

Reflections of Teaching Evidence-Based Management

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Abstract

Educators have begun developing courses and curricula to help managers cultivate an evidence-based mindset and acquire relevant knowledge and skills. This chapter describes what three evidence-based management (EBMgt) educators have learned in the process of creating relevant courses and curricula. It presents the learning objectives that their teaching has promoted along with the frameworks, content, and exercises used to realize them. It also describes specific assignments and activities to encourage EBMgt teaching and provide a basis for further adaptation and innovation by educators seeking to prepare learners to practice EBMgt.

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“Guiding students through a process of conceptual change
takes time, patience, and creativity.”
Susan Ambrose et al. (2010)

“Don’t confuse me with the facts.” That quote from an organizational decision-maker seems to represent an all-too-common mindset that may help explain “the apparent lack of demand” for an evidence-based approach to managing organizations (Briner & Rousseau, 2011, p. 19). Evidence-based management (EBMgt) is fundamentally “a way of thinking” (Pfeffer & Sutton, 2007, p. 12) about organizational decisions in a systematic manner; with due consideration for stakeholder concerns, practitioner expertise and judgment, local evidence, and evidence from formal research (Briner, Denyer, & Rousseau, 2009, p. 6). Instead of balanced consideration of those four EBMgt elements, managers tend to base decisions on personal experience, their strengths and preferences, hype and fads, uncritical benchmarking of others’ practices, or ideology (Pfeffer & Sutton, 2006a). Scholars have argued that an EBMgt approach has the potential to enhance the productivity of organizations and the well being of their members (Pfeffer & Sutton, 2006a, 2007). Realizing EBMgt’s potential requires changes in how managers think and act. To that end, fundamental shifts in management education are called for to forge closer links among teaching, research, and practice (e.g., Burke & Rau, 2010; Rousseau & McCarthy, 2007).

Management educators are beginning to adopt an EBMgt perspective in their teaching (Briner et al., 2009). Yet the fact remains that MBAs and other management students are not typically taught to know or use research evidence in their decision making (Graen, 2009; Rousseau, 2006; Rousseau & McCarthy,

2007). Educators who do incorporate scientific evidence in their classes, even if not teaching “EBMgt per se” know well the pushback students can demonstrate when their assumptions and beliefs are challenged. In teaching EBMgt, these challenges are amplified. Educators need to give attention to both evidence and assumptions in teaching EBMgt, in that major barriers to its uptake lie in the tendency of individuals to reject evidence at odds with a heartfelt opinion or preferred course of action. Further barriers stem from the limited capacity of human beings to systematically process information, including evidence. In educating students regarding both evidence and assumptions, we have sought to promote among our masters-level students greater ability and motivation to consider evidence with respect to practical questions and decisions.

The present chapter focuses on our experiences teaching EBMgt and in particular things we have done to support our students’ learning. We begin by offering a few stories about our students to set the stage for our own stories. Next we introduce the contexts in which we teach and approaches we use. We distinguish between stand-alone EBMgt-titled courses and a more integrated approach in which EBMgt ideas are woven through several elements of a graduate business program. Last, we provide a more detailed account of our teaching methods.

Stories to Set the Stage

Not all students have been equally receptive to or successful in grasping EBMgt and supporting concepts. Nevertheless, we have had sufficient positive experiences to reinforce our efforts. For example, we have seen EMBA students

interrogate, in a most impressive way, a guest speaker about a field experiment published in the *Journal of Applied Psychology* (i.e., Barling, Weber, & Kelloway, 1996)

“Frankly I was astounded at both the motivation and knowledge of the students. Not only had they read the published research that formed the basis of my presentation, they had clearly thought about the issues in considerable depth. My presentation quickly turned into a question and answer session during which the students probed every potential weakness of the research designs and in several cases suggested potential “fixes” for future research or extensions to the research questions that I had not previously considered. The level of discussion was far beyond that of a first year EMBA class – indeed I would be pleased to have this type of discussion in my PhD research seminars” (Dr. Kevin Kelloway, Canada Research Chair, Saint Mary’s University, personal communication, 2009).

At the same time, consciousness-raising regarding evidence and its implications for the individual manager is a major focus in our teaching. Carnegie Mellon MBA students have peppered the placement office with questions about whether its resume-writing advice and interview training is evidence-based. In addition, students report “I go for pizza with a classmate, something comes up and I wonder, ‘where’s the evidence?’” And when their own heartfelt beliefs are tested, students experience the same resistance we need to

help them overcome from others when they take a job and try to practice EBMgt.

As one student noted in his reading log:

“It was interesting to me, especially in light of my [learning goal *to be able to motivate others to use evidence-based techniques*], to see how resistant I was to the *That’s Incredible* article [Highhouse (2008), addressing why use of tests and systematic methods are superior in selection to managerial judgment]. At first I liked it, because I like using better information and better methods to do what I have to do better. Who doesn’t want to be the best at their job? But as it kept going, it began to undermine what I saw as one of my strengths, which is my ability to read people. And then I started to get a little less receptive to the article’s findings. Evidence won’t be accepted if it makes people feel less competent or deprives them of a cherished activity without replacing it with something they find meaningful.

After denial (“This guy is just wrong. He doesn’t understand people.”) came bargaining (“My intuitive judgments aren’t really that intuitive. I’m reading into signals I’m collecting another kind of evidence!”) This was the mindset I was bringing in to class, at least. The discussion there was more helpful, I realized one of my biggest problems with the evidence-based approach to hiring was that I didn’t trust tests to make good choices, and I felt like it was easier to deal with people who make hiring mistakes

than tests that lead to hiring mistakes. But you made a valid point that it can be easier to fix a test and adapt it to the needs of an organization than it is to change people. And that is something I agree with. Tests can't get testy when you change them. 😊

I think this was a good week for EBMgt, since I got to watch the same process happen to me that goes through some people when they are told that what they're doing is not good enough, and there's a way to make it better."

Our teaching has generated many more stories, as graduates take what they have learned into the workplace. Former students contact us about a current work challenge after they have already reviewed the evaluated research evidence to discuss possible implications for their decisions. We are heartened by the strong demand from our graduating students to retain access to academic databases as a critical source of evidence on the job. Alumni remain in close contact with us and some have expressed great interest in developing a collaborative EBMgt group as a way of staying connected, knowledgeable, and involved with research. We do not pretend that our courses have imparted all of our students' critical thinking skills. We do believe that we have sparked an appetite for critically considering and using evidence.

At this point, the quality of evidence we can provide regarding changes in students' knowledge, skills, attitudes, and behavior is somewhat limited. (Self-rated changes by students are reported below.) We recognize that EBMgt proponents face heightened calls to produce high-quality evidence for their own

positions and programs (e.g., Briner et al., 2009; Reay, Berta, & Kohn, 2009; Rynes, Trank, Lawson, & Ilies, 2003) and we encourage rigorous evaluations of EBMgt education and implementation. Indeed, more rigorous research is needed for management education, generally (Rynes et al., 2003). Examples of systematic reviews of EB-related education initiatives are emerging in other evidence-based practice (EBP) domains such as education and medicine, although the amount and quality of evidence tends to be low even in more established professions (Parkes, Hyde, Deeks, & Milne, 2001). We take solace in the argument that “using evidence does not mean slavishly following it, acting only when there is good evidence or doing nothing if there is none” (Briner & Rousseau, 2011, p. 6). An EB approach to teaching does not mean that educators must or should delay action pending the results of a systematic review of randomized control trials of EBMgt teaching strategies. Like EBMgt, EB teaching is action-oriented, reflective, and receptive to better information as it becomes available. We concur with our counterparts in other EBP domains (e.g., Murad et al., 2009; Wyer et al., 2004) that it is valuable for educators to share information about their instructional approaches. We encourage educators to consider, reflect critically upon, and experiment with insights (formally or informally) about teaching EBMgt. Resources for teaching EBMgt have appeared online (e.g., evidencebased-management.com and its associated Google group). Readers are encouraged to contribute. Importantly, there is considerable research on education, generating teaching and learning principles that figure prominently

in how we have developed our teaching. In that regard, Goodman and O'Brien (this volume) summarize important principles to support EB teaching.

Our Contexts and Approaches

Management educators face numerous decisions about how best to bring new concepts, knowledge, and skills into program curricula. For example, approaches for bringing ethics and entrepreneurship knowledge to students have been debated by faculty members in business schools. Some faculty think the best approach is to deliver stand-alone course(s) concentrating on the central elements, whereas others suggest that integrating a focal topic across all courses increases knowledge transfer. Although it appears that integration is seen as valuable to enhance learning and transfer, there is a risk that integration may only pay lip service to the topic. Both approaches have strengths and weaknesses and we can find no clear synthesis of evidence to suggest that one is better. Developing EBMgt awareness, knowledge, and skills can be debated along these same lines. Although there is no one best answer, we can share our experiences from both a course-based and integrated curriculum approach.

A Course-based Approach

Carnegie Mellon has two schools of “management,” the Tepper School of Business and Heinz College of Public Policy, Information and Management. Both are strongly research-focused, with Tepper having begun as a Ph.D. program before adding a Masters program for managers. The first EBMgt course was launched in Tepper in 2008 and is now taught in both programs. It is basically the same course in both. As described below, the teaching and student experience

differ in several respects. The majority of Heinz Master of Science in Public Policy and Management (MSPPM) students have social science backgrounds while Tepper students tend more toward engineering, physics, and math. Students in both programs are in their mid-twenties. Tepper students tend to have five plus years of experience working in industry while Heinz students have worked in government in the U.S. or elsewhere, non-governmental organizations (NGOs), education, or the Peace Corps. In Tepper the course is classified as an elective in Organizational Behavior (one elective is required for graduation) and at Heinz it is a management elective. Heinz students typically take the course in the second (final year) while Tepper students tend to take it in the first year following the required OB course.

The same syllabus, readings, and assignments are followed in both courses. It focuses on evidence-based ways to make decisions using business/local data and scientific knowledge, and ways to reduce bias and judgment errors in gathering and interpreting information. As the syllabus describes

“EBMgt means making decisions based on scientific evidence and organizational facts. These decisions rely on judgment processes that reduce bias and judgment errors and give due consideration to stakeholder interests. This mini course promotes your understanding and use of the principles of EBMgt. It also guides you in developing the skills and knowledge needed to identify,

access, and use quality evidence from science and practice in making better decisions.

This course addresses both the content and process of evidence-informed organizational decisions. Your instructor is also committed to pursuing an evidence-based approach to the course itself. Scientific evidence strongly supports the effectiveness of promoting student responsibility for learning.

This approach is sometimes referred to as natural or student-centric learning based on active participation in learning activities. It is the opposite of conventional teacher-centric learning...”

The flow of the course starts with an introduction and overview and drills down into understanding what “best available evidence” means. Concurrently, we address the role that cognitive biases play in failing to use or mis-using evidence. The goal is to help students recognize the effects of bounded rationality and bias in their thinking. Then we work on learning to think more critically about both their experiences and responses to scientific evidence. The course then provides repeated practice at finding and interpreting scientific evidence. Repeating this process of gathering evidence has the advantage of helping students make their tacit learning more explicit. This allows in-class sharing of how well various search strategies have worked. Subsequent classes present different types of decisions practitioners face in context beginning with basic, routine, and recurring issues (e.g., selection, people management) for which there is evidence. Here we introduce the notion of procedural knowledge, that is, how

to convert well-established evidence into implementable ways to solve practical problems and make decisions. This set of classes on decision making for which there is evidence also covers designing solutions as well as managing the implementation and politics of evidence. We then address how to make decisions by making the best use of available organizational facts, developing points raised in Pfeffer and Sutton's (2006a, 2006b) treatment of EBMgt. Ways to improve the reliability and meaningfulness of data (Donaldson, this volume) are presented, what we call turning data into information. Then we address the most difficult decisions managers are likely to face, responding to unforeseen events. The latter calls attention to the next theme in the course, evidence-based processes. Emphasis is placed on the value of process (decision steps and practices; e.g., Weick & Sutcliffe, 2007) when neither experience nor evidence can inform the content of the decision, as in the case when unforeseeable disasters coincide with economic downturns. Last, the course foreshadows the experiences students are likely to have upon graduating, addressing how to practice EBMgt in organizations where evidence is not understood or valued. This module promotes student planning to help them transfer learning as they prepare to move along the novice-to-expert pathway in practicing EBMgt.

From the course's outset, students are told that they are guinea pigs. That is, EBMgt is a very new concept, established in other professions, but novel in management. The course addresses EBMgt 1.0. As the students' own professional practice develops, they can help develop its 1.n, 2.0 versions, and beyond. For this reason, the course focuses on basic principles that can be

adapted over time as their learning deepens and they find ways of integrating EBMgt practice with their other learning from the graduate curriculum and elsewhere.

The primary learning in this class comes from a series of exercises and projects for which class time is used to prepare and debrief. These include having students examine popular business books to determine whether they make use of scientific evidence (not so much) and working in groups to get evidence on practical questions (e.g., do credit checks improve workforce quality? can virtual teams perform as well as face-to-face teams? how to hire (or reward) good performers in a start-up firm? can a hospital acquisition succeed financially when the firms have different cultures?). Having a reference librarian advise students on how to search proves to be very important since most Internet-savvy students believe themselves to be great searchers (though many have not used Google.Scholar before this class). Repeating the process of asking a question, searching for and interpreting evidence turns out to be critical to what students learn. Students are hungry for cases and real-life illustrations of managers using evidence. John Zanardelli (this volume), a local executive and long-time evidence-based management practitioner, has related first-hand experience that students enjoy querying. He has followed this up by having his direct reports come to class to share their experiences, reactions to EBMgt practices, and their own personal applications of EB approaches like using logic models and searching for evidence. A variety of EBMgt cases have now been written and, as

the practice evolves, more will be, which is a very important development for both credibility and learning among business students.

Students at Tepper are more heterogeneous in their responses to EBMgt than at Heinz. As policy students, most participants from Heinz have written research reports in the past, think research is important because of its policy role, and are more familiar with the jargon and methods of scholarship (e.g., hierarchical regression, panel analysis, scale development). Some of the business students are restive when it comes to writing up research findings (e.g., “feels like a Ph.D. class”). Basic principles of management research design and assessment are also sometimes at odds with marketing research practices at Tepper (e.g., single-item scales). On the other hand, Tepper students tend to take their future role as decision makers very seriously and bring a good deal of experience in making decisions and implementation. They tend to be quite animated by the difference between using evidence in structured and recurrent decisions as opposed to novel and unforeseen ones. In the course, we focus on using scientific evidence in two ways: as information to inform decisions and science-based practices for improving the decision process itself. Both business and public policy and management students resonate with the notion of developing different approaches to various kinds of decisions.

An Integrated Approach

The University of Prince Edward Island (UPEI) is a primarily undergraduate teaching institution that has made notable advances in research and graduate programs in recent years. Among Canadian universities, UPEI had the largest

percent gain in research income between 1999 and 2009 (ReSearch Infosource, 2010).

It has also introduced new graduate programs, including an executive-style MBA program in the fall of 2008. The EMBA program was designed to meet the needs of people who are working full-time but wish to return to university to pursue graduate-level studies. The EMBA program provides flexibility to mature students through course scheduling outside of the traditional workday and flexibility of program completion between two and four years (maximum six years). Degree requirements consist of 14 courses, including a signature project (equivalent to two courses) that involves research or consultancy with an organization.

The average age of UPEI EMBA students who have participated in our courses to date was 38 years, with an average of 14 years of work experience. Approximately 55% of students worked in the private sector and 60% were men. As with many MBA and EMBA programs, students varied considerably in terms of their fields (e.g., arts, business, culinary, engineering, sciences) and levels of previous education. A few had PhDs and some had no undergraduate degree, but were admitted based on extensive experience, professional credentials, or other qualifications.

Starting a new program, such as an EMBA, comes with both opportunities and challenges for faculty and administrators. The opportunity within this context was presented because two UPEI faculty members (Jelley & Carroll) are both interested in promoting EBMgt to enhance students' development and, ultimately,

better outcomes for organizations and their stakeholders. We seek to provide students with the skills, tools, and knowledge required to critically assess academic literature, integrate this knowledge with other sources of information, and apply such learning in practice back in their workplaces. In short, our overarching goals are to turn students on to research, make them savvy consumers of it, and help them use it in meaningful ways to foster improved decisions and actions in practice.

The UPEI EMBA approach to develop EBMgt awareness and education is to integrate EBMgt knowledge and skills throughout various aspects of the program. We first introduce EBMgt and relevant skills as part of the program orientation for students. Our most recent orientations have included a day, prior to beginning the first EMBA course, in which students are exposed to the landscape of academic literature and the ways in which it can be accessed efficiently and effectively. First, students are provided with a broad understanding of business and management research. After an overview of EBMgt, we explain to students the differences among journals (such as academic, bridge, & popular press). Second, our librarian or a faculty member conducts a session with students to show them how to find and use online databases to locate literature. This hands-on session provides students with the basics on the types of databases available to them and effective literature search methods. We encourage students during this session to think about a problem at their workplace that they want to know more about. The student then searches a database to

locate articles of possible interest. Thereafter, we have woven EBMgt into required courses we were assigned to teach.

The students' first course after orientation is *Managing People and Organizations*, which focuses on management and strategic human resource management content. Importantly, the management course provides opportunities for students to practice skills learned during orientation to access existing literature on topical issues. This course is an ideal start to the program given the centrality of the content to managers and because, in many instances, EMBA students *think* they are already well informed about management practices. As a result, it provides rich grounds to “myth bust” and question assumptions. Throughout this course, students develop skills in focusing research questions, gathering literature related to management and workplace problems, synthesizing and summarizing the results from their searches, integrating other sources of information with the research evidence, and assessing the practical implications of the knowledge. Students develop a familiarity and comfort with accessing and reading academic literature and begin the process of using the research evidence as one source of information to help guide decision-making in practice.

Subsequently, students take a *Business Research Methods* course, which further elaborates upon EBMgt and provides more practice opportunities with respect to gathering and appraising evidence and ideas. The EBMgt perspective seems to make research methods content (reasonably) palatable to pragmatic students, while the research methods content provides more of the knowledge and skill required to move students beyond a basic awareness of EBMgt. That is,

research methods content provides students with perspectives and tools (e.g., checklists) to improve critical thinking about the nature of evidence. Students are also encouraged to be appreciative of research as both a rigorous and a creative process. As well, some appreciation of difficulties inherent in designing and conducting research should be gained. The broad goals of this course are to provide students with essential grounding in methodology to help them evaluate evidence from formal studies or local investigations in a critical, yet constructive manner; and to prepare them to conduct, or collaborate in, original research and abbreviated versions of systematic reviews.

The three initial components of the UPEI EMBA program build a foundation to develop EBMgt as, hopefully, a viable approach for practitioners. Further opportunities for students to practice and refine these skills are available in some other courses (e.g., *Innovative Leadership and Cultures*). In addition, students are also required to complete a signature project in the form of a business plan, applied research project, or systematic review, providing another more in-depth opportunity to apply and refine EBMgt knowledge and skills. Some students have presented findings from their signature project research at academic conferences and in practitioner forums, and have also impacted change within their organizations. This level of post-program engagement shows promising signs of facilitating knowledge transfer beyond the classroom environment.

We cannot claim that the EBMgt perspective has been “fully” integrated within all UPEI EMBA courses. However, we have shared basic information about EBMgt with our colleagues and EBMgt seems to be emerging as a feature

of our EMBA program. Our undergraduate programs represent further opportunities for the future of EBMgt. We will continue to reflect upon, adapt, and share our efforts to teach EBMgt within and beyond our respective institutions.

What and How We Teach (So Far)

Now let us turn to more specific descriptions of teaching strategies we have tried. Goodman and O'Brien (this volume) review distinct research streams from cognitive psychology, instructional psychology, and education. They note that despite diversity in focus and assumptions "all streams agree that learners must deploy active cognitive processes, such as meta-cognition, critical reasoning, and hypothesis generation and testing to truly learn, and that instructional conditions must be structured to support these cognitive activities" (p. X). We now describe our efforts to engage students with EBMgt and promote their active learning in the fashion Goodman and O'Brien describe. Although we deal both with the "what" and "how" aspects of our EBMgt teaching, our emphasis here is on the exercises and assignments used ("how") in our different courses.

This section follows a structure developed for EBMgt by Barends (2010), based on EB steps outlined in health domains (e.g., Hadley, Davis, & Khan, 2007; Thomas, Saroyan, & Dauphinee, 2011). The educational elements our courses use to support EBMgt target (a) developing basic awareness of evidence and evidence-based practice, (b) learning to ask the right questions, (c) obtaining the best available evidence, (d) critically appraising the evidence, (e) integrating EBMgt elements in support of organizational decisions and actions, and (f)

evaluating the process. None of us has used all of the exercises, assignments, or substantive content discussed below in any one course; nor is the material presented in terms of a particular sequence for suggested use. Certain assignments require students to engage in multiple EBMgt steps in support of their deeper learning (i.e., interacting elements; Goodman & O'Brien, this volume). For this chapter, we have categorized each exercise or assignment in terms of the step it most directly serves.

Basic Awareness of EBMgt

“Evidence-Based Management (EBMgt) enhances the overall quality of organizational decisions and practices through reflective use of relevant and best available scientific evidence. EBMgt combines conscientious, judicious use of best evidence with individual expertise; ethics; valid, reliable facts; and consideration of impact on stakeholders. Its success is enhanced by quality connections among practitioners, management educators, and scholars.”

(https://wpweb2.tepper.cmu.edu/evite/ebm_conf/index.html)

The evidence-based management credo above is central and foundational to teaching from an EBMgt perspective. During introductory sessions on EBMgt with students, faculty, or professional audiences, we have conducted informal polls with respect to familiarity with EBMgt or evidence-based practice in other domains (e.g., education, medicine, & other health professions). Previous familiarity with the term “evidence-based management” has been low, although

some people profess familiarity with EBP in other fields. Showing links to other EBP movements conveys that respected professions have adopted a similar perspective (e.g., EB Medicine; Pfeffer & Sutton, 2006a; Rousseau, 2006). Highlighting relevant champions and authors draws attention to the fact that other respected people are concerned with evidence. For example, we have provided examples of other faculty from leading business schools on our course syllabi or during introduction to EBMgt presentations. Quotable endorsements from well-known and respected executive champions would likely be helpful to add. The EBMgt Collaborative credo (above) has appeared on some of our course syllabi to signal that a community of people are promoting and practicing EBMgt. The credo presents a definition of EBMgt.

Discussing EBMgt definitions and descriptions is important for creating basic awareness. Drawing on Briner et al. (2009; Rynes et al., 2003), Pfeffer (2007), Pfeffer and Sutton (2006a, 2006b), and Rousseau (2006), we have described EBMgt as a way of thinking about organizational decisions in a systematic manner, gathering and translating both scientific evidence (Big “E” Evidence) and local data (little “e” evidence) to inform decision-making, and learning systematically about human behavior to improve management practice. The “concept cleanup” offered by Briner et al. is helpful both in terms of the EBMgt definition provided, as well as clarification of what EBMgt is and is not (see their Table 1, p. 21). An important aspect of this concept clarification is that students become familiar with the notion that EBMgt uses scientific evidence in

two ways: both as content to inform decisions and through the processes whereby these are made -- related but distinct approaches.

To highlight the importance of being familiar with EB content, consider the following argument: if you (allegedly) have no time to search and evaluate evidence, then you will be acting on the information you have. How have you prepared yourself to be ready? No time, know answers. We have used Rynes, Colbert, and Brown's (2002) human resource management knowledge quiz as an example of the extent to which EBMgt content is known. Rynes et al.'s results demonstrate that established research findings are not well known among HR managers. When administered to students, this quiz serves to highlight their awareness of evidence-based content in HRM and as a basis for discussing limits in the dissemination of that knowledge. [Rynes offered a note of caution in that regard via evidence-based-management@googlegroups.com (May 25, 2011). Some instructors have encountered very negative student reactions such as defensiveness from students feeling exposed as "uninformed." Educators must use caution to ensure students do not feel distanced from an evidence-based perspective as a result of this or any assignment or exercise.] As noted by Goodman and O'Brien (this volume), this type of pre-testing helps instructors identify and address some learner misconceptions. Armstrong's adprin.com web site (2011) has an online "test your advertising IQ" quiz that could be used similarly in that domain. Also, Cialdini's influenceatwork.com website (2011) provides a 10-item quiz based on work-related influence scenarios appropriate for testing current knowledge. Having small groups discuss their implicit theories

related to quiz items may make use of other learning principles summarized by Goodman and O'Brien such as interactions with others, articulation of their perspectives, and delayed feedback (i.e., if quiz results are not made available immediately). Based on our own limited trials it appears that EMBA students take considerably longer to discuss their answers to quiz items than do senior undergraduates, possibly reflecting EMBA students' more elaborated mental models about management.

The **Self-Guided Field Trip** is a simple assignment to encourage critical thinking about common sources of business prescriptions, which may contribute to students' mental models. Students are asked to visit the business section of a bookstore, look through four or five business books, and prepare a one-page report in which they describe what the authors' basis of "evidence" appears to be. What types of sources are cited? Approximately what proportion of sources appear to be (1) personal or anecdotal, (2) based on so-called "best practices" or benchmarking of other companies, (3) other business books or publications, or (4) scientific evidence? Students are also asked to identify the book that appears most useful and explain their perception of what makes it most useful. Does evidence-based affect perceived usefulness? Having students go and look at the actual shelves of a bookstore seems to work well. Discussion of the Self-Guided Field Trip also allows the instructor to suggest that students start building their own professional research library for evidence-based knowledge related to their practice.

A lack of knowledge is not the only or even the biggest barrier facing would-be evidence-based managers. “It’s not what folks don’t know that is the problem, it is what they know that ain’t so” is one of Pfeffer and Sutton’s (2006b) themes. Misconceptions revealed via an evidence-based content quiz provide a starting point for learners to address their own false beliefs (Goodman & O’Brien, this volume). Discussions of quiz results can also be useful to examine others’ claims critically. Student questions about the evidence underlying the scoring key or research designs to probe alternative interpretations are opportunities to promote critical thinking. If such questions and challenges do not emerge spontaneously the instructor can point out that raising questions about research findings and their implications for practice is central to EBMgt. As instructors in EBMgt, it is important that we model receptivity to constructive challenges. For example, questions like “what’s the evidence on evidence-based management?” (Reay et al., 2009) provide great opportunities to welcome discussion and make the point that EBMgt education is about helping students develop as critical thinkers, not to create disciples.

The process aspect of EBMgt refers to the use of practices of known effectiveness in making decisions and improving the quality of the information used in decision-making. Processes refer to the routines EBMgt practitioners must learn if they are to overcome the inherent cognitive limitations of human beings and to create procedures that effectively act on evidence. Based on the idea of cognitive repair (Heath, Larrick, & Klayman, 1998), we explore the routines, heuristics, and management practices that can help people be “smarter”

than we otherwise are when we make decisions or act without aids. Asking students to describe all the information and decision aids they use in their lives (from shopping lists to goals on posted notes) introduces the broad utility of information and decision aids. This sets the stage for subsequent discussions of how scientific findings can be organized into procedures, checklists, and other artifacts that eases their practical use (e.g., Yates & Potwowski, this volume).

EBMgt instructors may also wish to consider presenting ideas like the attitude of wisdom (Pfeffer & Sutton, 2007) and the set of steps to becoming an evidence-based manager (Rousseau & Barends, 2011) as part of creating basic awareness. Together those sources encourage managers to think about decisions explicitly, ask for and seek out evidence, and use the best available knowledge. Note that the best available knowledge at a given point in time may be incomplete and is prone to obsolescence. Thus, evidence-based managers must be open to learn and adapt management practices in light of better evidence (Pfeffer & Sutton, 2007). Revisiting explicitly the four facets of EBMgt outlined by Rousseau (this volume) is another way to reinforce the dynamic nature of EBMgt – it is a decision-making process in which evidence from formal research is considered in conjunction with evidence from the local context, stakeholder perspectives and preferences, and practitioner judgment and expertise. This overview material can be presented as a stand-alone, in a brief workshop at orientation or a lunch discussion, to get students thinking about EBMgt's four facets. Consider having students ask questions about a management problem by using each EBMgt element as a perspective to consider.

Asking the Right Questions

To use evidence, a person must be aware of the decisions he or she is making (including decisions to take no action). The EBMgt process starts with the problem, question, or issue facing a manager or other practitioner (Briner et al., 2009). One way to emphasize the point that EBMgt is an inquiry-based approach is to engage students early in their education in developing a questioning mindset. For example, during EMBA orientation we have used an exercise in which students are asked to diagnose an attendance problem using the four elements of EBMgt, building on Briner and Rousseau's scenario (2011, Table 1). The scenario presented is brief: "Senior managers in your large firm believe the organization has high absenteeism and want something done to fix it." Students' task is to think of questions from each of the four EBMgt sources that could prove relevant to understanding the problem and what, if anything, should be done to fix it. Students are given time (e.g., 5 min) to work on the task individually before discussing it in small groups (e.g., 15 min). A plenary discussion of students' work precedes consideration of questions adapted from Briner and Rousseau's Table 1. EMBA students seem to do quite well on this exercise, collectively. The main objective of this **Absenteeism Diagnosis** exercise is to jumpstart students' integrative thinking about the types of questions and evidence that may be brought to bear on a problem. The problem used, allegedly high absenteeism, is one any organization may encounter. Importantly, this exercise highlights that all four EBMgt elements deserve consideration. The present version of the exercise is focused at the question development stage. It can be amended to be a more

integrated assignment in which students also engage in subsequent stages of EBMgt (e.g., getting and evaluating evidence as the basis for action planning).

Note this adaptation might require a more elaborate case.

We try to demonstrate links between EBMgt teaching and students' professional lives. Other exercises and assignments can help students identify issues and topics to investigate on their own, or with instructor or peer support. An out-of-class assignment that may be used to provide a richer and more personally motivating practice experience is the **Burning Question** assignment. Based on discussions in class and through individual interactions with students, the instructor develops a list of possible topics that may be used for the assignment. (In instances where less support is appropriate, students could be given complete responsibility for topic identification). Students are expected to take an EBMgt approach to this assignment and a rubric is provided to assist students with their understanding of the assignment. Graduate business students reasonably want to think in terms of "big picture" issues and often struggle to specify their question sufficiently. Students learn to "pull the thread" as a first step in learning to develop and focus their questions. In other words, as students migrate to broad areas of interest we work with them to refine their question to the specific issue or challenge they find problematic in their organizations or in business in general (e.g., interventions such as selection, mentoring). The identification of a broad interest area is like selecting a book you find interesting and pulling the thread means that students decide on a specific quote, passage or theme of the book that is of most interest (e.g., types of interviews, formal versus

informal mentorship, or gender differences in mentorship). More generally, students are guided by the FINER (feasible, interesting, novel, ethical, & relevant) principles of research question development (Littell, Corcoran, & Pillai, 2008) and pulling the thread is a first step to help students focus and create a specific research question to examine in a meaningful way. Often, working with students one-on-one to help decide on a topic, narrow the question to something specific, and understand peer-reviewed research evidence can facilitate learning about numerous steps in the EBMgt process. Students have examined specific topics such as barriers to women's advancement in leadership positions, fairness of Chief Executive Officers' (CEOs) compensation, and the effectiveness of downsizing. After conducting a rapid evidence assessment and synthesis of the relevant research evidence, students are often surprised to find that the answer is not exactly as they thought or the issue as straightforward as they expected.

Other assignments, discussed in subsequent sections, build on student-identified and articulated questions, as well as more refined uses of other EBMgt skills. For example, a Persuasive Paper assignment is meant to replicate an authentic, real-world task in which the student attempts to convince his or her (real or hypothetical) manager to take a particular "evidence-informed" action, related to a substantive topic from class. That assignment requires students to apply various EBMgt steps and is more fully discussed below.

A **Preliminary Research Proposal** is another assignment in which identifying a good, researchable question relevant to practice is the central challenge. It is the final deliverable for an EMBA business research methods

course. Broadly, it is an opportunity for students to apply methods content to a substantive issue of their choosing. Students may use the preliminary proposal as a basis for their EMBA signature project, but that is not required. The proposal is meant to be a brief sketch of a problem; relevant background information; specific research questions or hypotheses; and a basic design, measurement, and analysis plan. The instructor explains how brief, preliminary proposals can be used in applied settings to get agreement in principle from decision-makers before going forward with more detailed submissions for formal approval (i.e., it is not only an academic exercise). Students are instructed to think of this assignment as an opportunity to prepare a succinct, well-written description of their plans to a busy executive with neither time nor patience to read a long proposal.

Before students develop their own proposals, the instructor gives a mini-lecture outlining considerations and examples of real projects to show how general topics were refined into more specific research questions or hypotheses. Examples provided include real applied and academic projects that run the gamut from experimental, relational, and descriptive research. General aspects of design, measurement, and analysis considerations for those projects are also explained. This mini-lecture and the project examples are provided early in the EMBA research methods course, along with a workshop opportunity for students to start thinking about their own interests and research questions. Students are encouraged to think about the guiding question, “What don’t we know that matters?” (Locke, Spirduso, & Silverman, 2007, p. 44). Then they work to find an angle that transforms a general topic into a researchable question.

Characteristics of good, researchable questions are discussed in terms of being: right for you, right for your audience, acceptable, well articulated, and practical (O'Leary, 2004).

Clear and explicit statement of the question or problem is crucial for EBMgt (Briner et al., 2009), as is true for research questions more generally. A well designed question points to the relevant theory and literature to be reviewed, the data pertinent to answering it, and how those data should be collected and analyzed (O'Leary, 2004). Systematic literature reviews that integrate and interpret pertinent evidence are seen as central for moving EBMgt forward (Briner et al., 2009; Rousseau, Manning, & Denyer, 2008). Adapting the PICO (Patient, Intervention, Comparison, Outcomes) framework for systematic EB medicine reviews, advocates of systematic EBMgt reviews have suggested use of the CIMO (Context, Intervention, Mechanisms, and Outcomes) framework (Briner et al., 2009; Denyer & Tranfield, 2009). The CIMO framework seems useful to help specify both review and primary research questions. It helps students formulate their self-directed projects, including research studies or mini-systematic reviews (Rapid Evidence Assessments, Briner et al.; Critically Appraised Topics, Barends, 2010).

A smaller-scale **Question Specification** exercise can be done in class or online to provide students with deliberate practice using CIMO to refine a question. For example, Denyer and Briner (2010) asked participants in their Academy of Management systematic review workshop to make more specific the question, “Does team-building work?” Following that lead, we have used a

similar, in-class exercise wherein students are asked to use CIMO to make the team-building effectiveness question more specific.

Surfacing assumptions complements learning to formulate useful questions. This technique can be used in a variety of ways. To help students identify uncritical assumptions, have them read a pop management magazine article (e.g., *Working for Boomers*, Filipczak, 2011), one that is full of unsupported assumptions, and let them have at it. An alternative involves pre-class online discussions (e.g., twitter) of a different popular press article each week prior to class. In one example, pre-class discussions were held on twitter with students in a management course, five leading human resource practitioners, and the instructor. The article was initially “twitted,” and students and practitioners exchanged reactions and ideas about the article. Students examined the article for strengths and weaknesses based on the content material for the upcoming class, and related evaluated research evidence they could find. An in-class session reviewed the article in-depth, including all four facets of evidence. This exercise helps students critically assess popular press articles and understand the limitations to the information provided.

Getting the Best Available Evidence

The Surface Assumptions exercise highlights that readers must be wary of their sources and mindful of Rousseau’s rule #1 (from her course syllabus): Never trust truth claims made without references! It leads directly to Rule #1.1, Do your due diligence: Check (at least a sample of) those references. Similar warnings (i.e.,

“Reader Beware”) have been conveyed in lecture materials by drawing on Rynes et al.’s (2002) points regarding an *HR Magazine* article on graphology.

Explaining the business research landscape to students exposes them to different disciplines and paradigms as well as types of sources (e.g., academic, crossover, and practitioner journals). It helps them make sense of the variety of perspectives and quality of information they encounter as they search for the best available evidence. Instructors can provide students with examples of highly respected peer-reviewed journals as part of familiarizing them with original sources of management and social science research.

To support students in the development of their practice as evidence-based managers, we have partnered with librarians at our respective institutions to provide students with specific instruction on literature searching (**Literature Search Workshops**), a partnership strongly encouraged by proponents of systematic reviews (See for example Littell et al., 2008). Briefly, keyword searching, reference and citation searching, and pointer knowledge (key informants) are taught. Search instruction is covered in more detail elsewhere (Werner, this volume), but there are a few points worth noting here. Both our experiences and principles of learning (Goodman & O’Brien, this volume) suggest that guided exploration/discovery and opportunities for deliberate, distributed practice are important for supporting search-skill acquisition. As noted earlier, the UPEI EMBA program includes a structured library-skills session as part of program orientation. Students are then expected to practice those skills as part of personally-relevant assignments, such as the Burning

Question assignment discussed above. In the subsequent research methods course, an “advanced” session is held with the librarian wherein search strategies are re-visited and elaborated, and additional resources are revealed. Most recently, students in the advanced session have been given a topic to search consistent with that investigated in an existing systematic review (i.e., Joyce, Pabayo, Critchley, & Bambra, 2010). The Joyce et al. study serves as an example of an elaborate search strategy (see their Appendix I) and presentation of results from a systematic review. Students are encouraged to come to the advanced search session prepared with questions and challenges they have encountered, as well as successful tips to offer others. We advocate a similar session for faculty members.

Insofar as the volume of articles, books, and online entries continues to grow, the task of finding relevant, high-quality evidence is challenging, especially for time-constrained managers. Summaries or reviews of the literature *should be* helpful to distill theories and evidence pertinent to one’s research questions. However, too many such reviews are ad hoc. It is important to contrast traditional narrative reviews with systematic reviews, including but not limited to meta-analyses, to help students find appropriate syntheses of the best available research evidence.

Despite the questionable evidentiary value of traditional literature reviews, those works and other opinion pieces (e.g., this chapter) may be useful for sharing ideas, perspectives, and propositions. Literature reviews also provide contextual information for a study, be it primary research or a systematic review. Drawing

on Easterby-Smith, Thorpe, and Jackson (2008), and O’Leary (2004), we have explained that literature reviews are used to educate the author; inform readers (*cf.* Campion, 1997), for a dissenting guideline); establish author credibility; argue for and position the study in a wider context; and describe and critically evaluate others’ perspectives, methods, and findings. We believe it is also important to provide graduate business students with guidance for using and managing references, given the wide range of students’ prior preparation and possibly years (or decades) since they participated in formal education. Campion’s (1997) survey of journal reviewers identified guidelines for referencing that are especially helpful in that regard. Reference management and write-and-cite software that may be available to them can also be introduced.

The paucity of systematic reviews on management questions means that evidence-based managers may have to gather and synthesize existing research themselves, typically using a more expedient form rather than a full scale systematic review (e.g., Rapid Evidence Assessment, Briner et al., 2009; Critically Appraised Topic; Barends, 2010). Various assignments such as Get the Evidence, Myth Busting, and the Snake Oil Symposium have provided practice opportunities in this regard. As an example, the **Snake Oil Symposium** (thanks to Dr. Kevin Kelloway for the name) involves groups of students completing a rapid evidence assessment of a management fad, program, or practice to evaluate its validity and strength of research evidence. Students prepare a plain-language translation and summary for managers in the form of a comprehensive, yet concise (2000 word) paper and a 15-20 min presentation. Supplementary

materials include an appendix outlining the specifics of the literature search strategy (e.g., databases & keywords searched) and results (e.g., # of relevant studies). More elaborate systematic reviews are possibilities for students' EMBA signature projects.

The EMBA Signature Project includes the collection of primary data for applied research or consulting purposes and provides a deeper application of using an EBMgt approach for students. Research involving data existing within organizations or other sources of secondary data are also possibilities for signature projects. These are examples of "little e" evidence (Rousseau, 2006). To this point, our discussion of the search for the best available evidence has focused on "Big E" evidence (Rousseau, 2006) derived from formal research. However, it is important not to overlook evidence from the local context. Readings emphasizing local experimentation (e.g., Davenport, 2009; Pfeffer & Sutton, 2006a) and use of organizational data (e.g., Donaldson, 2011, this volume) can be assigned to support this perspective.

Instruction on how to design, conduct, and interpret formal research fit within the mandate of a business research methods course, yet it is challenging to incorporate any array of practice opportunities within any single course. The Preliminary Research Proposal is one reasonably integrated opportunity to think about primary research and some of those projects could provide local context evidence. More limited exercises have also been conducted to give students practice with **Semi-Structured Interviewing** and **Statistical Analysis** of existing data sets. Data sets could come from an instructor's previous research studies or

may be packaged with textbooks (e.g., Hair, Babin, Money, & Samouel, 2003), if quality or logistic concerns preclude class-originated data collection and analysis.

An **Online Questionnaire Development** workshop has also been used to demonstrate available technology in that regard. Becoming a proficient producer of research requires much more instruction and deliberate practice than can be offered in a single course. Nevertheless, introductory background in research methods may promote willingness and perceived capability to collaborate in research, appreciation for difficulties inherent in conducting research, and ability to critically appraise research.

Critically Appraising the Evidence

“Critical appraisal is the process of assessing and interpreting evidence by systematically considering its validity, results and relevance to an individual’s work” (Parkes et al., 2001, p. 1), and is argued to be central to EBP (Norman & Shannon, 1998). Thoughtful criticisms of the EBMgt movement (e.g., Learmonth, 2008; Learmonth & Harding, 2006) reinforce the careful and inclusive explication of what constitutes evidence in management and organizational science (e.g., Rousseau et al., 2008). We have introduced students, albeit briefly, to philosophical issues regarding the nature of knowledge, and different ontological and epistemological perspectives (e.g., Easterby-Smith et al., 2008; Rousseau et al., 2008; Shadish, Cook, & Campbell, 2002). Even brief introductions alert students to the idea that they may encounter different, valuable perspectives during their searches for the best available evidence. We also let students know where we are coming from. Our perspective is that reality exists

independent of our efforts to understand it; and that observations, facts, and concepts (our lay term for “constructs”) are subjective and value-laden, but not completely fallible (Rousseau et al., 2008; Shadish et al., 2002). We differentiate between meta-analyses and other forms of systematic reviews as examples of high-quality evidence, and opinion-pieces (expert or non-expert) as examples of weak evidence. However, evidence hierarchies, if presented, are inclusive of research designs (e.g., case studies; descriptive research; quasi-experimental investigations) that may be applicable for some questions, entities, or stages of knowledge development. Triangulation across methods and theoretical pluralism are valued, consistent with a critical realist perspective (Rousseau et al., 2008).

Learning to plan one’s own research and critically appraise others’ research are complementary learning experiences. We encourage critical appraisal of evidence from all four EBMgt elements (Briner et al., 2009). We describe to students various ways of acquiring knowledge (e.g., personal experience, tradition, authority, formal research) and associated strengths and limitations. Whereas personal experience is valuable and will inform managerial decision-making, an EBMgt perspective requires critical reflection upon that source, as well as the others. For example, the Absenteeism Diagnosis exercise, discussed previously, includes questions adapted from Briner and Rousseau (2011) such as, “What are my beliefs about the causes of absence?” and “How relevant and applicable is my experience?” Such questions are designed to encourage critical appraisal of personal experience. An additional question, “Have I developed an ‘expert’s intuition’ (vs. a ‘gut feel’)?” has been used in

debriefings of the Absenteeism Diagnosis exercise to encourage students to appreciate expert-level insights developed over years of education and deliberate, reflective practice (Thomas et al., 2011). Instead of “research vs. experience” we believe an EBMgt perspective fosters careful consideration of research *and* experience. Nevertheless, limitations of personal experience are important to highlight with students. Limited sample size of experiences, perceptual biases, and our tendency to underestimate the role of chance factors (randomness) place limits on the quality of evidence we can gather solely from our personal experiences (March, 2010). These problems can be used to help explain why formal research is also needed to obtain high-quality evidence (E and e; Rousseau, 2006). By formal research we mean the systematic gathering, analysis, and interpretation of information to describe, predict, explain, and/or manage a phenomenon of interest. The critical appraisal of formal research is a central focus of EBMgt education.

Instruction in research fundamentals should be included in EBMgt-related education, although the exact form likely depends on the nature of the course (e.g., substantive vs. methods focus) and the students’ prior training. Fundamental considerations include things like types of variables such as independent and predictor, dependent and criterion, mediator and mechanism, and moderator and contingency. Students can be given examples exemplifying each type and asked to work in groups to generate their own **Variable Type and Hypothesis Example** as an in-class exercise. Although a seemingly simple exercise, it provides opportunities for discussion and clarification of concepts

both in working with small groups and in plenary discussion of groups' examples. Other fundamental considerations include control and validity (see, for example, Pedhazer & Schmelkin, 1991). We also discuss threats to validity and threats to legitimacy of findings. The latter includes the perspectives of stakeholders that might not have been accounted for in the way a study was framed. Such might be the case in research on high-commitment work systems, which tends to emphasize benefits to the firm in terms of productivity and a motivated workforce but ignore its potential impacts on employee health or work-family balance.

The research trinity, the elements design, measurement, and analysis, defines the core of empirical research (Kline, 2008; Pedhazur & Schmelkin, 1991). They are covered more explicitly in a business research methods course than, for example, in a substantive course on management. Covering these elements aids in critical appraisal of research reports as well as helping students plan their own projects (e.g., Preliminary Research Proposal). Integrated coverage of the research trinity is recommended to “foster a sense of how each of design, measurement, and analysis gives context and meaning to the others” (Kline, 2009, p. 39) and provide a foundation for more advanced learning (i.e., interacting elements; see Goodman & O’Brien, this volume). Coverage of the research trinity may be constrained in any single course. Still, an integrated framework accommodates some coverage of measurement and statistics as well as qualitative approaches to data collection, analysis, and interpretation. More advanced content related to the research trinity can be supplemented by later courses or independent studies.

Although the multidisciplinary nature of business research makes it difficult to identify universal evaluation criteria, O’Leary (2004) provided a set of indicators of good research that are useful for judging the credibility of research conducted from various perspectives. Research credibility is higher to the extent that subjectivities are managed, methods are approached with consistency, the “true essence” has been captured, findings are applicable beyond the immediate context, and the research can be verified. These indicators can be used to foster critical engagement with others’ research as well as serving as goals for one’s own research (O’Leary, 2004). We have also provided students with other readings or summaries of criteria for appraising research and research reports. Rousseau et al. (2008) outlined six criteria for evaluating evidence which are especially applicable to a synthesis of a body of knowledge. Other indicators of good research come in the form of criteria for evaluating a research report, such as reviewer’s checklists (e.g., Colquitt & Ireland, 2009; Derosiers et al., 2002). Such checklists can provide advanced frameworks to help students organize incoming knowledge about critical appraisal and possibly be used as aids for practicing EBMgt.

To provide a practice opportunity in critical appraisal, a **Favorite Article Review** assignment asks students to appraise highly respected articles from prestigious peer-reviewed journals using indicators of good research. The objective is to help students articulate what they find particularly compelling about their chosen article while providing multiple (e.g., three) models of good research and writing for students. Students recognize that even highly acclaimed

studies are imperfect, yet the Favorite Article Review assignment is meant to be relatively inspirational. Its purpose is to foster a mindset that is critical, constructive, and appreciative of well-executed research.

We have tried a couple of variations of the Favorite Article Review assignment. In one version, students prepare papers of up to six double-spaced pages wherein they discuss the compelling features (e.g., exposition, design, measurement, analysis, interpretation, & implications) of their favorite of the target articles. They are asked to assume they are writing an award nomination for that article. They are also asked to identify areas in which their favorite article is deficient and suggest ways that future research could remedy those deficiencies. Brief descriptions of the other target articles can be included, but detailed review of all three articles is not required. Another version of this assignment asks students for a shorter write-up of the pros and cons of the target articles (e.g., one page) in terms of usefulness to practice, along with a stated choice and rationale for the one they see as most useful to practice. The pros and cons of each paper are subsequently discussed in class and the class votes on the most useful paper in terms of informing management practice. Different instructors have also varied somewhat in terms of the target readings assigned. To date three of the following articles have been used for this assignment, which also goes by the name Fun with Evidence or Award Winning and Otherwise Famous Studies: Audia, Locke, and Smith (2000); Frese, Garstf, and Fay (2007); Margolis and Molinsky (2008); and Sutton and Rafaeli (1988). Instructors should be aware that some resourceful students have used their literature search skills and found Frost and Stablein's

(1992) book, *Doing Exemplary Research*, in which the Sutton and Rafaeli paper is featured. Use of the commentaries within that source, with appropriate citations, may not be a problem depending on the instructor's perspective. Nevertheless, the availability of external commentary on award winning articles is something to consider.

Critical thinking about claims made by authorities is important to encourage. One assignment in that regard is the **Myth of Market Share** reflective paper. The assigned reading is Armstrong's (2007), *The 'Myth of Market Share': Can Focusing Too Much on the Competition Harm Profitability?* (*cf.* Armstrong & Collopy, 1996; Armstrong & Green, 2007). Students are assigned to write a brief (one page) paper reflecting upon how market share has been treated in their business school and university education more broadly. Students are also asked to consider any evidence they have that market share-related course content has been evidence-based. (At Carnegie Mellon, our Finance faculty does a good job of debunking students' beliefs regarding market share's importance. This assignment has become more focused on how to convince others in a company to be less competition-oriented and focus instead on business and profitability improvement). Providing "reader beware" examples of EBMgt proponents' contrasting positions is another way to encourage students to reflect carefully on authorities' claims. For example, as noted by Rousseau et al. (2008), whether or not incentive pay is deemed to be an effective motivator may depend on which EBMgt proponent you ask (*cf.* Pfeffer, 1998; Rynes, Gerhart, & Parks, 2005). Topics such as pay-for-performance can be investigated in more

depth as part of students' assignments wherein they refine one or more questions, seek relevant evidence (as well as theories and opinions), and critically appraise the information they obtained. Titles and details of the assignments of this genre may differ, but all have students get and critically appraise practice-relevant evidence.

Working in groups, students select a business problem within one of their organizations or develop another practice-related question to examine. Past groups have chosen to examine the construct of employee engagement, the role of personality testing in hiring, and some of the barriers to women's advancement such as the glass cliff (See for example Ryan & Haslam, 2005, 2007). Other specific questions might look like these: When are distributed teams more likely to perform effectively? Would pay-for-performance work in our company? When is investing in workforce training most likely to be financially beneficial? Students consult with the instructor with respect to their topic and specific questions. Students are required to use an EBMgt approach to examine the fad or phenomena they have selected. The group reviews the literature to examine the topic and includes information from other sources, such as the local context. Their task is to evaluate the literature and marshal the best available management and social science research to answer their question. Deliverables for assignments like these include papers (of lengths varying from 2-3 to 6-8 pages) and presentations. An instructor may require an annotated appendix to describe the search process the group employed to identify their sources. Often times, students discover that the evaluated-research evidence does not support the management

practice that is commonly used in business. After reviewing and evaluating the literature, the group may be required specifically to address the “so what” question to determine the practical implications for managers in the workplace, examining ways in which we can meaningfully incorporate evidence (rigour) into practice (relevance). One important learning point for the students is to construct a table describing each study’s quality, context, variables, and findings. Without a table, students tend to interpret each study separately (as one-offs) and have difficulty integrating the studies. With a table, patterns and trends become more apparent. By doing an assignment like **Myth Busting** or **Get the Evidence** twice in a term, students recognize what and how much they have learned. This experience reinforces the value of having opportunities to practice the kinds of behaviors and techniques we seek to help transfer to students’ work lives.

Integrating EBMgt Elements to Support Decisions and Actions

We emphasize the four EBMgt facets (Briner et al., 2009) through various exercises and assignments discussed in the previous steps. Classroom-based education, like ours, may foster knowledge about EBP, whereas EB education that is more closely integrated to practice settings seems to result in improved skills, attitudes, and behaviors (Coomarasamy & Khan, 2004). Moreover, “it may be unrealistic to expect university students to reach expert performance levels in EBP by the end of their educational experience” (Thomas et al., 2011, p. 262). Those insights on EB education in health domains are important to consider. Classroom-based interventions may not be as powerful as practice-integrated EB education in affecting all relevant outcomes (e.g., attitudes, skills, behavior).

Nevertheless, classroom teaching can incorporate cases and projects, including those dealing with real and current problems, to augment the authenticity of learning (Coomarasamy & Khan, 2004; Thomas et al., 2011) and provide a foundation for longer-term development.

Other assignments, though contrived, afford students opportunities to practice anticipating and planning for the challenges they may face in applying EBMgt. **That's Incredible!** is one such assignment. The content deals with employee selection, perhaps the most thoroughly researched management practice organizations use. Employers recruiting, screening, and hiring new employees can draw on 100 years of systematic research. Nonetheless, the vast majority of employers, even large corporations, use selection practices known to be invalid. For this assignment, students are asked to read Highhouse's (2008), *Stubborn Reliance on Intuition and Subjectivity in Employee Selection*. In two or three pages, students are asked to (1) summarize the gist of the findings from selection research; (2) explain in their own words (a) why companies fail to act on these findings, and (b) what makes the findings difficult to act on; and (3) suggest two or three ways to overcome the problems of #2 to help companies apply the beneficial findings from selection research. Guidance regarding ways to overcome problems is offered in the form of "sticky evidence" considerations (Rousseau & Boudreau, 2011).

A more context-specific assignment is the **Persuasive Paper**. Students prepare a short (2-3 page double-spaced) paper in which they attempt to convince their (hypothetical or real) manager to take a particular "evidence-informed"

action, using evidence and organization-related facts. A few of these have been written up as dialogues between themselves and their boss, sometimes in dialect. Topics for the Persuasive Paper relate to substantive issues discussed in class (e.g., whether to outsource the firm's HR function, use team-based rewards, or pursue a merger with another firm). Students are cautioned that many bosses have little professional management training and even less knowledge of social science. Criteria for evaluating papers consist of (1) how effectively the student marshals the best scientific evidence to make the case, (2) the extent to which the student has made the case in a strong, truthful, and convincing manner, and (3) how well the student used facts about the particular organization (again, real or hypothetical) to help make his or her case "sticky" (Rousseau & Boudreau, 2011).

A similar context-specific assignment is also used in a second-year EMBA course. Students are engaged in **The Great Debate** assignment to encourage critical appraisal of all four sources of evidence and to use the evidence to develop a compelling argument to support their case. The instructor assigns sets of three students to work independently on a specific debate topic. For each topic, there is a person to take each of the two sides of the debate and one moderator. Two participants in the debate taking a specific side must develop their position and argument using an EBMgt perspective and incorporating all four sources of evidence (Briner et al., 2009); and the moderator becomes familiar with both sides of the debate and develops questions to highlight the key issues. Debate topics in the past have included "is EBMgt a fad?", "are MBA programs contributing to a leadership crisis?", and "should organizational leaders assume the responsibility

for employee health and wellness in the workplace?” The debates are held in-class and provide a rich platform to stimulate further discussion.

Encouraging students to reflect, self-monitor, and engage in meta-cognitive processing should help them develop adaptive expertise for dealing with new and complex problems inherent in the practice of management (Goodman & O’Brien, this volume). De Dea Roglio and Light (2009), in a study of EMBA students, developed a model of the “reflective executive,” offering insights to scholars and educators about ways to bridge the rigor-relevance gap. The concept of the reflective executive focuses on the convergence of connective, critical, and personal thinking. For the EMBA student to experience this convergence, the learning environment must be structured around adult learning principles, with an instructor acting as a model and guide to prompt open dialogue and reflection.

Reflection and self-awareness is the goal of having each student complete a **Learning Diary**, log, or blog as part of course requirements (*Learning How to Study Again*, Dawson, 2004). Students are encouraged to make regular entries and instructors provide examples of ideas to help students get started. Diaries are to go beyond a descriptive record of what students have done, read, or noted in class. Instead, examples they receive encourage reflections on course readings, class discussions, group work, what they have learned, what they have found difficult, what they need to learn more about, and demonstrated applications of course learning to practice (e.g., raising the issue “what’s the evidence” outside of class). To date, a variety of diary formats have been used (hard copy, word processing files, web-based, e.g., google.docs). Sometimes diaries have been

reviewed only upon completion of the course. Or the instructor may review diary entries and engage with students as the course proceeds. Pragmatic versions of the latter are likely more valuable to students and instructors. Through diary assignments, we hope to develop conscious, reflective habits among students, as well as help them to be more effective learners. Studies show that “good” learners organize their learning, set their own goals, seek practice opportunities and monitor and evaluate themselves effectively (Ambrose, Bridges, DiPietro, Lovett, & Norman, 2010). Diary keeping not only encourages reflection and preserves valuable insights, but may also reveal attitudes and beliefs hindering learning. Students receive support and feedback to encourage authentic reflections on their personal learning experiences. Entries can transition over time from being descriptive to being analytical, from accepting to questioning, from doing to thinking, and ultimately to doing while being reflective and self-aware.

Instructors can further encourage students to plan to apply and continue their learning through a **Letter to Self**, which students complete as an in-class exercise in one of the final class meetings. This letter can be posted to www.futureme.org to be automatically sent to the student six months (or several times) after course completion. Relapse prevention is a concern in promoting knowledge transfer. It is an important concern in EBMgt given that learners will work in settings not necessarily supportive of integrating evidence into decisions.

Evaluating the Process

The final step in the EBMgt process we adopted involves evaluating the process in terms of efficiency and effectiveness with respect to the previous steps

(Barends, 2010; Thomas et al., 2011). The evaluation phase involves reflection on the EBMgt process as applied to a practical opportunity or problem. Reflective evaluation is an opportunity to use systematic approaches to gather evaluation-relevant local evidence and stakeholder perspectives. One approach we have taught in class to support students' EBMgt practice can actually be used to evaluate the progress made and needed improvements within EBMgt courses. Modeled after the **After Action Review** (AAR) used in the US Army (Garvin, 2000), it reflects the process improvement approach investigated in project research (Cho & Egan, 2010; Darling & Parry, 2000). After discussing the evidence on the importance of task and process feedback, we show the Harvard film (*Put the Learning Organization to Work: Learning After Doing*) and then use it to engage in a mini-after action review midway through the course. Students form small groups to identify features of the class that should be continued, where they recommend change or improvement, and lessons learned (in this case, about effective learning processes for EBMgt). Groups then report-out through a spokesperson to provide psychological safety in voicing criticisms. Following the next group assignment, students participate in an AAR in their study groups during class time and then share their lessons learned with the class. At the end of the class we do a full-blown AAR. One major idea from final AARs to date is the importance of more cases and more explicit framework for organizing evidence and business information.

At the last class, students also complete an assessment (now also given as a pre-test on the first day of class) to indicate how they rate themselves on

specific skills the class intended to address and on meeting their learning goals. These have included either initial goal choices identified by the instructor or a set of learning goals collected from students in the first week of the course, and students are asked the extent to which each of the goals was met during the course (1-3 scale: *not at all, somewhat, substantially*). Goals include such dimensions as “Find evidence,” “Use evidence to make better decisions,” “Persuade others with evidence,” “Define problems in my work environment that can be addressed with EBMgt,” and “Show others how to practice EBMgt”. Finally, students are asked to rate their “current level of expertise regarding evidence-based management” from (1) novice, (2) between novice and intermediate, (3) intermediate, (4) between intermediate and expert, and (5) expert. It is perhaps a comment on the success of the class that ratings on day 1 usually turn up a couple of students who rate themselves EBMgt “experts”, while there are no self-rated experts on the post-test. The vast majority of students judge themselves to be either novices or between novice and intermediate at time 1, increasing at time 2 to between novice and intermediate or intermediate, an outcome consistent with expectations. The last class is dedicated (prior to the final AAR) to the topic “next steps on the road to mastering EBMgt” to help students envision how they might continue to develop themselves as professional EB managers post-graduation.

The effectiveness of EBMgt teaching lies ultimately in whether it transfers to the workplace. In particular, EBMgt’s focus is improved quality of managerial decisions and organizational practices. As all forms of education increasingly

emphasize assessment and accountability, evaluation of the effects of EBMgt teaching will be closely linked to the effects of EBMgt itself (Reay et al., 2009).

Conclusion

Teaching EBMgt is a work in progress. It is increasingly prominent in executive management programs and executive doctoral programs (Salipante & Smith, this volume). Textbooks (Pearce, 2011, this volume) and cases (Kovner, Fine, & D'Aquila, 2009) are appearing and ease the transition to this innovative form of management education. In its EBMgt 1.0 phase, educators have the opportunity to apply evidence-based principles of learning in novel and creative ways.

Further integration of the EBMgt perspective and skills into other courses provides students with more opportunities to refine their skills and helps make searching for the best available evidence a habitual response. We enjoy the challenge teaching EBMgt poses and invite you to join in.

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