Business principles for basic researchers

Leadership, management, and marketing sound like skills for CEOs, not scientists. Running a research group requires MBA-type strengths, though, such as budgeting, mediating, and negotiating. Some universities now offer workshops on business principles for scientists and engineers, lending credence to the idea that mixing business with science is a path to success. By Chris Tachibana

Imagine meeting the director of your research institute on the way to the lab. She asks about your work. Do you give her a vague description, overwhelm her with details, or intrigue her with a brief, compelling science story? Rainer Mauersberger, coordinator of the International Max Planck Research School for Astronomy and Astrophysics in Bonn, Germany, uses this scenario to show how a business-school device—an “elevator speech”—benefits researchers. Although Mauersberger and many other scientists apply business principles to their work, some doubt that a field associated with sales and profits has anything to offer them. This article presents the case for business training for science faculty.

Business skills, says Lucila Ohno-Machado, are essential for academic scientists who want to advance their careers. She speaks from experience, as chair of the Department of Biomedical Informatics at the University of California, San Diego. Although Ohno-Machado holds a Master of Business Administration (MBA) degree from the University of São Paulo, Brazil, she has never worked in business. “I wanted to do health informatics,” she explains, “and my university had an MBA track in informatics systems.” Ohno-Machado says her business training helped her expand her research group. Specifically, she says, it taught her the basics of “hiring people, assembling a good team, measuring our performance, and planning for expenses.” It was also useful for the next step in her career.

“Scientists are selected to be a chair or division leader based on accomplishments in their field,” says Ohno-Machado, “but these are management positions. Scientists in these roles need to know about things like accounting, resource management, and organizational development.” Ohno-Machado urges experienced researchers to learn management skills and to take on executive academic positions; she particularly encourages women and minorities to do so. “That is the only way to have more diverse people in leadership,” she says.

Role playing: Not just for actors and businesspeople

Even faculty who aren’t planning administrative careers want to be effective leaders and lab managers (see Science Careers: bit.ly/297HXXx). Anyone who has witnessed a dispute or personality clash at work understands how training in mediation, negotiation, and conflict resolution can save time and energy. Increasingly, opportunities to learn these skills are available right on campus. One example is a leadership workshop for faculty that originated at the Massachusetts Institute of Technology (MIT) in Boston, Massachusetts. Developed in 2002 by Charles Leiserson, professor of computer science and engineering, and Chuck McVinney, management consultant, the workshop has trained nearly 1,000 people at MIT and elsewhere.

During a sabbatical at an information technology firm in 1999, Leiserson saw how a brief, intense workshop turned what he calls a dysfunctional group of engineers into a well-oiled machine. Back at MIT, Leiserson proposed similar training for professors, saying to administrators, “I’ve seen how training can prevent human-level mistakes that cause untoward fallout. Let me see if I can adapt these business management materials for academic settings.” MIT supported his time to develop the workshop. Rather than project management, though, Leiserson says the focus of the training is on “conspicuous weaknesses for many scientists— cont.>
FOCUS ON CAREERS

Faculty

Communication, relationships, and building a work culture. The course builds skills in these areas using a method that seems ill-suited to engineers and scientists: role-playing. The technique works because it is tailored for scientists. The role-playing situations address real-life issues such as disputes over first authorship or students with low motivation. Participants get comfortable with their roles using method-acting activities in which they talk about the emotions that people in those situations might experience. This approach resembles courses from the Alan Alda Center for Communicating Science, located at Stony Brook University. The center’s workshops use improvisational theater exercises to help scientists be genuine, clear, and responsive when talking about their work. Leiserson says that effective communication is an important overall goal of his workshop, and is not just for resolving disagreements. The practical benefits of good communication are enormous, he says: “If you can persuasively convey the mission statement of your research, you can convince administrators, colleagues, the public, and granting agencies about the impact of your work.”

Faculty naturally worry about spending time on this type of training. But workshop participants tell Leiserson that minimizing misunderstandings in their research groups actually saves time. The MIT course also works because of its academic roots. Rather than impose a management system on participants, the workshops give faculty autonomy in finding their own effective leadership style. Leiserson and McVINney use the engineering principle of iterative improvement—which involves repeated testing, analysis, and refinement—to continually develop the course.

Marketing? Really?

Effective leadership, team management, and communication have clear applications in basic research. But some areas, like marketing, seem outside the realm of academic science. Nonetheless, a few years ago, Mauersberger took a two-day workshop from Marc Kuchner, astrophysicist at NASA’s Goddard Space Flight Center and author of Marketing for Scientists: How to Shine in Tough Times. At the time, Mauersberger was working at the European Southern Observatory in Santiago, Chile. He says, “My colleagues and I thought, ‘We’re nerds, we don’t need to learn marketing. We do good science and it sells itself.’” But he had been thinking about why so many scientists with amazing results give lackluster presentations. “People make slides with bullet points,” he says. “The audience reads the points faster than the speaker talks, then turn to their smartphones and read their email.” Kuchner’s workshop, it turned out, included a section on using marketing ideas to create inspiring scientific presentations.

The main lesson Mauersberger got from the workshop, he says, was to structure a talk like a movie: Create a line of tension from the beginning to the end. Describe the state of the field, then build drama by revealing unsolved questions. Provide methods and data—the meat of your story—but move briskly, and consider peoples’ attention spans. End by presenting the resolution to the foreshadowed drama and showing how you’ve changed the field. And don’t pack too much into your talk. Most presentations, especially at a long conference, are forgotten.

If attendees remember two or three main messages, Mauersberger says, it’s a success.

Structuring a research talk as a film might sound glib, but presenters should do so out of courtesy to their audience, Mauersberger advises. “If I give a boring talk,” he explains, “I’ve been impolite to my colleagues, taking their time and energy.” Although no scientist wants to be considered a salesperson, he says, it’s noticeable that brilliant scientists and energy. “Although no scientist wants to be considered a salesperson, he says, it’s noticeable that brilliant scientists can also convince people about their ideas are the ones who attain influential positions and excel in them.

Hit the (virtual) business books

For researchers at institutions that don’t offer workshops, self-study is an option. Jeffrey Engler was a virology researcher for 22 years before becoming associate dean of the University of Alabama at Birmingham Graduate School. He learned business principles that apply to academic settings by taking massive open online courses (MOOCs). “I started taking MOOCs,” he says, “because my grad-school duties include overseeing professional development—helping students gain skills for careers in academics, industry, business, or policy. I took MOOCs to find out if they provide useful, specific training for students.” Engler chose topics helpful for students and postdocs, such as education, decision-making, and innovation, but found himself applying the content, sometimes in unanticipated ways. “A course on emotional intelligence helped me think through what good mentors do,” he says. “It’s helped me talk with students about their goals, aspirations, and values as they choose career paths.”

Although Engler says MOOCs vary in their usefulness, he recommends that faculty try them. They can take as little time as one evening a week, he adds. He also encourages openness-mindedness about how the lessons apply to academic environments. “Go to Coursera or edX and try a course you think will be fun,” he says. “Try to finish it, too.”

Faculty members might worry that their institution won’t recognize the value of training outside their discipline. Engler understands and would like to see academic culture change to reward more diverse training. “Skills in finance, management, and teaching especially benefit team-based interdisciplinary science,” he says. Cultural changes could come with the next generation of scientists. Engler says that students and postdocs he talks with are excited about combining research with teaching, mentoring, and business.

A little savvy goes a long way

Young biomedical researchers were the target audience for a pilot training module at Vanderbilt University titled “Business and Management Principles for Scientists.” The module was supported by the Burroughs Wellcome Fund with...
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—Sarah Baum

Kathy Gould, professor of cell and developmental biology at Vanderbilt School of Medicine, as principal investigator. Development, oversight, and teaching were coordinated by

Kim Petrie, assistant professor of medical education and administration, Rob Carnahan, director of the Antibody and Protein Resource core facility and associate professor of cancer biology, and Joe Rando, associate professor of managerial studies.

One-quarter of the students and postdocs who participated in the training were planning academic careers. For these scientists, the module offered valuable tools, particularly for their first startup year. “Faculty are generally given lab space and possibly a million-dollar budget, but no background in how to manage it,” Carnahan says. “Most people get up to speed on their own but if they don’t, the lab suffers.”

Gain the know-how to launch a basic research program is exactly why Sarah Baum, postdoctoral fellow at the Vanderbilt Brain Institute, took the training module. “I have friends who just got academic jobs, and they’re making budgets for startup packages,” she says. “The training helped me think about the financial aspects of a lab and how to balance spending between purchases and people.” Baum has been thinking about the management style she wants for her own lab, so she appreciated learning about building and leading a team. “The way your team works and the people you attract to it are vital to your research productivity,” she says, “so I liked learning about hiring people and thinking about what kind of team member they will be. I want a group that’s not just smart people but smart people who work well together.”

Reid Bolus, Vanderbilt University molecular physiology and biophysics graduate student, was interested in the financial sections of the module. Conversations with his advisor made him realize the amount of budgeting and planning required to run a lab. Like Baum, Bolus says the sessions on management were valuable. “We learned what it takes to be a good leader and motivator,” he says, “and that your job is to set the framework and culture of the lab. You have to know how to communicate, listen, accept criticism, and manage people with different personalities.”

Baum says that friends at other institutions who are also going into academia are eager to hear what she learned. Based on her experience and their interest, she recommends that universities offer business training to early career scientists. Exposure to business ideas gives trainees specific skills for starting and running a lab, says Gould, but also gives them more confidence and a greater sense of purpose about their work. “One of my students took the module,” she said, “and at two hours a week, it didn’t affect her lab work. It kept her motivated, and she enjoyed it and got a lot out of it.”

Time Management 101

To be successful, a business training course for scientists must directly demonstrate its value to research. Like Leiserson and McVinney’s MIT workshop, the Vanderbilt module was tailored for scientists. The sessions on business principles came first, but the rest of the course was practical, an approach enthusiastically recommended by both Baum and Bolus. In the practical sessions, teams of participants developed business-based solutions to real-world challenges from the university’s core facilities. Carnahan offers an example: “Faculty members often have to decide about investing in new technology,” he says. “To do that, it would help to have data-driven decision-making processes, like decision trees about buying new equipment.”

Finally, to promote the module among the faculty, Gould and Petrie applied marketing methods adapted for their audience of academic scientists. They built relationships and communicated a specific message about how the module could help early career scientists. “Faculty are data-driven,” says Gould, “so I went to 19 faculty meetings last year to talk about the data on jobs for our trainees and how this module could help them.”

Even with endorsements from established and early career researchers, science faculty might be reluctant to commit their own or their trainees’ time to a business workshop. These researchers can start small. The university’s technology transfer office or business and management school might have seminars or networking opportunities for an initial exposure to business ideas. For those who still hesitate about getting business skills to improve research productivity, Leiserson offers advice he learned from his father: “If you hate doing something, get good at it,” he says. “Then you don’t have to spend so much time at it. Engineering professors love the technical part of their job, so we tell them, ‘Get good at management and work relationships and you’ll have more time for being a nerd.’”

Chris Tachibana is a science writer based in Seattle, USA, and Copenhagen, Denmark.

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