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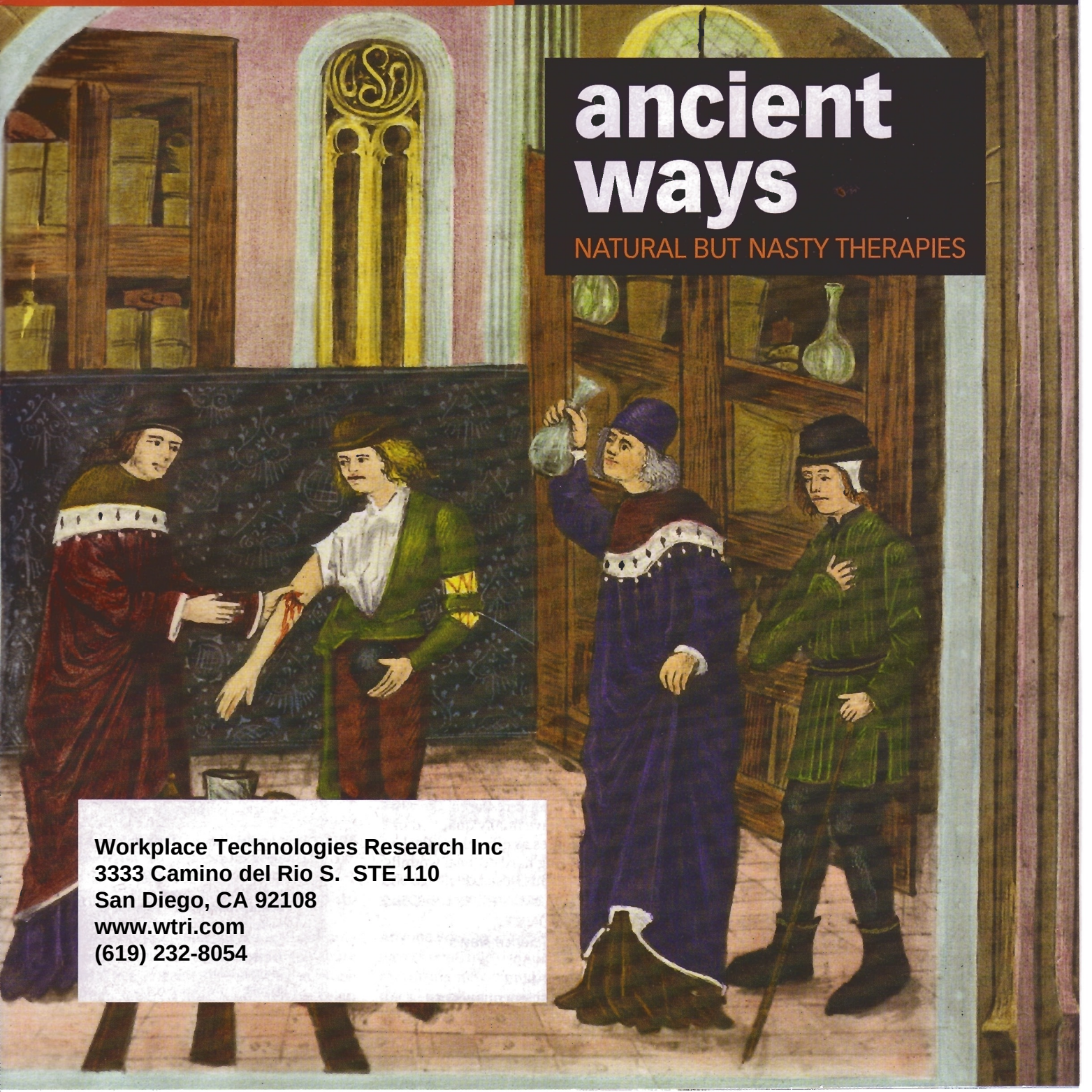

ancient ways

NATURAL BUT NASTY THERAPIES

REWORKING INTUITION

Business simulations spark rapid workplace renovations

BY BRUCE BOWER

About 3 years ago, psychologist Lia DiBello surmounted a business challenge that would have stumped Donald Trump. Armed with an unconventional theory of how people learn, DiBello and her colleagues coaxed some key employees at three financially endangered companies to confront their organizational failures and to devise new, successful operations. What's more, these transformations of workplace thinking and culture unfolded in a matter of just months after DiBello's team ran mere 2-day exercises at each site.

The National Science Foundation partially underwrote this effort as part of a larger attempt to encourage research on how learning occurs in organizations.

All three outfits in DiBello's project appeared in dire need of reversals of fortune. A biotechnology company that made devices for treating neurovascular disease had lost millions of dollars in its first 9 years. When a larger firm acquired this money loser, the new owners spent more than $300,000 on consultants who failed to reverse the financial freefall. Reluctant senior-staff members attended DiBello's training sessions as a last resort.

Also participating in the exercise was a foundry that makes industrial products. It had teetered on the edge of financial ruin for years. Although the cost of each item made at the foundry exceeded the price at which it was sold, no one in the company had realized it. Plant managers, faced with a bank debt of $8 million, desperately sought DiBello's aid.

Rounding out the group was a company that manufactures fuel for nuclear power plants that had consistently lost money for a half century. Different departments of the company operated in stubborn isolation. For instance, the maintenance and production divisions refused to coordinate equipment repairs with fuel-making schedules, so orders were usually shipped late. Personal animosities festered among top staff members.

Within months of completing intensive exercises designed by DiBello's team, each company showed dramatic signs of financial recovery. Two years after the intervention, each firm was turning a healthy profit. Managers and employees told DiBello that they their participation in the brief exercises had sparked a rapid overhaul of what were potentially fatal business practices.

Many elaborate and pricey programs attempt to foster better management by senior staff or train workers to deal with new technologies. Most of these efforts focus on classroom instruction, memorization of new material, and exhortations to think "outside the box." Participants typically nod their heads, do what they're told in class, and then return to their old ways of working, says J.C. Spender, a visiting professor at the Open University Business School in Milton Keynes, England, who studies how managers make decisions.

DiBello, who heads Workforce Transformation Research and Innovation, a private company in San Diego, takes a different instructional approach. She designs fast-paced, stressful simulation exercises in which small groups must assemble products, ship them to customers, and turn a profit, at least as determined by computer software that tracks each mock venture.

In line with psychological positions known as activity theory and situated cognition, DiBello holds that what experienced workers understand about their jobs grows out of their daily goals, such as making products on time or quickly satisfying a few major clients' demands. If a business' goals change, then employees must reorganize what they have come to know intuitively about their jobs, or that company won't succeed.

This type of learning requires a hands-on challenge that mirrors workplace demands and enables employees to tap into their collective knowledge, in DiBello's view.

Three decades of learning research coincide with this approach, says psychologist Lauren Resnick of the University of Pittsburgh. Evidence indicates that what a person already knows about a subject or an activity lays a foundation for new learning and achieving expertise in that area, she adds. Data also show that knowledge is best cultivated through active participation in relevant tasks, not through memorization or drills.

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>
> — LIA DIBELLO, CITY UNIVERSITY OF NEW YORK

One line of research, for example, finds that children who adopt multiple problem-solving strategies on math tasks, including wrong strategies, usually learn more than do peers who start out with only one or two strategies, even if they're correct ones (*SN: 3/17/01, p. 172*). Kids' mental strategies typically draw on their intuitive knowledge about numbers and other topics.

Over the past decade, staff members at nearly 30 firms of various sizes have negotiated simulated enterprises devised by DiBello, who is affiliated with the City University of New York, and her coworkers. Participants routinely begin as vocal skeptics of the approach and end up using the experience as a framework to revitalize their workplaces. In the three-firm project, the "financial benefits [of the simulation exercises] were shockingly great for each company," DiBello says. "We think we're tapping into basic principles of cognitive acceleration and learning."

Research papers on this project are in preparation.

MEDICAL RESCUE The resuscitated medical-device company offers a vivid illustration of how DiBello's simulation exercises work.

In initial interviews, her team noticed that company personnel held diverse views about the business' mission. Senior staff regarded the enterprise mainly as a laboratory for research and development. They paid little attention to its commercial side.

The company made nearly 150 products. Many sold poorly yet were still in production and had to be bought back from distributors who couldn't sell them.

Moreover, the firm's departments of marketing, production, and research and development failed to strategize together. The company nearly went out of business after badly designed clinical trials for one new medical device had resulted in failure to gain Food and Drug Administration approval for the product.

DiBello's group developed an exercise in which 20 top staff members had to run a simulated version of their company. Participants tried to achieve goals set by the researchers. These consisted of getting the research-and-development division to pay for itself by focusing on products with good sales potential, shipping customer orders on time, eliminating products that didn't sell well or were frequently returned, designing clinical trials for two new products, and completing the FDA-approval process for those products within the simulated equivalent of 15 months.

Staff assembled in a large meeting room, openly complaining that the exercise would never work. Resistance of this sort, which reflects an allegiance to old ways of working, actually paves the way for people to learn new approaches, in DiBello's view.

Participants split into groups representing divisions of finance, production, research and development, marketing, and sales. Group assignments weren't based on people's actual jobs.

Research-and-development employees used materials provided by the researchers and a hollow, wooden model of a person's body to develop and test possible new products to treat aneurysms.

Computer software developed by DiBello's group over the past decade and modified for this particular setting issued customer orders for an existing product that had to be assembled and shipped. The computer also provided regular feedback on each division's financial gains and losses, customer responses to products, and the status of clinical trials.

Each 20 minutes of this exercise represented a month of actual time. In this pressurized setting, separate divisions worked as fast as possible in blissful ignorance of what the others were doing.

CHANGE MAKERS — Foundry workers fill a mold after revising their operation to meet standards developed in a simulation exercise.

Familiar results ensued. Late orders piled up. Customers canceled orders. A new product was recalled. The company lost about $2.6 million in 15 simulated months.

Participants returned the next morning and were given an hour to examine financial and performance data from the previous day. In that time, they had to figure out how to do their jobs better.

A series of innovations quickly emerged. Workers set up easels at the front of the room to track production. Marketing employees talked with R&D workers about the needs of the company's surgeon customers. On a sheet of paper posted on a wall, R&D tracked progress in reaching specific FDA milestones. Different divisions met jointly every 90 simulated days to examine data on the company's overall performance.

By the end of the second day's session, the simulated medical-device company had achieved the goals set by DiBello's team.

When the researchers returned 9 months later, the company had developed several new products with considerable sales potential that were expected to gain FDA approval in no more than 15 months. The value of the firm's stock had more than doubled.

Moreover, staff members had posted charts and graphs of production schedules and performance. Members of different divisions convened for weekly performance meetings.

"Their own knowledge had become available to them in new ways," DiBello says. "They no longer reverted to their traditional ways of doing things in stressful situations."

The chief executive officer told DiBello that the simulation exercise had made the firm resilient to bad breaks. For example, when the company lost exclusive rights to a profitable product in a lawsuit with a competitor, its staff developed a substitute product, obtained FDA approval, and began marketing the product to customers in a 90-day span.

As the firm's CEO told DiBello, employees "set a nonnegotiable goal and then organized to achieve it," just as they had done in the simulation exercise.

THOUGHTFUL ACTIONS The other two firms followed a similar pattern. On the first day of training, participants resorted to familiar ways of operating. Then, the staff reassessed their ingrained beliefs and practices.

At the foundry, managers and floor workers—who make molds in which metal items such as engine parts are cast—operated a pretend business in which they manufactured small molds and had to fill a series of customer orders on time.

After the first day, the participants realized that they needed to reduce the amount of scrap generated during mold making. They then developed a way to monitor scrap output and to identify inefficient molds. Back at work, personnel set up an area on the shop floor to test new ideas for improving molds. As profits increased over the next year, floor workers—none with more than a high school education—formed a group to purchase the foundry, which they now operate successfully.

Spender asserts that a person's identity revolves around activities at the core of his or her life, such as making molds in a foundry. When managers of a failing firm are forced to institute changes in employees' self-defining behaviors—say, by requiring shop-floor workers to learn to use a computer system to track inventory—these directives naturally elicit resistance.

DiBello's simulation exercises prod workers to redefine themselves by inventing successful new practices, Spender says.

Psychologist Gary Klein regards the simulated failure that occurs on the first day of DiBello's sessions as critical to their success. "The failure is carefully designed to promote cognitive change," he says.

Klein runs Klein Associates in Dayton, Ohio, which works with government and private organizations to improve their business practices. He and his coworkers are now beginning to incorporate simulation exercises into their efforts.

DiBello's approach fits into an emerging movement in on-the-job training, remarks James C. Spohrer, director of IBM Almaden Services Research in San Jose, Calif. Large corporations are increasingly incorporating simulation exercises into the actual work process, Spohrer says. For example, some corporations use computerized game systems to simulate work environments, where several teams working on a common project from disparate locations can jointly test their ideas and coordinate their efforts.

In work under way with other troubled companies, DiBello plans to explore how successful simulation exercises transform the workplace. It's not clear whether advances at, say, the medical-device company rested on individuals reevaluating how to perform their respective jobs or on the formation of information-sharing teams that made it easier for each member to contribute.

A simulation exercise also provokes a range of ultimately constructive feelings in participants. "This is usually a very bonding experience," DiBello says. At the nuclear-fuel facility, formerly feuding managers began to consult one another in the months after working in a simulated version of their company, she reports.

DiBello concludes, "The world actually looks different when you learn to think about it in a fundamentally different way." ■

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