

RESEARCH AND RELEVANCE: IMPLICATIONS OF PASTEUR'S QUADRANT FOR DOCTORAL PROGRAMS AND FACULTY DEVELOPMENT

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ON THE IMPORTANCE OF RIGOR AND RELEVANCE

What is the role of research in business schools, and how is it different from the role of research in disciplinary departments? Donald Stokes, in *Pasteur's Quadrant: Basic Science and Technological Innovation* (1997), suggested that the classic distinction between “basic” research (performed without practical ends, intended to develop general knowledge and an understanding of nature and its laws) and “applied” research (performed in the service of some immediate end) is both inaccurate and pernicious. Instead, he proposed that research can be undertaken both as a quest for basic understanding (rigor) and with considerations of use (relevance). Drawing on Stokes's taxonomy, we argue that research in strategy and organizations would be better served if it were more grounded in the phenomena. We suggest that executive education contexts offer an underleveraged way for faculty and doctoral students to develop relationships with practitioners that can enhance the veridicality of our research and improve our field's ability to teach material that is both rigorous and relevant.

As professional schools located within universities, business schools and their faculties have an obligation to serve multiple masters. As responsible teachers and researchers, we contribute to the development of fundamental ideas and concepts, in the service of knowledge building, even as we link these ideas and concepts, in the service of practitioners (e.g., Bartunek, 2003; Hambrick, 1994; Roethlisberger, 1977; Rynes, Bartunek, & Daft, 2001). Unlike our colleagues in disciplinary departments, where research can be done unencumbered by the criteria of relevance,

business school faculty have a different, and more substantial, standard. Unfortunately, the conventional labeling of research as either basic or applied obscures this difference.

Stokes proposed that understanding and use are orthogonal, not at the opposite ends of a continuum. In his view, research can be evaluated on two dimensions: (1) the degree to which a quest for basic understanding motivates it and (2) the extent to which it is an attempt to solve a particular problem. Some research is undertaken in an effort to improve understanding of a phenomenon, with no thought of specific use (e.g., Neils Bohr and the discovery of atomic structure). Other research is done simply to develop applied uses (e.g., Thomas Edison and the invention of the phonograph), and still other research emerges from both a quest for fundamental understanding and a desire to apply the findings (e.g., Pasteur and the development of microbiology).

Where conventional academic disciplines are typically about a quest for understanding (*rigor*) with little thought of use (*relevance*), business schools, and professional schools more generally, are about both—and thus, operating in Pasteur's quadrant—with research that is both rigorous and relevant. Whereas disciplinary departments legitimately operate in Bohr's quadrant (rigor without the relevance criterion), and whereas consulting firms operate in Edison's quadrant (relevance without the rigor criterion), Stokes's challenge to professional schools and their associated professional societies is to develop communities that jointly value the quest for fundamental understanding and considerations of use. Figure 1, adapted from Stokes, graphically depicts the quadrants his book describes. *Pasteur's Quadrant's* call for scholars to pursue fundamental understanding of phenomena with the goal of tackling major real-world problems is also echoed in James March's and John Reed's perspectives on the nature of faculty research in business schools (Huff, 2000).

In spite of all the progress made in the fields of

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FIGURE 1
Three Quadrants^a

		Relevance: Considerations of Use	
		No	Yes
Rigor: Quest for Fundamental Understanding	Yes	<i>Bohr's Quadrant</i> Basic disciplinary research	<i>Pasteur's Quadrant</i> Professional schools Business schools
	No		<i>Edison's Quadrant</i> Consulting firms

^a Adapted from Stokes (1997: 73).

organization behavior, organization and management theory, strategy, and innovation over the past 25 years, these fields have had very little impact on practice. Too often faculty in our fields excel at rigor but are less interested or competent when it comes to practice (e.g., Pfeffer & Fong, 2002; Vermeulen, 2005). Perhaps worse, our lack of connection to the organizational phenomena we purport to study results in the development of theory uncoupled from the real world, leading some to suggest that it may be that “bad management theories are destroying good management practices” (Ghoshal, 2005: 86). In a classic vicious cycle, business school faculty who teach research that is devoid of practical implications often become alienated from their students and, in turn, retreat into ever more irrelevant research (e.g., Bennis & O’Toole, 2005). This cycle threatens to damage our reputation with key constituencies and the legitimacy of business schools more generally (Khurana, Nohria, & Penrice, 2005; Pfeffer & Fong, 2002). Indeed, Shapiro, Kirkman, and Courtney (2007) argued that our research is lost both before as well as in translation!

This concern about rigor without relevance is evident in Palmer’s (2006) review of the articles in *Administrative Science Quarterly*. James Thompson and Edward Litchfield, the founders of ASQ, suggested that their journal help develop fundamental understandings that could inform action. Thompson and Litchfield aspired to a cycle of action in which basic social science research could be employed for the improvement of human endeavors. Like Stokes (1997), Thompson and Litchfield identified “academic medicine, law, and engineering as models for the emerging field” (Palmer, 2006: 537). Yet 50 years later, Palmer (2006) observed

that ASQ has been largely irrelevant to the world of practice, that it has “not given voice to work motivated by the desire to develop knowledge that can improve managerial or other practice” (Palmer, 2006: 550). Palmer claimed that an important cause of the disjuncture between rigor and relevance is “a silent majority of academics that advocate disinterest in practice in order to achieve scientific objectivity” (2006: 548).

This defensive orientation to the phenomena on the part of this “silent majority” threatens to undermine our research, our doctoral programs, our MBA and executive education teaching, and our institutional legitimacy. Although we know much, we are collectively diffident about developing this knowledge with practitioners, as though a close interaction with the phenomenon might diminish our objectivity, blur boundaries, raise particularistic issues, and lead to conflicts of interest (e.g., Kimberly, in press; McKelvey, 2006). Our field’s silent majority has the confidence (or hubris) to suggest that we can deduce important research topics and gather useful data only through disinterest. In contrast, we believe that this self-imposed distance from the phenomena we study reduces the quality of our field’s research, undermines the external validity of our theories, and reduces the overall relevance of the data used to test ideas.

EXECUTIVE EDUCATION AS A CONTEXT FOR ENGAGED SCHOLARSHIP

Aspiring to facilitate research that occupies Pasteur’s quadrant, we have argued that executive education settings can be fruitful venues in which to shape research that is both rigorous and rele-

vant (Tushman, O'Reilly, Fenellosa, Kleinbaum, & McGrath, 2007). We argue that executive education in general and custom programs (executive programs custom-developed for a particular firm or set of firms) more specifically can create contexts where business school faculty and thoughtful practitioners might forge relations that foster virtuous cycles of knowing (faculty and doctoral student research) and doing (linking scholarly research to real-world practice).

For example, we have collaborated with IBM over a five-year period in a series of custom programs that linked our research on innovation, leadership, culture, design, and change to their specific strategic challenges. This executive education relationship was rooted from the outset in our commitment to link our field's research to their issues and in IBM's understanding that we had distinct research agendas. Through these programs, we have been able to directly apply our field's research to their strategic issues. These workshops have had an impact on practice at IBM (e.g., Harreld, O'Reilly, & Tushman, 2007), and we have been able to deepen our understanding of the relations between innovation, executive leadership, and organizational design. For example, our work on ambidextrous design, dynamic capabilities, and senior teams was significantly advanced by interacting with senior leaders and testing our conceptual ideas against their experience (O'Reilly & Tushman, 2007; Tushman, Smith, Wood, Westerman, & O'Reilly, 2007). Our concepts were shaped by their reality (Benner & Tushman, 2002; Smith & Tushman, 2005). Access to IBM data was substantially facilitated by their understanding of the importance of research to us and our doctoral students.

Further, through these engaged relationships with IBM, we have discovered topics that have become central to our current research. For example, our work on cross-line-of-business innovation (Kleinbaum & Tushman, 2007), corporate ambidexterity (O'Reilly & Tushman, 2007), and dynamic capabilities (Harreld et al., 2007) has emerged from this relationship. The level of trust built over the years has also resulted in a unique social network data set and in access to the full set of IBM's attempts to execute cross-line-of-business innovation.

These collaborative relations between business schools and firms are consistent with Van de Ven and Johnson's (2007) notion of "engaged scholarship" and Chatman and Flynn's call for "full-cycle research" (2006). This ability to co-create knowledge that is both professionally important and managerially relevant is not unique to Harvard Business School, Stanford, or IBM. Many of our colleagues

have experimented with innovative relations with firms that protect the integrity of faculty research even as they work to apply social science research in a fashion that impacts a firm's specific strategic issues (see Tushman, O'Reilly, et al., 2007). These examples of engaged scholarship and relationships anchored in joint respect for research as well as relevance are associated with virtuous cycles whereby knowing affects doing and doing, in turn, affects knowing.

In the 50 years since the foundings of *AMJ* and *ASQ*, the various fields of management scholarship have developed deep reservoirs of research-based knowledge. Our theory and research results can provide coherent frameworks to help executives more deeply understand and then act on strategic issues. Our concepts can help practitioners develop more complex cognitive models of their firms. Further, our involvement with their managerial issues in executive education programs can deepen our understanding of the phenomena and increase our insight into topics that are important to us, such as strategy formulation and implementation, organizational design, innovation, and change. Collaborative interactions with thoughtful executives help faculty increase the set of experiences from which more creative research questions can be induced (Weick, 2006).

As Chatman and Flynn (2006) noted, the development of high-quality theory requires that researchers move back and forth between observation of natural phenomena, construction of abstract models, and subsequent testing and refinement of theory. These related knowing/doing activities in turn affect the quality and substance of our teaching. Finally, the more sustained these relations, the greater the mutual trust they engender. As trust in these relations evolves, it becomes easier to help junior faculty and doctoral students also benefit from the opportunity to build their own engaged relations with firms. With all this potential, as a field, we dramatically underexploit these opportunities of leveraging executive education contexts.

IMPLICATIONS OF PASTEUR'S QUADRANT FOR DOCTORAL PROGRAMS AND FACULTY DEVELOPMENT

If operating in Pasteur's quadrant is an important mandate for business schools, then the doctoral programs and the mentoring of junior faculty in those schools should be informed by the dual criteria of rigor and relevance. Further, if executive education settings are fruitful contexts for developing relations with executives who value engaged scholarship, then we as scholars can be more pro-

active in leveraging executive education in our doctoral training and in our mentoring of junior faculty.

Operating in Pasteur's quadrant, where both a quest for fundamental understanding and considerations of use drive research, suggests that our doctoral programs encourage students to identify research questions anchored in managerially important organizational phenomena. Our doctoral programs should pivot on the choice of research question—and then train our students in the use of appropriate, discipline-based theoretical and methodological tools. Whereas dissertations are now often driven by disciplinary concerns, we believe that the source of research questions should be the phenomena, not the traditions or constraints of a given disciplinary point of view. Further, since the phenomena we study are inherently cross-disciplinary, theory and methods from multiple disciplines should drive our students' training. Our students should demonstrate strength in a core discipline and depth in an associated discipline (e.g., sociology and economics).

Doctoral programs that train their graduates to operate in Pasteur's quadrant would have matrix-like designs. A student would choose a research question on the basis of a phenomenon (the horizontal axis of the doctoral program design) and then select several disciplines to inform this research question (the vertical axis of the design). Helped by their senior faculty advisors, doctoral students could leverage executive education settings to get closer to their phenomena of interest and test their ideas by interacting with managers who had come to campus and are in a frame of mind to be thoughtful about the world of practice. Students could then leverage relationships formed in executive education contexts to get access to the phenomena and, in turn, build unique databases. Dissertations rooted in broad, substantive problems (e.g., interdependent innovation) would provide bases upon which emerging scholars could build research streams. Further, to the extent that dissertations were informed by phenomena, junior faculty would be better informed, more credible instructors.

The current reward system for faculty in research universities is clear: promotions of junior faculty members are based on their ability to do first-class research and to have an impact on how the field thinks and talks about some important phenomena. Careers are made or lost on disciplinary rigor (Bohr's quadrant). However, too often, such research is so discipline-based that it lacks external validity. Without encouragement from senior faculty to couple their research to practice, junior

faculty risk becoming more and more uncoupled from issues faced by their students. If so, it is incumbent on senior faculty to actively help their junior colleagues link their research to practice.

This linkage can be helped by encouraging junior faculty to engage more with practitioners while the latter are on campus—not as consultants, but as researchers interested in more deeply understanding organizational phenomena. On-campus engagement should not be rooted in solving short-term managerial problems, but in inducing from practitioners their most fundamental strategic, team, leadership, and/or organizational challenges. Such interactions with engaged practitioners can help faculty discover the gaps between phenomena as they exist in practice and the current state of academic knowledge. Links to practitioners who are grappling with issues related to our junior colleagues' research interests provide both parties with added value. The practitioner gets research-based insights, and junior faculty get closer to the reality of the phenomena they are studying. Contact of this sort with managers also provides insight into organizational reality that faculty can use both in the classroom and in their research.

CONCLUSION

Ghoshal claimed that “nothing is as dangerous as a bad theory” (2005: 86). Uncoupled from the phenomena we purport to study, our field is more likely to develop bad theory—theory that is beholden to academic strictures and not to the actual phenomena of interest. We argue that robust theory is more likely to be developed by dispassionate faculty interacting with practitioners who live what we purport to study. Such dispassionate faculty members have a clear sense of the boundaries between consulting and research, do not become trapped by a focal firm, and are able to forge engaged relations with practitioners. Management scholars have much to offer and much to learn in these relations. And although there are many ways to build collaborative relationships, we suggest that they are particularly well developed in executive education contexts.

We suggest that operating in Pasteur's quadrant, where rigor and relevance are jointly valued, is the appropriate strategic position for business schools. Whereas Ghoshal (2005) argued that deans and business school executive boards must push their institutions toward engaged scholarship, and Hoffman (2004) argued that the academy itself must be changed to affect this shift, ours is a more modest proposal. We suggest that executive education is a fertile and underleveraged setting in which prac-

tice can be impacted through our teaching, and we can engage practitioners to help us more deeply understand the phenomena that we aspire to study. Attention to boundary issues is clearly crucial (see Kimberly, 2007; Tushman, O'Reilly, et al., 2007), yet when executive education is done well, business schools can strategically couple it to research, to doctoral education, and to the development of junior faculty. This leveraging of executive education involves helping faculty see the potential in this boundary spanning and developing administrative structures to support the links between managerial relevance and faculty research.

To leverage these executive education possibilities, faculty must be interested *both* in a quest for fundamental understanding *and* in application. Faculty members who have discovered how to leverage executive education contexts can help their silent majority colleagues see the possibilities of using these settings to further their research agendas and enhance their teaching quality. Frankly speaking, faculty who desire to pursue knowledge without consideration of use (Bohr's quadrant) or who pursue use without knowledge generation (Edison's quadrant) should probably not be in a professional school. It is research that both leads to provocative theory and can be translated into practice that differentiates business schools from disciplinary departments and from consulting firms. We see executive education as a relatively simple yet underleveraged context where business schools can live into Pasteur's quadrant.

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