is a quantitative, not qualitative, difference in the way that perspectives are integrated in the Pooled learning mode versus the Fragmented mode. Learning in both modes is primarily individual, not collective. However, in the Pooled mode, individuals learn more because members are more open in expressing their ideas, sharing information, listening to each other, and seeking help.

During the Pooled mode, team-learning conditions in the Logistics group were favorable. Wynona spoke glowingly about the group's positive experience before Black Wednesday when the team enjoyed its "weekly meetings . . . [when we were] sharing stuff and trying to move forward." Although team members seemed to appreciate teamwork and developed some effective operating principles, concern for building relationships was probably unattended. The data include several examples of interpersonal discord that went unresolved, like the example mentioned by Rodney when he described how his attempt to redirect the project away from the ill-fated software was interpreted as personal criticism.

The Fragmented learning mode. After Black Wednesday, the team disintegrated into a Fragmented mode where learning processes and conditions closely resemble those in the Production Systems story. The team could neither think nor act together. Individuals adopted the attitude summed up by Wynona, "Just do your work." Disheartened by a sense of being abandoned by their manager and ridiculed in the larger organization, the team members saw no reason to appreciate teamwork, to express personal views, or to function according to the operating principles that the team had crafted in its earlier work.

Although there is a resemblance here to the Production Systems story, similarities are surface. The lack of cohesion in Production Systems grew from individualistic values that were never reframed. In contrast, lack of cohesion in the Logistics team was a reaction to an outside assault that left members feeling devastated and demoralized.

The Synergistic learning mode. In the June meeting, the group reframed its understanding of the problem and came to realize that the users had been a primary force in stymieing the project. The result, Kay reports, was a new level of group cohesion and creative interdependence. Our analysis of the June meeting helps us understand why breakthrough thinking is associated with synergistic learning. In the Fragmented and Pooled modes, individual team members integrate perspectives to craft problem solutions. Although teams in the Synergistic learning mode continue this process—and probably do so more efficiently and more often—there is a qualitative leap in the team's ability to create knowledge mutually. This new capacity is for synchronous insight, the moment of a group "aha!" For example, as the Logistics team members absorbed the meaning of the lists that Barbara had written on flipchart paper, the group experienced an insight that was holistic and mutual. As a team, the group realized that the users, not they, were the problem.

CONCLUSIONS AND OBSERVATIONS

In this section, we draw some conclusions about how the conditions and learning processes change as the team adopts different modes of team learning. We then offer our observations about the roles of time and human dynamics.

Development of Team-Learning Conditions That Support Team-Learning Processes

Team learning is a dynamic process in which both learning processes and the conditions that support them change qualitatively as the team adopts Fragmented, Pooled, or Synergistic modes of learning. Table 3 summarizes these differences.[4]

Team-learning conditions. The first condition, appreciation of teamwork, strongly influences the remaining two. The meaning that individuals attach to teams is the context for both individual expression and operating principles. In the Fragmented mode, the focus is on meeting the needs and enhancing the value of the individual contributor. In the Pooled mode, members continually balance individual needs against the group's need. In the Synergistic mode, members have acquired a deep understanding of the creative potential in teams.

TABLE 3
Team-Learning Conditions and Processes at Each Team-Learning Stage

Team-Learning Conditions	*Team-Learning Processes*
Fragmented learning stage	
Teamwork is perceived as unnecessary to task accomplishment; little interest is taken in developing as a team.	Team members retain initial frames.
Members show impatience in listening to others' views and do not value interdependence.	Little or no boundary crossing occurs except to seek information that meets individual needs.
Group-operating principles support individual, separately conceived, pieces of the work; little attention is paid to relationships.	Experimentation occurs at the individual rather than group level.
	Perspective integration is limited because members do not willingly attend meetings, are not interested in others' views, and are not open to reframing.
Pooled learning stage	
Teams are valued both as a context for individual learning and also as an efficient, effective mechanism for coordinating complex tasks.	Reframing occurs, but our data suggest it is externally imposed or catalyzed.
Members are open to hearing others' views to reach task objectives.	Members cross boundaries to share information when they see a clear relationship to task accomplishment.
Operating principles allow negotiation of differences and interpersonal conflict to achieve the goal. Members may repress comments irrelevant to the goal.	Experimentation is, for the most part, focused on individual learning.
	Perspective integration occurs sometimes but is impeded by suppression of interpersonal conflict.
Synergistic learning stage	
Teamwork is valued as an enriching modus operandi that can lead to breakthrough thinking.	Members reframe views individually and collectively based on internal and external insights.
Ideas are freely and openly expressed; members see the potential payoff of all contributions, even when they might at first seem irrelevant.	The team becomes boundary-less as information is sought and given freely.
	Experimentation is frequent and bold; it is both individual and collective.
Operating principles go beyond task accomplishment to include attention to relationships and to each other's growth, learning, and development.	Members seek out views that may be disconfirming or challenging. The team acquires collective memories that enable sudden leaps of insight.

Team-learning processes. A team evolving toward a Synergistic learning mode reframes more frequently and develops capacity to be self-directing in its reframing. Reframing frequently sets off a chain reaction where one new frame induces another, leading a team to challenge deeply held assumptions. For example, when the Distributed Systems team reframed itself as self-managing in relation to Leroy's performance, its action challenged both Marie and HR to rethink personnel management practices.

To reframe, team members must explore new ideas and perspectives, which can originate from within or outside the group. Whether and how boundaries are crossed depends on what team members perceive to be relevant. In Fragmented learning, only information or ideas that meet individual needs are sought, as in the example of members of the Production Systems team who developed a norm of walking out of meetings when the topic did not relate directly to an individual's current project. Stephen went even further, by actively withholding information from John, the project leader. In Pooled learning, boundaries are crossed to give and get ideas that contribute to what the team has defined as its task. In Synergistic learning, team members do not construct artificial boundaries between the issues they tackle within the team and their modus operandi elsewhere in the organization, a phenomenon that has been described as the "boundary-less quality" of team learning (Bray, 1995; Gerdau, 1995; Smith, 1995; Yorks, 1995; Zelman, 1995).

> Each time the group convenes, each individual brings new experiences and insights accrued since the group's last meeting. Each time the group adjourns, individuals go into the world with new insights and experiences. . . . [The] group represents a dynamic, ever-changing intersection of individuals' perspectives in which boundaries between personal and group knowledge become blurred. (Group for Collaborative Inquiry & thINQ, 1994, pp. 58-59)

Integrating perspectives involves much more than being willing to listen to the viewpoints of others; it ultimately involves enabling others to express their views and actively seeking out views that are disconfirming or challenging. In Synergistic learning, members acquire a deep capacity to enter into the mind-set of others on the team.

The Role of Time in Team Learning

In addition to the changes in learning conditions and processes that are outlined in Table 3, our analysis provides insight into the role of time in team learning. Gersick (1989) recently drew attention to the importance of time when she found that for teams to achieve their goals, members had to reach a point of relatively smooth, cohesive operation about halfway through the time frame they had allotted to their task. This was so whether groups were to achieve their tasks within days, months, or longer. In this study, we found that time is perceived differently in the three learning modes and that changes in perception influence the kind of team learning that is possible. In the Fragmented and Pooled modes, time is seen as a resource, and in the Synergistic mode, time is understood to be a dimension of learning.

In Fragmented learning, time is an individual resource to be conserved and used to advance individual needs and agendas, as was the case in Production Systems. In Pooled learning, team members begin to think of time as belonging to the group and are concerned about conserving and investing time wisely. Team members are sometimes willing to add to the team's resource by donating time that might otherwise be spent on individual tasks. For example, the Distributed Systems team, in its crash effort to bring Leroy's project in under deadline, made "extra" time by working long hours and pushing aside other responsibilities.

When time is perceived as a resource that can be expanded in order to meet a team's needs, there is also a potential danger. As Dean pointed out in the context of his comments about decision making, "[management] can't just arbitrarily set a date and expect that the project will come in on time . . . as if we're not working hard enough and by putting a little extra effort in, that's all that's required." In addition to being a resource, time can also be seen as a dimension of learning. As such, time functions in three ways—an ingredient of learning, as a context for incubation, and as a context for shared history.

Time is an ingredient of learning when members take time to explore ideas for which relevance is not immediately apparent. These "time-outs" often lead to the generative thinking that typifies synergistic learning. For example, in its June meeting the Logistics team allowed itself to follow the activity begun spontaneously by Rodney and Barbara. By abandoning the planned agenda and indulging in associative thinking, the team accomplished an insight and a plan for dealing with the users that launched it into a new stage of cohesion. Although we do not have examples in the Brewster data to support this claim, we have learned in other contexts that as synergistic learning becomes habitual, teams learn to choose strategic moments to suspend their concern with time (ARL™ Inquiry, 1995; Group for Collaborative Inquiry, 1991; Kasl et al., 1993).

The second way in which time serves as a dimension of learning is as an incubator. Learning proceeds in cycles of reflection and action that often cannot be accelerated. Incubation is a context in which intuitive knowing finds its way into the learning mix.

Third, time is a dimension of learning when it is the context for shared history. When teams share the joys and pride of achievement, as typified by the Distributed Systems team experience, and moments of pain, as typified by Black Wednesday for the Logistics team, they develop shared-meaning schemes. Shared-meaning schemes enhance the team's capacity for sudden insight, as in the case of the Logistics team's June meeting. "The 'aha' of synchronous group response" is composed of an intuitive recognition that a solution to a problem has been found as well as a capacity to articulate the intuitive knowing (thINQ, 1994, pp. 354-355). Shared history also creates the store of interpersonal interactions that contribute to team members' capacity for deep understanding of the other's perspective.

Further Research on the Human Dynamics of Team Learning

The team-learning model derived from our research focuses on rational, cognitive learning processes, but not on the affective interactions that influence a group's capacity to execute these processes. Many of the factors that govern these affective interactions are described in the group dynamics literature. We argued earlier that

healthy group dynamics is a prerequisite for collective learning, although not sufficient as a guarantee. Here, we identify elements in this literature—interpersonal conflict, power, ego, and emotion—that may have special relevance to team learning and call for further research about their role.[5] We suspect that, as with the role of time, team members' perceptions about the nature of these elements have an important effect on the team's capacity to learn. Because our case study did not focus on these factors, our data are limited, but suggestive.

First, we perceive that teams in the synergistic learning mode may reframe their understanding of interpersonal conflict. The group dynamics literature (Forsyth, 1990) teaches us that effective groups evolve from strategies for avoiding conflict to strategies for confronting it constructively. Teams that learn must evolve similarly, but they do more. They recognize that conflict and the differences that produce it can be valuable resources for generative learning, as happened in the handling of Leroy's performance problems. A second issue, related to conflict and reflected in our data, is the management of power dynamics. Brooks (1994) examined power in some detail in her research on team learning.

Third, research could better illuminate the interaction between individual ego and the team's need for healthy interdependence. In Western culture, success has been framed as an individual accomplishment. Recently, educational and business institutions have begun to foster collaborative learning and management but must counteract deeply held cultural values of individualism. As Brooks (1994) observed,

> We frequently view . . . our success as having been won in competition with others. . . . Thus, the shift to working in teams in many U.S. work organizations represents not just a structural change in how work is done, but a significant historical and cultural shift. (p. 231)

Logistics team member Rodney echoes Brooks: "You're trained from school, from grade school to high school to college, for that matter, to work as an individual and to excel as an individual, and when you go into a team effort, all of a sudden there's no more competition." In Synergistic learning, members acquire a team identity. They reframe ego as an individual characteristic to ego as a group attribute, as Robert describes regarding the Distributed Systems team's success: "None of us really have [*sic*] a major ego problem." Members of the group learned a new way of team thinking.

Finally, socioemotional roles have been recognized in the group dynamics literature as important for effective group functioning (Forsyth, 1990). More recently, the adult learning literature has blossomed with additional insights (Belenky, Clinchy, Goldberger, & Tarule, 1986; Boud, Cohen, & Walker, 1993; Loughlin, 1993). Yet emotions are anathema in the workplace. Research can explore how work teams can reframe emotion as a resource for team learning.

Over the course of time, we have changed our awareness about the dynamic character of this model. Although we always postulated that the team evolved through stages of maturity in its learning capacity, in this analysis we clarify how the team-learning processes and conditions change qualitatively to create distinct modes of learning. Our analysis of the role of time is also an extension of our work.

NOTES

1. In an empirical study of four teams in the research-and-development unit of a large high-technology manufacturing company, Brooks (1994) derived similar concepts to describe collective team learning from her data.

2. Conditions are derived empirically. Gail Robinson worked with us to create Likert-type items that represented conditions identified from open coding of the petrochemical interview data. The resulting survey was administered to a large sample of petrochemical company employees and to University of Connecticut MBA students. Factor analysis created clusters that equate to the learning conditions. Robinson tested construct validity with a team-effectiveness instrument used in a Fortune 500 company involved in extensive team building. A diagnostic instrument, the Team Learning Survey, was created to measure the conditions. The manual for this instrument provides statistics about the factor analysis and the validity test (Dechant & Marsick, 1993).

3. In our earlier descriptions of the developmental stages of team learning, we used different labels. The words—*contained, collected, constructed*—are now replaced by *fragmented, pooled,* and *synergistic*. The conceptualization of the stages has also evolved, but the major constructs are largely unchanged.

4. A preliminary conceptualization of changes in team-learning processes can be found in Marsick, Dechant, and Kasl (1991).

5. Team learning as a developmental process should also be studied in real time and over time, through longitudinal design. Our team-learning model is based on two case studies. Data from a variety of companies and teams are needed to understand the way in which our case study contexts affected the model we created.

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Emotion in Organizations

The Case of English University Business School Academics

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It is an open secret that one's place of work can be, and indeed often is, a hotbed of intrigue, loyalty, betrayal, back-scratching, back-stabbing, pain, and laughter. In short, work is a home away from home. The article uses aspects of the scientific method to reveal the submerged variable of emotion in an organization. It does not put forward suggestions of how emotion should or could be investigated more fruitfully, nor does it pretend to have produced knowledge of theoretical significance. It does not even tell academics anything that they might not otherwise have noticed about the emotional aspects of their academic lives. Nevertheless, the results of this semiscientific (or pseudoscientific) investigation may strike a cord in its academic readers, who will smile or even chuckle as they recognize themselves in what they read. The finest comedy works because it is serious at its core. This article may amuse, but the kernel of what it has to say is in no way amusing.

At first glance, we might consider that the operation of a university business school (UBS) has little to do with emotions. After all, the fundamental purpose of UBS faculty is to teach and research issues concerning organizations and organizing, managers and managing, business people and business processes. UBS academics are not employed to express their emotions but to pursue the overt purpose of the UBS in acquiring and

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